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The Dialectics of Science and Magnetism

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Abstract

The lack of rigor and the resulting ambiguity of the definition of the magnetic field were hidden behind a mathematization borrowed from hydrodynamics. But in both cases, ideological aspects remained unexplained, leading the very existence of the rotor used to a direct contradiction with curie's theorem. And through maxwell's electrodynamics, this contradiction was extended into the theory of relativity. Thus, a formal, in-depth combing of the basic experiments underlying the theory of relativity, through modeling and a more rigorous mathematization of the magnetic field, proved insufficient. A refinement upwards, into the realm of the basis that defines the understanding of relativism, was also required. And this view from above gives us not a polished history of persons, but the genesis of scientific ideas.

Kaywords: fragmentation of science, contradictions of fragments, paradoxes, the principle of logarithmic relativity, elementary mathematics, relativism.

Multidimensionality

Dialectics itself the art of arguing with oneself, according to plato means nothing more than a comprehensive examination of the subject of discussion, including its obvious contradictions paradoxes. Friedrich engels translated dialectics from the spiritual world to the material world, to the world of properties that characterize nature itself, i.e., to the physics of reality [1]. Friedrich engels' dialectics of nature can be clarified and deciphered by taking into account the principle of logarithmic (ordinal) relativity where and at what scales can and should one move from the description of the behavior of, say, individual particles to the description of fields or waves [2]. Thus, instead of engels' impersonal ORs, we obtain ANDs, strictly defined by the boundaries of applicability, the functional relationship of which was conceptualized by the blind mathematician pontryagin. And thus, we will bring the body of science, with its models and theories, into strict correspondence with the dialectics of nature itself. At the same time, the founders of quantization intuitively projected the principles of our consciousness, phenomenologically psychiatry onto the organization of matter [3].

But this "instantaneous" correspondence has a tiny error: nature is not static, and science, as the highest level of consciousness, lives and develops. In principle, the "locomotive" of science runs behind the "locomotive" of nature, which changes over time and runs away. But whether science can "jump" onto the "step" rushing past us depends on the life and development of science, i.e., on its internal dialectics. After all, the very development of nature, including the emergence of life, is determined, as ilya prigogine [4] understood, by the currents of chaos. And the highest level of consciousness science, operating on the border of chaos and understanding is itself subject to chaotic currents, both externally and within the body of science. And science, like art, strives to harmonize the awareness of harmony within nature itself. Only if art harmonizes images (including music) does science harmonize our sensations of nature, while eliminating, thanks to mathematics, the jumble of thought [5].

The goal of a comprehensive examination of the subject of discussion in science is the search for truth, which, by definition, can only be free. But comprehensiveness can also be directed toward infinity, which lenin proposed replacing with the choice of the main link. And the choice of subjects of discussion requires limitations, for "the immensity cannot be grasped." Otherwise,

we will have an infinite value of purely local judgments, which in fact form the streams of prigogine's chaos, only not in nature, but in consciousness.

But both restrictions on freedom are justified only if introduced by someone possessing a lofty flight of thought. Therefore, to avoid chaos in consciousness, a scientific head is simply necessary. Just as an orchestra cannot play a complex piece of music without a talented conductor, and just as a stage in which people "believe" cannot be constructed without a talented director, so without a talented, true scientist, a scientific team will merely imitate activity, but will in fact be treading water. Attempts without such a head to impose restrictions on freedom of thought" ordering to think this!" Are like a dam on the path of chaos, which, when overflowing, will collapse, equating to a catastrophe for both science and consciousness as a whole. For example, planck's quantum initially denoted the minimum resonance energy, specifically, a resonant wave whose wavelength is equal to an integer fraction of the length of the wall of planck's box. But without an understanding of this elementary thing, anything, small in size and large in energy, was classified as a quantum. And, in doing so, they effectively built a dam in the path of a number of studies.

