The Ether Model Defined by Trialism

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Abstract: Within the knowledge framework of Trialism, a self-consistent ether model is proposed by adopting the reasoning approach from philosophy to science, taking the value *c* of light speed in vacuum as the starting point and drawing upon relevant objective laws and experimental facts. This model can simultaneously satisfy the requirements of Newton's absolute space-time view and of Maxwell's electromagnetic theory for an ether medium, and can provide a perfect explanation for the Michelson–Morley experiment. Its highlight lies in filling an important gap in classical physics—there is continuity between the ether in reality and the state of rest in Newton's absolute space-time. Thus, it eliminates the inherent ambiguity in dualism, dispels the "dark clouds" associated with certain authoritative theories, and enables modern physics to step out of the predicament of a century-long wandering. Key points in the text: 1. Truth does not exist in reality, but there is continuity between it and the relevant objective things in reality, and this continuity's intrinsic mechanism is inertia. Inertia produces continuity, which is a necessary condition for reasoning. 2. The ultimate state of disordered motion breeds stillness. 3. The deformation of the ether (ether wind) should be the intrinsic mechanism by which gravitation and repulsion come into existence. 4. The formation mechanism of high-density particles, the two types of nuclear forces, and requirements such as improving the truth database of AI systems are discussed.

Key words: trialism; ether; truth; inertia; continuity; nuclear forces

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1. Introduction

In reality, absolute rest (or constancy) does not exist. As a result, everything can only be in the process of change—that is, there is no first driving force [1]. Each of these things encompasses the

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"objects" as well as the phenomena and concepts pertaining to it. As the argument of this article, this is a truth.

It can be confirmed that no truth can be proved through empirical methods; rather, truth is an unambiguous consensus gradually approached through repeated practice based on objective facts. (Note: Replace the previous "unanimous consensus" with "unambiguous consensus.") Therefore, truth possesses not only absoluteness (unambiguity) but also immutability; it does not exist in reality and belongs to the category of metaphysics. This means that those so-called relative truths must be ambiguous. They can only be hypotheses verifiable by practical means, that is, objective facts in the process of change. It may be deduced from this that there is only similarity but no absolute identity among all objective things in reality. Furthermore, everything in reality has a life-cycle. [2]

In reality, everything contains two aspects that are simultaneously opposed and unified. This is the fundamental law of materialist dialectics, as well as the core idea of dualism. Trialism adds a third aspect—Truth—to dualism, namely, an unambiguous consensus recognized by both opposing aspects, or what may be called an absolute consensus. As the "background," its characteristic is to form a qualitative opposite [3] with the two opposing aspects in reality, which implies rules and unity. Therefore, the law of the unity of opposites should be subsumed under Trialism. All things in the world are originally constituted by such unities of opposites. In fact, we make use of them every day, yet we do not deliberately delve into them.

Based on this, I have discovered that there is continuity between truth and objective things related to reality, and the inherent mechanism of the continuity is inertia. Inertia produces continuity, which is a necessary condition for reasoning. So, I initially formulated the "Trialism on Things' Limits," which resolved the dilemma that truth had no place to reside within dualism and could only be treated ambiguously, and expanded the philosophical view of materialism to the category of metaphysics.

Most of the existing authoritative theories are summarized within the knowledge framework of dualism via the research method of reasoning from science to philosophy. That is, practice tests truth, or as the saying goes, "Crossing the river by feeling the stones." Given that truth has no place to reside in dualism, it lies in the dilemma that is passed over ambiguously. As a result, there are inevitably some errors, which need to be tested by a process of reasoning from philosophy to science within the knowledge framework of Trialism. And truth, as the starting point of the reasoning process, is not only an unambiguous consensus, but also absolute and immutable. By virtue of the fact that there is

continuity between truth and the relevant objective things in reality, the conclusion must be correct as long as there is no problem with the process of reasoning. This conclusion can be called an unambiguous consensus rooted in truth and obtained through reasoning. [2]

Drawing on Aristotle's definition and distinguishing different domains of definition based on whether they exist in reality, we can say that metaphysics is the first philosophy, and the knowledge it covers can only be truth; science is the second philosophy, defined as all the knowledge that has continuity except for metaphysics and mathematics. This means that the contents that originally belonged to metaphysics were normalized and defined, and those thoughts or cognitions that could not have continuity with objective things in reality were removed from it. And all the contents contained in the original metaphysics will henceforth still belong to theology. That is to say, after the above norms and definitions, when metaphysics or first philosophy is mentioned again, its contents contained can be called truths, such as noumenon, axiom or postulate, absolute motion, etc.

Based on this, idealism is equivalent to Trialism and covers all knowledge and ideas, while mathematics contains their abstractions. Under the premise that mathematics is treated as a separate category, the "Trialism on Things' Limits" is equivalent to the materialism that has been extended to the metaphysical category, and all knowledge covered by it must have continuity with the relevant objective things in reality. Therefore, things, limit and inertia are the three elements that constitute the "Trialism on Things' Limits."

