(1) Time and Space

(1.1) The Manifestation of Time and Space

Let us imagine a type of thing that does not manifest itself, but instead relies on other things to embody manifestation action. Since this possibility exists, such a thing should exist in some way. Space and time should be such things; space and time themselves do not manifest. Space is indirectly manifested through the manifestation of the volume (isolation action) of the objects within it; time is indirectly manifested through the manifestation of the motion and change (motive force action) of the objects within it. In reality, what we observe are the volume of objects and their motion and change, not the volume of space and the passage of time. We do not directly know space and time.

In other words, space relies on the things within it to be indirectly manifested, while the things within it are isolated by space. Time relies on the things within it to be indirectly manifested, while the things within it change through time. This is a dependent coexistence. This dependent coexistence creates a distinction between space (or time) and individual things. The benefit of this dependent coexistence is that it highlights space and time, and at the same time, highlights individual things. This makes time and space into 'containers' for individual things (where 'container' is a functional description, not an independently existing entity).

Viewed in this way, space is only a thing that possesses isolation action, but does not manifest; time is only a thing that possesses m-otive force action, but likewise does not manifest. Therefore, the manifestation of macroscopic things in spacetime is different from the manifestation in our consciousness. The manifestation of macroscopic things is a manifestation oriented towards spacetime; it manifests for spacetime. Things in the macroscopic world must occupy a position in space and undergo change in time in order to exist and be perceived. This manifestation oriented towards spacetime is a necessary condition for the being of things. For instance, a stone occupies space (and time). The space (and time) that this stone occupies is a kind of manifestation oriented towards space (and time).

The manifestation in our consciousness, however, is different; it is not accountable to spacetime. The manifestation in our consciousness is not limited by spacetime; it can be subjective, imagined, and abstract. For example, we can imagine things that do not exist in the real world, and we can understand concepts that transcend spacetime. For instance, the color we perceive is not in spacetime; we cannot find it anywhere in spacetime. It is a subjective thing, not an objective thing of the macroscopic world. However, we also see the difference between space and time and ordinary things.

This means that space (or time) has the ability to influence and interact with other entities, while itself having no directly observable, tangible form. Viewed in this way, space (or time) is a pure no form action (note, not no form itself). This is a mode of being for no form action. This mode of being both allows no form action to exist and function, and also allows it to maintain the essence of a pure no form action: it has form, but does not directly manifest. This type of being is one that manifests its own action by causing other things to manifest, while at the same time maintaining its own self.

In other words, space (or time) is the purest and most direct mode of operation of no form action. That is to say, space (or time) is the most basic and simplest no form action; anything simpler would be no form itself. Between space (or time) and no form, there are no other no form actions. Therefore, space is pure isolation action, and time is pure motive force action. In this way, we come to recognize that "no form action" can indeed exist as a special mode. This existence can be known through indirect means.

(1.2) Assuming Time and Space are Discrete (Discontinuous)

(1.2.1) The Minimal Units of Space and Time

In physics, the Planck length, Lp, is considered the smallest unit of distance that can be meaningfully discussed. Below this unit, the conventional concept of space no longer applies. The Planck time, Tp, is also considered the smallest meaningful unit of a time interval (Weinberg, 1977). These two minimal units require the assumption of the principle of the constancy of the speed of light. Now, let us reverse this. Let us assume that space and time are both discrete, composed of minimal units Lp (Planck length) and Tp (Planck time). Then, a natural upper limit for velocity is c = Lp / Tp. This velocity limit corresponds to the speed of light, indicating that the maximum speed for traversing one unit of space is a fixed value.

The Lorentz transformation in special relativity can be understood as the rule for spacetime transformation that ensures this 'fundamental operational rate' (c) remains constant in all inertial reference frames (Einstein, 1916). No matter in what manner or from what perspective we measure the speed of light, the speed of light passing through each unit of space reaches this maximum, fixed value. Therefore, the measured speed of light is always c, because it is the direct embodiment of this fundamental process.