SENSATION-UNDERSTANDING

Perfect organoleptic human sensations, enhanced by the development of certain areas of the brain, allow not only sculptors, artists, and musicians, but also scientists, to subtly sense nature. Moreover, when perfected, they exceed many, many orders of magnitude in instrumental measurements. Thus, the sensations of mozart, bach, raphael, nikola tesla, and leon theremin were many orders of magnitude more accurate than the instruments of not only their time, but also many modern ones. Similarly, newton, one might say, based on sensations, constructed his theory of light from particles, which was later replaced by huygens' wave theory, and then clumsily reinstated with the help of einstein's nobel prize for the photoelectric effect. Clumsily, "thanks" to bohr and his principle of compatibility of mutually exclusive entities in nature. Sometime later, the blind mathematician pontryagin "saw" understood that dualism in nature requires no mutual exclusion (in bohr's mind). That between different functional sets, there are simply connections. So, too, the elementary fourier transform allows us to move from a particle description to a wave description. But mathematicians have not yet attempted to comprehend goethe's sensations, as he described them in his book "the theory of color," an alternative to newton's theory of light.

And the expansion of our sensitivity orders with instruments, based on generally accessible sensations, provides a comprehensive understanding of the expanded physical reality. And this expansion is ensured by elementary logic, which, in fact, forms the very body of science the description of nature and man within it. Without this body of science, without its theories, time will "erase" the understanding of nature by genius (as already happened with tesla and theremin), and "everything will repeat itself from the beginning." Many reasons can be found for such a vicious cycle. But looking ahead a little, we can say that the "dualism of understanding" arises from the gaps in sensations on different scales. And this "dualism" (in the head) can be avoided by taking into account the principle of logarithmic (ordinal) relativity the alternation of field and partial descriptions.

But the formation of understanding of nature itself did not come (in the history of our civilization) immediately. Weyl once formulated it simply: "symmetry rules the world" [6]. He started from the statistical description of nature, but ilya prigogine, as already noted, pointed out that static harmony also arises in streams, i.e., in fact, in time.

And, at the same time, the struggle between chaos and harmony occurs at different levels of the organization of matter, including at the level of consciousness, which is most clearly manifested in science, which, at its core, must adhere to the principle of causality and logic. And the apotheosis of this was niels bohr's "principle of complementarity of mutually exclusive entities in nature." Although it primarily characterizes bohr's own psychological state, who mistook the schizophrenic fragments of his own consciousness for the unified phenomenology of nature. Thus, by pushing aside the founders of quantum theory, max planck and albert einstein (including nobel prizes for "quantization") and promoting schrödinger's "quantization," niels bohr set the false direction for the development of all modern quantum theory.

RECOGNITION-AWARENESS

The history of science itself is written, unfortunately, not in ideas, but in the faces of scientists recognized as outstanding. And although it is written from the words of scientists, it is primarily written by lyricists and philologists, or by fellow witnesses. That is, it is written, by and large, without understanding the essence of the physical problem, but based on the sensations of an "observer" of the development of a scientific idea. And this became one of the main reasons for the sharp fragmentation of the phenomenology of science.

Thus, at the instigation of niels bohr, not just recognition, but deification of the schrödinger equation occurred. In fact, niels bohr forbade awareness of the fundamental aspects of quantization, introduced by max planck and taken up by einstein. So, they were awarded nobel prizes instead of recognition of the essence of quantization. While einstein's theory of relativity brought him recognition, landau relegated his teacher, planck, to last place in his logarithmic table of the stars in physics. And the entire edifice of modern quantum theory was built on the foundation of the deified, containing the mutually exclusive. The deified, the mutually exclusive, contains both elementary mathematical errors and excludes the principle of causality. So, it's not surprising that, in the conceptualizations of such a description, the entire world arose instantaneously from a point. After all, einstein wisely remarked regarding the schrödinger equation: "some (correct) equations of classical physics (simply) allow rewriting in operator form." But a purely technical technique from the field of applied mathematics the operator notation of equations was recognized by the global scientific community as "new thinking" in the realm of the ignorant gorbachev's policies. Thus, matisse, by commissioning his philologist wife to write the introductory chapter on the classical understanding of magnetism in his book "the theory of magnetism," essentially relegated classical physics to the category of insignificant history. But even to write a genuine history of science, scientists need to understand the problems their