From this, it can be seen that the relationship between science and metaphysics (referring only to content attributable to truth) is just like the process of seeking a limit in mathematics and the corresponding limiting value; the two belong to two different domains of definition on existence and non-existence, respectively. Therefore, the content within science does not contain truth; that is, there would inevitably be erroneous cognitions. The so-called science is nothing more than the knowledge summarized by people in the process of constantly correcting errors in order to explore objective laws or pursue truth. If it is considered that the necessary condition of philosophy is reasoning, then the knowledge it covers is equivalent to the "Trialism on Things' Limits". It can be seen that the "Trialism on Things' Limits" is like a ruler that can eliminate the ambiguous dilemma passed over in dualism, and clearly distinguish the respective contents covered by philosophy, idealism, and materialism from all knowledge. In other words, philosophy—that is, the so-called philosophy of science—can cover both metaphysics and science, and is equivalent to the "Trialism on Things' Limits." [4]

The most typical example of realizing Trialism within the knowledge framework of dualism is Newton's First Law. Its statement is as follows: Every body perseveres in its state of rest, or of uniform motion in a right line, unless it is compelled to change that state by forces impressed thereon. [1]

The law is also known as the law of inertia. The body described therein is unaffected by forces. Whether it is stationary or moving in uniform motion along a straight line, its motion state is absolute (or ideal). It does not exist in reality and belongs to the category of metaphysics, because it is merely the "limiting value" of real objects and their states of motion—that is, absolute motion, or what may be called abstraction. Thus, based on the inertial frame defined by the formula stating that the straight-line distance S is equal to the velocity V of uniform linear motion multiplied by the elapsed time T, namely S=VT, the concepts of absolute time and absolute space in Newtonian mechanics are abstracted and referred to as absolute space-time. Only with this as the criterion can we, starting from an absolutely error-free consensus and on the basis of the fact that there is continuity between truth and the relevant objective things in reality, explore the changes of objective things in reality through reasoning.

With the introduction of the concept of absolute motion, Newton's First Law can be called the starting point of classical physics, which has been widely applied to the physical space in reality. This should have been the best evidence for the existence of the ether, yet it left behind the ambiguity that is the inherent drawback within the knowledge framework of dualism. That is, it has not yet been confirmed that there is continuity between the ether in actual physical space and the state of rest in Newton's absolute space-time. The specific error should be attributed to the hypothesis of the ether wind in the Michelson–Morley experiment [5]. In physics literature, "ether wind" is equivalent to "ether drift". Next, building on the foregoing preliminaries of Trialism, a self-consistent ether model is proposed by adopting the reasoning approach from philosophy to science, taking the value *c* of light speed in vacuum as the starting point and drawing upon relevant objective laws and experimental facts, for further discussion and refinement.

2. From the value *c* of light speed in vacuum to the ether model

The value *c* of light speed in vacuum is a physical constant. In October 1983, at the 17th General Conference on Weights and Measures (CGPM) held in Paris, the new definition of the length unit metre (m) was approved, specifying c = 299792458 m/s as the value of light speed in vacuum. It was

a definitionally exact value with zero uncertainty, serving as an absolutely accurate reference value. This showed that many mainstream scientists around the world had already confirmed, through a large number of scientific experiments, that the highest velocity existed in the universe and that its measurement error had been reduced to a very small magnitude. So, in order to define this limit value c of the velocity in the universe, they were even willing to take the risk of fine-tuning the unit of measurement for length.

From the perspective of Trialism, this was a very wise decision, because *c* is a particular case of Newton's first law. Following the language style of this law, namely, every photon perseveres in its state of uniform motion in a right line at c=299,792,458 meters per second, unless it is compelled to change that state by forces impressed thereon. [6]

Perhaps this implies that even these mainstream scientists have failed to truly understand that *c* represents an absolute motion beyond real space. It possesses not only absoluteness (unambiguity) but also immutability; it does not exist in reality and belongs to the category of metaphysics. In reality, regardless of the experimental means employed, the experimental results obtained can only gradually approach, yet never equal this limit value of the velocity in the universe. Therefore, as an absolute reference frame, *c* is defined relative to the state of rest in Newton's absolute space-time. It should be higher than the highest light speed in reality by an arbitrarily small value, and there is continuity between the two.

In reality, the photon that moves at the highest light speed can only be an electro-ultimate particle [7]. Once it "returns" to reality, the electro-ultimate particle begins to exhibit physical phenomena such as inertia, subjection to external forces, and wave motion. Therefore, a distinction arises between velocity and speed, and the motion state of photons in reality is no longer uniform linear motion.

From the fact that the charge-mass ratio of an electron remains unchanged after a photon is radiated, it follows that the radiated photon (the electro-ultimate particle belongs to the category of photons) also possesses the same constitution and charge-mass ratio as the electron [8]. As the most fundamental particle in reality, each electro-ultimate particle manifests as the negative charge of one unit. It is a unity composed of an ultimate particle portion (i.e., the ultimate particle itself) that manifests as one unit of positive charge and a negative-charge portion that manifests as two units of negative charge. As previously discussed, the law of the unity of opposites should be subsumed under Trialism. Therefore, the two most fundamental opposing aspects in reality should be the ultimate

particles and Being Emptiness, yet the two can hardly exist in isolation. The so-called "Being Emptiness" is not a vacuum, but rather a real space that seems to have nothing. In other words, if there were no ultimate particles in the universe, the whole universe would be Being Emptiness without inertia, namely, with zero mass.

