

Theory of Everything

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Keywords: Relationship; Parties; Object elasticity; Schrodinger's cat
The ionization energy; Japan kilogram standard

Abstract: This universe is the so-called "clockwork organism". If a metagalaxy is compared to "clock", each "part" of which that's composed will be each object (galaxy, star, elements, and atom). Those have to be equipped with the individuality in the purpose which is the organization. It's possible to be continuing this universe by existences with the peculiar feature in the size, the mass and speed harmonizing in one structure. The natural world is formed by such harmony principle. If it's so, to elucidate such mechanism of harmony has to be the main purpose of physical science. The key which solves the mystery is to consider natural law by the angle as "the interaction of the substance and the energy". If we look back to history of physics, we will find that a study has developed through the angle of the approach action. But the natural reality couldn't be made that clearly. The methodology reached the limit already, and it didn't seem to lead any more development by such approach. A completely new way of thinking is needed for us to get correct and deep understanding to nature at present. I thought the members in this world are harmonized by exerting the force and the energy each other by a remote action and produced "relational physics" newly. As a result, I succeeded to explain all force which exists in the natural world in one structure.

This paper is the revise which gave correction to the article I announced in the past "Unified description of all force" (PACS Nos. 01.55. +b; 89.90. +n).

That's the more systematic universal contents as theory and is the one which guarantees the correct consistency to the experimental data. And also, I considered so that the law I found based on an original stance of "numerical formula negativism" might be expressed by mathematics of the very simple junior high school level in it. Please read pleasantly.

Then, I'll enter statement.

It has been thought that the natural world is formed by simple law which is to the extent it can be described, by only one equation from the past. It's said that there are four kinds of force (gravity, the electromagnetic force, the strong force and the weak force) in the natural world present [1], but it's thought that it was gathered before as one [2]. Therefore, the try to catch four of force in unifying way has been formed out of physicists. They have built a basic answer about it through history. It was the proximity theory which is a common view of present-day physics. During shifting to the quantum theory from classical physics soon, that was developing into the way of thinking which handles a source of force by a model as an exchange of a particle [3]. It has been thought a source of the electromagnetic force is exchange of a photon [4], and that a source of gravity is exchange of graviton [5]. But those aren't observed yet, and proximity theory isn't proved to be right. The try which unifies four kinds of force isn't also successful yet. Therefore, unless those are achieved, it can't be said that proximity theory is right. On the other hand, discovery of such particle isn't needed to inspect right of the remote theory. When there even are strong theory system and experimental data of existence, it can be proved sufficiently that it's right. We have value which should convert into remote theory from proximity theory greatly in view of such point.

Then, I'd like to touch about the difference between the proximity theory and the remote theory here. Proximity theory handles force by a model as "exchange force". Therefore, a concept as reciprocation of gauge particle [6] for such exchange has to be assumed absolutely. And reciprocation needs time. Therefore, the spread of force in proximity theory involves limited speed. It was put on as the primary focus of study that classical physics aims at movement of an object since birth of a motion equation [7]. It can be said that the essence is "movement model".

It's suitable for such models describing the state from which speed and the point of view of the object change successively, so it's natural to handle communication of force between the objects with an action through medium with limited time. Therefore, it has been thought the medium which mediates between that has to exist for force to spread by action through medium from old days [8]. It has been expected that force moves space with time successively while being transmitted through a medium. However, Michelson-Morley experiment proved in 1887 that ether doesn't exist [9].

If becoming it like this, physicists should model again once more, the mechanism that the energy (gravity and light) is transmitted without making them mediate between a medium. It is scientifically honest attitude to theorize a new picture of the force propagating at infinite speed without time, without the mediation of either a ether or gauge particles in the space that separates objects.