predecessors attempted to solve. Only when they reach a higher level of understanding will they see the errors of their predecessors, and the history of science itself will reveal, on the one hand, tragedies of science worthy of shakespeare's pen, and on the other, a deeper understanding of the phenomenology of the section of science being analyzed. Thus, "quantum" theorists like matisse, who disdainfully (why, i'll explain later) treat classical physics and, thus, lose touch with reality, are profoundly wrong and, in fact, have added nothing fundamentally new to understanding. The basic formulas, constructed on the basis of a previously achieved understanding, are simply being stupidly used. This detailed analysis of the basic formulas also has some merit, but the opportunistic adaptation of conclusions to them, with the sole justification of "that's how it works from the formula," cannot in any way be considered scientific progress.

At the same time, true scientists, like true artists of any kind of art, extract their own creativity from themselves. Grisha perelman's refusal of a million-dollar prize was precisely due to the fact that a shadow of suspicion arose that he was passing off something not his as his. He rejected the scientific environment altogether because he simply knew its narrow circle and was unaware that the homespun truth is needed and understood not only by narrow specialists, but by everyone. And this is no coincidence. As mathematicians themselves understand, juggling abstract concepts in formulas is not the highest level of skill, even in mathematics itself. The highest level of skill is juggling images, which grisha has mastered to perfection. Therefore, theoretical physics, following the mathematical fashion, has now been completely reduced to juggling formulas and, thus, has become disconnected from reality. Richard feynman with his graphs methodologically shifted toward images, but he did not dare extend this methodology to the foundations of quantum mechanics, limiting himself to the phrase: "my path integrals, just like the schrödinger equation, do not explain quantum mechanics; they are simply a simpler way to solve the schrödinger equation." But creators need recognition. And it does not always come, and not always in the form recognized by the creator himself. This leads not only to the personal tragedy of the creator, but also leads science away from the correct guidelines, leading it into dead ends [7].

ELEMENTARY Mathematics and Reality

Mathematics essentially teaches us to think correctly. But the statement by a prominent mathematician, "mathematics is the language in which the universe speaks to man," is an absolutism a clear exaggeration. That mathematics is at the very forefront of the struggle between harmony and chaos is undeniable. But at the same time, the infiltration of chaos into mathematics is also inevitable. Even a mathematician, by hitting the highest "note," can slip into a falsetto. And since the rules of selection, as in physics, are essentially nonexistent at the very forefront, to prevent mathematics from becoming detached from reality and completely immersed in a purely abstract mind game, it desperately needs an elementary foundation its internal invariants, the principles of mathematics, even if they are still intuitively borrowed from the universe. Without them, mathematics itself would easily fall out of the "gutter" of reality.

Grisha perelman, like no one else, could competently reconstruct the foundations of correct thinking elementary mathematics. But he, having rejected science along with the scientific community, did not respond to my request for this in a popular science article. Therefore, i, who was introduced to the theory of numbers and sets as a child by professors of pontryagin's school, but who later moved on to physics, must begin with some elements of mathematics, which are the homespun truth, accessible to everyone, not just narrow-minded theorists who themselves are "lost in the woods" of the phenomenology of nature and have been unable to do anything better than mathematize the creation of the world according to the bible, which is no older than its authors.

And phenomenology is nothing more than a correct description of an effect, used in constructing its mathematical description, a first approximation, which sufficiently fully and rigorously describes the effect being analyzed. That is, phenomenology is a qualitative description of effects in words (which was mastered to perfection by roentgen's student, academician ioffe, about whom they said: "he knows the answer to any physical question"), followed by the translation of words into a minimal set of equations that give a correct description of basic experiments. The equations can be very simple - algebraic (with the help of which academician mandelstam could describe all physics [8,9]), and differential (with the help of which landau could describe "everything" [10]) and even integro-differential (which vlasov mastered perfectly [11]), but they can also be more general - symmetric (weyl) and operator (dirac, heisenberg), where, in contrast to ordinary functions, vector special functions are used as arguments, usually simply differential (as in modern quantum mechanics), but sometimes more complex (as, for example, in the most fashionable abstract theories, but constructed without a proper analysis of the elemetary base of the abstractions used in them, and, as is well known, "a large cabinet falls louder").