As far as I can see, the ultimate particle occupies a position in Being Emptiness; an "electric hole" is formed, thereby generating electric charges. The ultimate particle is a superconductor, exhibiting positive-charge characteristics in an electric hole, while the region around it accordingly exhibits negative-charge characteristics. Therefore, according to the Meissner effect [9], all negative charges can only be confined to the surface of the ultimate particle and can flow at high speed. This is not only the most fundamental charge layer but also the root cause of spin. The interaction between the ultimate particle and the charge layer is mainly governed by the Lorentz force and obeys Lenz's law. Once the ultimate-particle portion tends to accelerate in a certain direction, the charge layer will sense this and automatically generate an opposing effect in an attempt to resist the accelerated motion, and vice versa. This is what the citation "Tao always tries to resist changing the current state of things" [10] describes, and precisely the characteristic manifested by inertia.

Annihilation refers to the process in which objects vanish against the background of nature (ether/vacuum). As a concept of physics, it refers to a process in which matter and its antimatter convert into the ether upon meeting. That is to say, the most fundamental matter and its antimatter are ultimate particles and electric charges, and their intrinsic mechanism originates from the aforementioned Being Emptiness and electric holes. Every one of the electro-ultimate particles, up to photons or electrons, is a unity formed by the two in the form of annihilation. This means that, as the background of nature, pure ether is a medium formed by Being Emptiness and photons in disordered motion (which contain the electro-ultimate particles). It can also be determined from a macroscopic perspective that, when the interior of a certain container is evacuated to a given degree of vacuum, the vacuum in that container is pure ether.

Since all things in the world manifest themselves in the form of the unity of opposites, the concept of Being Emptiness is employed in this article only when strictly necessary; in all other cases, "ether" or "vacuum" is used instead, as this better reflects the actual situation. On this basis, it may be considered that, within an arbitrarily small region of pure ether space, numerous photons pass through in a disordered manner at various speeds close to c, and that their combined effect is such that the

relationship among the three physical constants in that region—the permeability of vacuum μ_0, the vacuum permittivity ε_0, and the value *c* of light speed in vacuum—is $\mu_0\varepsilon_0 c^2 = 1$. This conclusion is derived from Maxwell's equations in vacuum. By analogy with the fact that light travels at different speeds in different media, it can be inferred that the propagation of light in a vacuum must also rely on a medium—the ether.

At this moment, as I revisit the arguments of this article on the ether, a sudden realization strikes me: the ultimate state of disordered motion breeds stillness. The reasoning is straightforward: water's quiescent appearance at the macroscopic scale cannot conceal the disordered state of motion of its constituent molecules at the microscopic scale. Drawing on the above statement that *c* "should be higher than the highest light speed in reality by an arbitrarily small value," we can see that, in an arbitrarily small region of pure ether space, all photons are moving chaotically at different speeds close to *c*, and their resultant effect differs from the rest state of Newton's absolute space-time by only an arbitrarily small amount. This means that there is continuity between the ether space in reality and the state of rest in Newton's absolute space-time. In other words, the ether can be considered stationary and isotropic in reality. Its characteristic manifests itself in the principle that "Tao always tends to resist changes to the current state of things;" this principle not only implies inertia but also entails the conservation of energy and provides the foundation of all objective laws. This is the ether model constructed within the knowledge framework of Trialism, by adopting the reasoning approach from philosophy to science, taking the absolute motion represented by *c* as the starting point, and relying on relevant objective laws and experimental facts.

3. The Michelson–Morley Experiment from the Perspective of Trialism

Such an ether model is fully consistent with the requirements for the ether medium under Newton's absolute space-time view and Maxwell's electromagnetic theory, and can provide a perfect explanation for the Michelson–Morley experiment. Actually, in classical physics, the fact that Newton's three laws of motion are widely applied to real physical space is the best evidence for the existence of the ether. The highlight of this ether model lies in filling the most crucial gap in classical physics—the lack of continuity between the real ether space and the state of rest in Newtonian absolute space-time. Once a consensus is reached, one may start from the state of rest (an abstraction of the ether) in Newton's absolute space-time or from *c* derived from Maxwell's equations, and adopt the

reasoning approach from philosophy to science to locate all relative motions in reality. Thus, it eliminates the inherent ambiguity in dualism, dispels the “dark clouds” associated with certain authoritative theories, and enables modern physics to step out of the predicament of a century-long wandering.

The ether was a substance (the fifth element) conceived by the ancient Greek philosopher Aristotle. It was also regarded in the 19th century as a supposed propagation medium whose existence was implied by Newton’s absolute space-time view and Maxwell’s electromagnetic theory. Therefore, physicists inferred that since the Earth revolves around the Sun at approximately 30 kilometers per second, it must experience an oncoming ether wind, much like a ship sailing through the sea. If the ether exists, then photons moving along or against the direction of the ether wind should have different speeds. Within the knowledge framework of dualism, they can only adopt the one-way reasoning research method from science to philosophy. They first assumed the existence of the ether and, on that basis, proposed a further hypothesis—the ether wind. Then, experiments were carried out to verify this hypothesis.

The Michelson–Morley experiment is a famous experiment designed to detect the ether wind and thereby prove the existence of the ether. They used an extremely precise Michelson interferometer. Its core idea was that the effect of the ether wind would be detected. That is, a light beam was split into two, with one beam traveling along the tangential direction of Earth’s revolution around the Sun, and the other perpendicular to that direction. After reflection, there would be an optical path difference between the two light beams. Once they were recombined into a coherent light beam, the resulting beam would produce interference fringes on the screen. If the ether wind existed, the optical path difference would vary with the orientation of the coherent light beam relative to the tangential direction of Earth’s revolution around the Sun, thereby producing an observable shift in the interference fringes on the screen.

