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Physics and geophysics — what is the difference?

Abstract

The presented article substantiates the invalidity of several key statements accepted in geophysics, but absent in classical physics. This leads to a distorted perception of the structure of planets and to the phenomena observed on the surface. It is hoped that the common sense of researchers will accept these substantiations as a tool for further exploration of nature. Any constructive criticism on the topic is welcome.

Keywords: oceanic tides, magnetic field, geotectonics, planetary structure, convection, geophysics

Volume 10 Issue 1 - 2026

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Received: January 30, 2026 | **Published:** February 12, 2026

Notes

1. Everything described in this article in no way applies to specialists working in applied geophysics, but I hope they will find some of the facts interesting as well.
2. There are many examples of the approach described, so to avoid leaving anyone out and to keep the text uncluttered, I have not listed specific sources.

Newton is credited with the quote: "I feign no hypotheses" (Hypotheses non fingo). The full phrase is longer: "I feign no hypotheses. For whatever is not deduced from the phenomena is to be called a hypothesis; and hypotheses, whether metaphysical or physical, whether of occult qualities or mechanical, have no place in experimental philosophy."

The primary difference between geophysics and physics is that its postulates and conclusions cannot be verified through experimentation

This is exactly what geo-"physicists" exploit, constantly inventing processes and properties that supposedly take place inside the planet. Measurement data rarely serves as the evidentiary basis, and when it is present, it is applied to an unsubstantiated model of the planet, thereby distorting the actual nature of the process

In this field of "science," the status of a "scientist" is of immense importance—the higher the position, the weightier the "arguments." It would be one thing if these were presented as hypotheses or conjectures, but instead, all kinds of mathematical models are built upon them. This material is then published in affiliated journals and books and presented on television with a "scholarly" demeanor as if it were a proven fact.

Unfortunately, with this approach, even blatant violations of fundamental, proven laws of physics occur with the full consensus of the entire mass of "scientists." These positions are taught in universities and schools and presented as absolute truth to unprepared audiences.

So many titles and merits have been obtained through this approach. So much fog is cast over simple phenomena. So many newly introduced concepts (or "hidden properties," as Newton called them) are born that it is impossible to understand anything without a specialized dictionary. And even with one, it is often no better. Sometimes these articles resemble a collection of arbitrary, random, quasi-scientific terms. Instead of describing facts, they offer nothing but references to names.

As for mathematical models, that is a whole different story. Without understanding or knowing the underlying physics, people manage to concoct all sorts of models! These models are then accepted as reports and publications, met with complete silence and zero resistance to such an approach. One hand washes the other.

In physics, all discovered laws and phenomena are applied in practice—within devices, instruments, and daily life. Nearly all of them have been derived from experiments through empirical means and confirmed, at the very least, by laboratory research.

Adhering to Newton's approach, let us examine some currently accepted "achievements" and demonstrate their lack of substantiation, and moreover, the invalidity of the conclusions and theories built upon these hypotheses.

Accepted in geo-"physics," but not real and not confirmed

"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 movement of a moving coordinate system on the relative motion of a material point." In some definitions, it is explicitly stated that this "force" is fictitious. This force does not actually exist. It is a conventional "force" introduced to describe the behavior of a body when transitioning between different observations systems. There is no source of this force in nature. It moves nothing anywhere and acts on nothing. The fact that an observer changes their point of observation, and the planet has rotated by a certain angle during the flight of a stone (or projectile), does not change the projectile's rectilinear motion. It is often confused with frictional forces. It is used to explain cyclones and currents. However, real phenomena cannot be explained by a fictitious force.

Satellites neither fall onto their planets nor "miss" them

They move in orbits where centrifugal forces equal centripetal forces (gravity). In physics, the motion vector during free fall is directed toward the center of mass — toward the Earth. In "geophysics," for some reason, it is directed parallel to the planet's surface. It is interesting how proponents of such an approach envision a fall that lasts for years, with acceleration, yet without any increase in speed? The acceleration of curvilinear motion — which is not free fall, but is what forms the trajectory — compensates for the deviation from rectilinear motion.

It is precisely because there is no free fall that tidal effects caused by the influence of the Sun and the Moon are observed on Earth. These are clearly recorded by gravimeters. Such effects could not arise during free fall. And since there is no fall, it becomes possible for substances inside the planet to separate by specific gravity under the influence of an external gravitational force. A clear example of such separation is a simple aquarium.