So I stood as remote theory and derived the hypothesis that the energy is "the relationship with which it's tied between the objects" intuitively. I called that "relational theory" or "relational physics". Though it's a natural thing, this theory handles force and the energy based on a "relationship model". For example when there are a man and a woman as a person concerned at the place in relationship between the man and the woman, a relation between the opposite sex will stand up only with that freely. Even in a vacuum, even in space. It is because of the remote theory that such a conclusion can be taken. In this respect, relational theory doesn't require a medium to convey the force, but instead, it require a new concept of "parties" that constitute the force. For example, in the gravitational force that constitutes between the earth and the moon, the earth and the moon are "the parties concerned", in the electromagnetic force that constitutes between a metal and a magnet, the metal and the magnet are "the parties concerned", in the romantic relationship that brings together a man and a woman, the man and the woman are "the parties concerned" that constitute it. It is the position of relational theory that without the existence of these "parties" there would be no force or energy. And in order to be called a "relationship" there must be an (invisible) bond connecting two or more "parties". If you can see it, it's no longer energy or force (except for visible light [10]).

Now, as mentioned earlier, since there is no need for a medium in relational

physics, there is also no need for time for the force to act between objects, which means that the speed of transmission of the force is infinite. In addition, the way the position and speed of the objects change is not seen as the objects moving, but as the "relationship between the objects" changing. For example, when an apple fruit falls from the branch of a tree to the ground, it is not seen as the apple's falling motion, but rather as a change in the "three-way relationship" composed of the apple, the branch, and the earth over time. That is the basic idea of relational physics.

Indeed, the proximity theory (classical physics and quantum theory) is one of the best theories that can explain many experimental facts. However, we should realize that the remote theory makes it possible to further understand the unity of forces such as gravity and electromagnetism, as well as the duality of particles and waves in light. This should lead to a deterministic prediction of the behavior of electrons in atomic structures, which in turn should lead to the development of semiconductor physics and stimulate industry. I believe that it is my relational theory that will lead the scientific world in the future.

Now, let's discuss this theory further.

I have developed a new "relational model" based on the remote theory, which defines force and energy as "relationships". The rationale for this is based on the fact that all energy (except for visible light) is invisible to the human eye, and should be viewed as a "relationship between objects" rather than matter. In addition, when we look at the properties of light, we can find both wave [11] and particle [12] characteristics, but we also have reason to believe that the superordinate concept that encompasses them is exactly "a relationship". Such a concept is the most basic and universal way of explanation that can cover all the features that appear in the results of experiments examining light, heat, and force. Because of its pervasiveness, it can integrate both wave and particle properties without contradiction. The first time such duality was recognized in physics was when the double-slit experiment [13] and the photoelectric effect experiment [14] were found to have different characteristics. In the double-slit experiment, when light is irradiated toward a wall with two light loopholes, a stripe pattern is created on the screen behind the wall. It reminds us that light has the properties of a wave. This is because if the light grains only traveled in a

straight line, the screen would only have a dark pattern with no gradient in the form of a grid of squares. On the other hand, in experiments on the photoelectric effect, when high-frequency light, such as X-rays or ultraviolet light, is bombarded on metals, electrons are ejected from them. It reminds us that light is a grain like a gunball. The reason for this is that it is thought that the tiny particles, such as electrons, were bounced around because of the concentrated interaction at one small point. The above two different pictures of light are understood by modern physics (commonly known as "physics") in terms of the duality of particles and waves. Because it was double experiment with double results. The reason is that since both were present, it was deemed that it had to be treated as a duality.