However, the experimental results did not reveal any observable shift in the interference fringes; that is, no change in the expected optical path difference was detected. This is the famous null result. Direct conclusion: It has been proven that the ether-wind hypothesis does not hold. Furthermore, regardless of whether the ether exists, under the premise that the influence of other media along the optical path is excluded, the magnitude of the measured speed of light is exactly the same in all directions.

The problem lies in the direct abandonment of the ether concept. In order to prove the assumption that the ether exists, scientists further hypothesized the existence of the ether wind. When experiments demonstrated that the ether wind did not exist, two possibilities arose: first, the hypothesis of the ether wind was false while the ether itself existed; second, the ether did not exist at all. Therefore, the direct abandonment of the ether concept means that an error involving a loss of continuity has occurred in the reasoning process. Even within the knowledge framework of dualism, this is still regarded as a low-level error. This shows that mainstream physicists lack confidence in the significance of the existence of the ether; they have vague concepts and are not sufficiently rigorous. In response to this, some of them once tried to remedy the situation, yet failed to find the right approach. With no other choice, they could only go along with the prevailing trend.

Yet within the knowledge framework of Trialism, reasoning-based research methods are bidirectional: the path of reasoning may proceed from science to philosophy, or from philosophy to science. The first step is to define the research direction and establish a consensus, namely to verify the continuity between the ether space and the state of rest in Newton's absolute space-time. Thus, one may adopt the reasoning approach from philosophy to science, take *c* as the starting point, and, based on relevant objective laws and experimental evidence, derive the ether model presented in this paper. In this model, the ether is a medium composed of Being Emptiness and the photons in disordered motion; it is characterized by isotropy and has extremely strong penetrating power. Therefore, as far as its motion relative to the Earth is concerned, it either passes through or penetrates into the Earth, rather than being blocked by the Earth in the way that wind is blocked when it blows against a person. This explains why the Michelson–Morley experiment failed to detect the effect of the ether wind. Of course, it also provided evidence that the speed of light is isotropic in the ether.

The Michelson–Morley experiment demonstrated that the ether-wind hypothesis did not hold. The error lies in the fact that the Earth can block winds but cannot block the ether. Because the ether is a medium, it is composed of Being-Emptiness and photons in disordered motion. Then, does the study of the ether wind still have referential value? The answer is yes. According to the Meissner effect, in real space, the entities that can block the ether are high-density particles, such as photons, electrons, protons, and neutrons. Each high-density particle can usually contain a large number of ultimate particles inside, but can possess only one charge layer.

As far as my limited observation goes, the necessary condition for their formation is that ultimate

particles occupy positions in Being Emptiness. Of course, electric holes are also formed. These electric holes cause Being Emptiness to deform; perhaps this is exactly the intrinsic mechanism by which gravitation and repulsion arise. This implies that ultimate particles cause Being Emptiness to deform and that this hypothesis and the law of universal gravitation corroborate each other. Once this is confirmed, given that Being Emptiness cannot exist independently, it follows that any deformation of Being Emptiness entails a deformation of the ether—this is the genuine ether wind.

Furthermore, photons are products of electromagnetic radiation from high-density particles. Once electromagnetic radiation occurs, the radiated photons, after entering a medium, become independent of the motion state of the emitter. That is to say, according to the Michelson–Morley experiment, once photons are radiated into the ether medium, they propagate at a given actual light speed v, close to c—regardless of propagation direction.

This means that, if the influence of other media is temporarily disregarded, the speed of light in the Michelson interferometer is relative to the ether medium, that is, relative to the state of rest in Newton's absolute space-time. Therefore, once coherent light beams have been formed, the only component in the interferometer that moves with the Earth and may affect the experimental results is the screen. The screen can move either in the direction of the coherent beam incident upon it or in the opposite direction. Thus, it can be concluded that, since the optical path difference between the coherent light beams remains constant, the interference fringes on the screen also remain unchanged. This is precisely the result that the Michelson–Morley experiment yielded under this ether model.

4. Brief explanation of the key points

It should be noted that Trialism, developed on the basis of dualism, introduces a third aspect—truth—which does not exist in reality. This addition follows the principle that this third aspect must stand in qualitative opposition to the two opposing aspects in reality. It can be confirmed that truth possesses not only absoluteness (unambiguity) but also immutability; it does not exist in reality and belongs to the category of metaphysics. In this "background," there is neither continuity nor chronological order among various truths. They can rely on the inertia of relevant objective things in reality to generate continuity and form a logical causal relationship, but there must be no contradictory situations. For instance, the arguments of this article and its inferences, Newton's first law and its special case c, and so on—all fall under the "background", namely, truths.

It should also be noted that this “background” is not that background—the ether. As the background of nature, the ether exists in reality. Pure ether appears to be electrically neutral. It is a unity of opposites composed of photons moving disorderly within Being Emptiness at various light speeds close to c. As previously stated, the ultimate particle is a superconductor; it forms an electric hole in Being Emptiness and annihilates into an electro-ultimate particle that has the same charge-to-mass ratio as that of the electron. Thus, the question arises: since every electro-ultimate particle carries one unit of negative charge, why does the ether appear electrically neutral?