Convection inside the planet

There is no convection within the body of a planet, nor can there be. When describing convection, a heating kettle is often used as an example, but a planet is not a kettle; it is more like a thermos. In a thermos, there is no convection, and there cannot be — once the temperature is distributed, it does not change that distribution unless there are external influences. If there is no heating of the planet by the Sun, the surface temperature drops into the negatives, which means that the heating from inside the planet is very small.

How can a process of simultaneous heating and cooling occur for many millions of years within the closed, thermally insulated volume of a planet? This contradicts all known laws of physics. But in geo-"physics," this is not only permitted but also forms the basis of many "theories (Figure 1)."

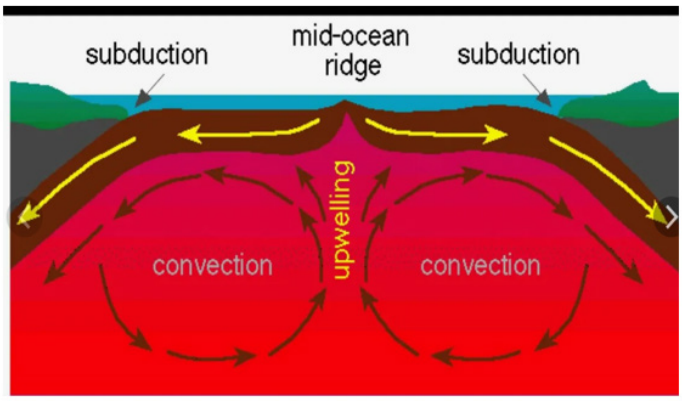

Figure 1 Convection.

Such drawings (from the internet) do not reflect reality: rising currents will not descend without cooling. The ocean does not boil and does not absorb heat, yet the temperature difference between the planet's surface and beneath the crust exceeds [3000] degrees Celsius. There is no active heat transfer. It is a thermos, a very good one that has been working for many centuries.

These currents are used to explain the generation of the planet's magnetic field, tectonic movements, and the emergence of fairytale-like plumes, jerks, and much more. This is exactly what is meant by "hidden properties that have no place in experimental philosophy or science." By accepting the convection hypothesis as a working one and building theories on this basis, "scientific" workers stray far from reality, replacing it with fantasies and models. Yet reality, as seen in the example of a teapot, shows that the teapot eventually boils, and there is no longer any convection even within it; instead, there is violent mixing at a single temperature throughout the entire volume. Additionally, it should be noted that convection implies a constant influx of energy. It would follow that there must be an eternal, inexhaustible source of heat inside! The reality observed on the planet provides no examples of such a thing.

Furthermore, it is necessary to mention such a physical phenomenon as simple thermal conductivity, which, even in thermal insulators, exceeds the assumed speed of convective flows (5-8 cm/year) and negates the assumed temperature difference.

The possibility of the proposed convection is ruled out by any of the stated facts.

Based on the above, everything founded upon this hypothesis must be considered inherently false

Now imagine how many academic degrees have been defended, and how many prizes, salaries, and awards have been granted using this hypothesis. Its exploitation continues, hindering the pursuit of the true physics of the Earth and geophysics.

It is doubtful that a nuclear reaction (the radiogenic hypothesis) is the source for maintaining the high temperature inside the planet for the following reasons:

a) Lava flowing from volcanoes has low radioactivity compared to, for example, the radiation in a nuclear power plant reactor.

b) Moreover, the concentration of radioactive elements is very low in the total mass of the planet, and there are no prerequisites for their concentration in the center.

c) Most of them have a short half-life and should have decayed over the lifetime of the planet.

The tide of water in the ocean does not correspond to, and is even opposite to, the tide (bulge) of the Earth's crust

Example - if you press from below on a plastic plate with water, the water will spill to the edges and there will be an indentation at the point of pressure. This is why tides are mainly observed near coastlines and are almost absent in the open ocean, and do not follow directly behind the Moon and Sun as they should according to modern geophysical theories. More details can be found in paper,[1] where combined graphs of Earth's crust and ocean level changes are presented, clearly showing the relationship between water outflow and the planetary body's "bulge".

There is no such concept as "geodynamo" in classical physics that supposedly generates a magnetic field.

Such illustrations demonstrate the distortion of several laws of physics at once:

A. Continuous convection within a closed volume is impossible; it is an example of a contrived perpetual motion machine, contrary to all known physics.