Although time and space are composed of minimal units, space can have a density—that is, the degree of density of the distribution of spatial units within a specific region. According to general relativity, we know that the curvature of spacetime can reflect the distribution of the mass of matter (Einstein, 1916). Assuming that space has a density, I would think that the more concentrated the mass, the greater the curvature of space, and the denser space should be.

If motion is discontinuous, with particles traversing spatial units one by one in a discrete manner, then the density of space would directly affect the passage of time, and the concept of spatial density would be meaningful. In regions of high curvature (such as near a massive object), the density of space increases, meaning that a unit volume contains more spatial units. A particle traversing these units is like passing through more 'checkpoints', requiring more Planck time units, which causes the passage of time to slow down. For example, a particle near a black hole, due to the extremely high density of space, experiences a significant increase in the number of units along its path of motion. From the perspective of an external observer, its passage of time is markedly slowed. This phenomenon is commonly known as 'gravitational time dilation'.

Gravitational attraction is not a mysterious 'force field', but a natural result of the variation in the density of space. The concentration of mass makes the spatial units dense. A particle's traversal of a high-density region becomes 'time-consuming', and its trajectory bends towards the center of the density. The so-called simple fastness or slowness of time is merely relative to the different densities of space.

Let us explore this idea with a thought experiment. Imagine two identical regions of space: one is completely empty, and the other contains an electron. The region containing the electron should have a different distribution of spatial density. Now, if another particle (say, a proton) is made to traverse these two regions, their trajectories should be different. In the region containing the electron, the proton's path might bend slightly, which is what we observe as the electromagnetic interaction.

The beauty of this idea lies in its potential to unify our understanding of the different fundamental interactions. Gravity, electromagnetism, and even the strong and weak nuclear forces might all be different manifestations of the structure of spatial density. Different types of particles would affect the density of space in different ways, thereby producing the various interactions we observe.

Mass and the spatial density it affects are co-emergent. If mass is simply a special structure of space, then when mass is formed, the space around it will generate a corresponding structure. On the one hand, the distribution of an object's mass requires the size of space to be calculated or described. On the other hand, the distribution of mass determines the structure of space: according to the field equations of general relativity ($G_{\mu\nu} + \Lambda g_{\mu\nu} = \frac{8\pi G}{c^4} T_{\mu\nu}$), the mass-energy distribution determines the structure of spacetime. The speed at which the change in the density of space caused by mass propagates will not exceed the speed of light, c; this propagation will pass through each unit of space.

In the early stages of the Big Bang (within approximately 10^{-43} seconds), the universe was extremely small, and its spatial density should have been very high. High spatial density means that a unit volume contains a large number of spatial units. Assuming that particles or energy traversed these units in a discrete manner, the dense structure of space would increase the number of time units required for traversal, causing the passage of time to be very slow. From the perspective of an external observer, the passage of time in the early universe would have been nearly at a standstill.

Imagine being in a spaceship that is accelerating very rapidly. The number of spatial units it 'contacts' will increase, which is equivalent to increasing the density of the space it occupies. The motion of the spaceship does not actually make the density of the space it is in greater; rather, its high-speed motion causes it to 'contact' more spatial units, which has the same effect as a massive object increasing the density of space. In a place where the density of space is high, a moving object also contacts more spatial units. This is like a moving car: the faster its speed, the greater the air resistance it experiences, which is equivalent to an increase in the density of the air it is in, and the pressure also increases. This high velocity of the spaceship increases the density of the space it occupies, which in turn causes the passage of its time to slow down.

From the perspective of an external observer, every motion and change on the high-speed spaceship will slow down, which is equivalent to an increase in the density of the space the spaceship occupies. Otherwise, the external observer would see the speed of change of some object on the spaceship, plus the high velocity of the spaceship, exceeding the speed of light. However, from the perspective of an observer on the spaceship, the spaceship is not contacting more spatial units, because they take their own spaceship as the frame of reference. Therefore, the speed of light measured on the spaceship is still c.