And in general, back at the dawn of the last century, a prominent theoretical physicist declared: "theoretical physics is dead, since all the equations have been solved." The fact that he, supposedly a physicist, neglected new physical models indicates that he is simply a mathematical physicist. Moreover, a craftsman-calculator who is not on good terms with elementary mathematics. Thus, in my works it was shown that even for the elementary oscillator, newton's canonized differential equation is incomplete [12]. And the use of a purely technical mathematical technique traversing a singularity on the real axis along the complex plane, without understanding the meaning of imaginary [13,14] completely led quantum theory in the wrong direction [15-17]. But this understanding of the incompleteness of the mathematics used (back in newton) was provided by the analysis of the properties of the magnetic field. To understand to "see" whether we've wandered "down the wrong path" in abstractions, it's important to consider the methodological principle of logarithmic (ordinal) relativity. In any dimensions of nature's properties, be it spatial scale (size), a period of time, or force or energy, it clearly manifests itself in the fact that we compare quantities of the same order, and when we move to a lower or higher order, we "see" similar connections-regularities of nature's properties. Logically, this principle was intuitively used by the ancient greeks when they "saw" that granite, under the pressure of boots, wears down to invisible grains, which they called an atom an indivisible particle

that determines the properties of the worn-out material. People have repeatedly "seen" that waves can form from particles. But it took de broglie's genius to realize that not only sea waves, but also particles, can be composed of waves. Although this had long been demonstrated to people by the cosmos itself, where planets, stars, and galaxies are formed from the "tiniest" particles. And russell had long ago explained how solitons are formed from waves.

This same (multi)ordinal relativity also follows from pure mathematics, where the fourier transform, taken over a limited range of variations of the argument, formally yields an infinite set of solutions. So, "leaving aside" the reasoning, the question of whether the repetition of the alternation of particles seems to us.

The Genesis of Science

True science is built on invariants, and it itself is invariant. And this is the manifestation of the highest degree of harmony. And harmony is precisely what our world, torn by contradictions, currently lacks. But the "powers that be" strive to subordinate reality to the ideas they can understand that is, they construct the world for themselves, deliberately cutting themselves off from invariants. Thus, unconsciously, in their declining years, they strive to take the entire world with them.

Science, like consciousness in general, like life itself, develops (lives) in a piecemeal, continuous manner. From birth, a normal child is determined to live and, to this end, strives to improve. At the same time, the information embedded within them at the genetic level also improves up to a certain point, but repeated rewriting of this information also leads to the loss of basic genetic information, which leads to the decrepitude of the organism. But the individual consciousnesses of people form a "wave" a collective consciousness that outlasts more than one generation. True, this unconscious "wave," akin to gusts of wind, can easily run into an insurmountable obstacle. Nevertheless, even at this level, the difference between a dead artificial intelligence and a living consciousness is visible. Science, on the other hand, consciously forms an invariant collective consciousness, which is capable of outliving many generations, barring the destruction of the entire civilization. But even within the body of science itself, according to the principle of logarithmic relativity, one can distinguish relatively short-lived "particles" local empirical rules and theories and general phenomenological "waves," which determine the "infinity" (duration) of the lifetime of sciences.