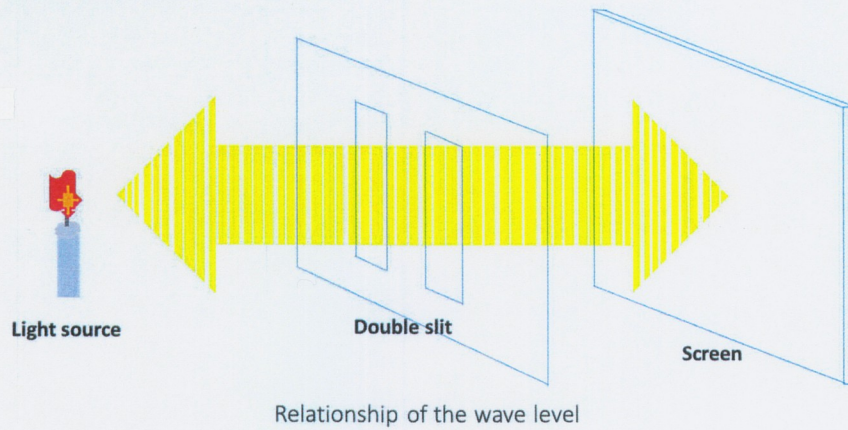
Such an interpretation is not necessarily wrong, but it does not fully capture the nature.

Therefore, it will be necessary to extract further essences that encompass duality.

In my view, light is energy, and energy is a "relationship". Hence, light is a "relationship". If that is the case, then there must be "parties" to constitute light. The "parties" are the multiple relational components that hold the energy from the edges. It will be structured differently for each experiment. If the experimental method is different, the "parties" will be different, and if the "parties" are different, the "relationship" will be different.

Now, let's take a closer look at the double-slit experiment with this in mind. The "parties" there can be broadly divided into three: the light source, the slit, and the screen. In other words, a "three-party relationship" has been created there (Fig. 1).

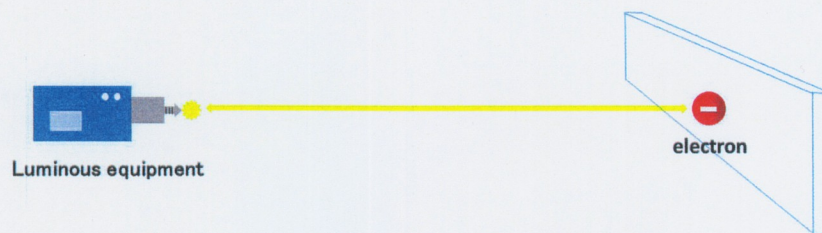
Figure.1



It is a thinner relationship than a "two-party relationship". The double-slit experiment was the expression of such a "relationship" in the form of waves. The double-slit experiment made the "relationship" into a wave level. The thin relationship between the three parties has emerged as a somewhat expansive wave nature.

Let's take a closer look at the experiments of the photoelectric effect. The two main "parties" there are the light source and the metal. In other words, a "two-party relationship" has been established (Fig. 2), which is a stronger relationship than a "three-party relationship".

Figure.2



Relationship of the particle level

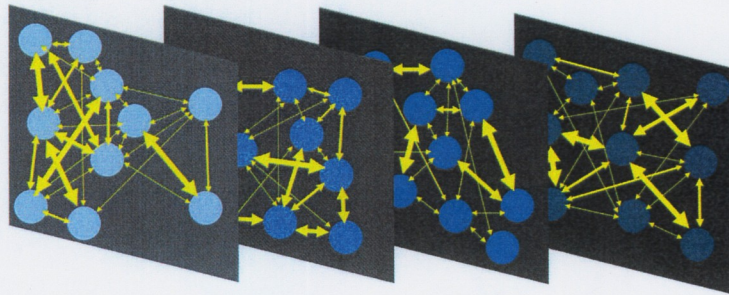
The photoelectric effect is the manifestation of such "relationship" in a microscopic form reminiscent of particles. Experiments with the photoelectric effect have brought "relationships" to the level of particles. Because the relationship is so strong, as if it were a "red thread of fate", the area of action is limited to the narrow range of a single electron. The strong relationship between the two parties was expressed as a particle nature. Thus, by conducting two different experiments, the "parties" will be different, the "relationship" will be different, and the results of the experiments will be different. What modern physics is pointing out through the concept of the duality of particles and waves is about the equivalent of that difference. For example, when a man and a woman meet face to face, the "opposite sex relationship" is formed, and when a man meets a man, the "same sex relationship" is formed. Although we are the same person, our narrowly defined "relationship" differs depending on which gender we face, and thus our position be "same sex" or "opposite sex". This is the very "duality of same sex and opposite sex". Both positions are correct. Also, when we face our elders, we are "juniors", and when we face our juniors, we are "seniors." Although we are the same

person, our relationship in a narrow sense differs depending on who we are facing, and thus our position becomes "senior" or "junior". This is exactly the "duality of senior and junior". Both positions are correct. We are both a "senior" and "junior". As our position differs depending on the opponent, we cannot limit ourselves to one or the other. In other words, duality.