General relativity is a successful theory, and its gravitational field equations describe a continuous, idealized spacetime. The real physical spacetime may be discrete at the Planck scale. If the concept of 'spatial density' proposed on the basis of a discrete spacetime can effectively describe or approximate the phenomena described by the gravitational field equations of general relativity (that is, if it can recover or match general relativity in the macroscopic, low-energy limit), then the concept of 'spatial density' can be considered successful.

(1.2.2) Explaining Motion

Since spacetime is discrete, an object moving through space certainly does not pass through all the points on its trajectory (if we consider the trajectory to be continuous), but rather through a finite number of points. The reason is that if it were to pass through every point of a continuous trajectory, it would be an infinite process, which cannot be manifested. In other words, even if it did pass through every point of a continuous trajectory, it would be unable to be manifested. Since it cannot be manifested, then it can only be that, in theory, it passes through every point, but in reality, it cannot be manifested, which means it cannot be confirmed. That is to say, the motion of an object can only be a series of discrete jumps, like a quantum leap. This is to say that the motion of an object in space is discrete and discontinuous.

Why do quanta exist? If we use the viewpoint of no form action theory to explain this, it is because for motive force to be manifested, it must be isolated. Once it is isolated, it becomes discrete quanta. This shows that the discreteness observed in quantum physics is simply a necessary consequence of the mode of no form manifestation in our universe.

Let us now re-examine the problem of motion from the perspective of Zeno's paradoxes. Zeno's arrow paradox: A flying arrow is motionless. Because at each instant, it occupies a single position in space, which means that the arrow is at rest at each instant. Therefore, Zeno concluded that motion is impossible.

An arrow that has been shot has motive force. If this motive force is to be manifested as change, then isolation is required; this is a no form united transformation. Just as analyzed above, this isolation consists of the finite number of points that the arrow passes through on its trajectory. Thus, in the process of no form united transformation, the arrow manifests motion and change. If motion were continuous, it could not be manifested at all.

The problem with Zeno's paradox lies in the fact that it tries to deduce dynamic change from static points, but ends up concluding that the arrow does not move. This is an inversion of cause and effect. Because each point the arrow passes through is the result of motive force, and motive force is the cause. The formulation of Zeno's paradox does not embody motive force action; it only looks at the problem from the perspective of isolation, and thus arrives at the result that the flying arrow is motionless. Zeno's paradox arises from the illusion of a logical contradiction, which is caused by failing to see the no form united transformation as the underlying law.

The explanation of motion based on the concept of discrete space is logically coherent. If motion were continuous, one would fall into the 'flying arrow is motionless' paradox.

(1.2.3) A Priori Forms of Intuition

If spacetime truly has a discrete 'granular' structure, then our brain—as a physical system—also exists within these 'granules' of spacetime. This means that consciousness itself has some deep connection with the fundamental structure of spacetime. The discrete structure of spacetime may be what Kant called the 'a priori forms of intuition'—time and space as the preconditions for perception and understanding (Kant, 1781, B46).

However, the experience of spacetime in consciousness can be continuous, such as the smooth flow of time or seamless space that we perceive. This phenomenon indicates that although the discrete structure of objective spacetime provides the intuitive forms for consciousness, consciousness is able to transcend these forms. Consciousness is not limited by the discrete constraints of spacetime and does not have to be 'accountable' to it. For example, when imagining fictional scenes or abstract concepts, consciousness can construct continuous experiences that transcend physical spacetime. Therefore, our consciousness can transcend the limitations of the discrete structure of spacetime.

(2) Taking 'the Now' as a New Dimension

(2.1) The Now

Note, does there exist a thing that possesses manifestation action but does not manifest itself, instead relying on the manifestation of other things (things in manifestation) to be manifested? Just like space and time. We have already concluded that space is isolation action and time is motive force action. Then, according to the logic of the no form trinity, there must exist a manifestation action as a third dimension. What is this manifestation action?

Let us first explore the past, present, and future:

1) 'The now' is manifestation action: it is the direct manifestation and presence of things in spacetime.

2) 'The past' is isolation action: it represents that which has been fixed; it is a distinguishable event or state, possessing determinacy. It provides the background for the current state.