Take, as an example, the fact that the electro-ultimate particle carries one unit of negative charge. This conclusion is drawn from the fact that the electron’s charge-to-mass ratio remains unchanged after the electro-ultimate particle is radiated from an electron (or further from a photon). Let us tentatively conceive of its ultimate-particle portion as a sphere of arbitrarily small radius. Throughout the process from the moment it is radiated as a component of the electro-ultimate particle until it moves through a vacuum at the highest light speed in reality, will the electric hole thus formed still retain the shape of this sphere of arbitrarily small radius?

The answer is no, because in reality, there must be a temporal delay between any cause and its effect. That is to say, along the moving direction of the electro-ultimate particle, the electric hole must be continuously expanded in front of the ultimate-particle portion, whereas the electric hole at the rear is gradually filled; as a result, there will be a tiny time delay in this process. This means that the electric hole has become somewhat larger, while the charge layer attached to the surface of the ultimate particle tends to fill the electric hole from the rear (neutralizing trend), thus causing the electro-ultimate particle to approach electric neutrality. By the same token, this law also applies to photons. This inference may be tentatively named the “Photon Electric Hole Effect”. As a result of this influence, the charge-to-mass ratio of photons is no longer constant and becomes unequal to that of electrons. This implies that the ultimate particle is nothing but a superconductor, while the magnitude of the electric charge depends on the size of the electric hole.

Furthermore, from the aforementioned proposition “the ultimate state of disordered motion breeds stillness,” one can abstract the conclusion that the limiting value of disordered motion is the state of rest in Newton’s absolute space-time. Why is this the case? This is because the law of the unity of opposites should be subsumed under Trialism: on the basis of dualism, Trialism further adds a third aspect (truth) that does not exist in reality—namely, an unambiguous consensus mutually

acknowledged by the two opposing aspects, or what may be called an absolute consensus. Its characteristic is that it forms the qualitative opposite with the two opposing aspects in reality, which implies rules and unity.

As for the ether, it is a medium formed by Being Emptiness and the photons in disordered motion. The photons in disordered motion cause Being Emptiness to undergo innumerable deformations. In this process, every deformation signifies a new trend toward equilibrium. By analogy with a mattress composed of numerous springs, the underlying principle is that interactions among all opposing aspects attain equilibrium, that is, unity. Thus, the third aspect in Trialism here refers to the limiting value approached when all opposing aspects within the ether attain a state of equilibrium. This is precisely the intrinsic mechanism whereby "the ultimate state of disordered motion breeds stillness;" it provides a theoretical basis for the state of rest in Newton's absolute space-time to be abstracted from ether space.

Imagine: if there were no ether, how would photons be subject to forces, and how would they behave as wave motions? Therefore, wave motion serves as strong evidence that photons possess inertia. This means that Newtonian mechanics and Maxwell's electromagnetic theory have been widely applied to real physical space, and the existence of the ether is precisely the most urgent requirement for their unification.

With regard to the null result of the Michelson–Morley experiment, many distinguished scientists of the era were perplexed. For example, Lord Kelvin (William Thomson) referred to this null result as the "first dark cloud" hanging over the sky of classical physics at that time. It is reasonable for dualists to feel perplexed, because they fail to recognize that the law of the unity of opposites should be subsumed under Trialism; that is, they are unaware that behind the ether there is also a "background" supporting it.

What is perplexity? Perplexity implies ambiguity, which arises from a loss of continuity in the process of reasoning. Thus, on the premise that continuity was lost, the nonexistence of the ether medium as a reference frame became the authoritative theory accepted by mainstream dualists. Not only that, mainstream dualists hold an ambiguous understanding of the relationship between c and the value v of light speed in reality. Once again faced with a loss of continuity, they went so far as to offend the truth that "in reality there is only similarity but no absolute sameness," to ignore the fact that light waves have different frequencies, to assert arbitrarily that in reality the speed at which all

photons move is v = c, and then to derive the paradox that in reality the mass of a photon equals 0.

As mentioned earlier, within the knowledge framework of Trialism, authoritative theories must be tested through a process of reasoning from philosophy to science, and this reasoning should start from a certain truth. Then, based on the continuity between *c* and the highest value of the speed of light in reality, we can arrive at the aforementioned proposition: the ultimate state of disordered motion breeds stillness. Thus, "the highest excellence is like that of water" [10]: As a medium, the (stationary) ether, like water, is characterized by energy conservation.

In the ether medium, light waves have different frequencies, and their speeds also differ from one another, with their limiting value being *c*. For example, in the case of an electron, once electromagnetic radiation occurs, the state of motion of the radiated photon is no longer dependent on the emitter; its speed $v_1 < c$ is relative to the (stationary) ether. Similarly, the secondary photons reradiated by this photon, and even the successively radiated n-th-order photons, all have speeds $v_n < c$ measured relative to the (stationary) ether. Thus, $v_n \geq c$ does not hold for any photon. Its basis lies in the premise that the ether exists in reality and has continuity with the state of rest in Newton's absolute space-time.