The same is true for the duality of particles and waves. Since the "parties" in each experiment are different, it is natural consequence that the "relationships" in the narrow sense are also different. As long as there are two different members in the experiment, it is natural that there will be two different "relationships", or dualities, in the narrow sense. Therefore, if we extract the essence between the particle nature and the wave nature, it can be regarded as a "relationship" in a broad sense. This is because it is a broad superordinate concept that can be applied in both experiments.

Because of this, I was convinced that all forces and energies in nature could be universally explained using the model of "relationship". Now, let's move on to a detailed discussion of it. My image of space-time is something like an animation book. It is a film booklet made up of many consecutive manuscripts. When we flip through them, the pictures on the manuscript look as if they are moving. I modeled the image of the universe by analogy from there. In this context, space refers to the individual sheets of the animation book, and time refers to their continuous change (Fig. 3).

Figure.3



What this space-time model reveals is that "relationships" are an essential requirement for both space and time. Space is a concept that consists of all the elements that make up a film and the "relationships" that connect them to each other, while time is a concept that consists of the "relationships" that connect a film to the next film. However, the requirements for establishment of spatial and temporal relationships are different. There is a difference in that the former takes no time at all to complete, while the latter takes time to complete. The difference is that the former connects objects to each other in zero seconds, while the latter connects the present object to the future object over a period of time longer than zero seconds. If the current object and the future object are connected in zero seconds, then the flow of time would stop, but in reality this is not possible. On the other hand, the relationships that connect the objects that make up a space are always established in zero seconds. It is easy to understand if you think of it as an animation book. If all manuscripts were connected to each other in zero seconds, it would not be an animation book at all, but the components of each film are connected in zero seconds. In addition, my image of the universe is based on the model of a

"clockwork organism". In other words, each film has an organic structure. The term "organic" refers to a state in which the various elements are related to each other and influence each other, but are harmonized in a finite order. In the case of a watch, it is composed of various parts, and each part creates autonomy by harmonizing with each other. These characteristics apply not only to the universe as a whole, but also to the global environment and the human body. In that model, the universe is defined as a "clock", individual objects are defined as "parts", and energy and force are defined as their "sources of action". Of course, the terms "clock" and "parts" are metaphors, but I used them to support my remote theory of the universe. In other words, I defined all the forces and energies that exist in the natural world as "relationships between objects", like the "intertwining" of the gears inside a clock.

Therefore, the concept of "individuality" of an object is derived from this. The members of this universe are designed to be unique, or else they would not be able to interact with each other. Just as a watch has a long hand and a short hand, a large screw and a small screw, a large gear and a small gear, the individual parts that make up this world also have a wide variety of unique faces. And again, the "relationships" that connect these unique objects are seen as force and energy.