3) 'The future' is motive force action: it represents potential change and possibility; it possesses a driving force. It has not yet manifested, but it propels the evolution of things.

Time is a more macroscopic, holistic concept that includes the flow of past-present-future; its essence is the driver of change (motive force). However, when we minutely analyze the internal structure of the flow of time, we can regard 'the future' as the direct embodiment of this driving force (potential), 'the past' as the solidified result (isolation), and 'the now' as the direct presentation of things (manifestation). 'Time is motive force action' refers to its overall essence of flux, while 'the future is motive force action' refers to the driving factor in its constituent moments.

The now can be transformed into the past, and the future can be transformed into the now:

1) For the now to be transformed into the past, the future is certainly required. Because without the future as the motive force, the now would not change at all. This is a no form united transformation.

2) For the future to be transformed into the now, the past is certainly required as a foundation, because 'the now' is always in relation to 'the past'. This is a no form united transformation.

I believe that the dimension of manifestation action corresponding to time and space is 'the now'. Similarly, 'the now' does not manifest itself; it relies on the things within it to be manifested. 'The now' is pure no form manifestation action. Thus, we have discovered a third dimension in this world besides time and space: 'the now'. This dimension of 'the now' is more concealed than the dimension of time, making it very difficult for one to become aware of it. In relativity, we already know that time and space are one. In fact, time, space, and the now are a no form trinity. Their existence endows concrete things with a real existence.

It was mentioned earlier that space has a minimal unit (L) and time has a minimal unit (T). Then, 'the now' is a 'pause' of the changing time T on L, and this 'pause' manifests the things in spacetime. Without this 'pause', time would be infinitely fast, and everything would be completed and fixed in an instant, and thus no change would exist. Such a process makes the existence of this shortest time possible. That is, it makes the existence of time possible. Our understanding of time is very difficult; we can hardly imagine how time is formed. But with 'the now' as a dimension of manifestation action, it is not difficult for us to understand.

In fact, 'the now' has the characteristic of Immediacy. It is a 'pause' in time that allows things to be directly manifested in spacetime, without any intermediate process. 'The now' is a special and crucial operational node or interface of 'Immediacy' on the motive force dimension of 'time': it is precisely at the node of 'the now' that Immediacy enables the potential (the future) in the flow of time (motive force) to be manifested as reality, and to be instantly solidified as 'the past' (isolation).

It is impossible to understand time in isolation. Only from the perspective of no form united transformation can an essential understanding be achieved: a thing, through a 'pause' (manifestation action) on the L of space (isolation action), is transformed into time (m-otive force action).

Time in spacetime is bound together with the now: time includes past-present-future. Therefore, 'the now' is connected to time in this way. The now is certainly also connected to space; a real thing must appear now at some position in space. This tells us that space is three-dimensional (up-down, left-right, and front-back), time is one-dimensional (from past to future), and 'the now' is zero-dimensional (the now is a single, indivisible moment, like a 'point'). The exploration of 'the now' and its relationship with spacetime will greatly change our understanding of this world. Our macroscopic world is the three-dimensional world supported by time, space, and the now.

The now as a zero-dimensional point is consistent with its role as manifestation action. It represents a single, indivisible moment; this point of identity comes from manifestation. At this moment, spacetime and the things within them converge and are manifested. At this moment, the future (potential) collapses into the past through the manifestation action (the now). The concept of a zero-dimensional 'now' resonates with certain interpretations of quantum mechanics, where the collapse of the wave function is often described as an instantaneous event occurring at a specific point in time. That is to say, the collapse of the wave function causes the motive force that is the quantum to collapse into a particle of the macroscopic world, which is supported by the framework of spacetime and the now.

(2.2) Quantum Entanglement

From the perspective of the photon itself, it has neither a past nor a future, because for the photon itself, time is zero. This means that from the photon's own point of view, there is no distance of propagation and no time has elapsed. The photon exists in an eternal now, with no past or future. However, at this single moment, the photon continuously undergoes transformation and interaction. This change is the change of motive force itself and has no relation to the spacetime of the macroscopic world. This change is also not a change in spacetime. The propagation of light in spacetime—that kind of change—is the manifestation of motive force in spacetime.