B. The Earth's rotation cannot twist flows in the manner depicted, with directions alternating back and forth. It is incapable of twisting anything inside the planet at all. To imagine a yolk rotating independently within an egg during uniform, slow rotation (one revolution per day) is only possible by disregarding all known laws of friction and the effects of viscosity.

C. Neutral flows cannot generate a magnetic field. If they are polarized, what is charging them and how? Furthermore, why are they not neutralized while existing in conditions of high conductivity?

D. The magnetic field lines resulting from such depicted flows would not produce a magnetic field oriented as it is in reality (Figure 2).

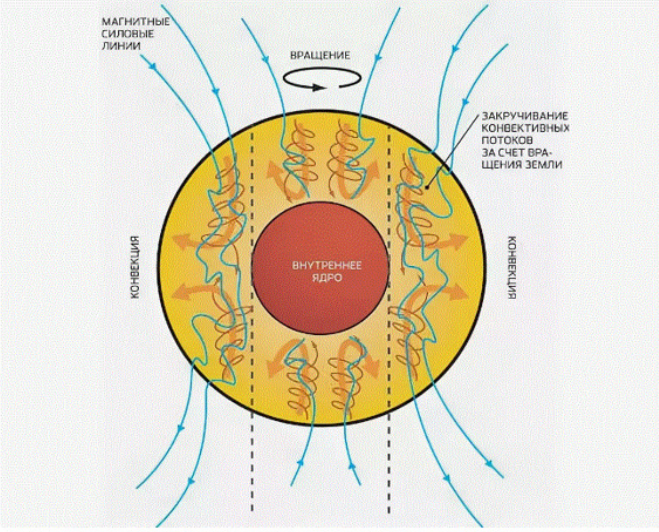

Figure 2 Geodynamo.

This is an example of attributing contrived, hidden properties to an object and constructing theories based on them that have nothing to do with reality—theories unsupported by proven laws of physics, surface observations, or any empirical data.

In geo-"physics" alone, having failed to find the true cause, they devised a concept known as "geodynamo." A "dynamo machine" (an obsolete term) is a device, not a process, designed to convert electrical energy into mechanical energy and vice versa (the modern term is an electric motor). The "geodynamo" concept is utilized in nearly all publications related to the nature of planetary magnetic fields.

In physics, a magnetic field is created by an electric current or a permanent magnet

The magnetic field of planets is generated by a flow of charged masses within the planetary body, which is equivalent to an electric current. This flow is well-registered by gravity measurement data. On different planets, these flows have various directions and trajectories, which coincide with the magnetic fields they generate.

The mechanics of how this occurs are described in works.[1,2]

Natural oscillations of the planet

This is roughly equivalent to the expression "natural oscillations of a brick." The meaning is the same. Yes, everybody has its own resonance frequency, but these are not "natural oscillations"; it is the oscillation frequency at which the body reacts most strongly to an external influence. When that influence disappears, the body, according to its own damping time, returns to its initial state of rest. However, the Earth, like a brick, does not oscillate on its own; they have no perpetually operating mechanism inside. Only external influence brings all bodies out of the state of minimum entropy. There is no need to attribute non-existent properties to them; rather, determining which forces, bodies, or external fields affect the mass of the planet and cause the measured oscillations is exactly what geophysics should be doing.

The core of the planet

Let's assume that the planet has a structure as it is currently accepted. Fig.2. In this case, the temperature and pressure in the core will cause the substance to lose its chemical properties and approach the state of high-temperature plasma. This is based on the findings of physicists who study the properties of materials at high temperatures using specialized equipment.[3] However, in the field of geoscience, it is commonly believed that the core is composed of iron and nickel. Moreover, it is believed to have its own independent life, rotating separately from the main body of the planet. In general, measuring the rotation of a sphere, no matter which one, is not an easy task. Any auto mechanic will tell you why marks are placed on the pulleys. Without marks, it is impossible to fix the rotation.

Conclusion

This short article is intended to make us think about what is being imposed upon us through these postulates. If it stems from a sincere misunderstanding, it might be excusable, but what if people are being deliberately misled for the sake of mercenary interests? In any case, many materials, including educational ones, must be re-examined and the appropriate conclusions must be drawn.

Acknowledgments

None.

Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this study.

Funding

None.

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