5. The constant velocity of light and two types of nuclear forces

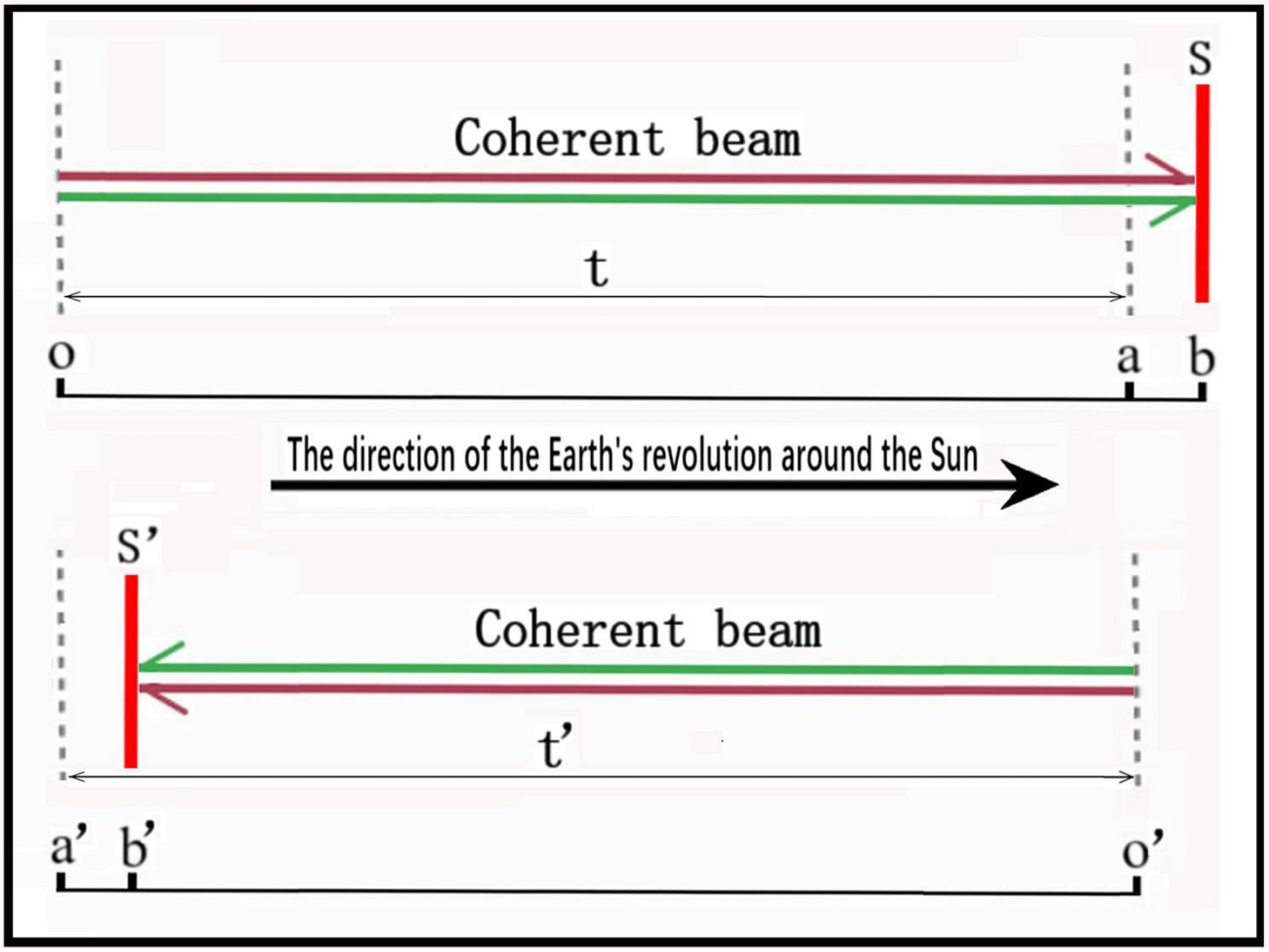
From the perspective of Trialism, the "principle of the constant velocity of light in vacuo" [11] can be stated as follows: In an ideal vacuum, a photon has zero mass and always moves in a straight line at a definite velocity c; this velocity is independent of the state of motion of the light source. In this context, the "ideal vacuum" does not exist in reality, but there is continuity between it and the real vacuum (ether).

Once the photon "returns" to reality, it begins to exhibit physical phenomena such as inertia, subjection to external forces, and wave motion; its motion is no longer uniform linear motion. Thus, a distinction arises between velocity and speed. Then, should *c* be "velocity" or "speed"? The only explanation is that *c* can only be the unity attained by the two. In other words, as a physical constant, *c* represents an absolute motion (unambiguous consensus), which does not exist in reality. Therefore, we should reflect carefully on the process of how the two are unified into *c*, and we will surely gain insights.

As for the principle of relativity, when formulated in mathematical language, it should be stated

as follows: The mathematical expressions of all physical laws remain invariant in form under Galilean coordinate transformations. That is to say, *c* and the state of rest in Newton's absolute space-time—these two absolute motions—are each unified through continuity with the real ether medium.

The Michelson–Morley experiment has demonstrated that, although the Earth is moving relative to the ether medium, the speed of coherent light beams in the Michelson interferometer is isotropic (relative to the ether). Among them, the average linear speed of Earth's revolution around the Sun is 29.78 km/s, which is approximately 10^{-4}c, i.e., one ten-thousandth of the speed of light. See the figure below and the following explanation:



1. When the tangent of the Earth's revolution around the Sun is in the same direction as the coherent light beam, the time interval between the beam's emission from point o and its arrival at point a (the screen S) should have been t. However, since the screen S moves along with the Earth, the time taken for this light beam to travel from point o to the screen S (point b) is slightly longer, approximately $(1+10^{-4})$ t.