How can it be shown that the photon itself possesses changeability? The superposition state of a photon can illustrate this point. For example, a photon has two basic polarization states, usually corresponding to right-handed and left-handed circular polarization. The polarization state of a photon can be any linear combination of these two basic states, i.e., a superposition state. But once a measurement is made, the photon's polarization state will 'collapse' to one of the definite states (right-handed or left-handed). Whether it collapses to right-handed or left-handed is probabilistic (indeterminate). This shows that the superposition state of a photon is a kind of change (this is the evolution of the quantum state, and its evolution is unitary and deterministic), but this change leads to the indeterminacy of the measurement result. It is different from the change in our macroscopic world, which has a spatiotemporal nature.

Although from the photon's own perspective, the photon has no temporality. This state of zero time for the photon is, in fact, the photon's dimension of 'the now'. That is to say, the photon itself possesses 'nowness'. This 'now' dimension that the photon possesses is bound to the photon as a motive force, not bound together with spacetime.

However, from the dimension of time, the photon should have temporality, because the photon propagates through space over time. The photon also has a certain spatiality, it is just that its spatial position is indeterminate, existing in the form of a probability wave. In other words, the spatiality of the photon is weak. Observation merely determines the spatial position of the photon. This means that our observation 'collapses' the quantum state of the photon, forcing it to become a particle within the macroscopic world's framework of spacetime and the now.

Thus, we can imagine that certain aspects of the quantum world are not controlled by space. For instance, quantum entanglement. Quantum entanglement is a non-local correlation; two entangled particles, even when separated by a great distance, can instantaneously influence each other's state. This seems to be unrestricted by time, but I believe its essence is that it is unrestricted by space (if it is unrestricted by space, quantum entanglement would also not require time). This is because this entanglement does not transmit any information. If it were restricted by space, then there would necessarily be information about the path it traversed. In other words, the mutual correlation of quantum entanglement does not pass through space at all. This correlation seems to transcend the limitations of space, but it still needs to occur in the dimension of 'the now', because the occurrence of any event requires a moment of 'the now'.

I will attempt to explain quantum entanglement using no form action theory.

Description of quantum entanglement: Quantum entanglement is a peculiar quantum phenomenon in which two or more particles are interconnected in such a way that they are correlated even when separated by great distances. Taking the polarized light experiment as an example, when a laser is shone on a crystal in the middle, a pair of 'entangled' photons is produced. The polarization direction of each is in an indeterminate superposition state. The polarization directions of the 'entangled' photons are then measured on two separate sides. However, when you measure the polarization direction of one photon, its superposition state immediately collapses to a definite state (e.g., horizontal polarization). At the same time, the polarization state of the other photon also immediately collapses to the opposite state (e.g., vertical polarization) (Einstein, Podolsky, & Rosen, Physical Review, 1935).

What is strange is this: the photon pair is generated first, and the measurements on the two sides should be independent. Therefore, it is incomprehensible how, no matter how the direction of the polarizer is changed, the other side seems to instantaneously know about the change on this side. This correlation is not limited by distance, even if the two photons are separated by several light-years. This challenges our traditional understanding of space and time.

My explanation: Before the two 'entangled' photons are measured, they are things of motive force belonging to the quantum world, not isolated things of the macroscopic world. Although they are separated, they have not become two isolated particles of the macroscopic world. Therefore, they do not possess the property of distance that belongs to isolated things of the macroscopic world (that is, they are not restricted by space).

To elaborate, from the perspective of the macroscopic world, photons do indeed propagate through space. However, this propagation is in the form of a wave; they have not manifested in the space of the macroscopic world and are not yet truly particles of the macroscopic world, and thus do not have the property of distance of the macroscopic world. Therefore, these propagating photons only possess a concealed spatiality. Only a measurement can make them truly manifest as isolated particles in the macroscopic world. In other words, measurement transforms the concealed spatiality of the photons into the manifested spatiality of the macroscopic world, and thus they acquire the property of distance of the macroscopic world.