Field Substructure

As already noted, the false development of quantum theory effectively led to the emergence of a missing research scale the field substructure. And the field substructure includes not only its sub particles themselves, but also the excitations of their flows, such as waves and solitons. Thus, neglecting this, both the authors of "quantum" fields and cosmologists rushed either too deeply, constructing an erroneous hierarchy of "elementary" particles, including the god particle, and attempting to capture them, or too far, interpreting, forgetting the principle of causality, the compression and rarefaction of fields as black holes and dark energy. Thus, in effect, both of them replaced scientific phenomenology with ancient mythology. But we will not consider the substructure of the magnetic field itself for now - in the second part of this work, which goes not upwards, but deeper, we will limit ourselves to a correct consideration of its manifestations, its characterization.

Magnetism and Worldview

Thus, the purely relativistic effect of magnetism, resulting from the interaction of coulomb fields moving relative to each other, has been effectively justified until now by the force of the tao, which descartes re-called "gimlets," and maxwell "rotor." Moreover, both in terms of the alternation of partial and field descriptions and in terms of the presence of a minimal set of functions satisfying the principles of real space symmetry, strictly speaking, the theory of magnetism simply does not have a phenomenology until now. Instead, it is a crude attempt to force the various manifestations of magnetism into some set of abstract formulas. Tellingly, when hertz, during his demonstration of the transmission of electromagnetic oscillations over a distance, was asked to explain how electromagnetic waves are formed and behave, he replied, "ask maxwell for an explanation." This is essentially how the electrodynamics course was structured: we take maxwell's formulas and calculate electromagnetic fields. But the problem is that maxwell's canonized equations do not correctly (consistently, to a first approximation) describe even the simplest (single) electromagnetic wave. So, in practice, when calculating even the simplest electromagnetic devices, empirical laws are used and a host of adjustable parameters are introduced into the "theory" of magnetism. This "theory," as shown in my previous works, was itself initially constructed on simplified (for low speeds) coulomb and ampère equations, which do not take into account the relativism fundamental to the very origin of the magnetic field. Thus, the theory of magnetism, in addition to "quantum theory," has not so much clarified as obscured the worldview.

Whereas the conducted analysis of the magnetic field already shows the way to correcting and expanding the worldview into the realm of relativism.

As shown in the above-mentioned works on the analysis of the magnetic field "in depth":

1. To describe relativistic effects, it is sufficient to take into account the causality principle and fields that are stationary relative to the observer.

2. When both mass and charge move, due to the compression and extension of equipotential, longitudinal (with respect to the direction of velocity) inertia arises, [18,19] which provides an addition to the momentum, described in a first approximation by einstein's relativistic corrections.

3. When a charge moves, an oersted force arises around it, orthogonal to the velocity, which is a consequence of the reactive friction of the coulomb field of the charge against the field, which is stationary relative to the observer.

4. The friction of the fields leads to the formation of vortices, which lead to reactive resistance.

5. The orthogonal force, due to the reactive parametric connection [20], gives an addition (we'll call it transverse inertia) to the

charge impulse, which we observe in the form of a back-emf in any inductance.

But a more detailed characterization of the magnetic field "in depth" will be given in the next work.

References

[1] A. Einstein, "*Physics and Reality*." Moscow: Science Press, 1965, 358 pp.

[2] S. Ordin, "Dualism of Newton's elementary particle," *International Journal of Physics and Applications*, vol. 4, no. 1, pp. 7–16, 2022, doi: 10.33545/26647575.2022.v4.i1a.49.

[3] P. A. M. Dirac, "*The Principles of Quantum Mechanics*", 4th ed., transl. Moscow: Nauka, 1979, 457 pp.

[4] I. Prigogine and D. Kondepudi, "*Modern Thermodynamics: From Heat Engines to Dissipative Structures*". Chichester–New York: John Wiley & Sons; Moscow: Mir, 2002, 462 pp.

[5] S. V. Ordin, "Chaos – Imaginary Ostensibility – Orthogonality," Global Journal of Science Frontier Research: A Physics and Space Science, vol. 19, no. 3, pp. 49–58, 2019. [Online]. Available: https://globaljournals.org/GJSFR_Volume19/3-Chaos-Imaginary-Ostensibility.pdf

[6] G. Weyl, "*Symmetry*". Moscow: Nauka, Main Editorial Board of Physical and Mathematical Literature, 1968, 191 pp.