2. When the tangent of the Earth's revolution around the Sun is in the opposite direction to the coherent light beam, the time interval between the beam's emission from point o' and its arrival at point a' (the screen S') should have been t'. However, since the screen S' moves along with the Earth, the time taken for this light beam to travel from point o' to the screen S' (point b') is slightly shorter, approximately $(1\text{-}10^{-4})$ t'.

3. When the tangent of the Earth's revolution around the Sun is in the same direction as the coherent light beam, while the observer and screen S are in the same inertial frame, under the Galilean coordinate transformation, the speed of the coherent light measured by the observer is approximately equal to $(1\text{-}10^{-4})$ c.

4. When the tangent of the Earth's revolution around the Sun is in the opposite direction to the coherent light beam, while the observer and screen S' are in the same inertial frame, under the Galilean coordinate transformation, the speed of the coherent light measured by the observer is approximately equal to $(1+10^{-4})$ c.

Items 1 and 2 above show that, as long as the optical path difference of the coherent light beams remains unchanged, regardless of whether the screen moves along or against the direction of the coherent light beams incident on it, the interference fringes on the screen remain unchanged. Moreover, items 3 and 4 above show that, under the Galilean coordinate transformation, the measured (relative) speed of light is related to the observer's state of motion. But no matter what the (relative) speed of light measured by the observer is (for example, it can be greater than *c* in item 4), every photon in the light beams moves in the ether at a certain speed close to c, and this certain speed (relative to the state of rest in Newton's absolute space-time) is independent of the state of motion of both the light source and the observer.

At this point, it is necessary to briefly describe the formation mechanism of high-density particles and the two types of nuclear force from the perspective of Trialism [7]. The electro-ultimate particle, which falls within the category of photons, manifests as one unit of negative charge and is merely the most fundamental high-density particle. Typically, the interior of each high-density particle contains many ultimate particles, all of which are superconductors and already in contact with one another. According to the Meissner effect, all the charges can only be confined to their surfaces and can flow at high speed. This is the charge layer. Each high-density particle can possess only one charge layer. It is precisely because of the existence of this charge layer that people have discovered that spin is an

intrinsic property of high-density particles themselves. The magnetic field generated by its charge layer dynamically repels all the streams of the charged particles attempting to enter its interior, while internally it maintains the stability of the ultimate particles within it. A single charge layer lacks resistance to incoming particles with positronic characteristics. The high-density particles that exist outside atomic nuclei are usually only electrons and photons.

As a comparison, the electromagnetic binding force (strong force) generated by the superconducting current inside an atomic nucleus can be divided into two types depending on strength. The first type of nuclear force originates inside high-density particles, and consists of the strong repulsive forces among the ultimate particles. At the same time, these ultimate particles are also subject to the electromagnetic binding force generated by the charge layer. The result is that, with the charge layer as the boundary, the internal and external forces of the particle achieve dynamic balance. Its internal mechanism is just like an evenly matched thrust competition, where the balance point between the two sides (analogous to a tug-of-war) is always in a state of reciprocating swing. These strong repulsive forces are precisely the root cause of electromagnetic radiation. The second kind of nuclear force is much less powerful than the former. As there are shared parts between the charge layers of adjacent high-density particles, the combined action of the electric field force and superconducting electromagnetic force can also confine internal binding energy to a certain degree. The fission or decay of an atomic nucleus is related to this. In terms of the nuclear force, it should be understood that the latter is much less powerful than the former.

Inside the atomic nucleus, the main constituent of the gluon is flowing electric charges, which belong to the charge layers of adjacent high-density particles—including their shared regions. Hence, only one gluon exists within each atomic nucleus. The superconducting effect is generated by flowing electric charges, among which there are some tiny high-density particles. And these tiny high-density particles are mesons. Therefore, the binding function of the gluon acting on various high-density particles within the nucleus constitutes the two types of nuclear forces. This implies that the internal structures of celestial bodies such as neutron stars and black holes should be similar to those of atomic nuclei.

Inside an atomic nucleus, two high-density particles are disconnected in the gluon’s state of electromagnetic adhesion, which is a necessary condition to generate decay and fission; while a few ultimate particles escape out of the charge layer in the form of high-density particles, which is a

necessary condition to generate electromagnetic radiation. That is to say, there are two kinds of binding functions of gluons: one is the electromagnetic binding force from the charge layer, and the other is the resultant force of electric and magnetic fields among high-density particles. The electric field forces are generated by the charges adhering to each other, and the magnetic field forces are generated by the superconducting currents.

The largest high-density particle inside an atomic nucleus is the quark. Therefore, a quark has only one charge layer, which is shared with the charges in the gluon. As for neutrons or protons, they themselves are two forms in which quarks can exist independently. The two are just like two elephants inside an atomic nucleus, differing only in gender. This is the most reasonable explanation for the phenomenon of "quark confinement." A quark is shaped like a coral in the sea or a tree root in the soil. If nuclear microprobes are used to study it, you will find different spins at different locations. Thus, there are quarks with different "flavors," yet they can only be "confined" within the nucleus. The reason for this is that an essential characteristic has been overlooked: whether these different "flavors" of quarks lie within the same charge layer.

6. Inertia is a necessary condition for everything in reality

Over the past century, physicists have discovered an increasing number of "elementary particles" inside atomic nuclei, and there seems to be no end to this trend. This means they have already strayed from the right research direction. What is unity? How is unity achieved? The ambiguity surrounding this concept of "qualitative opposites" is precisely where the flaw of dualism lies.