In other words, before the two 'entangled' photons are measured, they exist as a 'quantum motive force whole'. Their internal correlation (potential opposite polarizations) exists in the 'eternal now' (the 'now-ness' of the photon). Measurement, on the other hand, occurs at a specific moment of the 'macroscopic now', forcing this whole to manifest, within the framework of 'spacetime and the now', as two particles with definite properties, which then truly possess the distance of the macroscopic world. At this point, the entanglement between the two photons disappears, and the previously mutually entangled polarization directions will consequently display definite, opposite polarization directions.

This illustrates that, from the perspective of the macroscopic world, although photons propagate through space, when we are not observing them, they do not truly manifest in space as isolated particles. In space, they exist only in a concealed state as a wave of motive force. They are simply evolving continuously over time in the quantum world. After a measurement, the substantial nature of the quanta is changed, bringing them into the realm of classical, isolated particles of the macroscopic world.

(2.3) Dimensions in Consciousness

In our consciousness, there is a scene. However, the spatiality of this scene is not important for consciousness; no matter how large the scene is, it will fit into our consciousness. This means that in consciousness, spatiality is weak. Our thinking can even almost dispense with this spatiality and think using only abstract symbols. In consciousness, when our body is struck and we feel pain for a period of time, for such a directly stimulated conscious manifestation, there is indeed a temporal causality. However, this is merely the interaction of the external world with consciousness. Even if our consciousness lasts for a period of time, there is no temporal standard within consciousness to measure such a time; it can only be measured by relying on macroscopic time.

But for pure consciousness, it can almost dispense with temporality. For instance, we can think about problems teleologically, which is to reverse causality: the purpose comes first, and the cause comes later. For another example, we can recall the past, imagine the future, and even contemplate being and meaning that transcend time. But the logical relationships in these thoughts are not controlled by temporal sequence, even though our process of thinking does have a temporal sequence. The fact that logical relationships in thought are not bound by temporal sequence indicates a fundamental difference between the structure of conscious thought and the structure of physical reality.

All of this shows that temporality and spatiality are weak in the world of consciousness, and can even be purified to the extent of being purely uncontrolled by spacetime. The world of consciousness is dominated by manifestation action; it is more concerned with the mode of manifestation and the meaning of things, and is less constrained by the limitations of space and time. Temporality and spatiality are replaced by the laws of thought (e.g., the laws of logic) and the modes of thinking.

However, in the world of consciousness, there is the dimension of 'the now'. Our consciousness always exists in 'the now', and this is the primary dimension in the world of consciousness. It is precisely because consciousness operates primarily on this zero-dimensional, non-extended interface of 'the now' that it is able to be relatively free from the constraints of extended space and one-dimensionally flowing time.

That is to say, the dimension of 'the now' exists in the world of consciousness, the quantum world, and the macroscopic world. It is the dimension that traverses these three worlds. In the world of consciousness, all our conscious experiences happen at the moment of 'the now'. In the quantum world, the occurrence and evolution of quantum events also require 'the now' as a reference point. In the macroscopic world, macroscopic events and processes likewise cannot do without the participation of 'the now'. This is also the essence of the dimension of 'the now'. Because 'the now' itself is the dimension that possesses manifestation action, it therefore possesses identity, and is able to encompass and penetrate the specific forms and actions of different worlds, thereby playing a unifying role.

The dimension of 'the now' connects the world of consciousness, the quantum world, and the macroscopic world; it is the common point of convergence for the three worlds. Our perception of the macroscopic world, as well as the measurement results of the quantum world, all happen at the moment of 'the now'. 'The now' also possesses the Immediacy of manifestation. Only 'the now' is the most direct; in this dimension, things are directly manifested, with no intermediate process. From the perspective of no form action theory, 'the now' can be understood as the ultimate embodiment of manifestation action. In the dimension of 'the now', isolation and motive force both recede into the background, and only manifestation occupies the dominant position.

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