[7] S. V. Ordin, "Science-Based Dead Ends," Journal of Industrial Engineering, Systems, and Manufacturing Technologies, vol. 2, no. 2, pp. 1–6, 2026. [Online]. Available: https://mkscienceset.com/journal/journal-of-industrial-engineering-systems-and-manufacturing-technologies

[8] L. I. Mandelshtam, "*Lectures on Vibration Theory*". Moscow: Nauka, Publishing House of Science, 1972, 465 pp.

[9] L. I. Mandelshtam, "*Lectures on Optics, Relativity Theory, and Quantum Mechanics*". Moscow: Nauka, Publishing House of Science, 1972, 475 pp.

[10] L. D. Landau and E. M. Lifshits, "*Electrodynamics of Continuous Media*". Moscow: Nauka, Main Editorial Board of Physical and Mathematical Literature, 1982, pp. 491–508.

[11] A. A. Vlasov, "*The Theory of Many Particles*". Moscow–Leningrad: State Publishing House of Technical and Theoretical Literature, 1970, 352 pp.

[12] S. V. Ordin, "Non-Elementary Elementary Harmonic Oscillator," *American Journal of Materials & Applied Science*, vol. 3, no. 1, pp. 3–8, Mar. 2021. [Online]. Available: https://www.scireslit.com/MaterialScience/AJMAS-ID14.pdf

[13] S. V. Ordin, "Imagination and real quantization," *International Journal of Physics and Applications*, vol. 4, no. 1, pp. 35–38, 2022. [Online]. Available: www.physicsjournal.in

[14] S. V. Ordin, "Comprehensive Analysis of the Elementary Oscillator," *Journal of Electromagnetic Analysis and Applications*, vol. 15, no. 5, pp. 54–60, May 2023, doi: 10.4236/jemaa.2023.155005. [Online]. Available: https://ntsr.info/upload/My/2025/ordin/Osc.pdf

[15] S. V. Ordin, "Gaps and Errors of the Schrödinger Equation," *Global Journal of Science Frontier Research: A Physics and Space Science*, vol. 22, no. 3, pp. 1–5, 2023. [Online]. Available: https://globaljournals.org/GJSFR_Volume22/3-Gaps-and-Errors.pdf

[16] S. V. Ordin, "Quantization Essence," *Global Journal of Science Frontier Research: A Physics and Space Science*, vol. 23, no. 5, pp. 21–29, 2023, doi: 10.34257/GJSFRAVOL23IS5PG21. [Online]. Available: https://doi.org/10.34257/GJSFRAVOL23IS5PG21

[17] S. V. Ordin, "Non-Schrödinger Orbitals," *Global Journal of Science Frontier Research: A Physics and Space Science*, vol. 24, no. 2, pp. 39–48, 2024, doi: 10.17406/gjsfr. [Online]. Available: https://globaljournals.org/latest-ejournals-in-gjsfr

[18] S. V. Ordin, "Absoluteness and Relativity of the Coulomb Force," *Iris Online Journal of Sciences*, vol. 1, no. 5, pp. 1–7, Sep. 2025, doi: 10.33552/IOJS.2025.02.000526. [Online]. Available: https://doi.org/10.33552/IOJS.2025.02.000526

[19] S. V. Ordin, "Coulomb's & Ampere's Relativism," *Global Journal of Materials Science and Engineering*, vol. 7, no. 2, pp. 1–5, 2025, doi: 10.36266/GJMSE/181. [Online]. Available: https://www.pubtexto.com/pdf/?coulombs-and-amperes-relativism

[20] S. V. Ordin, "Parametrically Excited Anharmonic Oscillator," Global Journal of Science Frontier Research: A Physics and Space Science, vol. 19, no. 3, pp. 133–144, 2019. [Online]. Available: https://globaljournals.org/GJSFR_Volume19/7-Parametrically-Excited.pdf

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