In fact, whether it is from philosophy to science or from science to philosophy, the reasoning processes in both cases are identical. Superficially, the distinction lies in the starting point of reasoning: the former originates from truths that transcend real space, while the latter proceeds from objective things. Yet in essence, reasoning is constituted by the inertia of each relevant objective thing in the process and the third aspect (truth). Its basis is that inertia produces continuity, which is a necessary condition for reasoning.

Imagine this: without the latter, truth could never be attained. Where could the former come from? But if there is only the latter, within the knowledge framework of dualism, errors or even paradoxes may arise due to ambiguity. Because truth does not exist in reality, there is only similarity, not absolute identity, between any objective things in reality. In view of this, people's cognition of objects is bound

to be ambiguous and not absolutely correct. The same holds true for authoritative theories, unless they, like Newton's first law, transcend real space and become unambiguous truths.

Even authoritative theories can be wrong. As far as quarks are concerned, physicists have found through a reasoning approach from science to philosophy that different spins exist at different positions of a quark. Accordingly, they further defined quarks of different "flavors." Yet no experimental method has so far succeeded in enabling quarks to exist in isolation, as neutrons, protons and mesons do. Therefore, they termed this physical phenomenon quark confinement. If they can recognize and adopt the reasoning approach from philosophy to science, they may suddenly realize that neutrons and protons are actually quarks that can exist independently. A quark has only a single charge layer. It resembles a coral in the sea or a tree root underground, and exhibits different spins at different positions.

As for examples of paradoxes, a brief account has been given earlier: some authoritative theories ignore the fact that light waves have different frequencies, arbitrarily assert that in reality the speed at which all photons move is v = c, and then derive the paradox that in reality the mass of a photon equals 0. Why is this considered a paradox? Since in physics mass is defined as the measure of an object's inertia, real photons without mass would lose inertia—which contradicts the fact that they exhibit wave properties and carry energy. In other words, inertia is a necessary condition for producing wave motion and energy. All things existing in reality, whether photons, quanta, or the so-called phonons, cannot evade the objective fact that they possess inertia. Therefore, inertia is a necessary condition for everything in reality. Whatever we encounter, so long as we rely on the three elements (things, limits, and inertia) set forth in "Trialism on Things' Limits," firmly hold inertia as the necessary condition, and reason through the continuity among things, we can achieve the effect of grasping the principal link and thereby illuminating the whole.

Within the knowledge framework of dualism, truth has no place to reside. Compared with the so-called "truths" that exist in reality (which are ambiguous), Kant's criterion should be regarded as the wisest definition of truth. According to Kant's criterion, truth is defined as "the agreement of cognition with its object" [12], which represents the mainstream conception of truth in the history of philosophy. It is the correct knowledge that people summarize, based on their own cognition and through reasoning, after exploring objective things and the laws of their changes—knowledge that is consistent with the object. The crux is that truth must be an unambiguous consensus, which is equivalent to a limiting value in mathematics. This is precisely the internal mechanism by which truth does not exist in reality.

In other words, the principle of seeking limits in mathematics—that is, gradually approaching the limit value by infinite subdivision—is abstracted from the physical processes of identifying truth.

This means that frequently and repeatedly employing the reasoning process that infinitely approximates from science to philosophy is precisely what causes the enormous power consumption of AI systems. Reasoning from philosophy to science, by contrast, can circumvent this process of infinite approximation. In other words, current AI system models lack a continuously refinable repository of truth. This initiative not only reduces energy consumption, but more importantly, eradicates the inherent drawbacks within the knowledge framework of dualism—errors and even paradoxes caused by ambiguity. In terms of the reasoning approach from philosophy to science alone, this paper can also serve as an example. That is, within the knowledge framework of Trialism, a self-consistent ether model is proposed by adopting the method of reasoning from philosophy to science, taking *c* as the starting point and drawing upon relevant objective laws and experimental facts.

Final remark: The speed of light measured by an observer in the Earth's reference frame should deviate from *c* by no more than one part in ten thousand depending on the direction of propagation; this may serve as a verification marker. Even if it does not conform to expectations, it does not detract from the practical value of the reasoning approach from philosophy to science presented in this paper.

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三元论所定义的以太模型

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摘要：在三元论的知识框架下，采用由哲到科的推理方法，以真空中光速值*c*为起点，借助相应客观规律和实验事实，给出一个自洽的以太模型。该模型可同时满足牛顿绝对时空观和麦克斯韦电磁理论对以太介质的需求，并可通过迈克尔逊－莫雷实验得出完美的解释。其亮点在于填补了经典物理学中的一个重要空白——现实中的以太与牛顿绝对时空中的静止之间存在连续性。从而达到消除二元论中固有的模糊，驱散了某些权威理论带来的“乌云”，使得近代物理学走出百年徘徊的窘境。文中要点：1、真理在现实中并不存在，但它与现实中相关客观事物之间存在连续性，其内在机理是惯性。惯性产生连续性，是推理的必要条件。2、无序运动的极致孕育着静止。3、以太的形变（以太风）应是引力和斥力得以存在的内在机制。4、讨论了高密度粒子的形成机理及两种核力，还有诸如改进AI系统真理库等需求。

关键词：三元论；以太；真理；惯性；连续性；核力
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