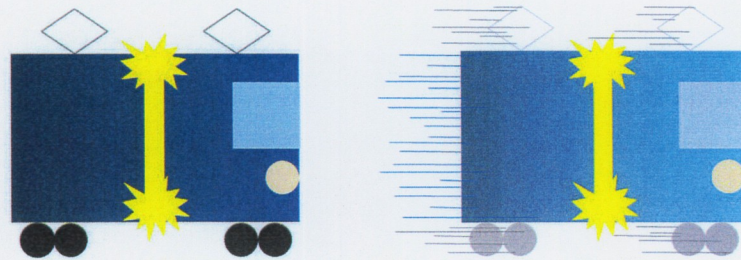
If we compare it to Coulomb's law [15], the electric charge corresponds to "individuality" (they are strictly different concepts), and the Coulomb force corresponds to the "relationship". This is the similarity between relational physics and Coulomb's law. However, the difference is that Coulomb's law (electromagnetism) assumes that repulsion acts between objects with the same sign of charge, while relational physics assumes that repulsion does not exist between objects with equal individuality. The theory says that there is neither repulsion nor attraction between equivalent individualities. For example, let's consider the example of a magnet. Magnets have an S-pole and an N-pole, and they attract each other when different poles are brought close to each other, and repel each other when poles of the same sign are brought close to each other [16]. If we look only at such a phenomenon, it seems that the repulsion force works between poles of the same sign. However, relational physics does not take such an interpretation. It sees the

"relationship" between poles with the same sign of a magnet as being "irrelevant". The reason why it is "irrelevant" is that there is no difference in individuality between poles with the same sign of a magnet. Since this universe is a "clockwork organism", every member within it must be unique. In other words, the composition of this world must be rich in variety. It is because of this richness of variety that forces and energies can arise in this universe. If this is the case, then the "relationship" between poles with the same sign of a magnet is not rich in variety at all, and is, so to speak, the "ultimate unrelated world". Therefore, no force of attraction arises at all. So, how should we think about the action that looks like repulsion? At first glance, it seems as if repulsion has occurred, but the force that is manifested there is not repulsion. It is "the force brought about by the action of human hands bringing magnets closer together", not the force inherent in magnets. The repulsion force in electromagnetism can be explained in terms of relational physics as the phenomenon of a magnet being pushed farther away due to a human hand injecting force into the "irrelevant space" created between poles with the same sign. It's just that it looks like repulsion. There must be a difference in individuality in order for the force to arise, and if objects with individuality are brought close together, there will be no "relationship" (force or energy) at all. Therefore, we can conclude that there is no repulsion in nature.

Now, let's take a closer look at relational theory.

Every force or energy is a "relationship". In order to be able to say so, there must be multiple parties intervening, each party must be unique, and the speed at which they are related must be infinite. In order to convert such requirements into mathematical formulas, I tried a thought experiment using light. Since light is a form of energy, it follows that light is also a "relationship". Therefore, we can assume that its speed of travel is theoretically infinite. Please take a look at Figure 4.

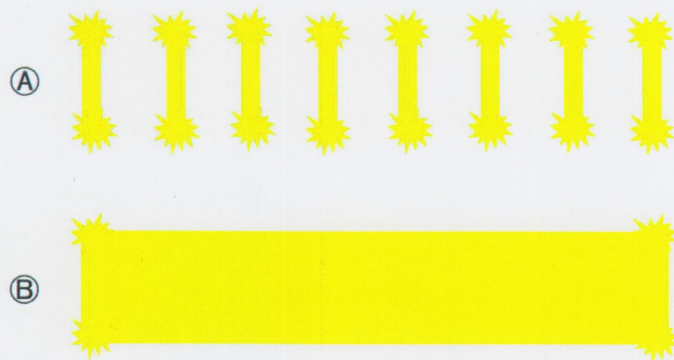
Figure.4



If light is emitted from a light source installed in the ceiling of a train, it will reach the floor in zero seconds, and the vertical line will remain straight no matter how fast the car moves horizontally. I coined the term "light pillar formation" for this.

So, if the train in Figure 4 were to travel at $299792458 \text{ [m}\cdot\text{s}^{-1}]$ [17], what would the light pillar look like? For that matter, two ways of seeing can be assumed (Fig. 5).

Figure.5



When considering which of them is more appropriate (as I will explain in detail later), it is best to take the image of ② for the moment. I coined the term "optical band formation" for this.

I'd like to express that in a mathematical equation. The light pillar is the vertical length of the light band, so it can be expressed as " l ". This is because it is a straight line made of light that connects the ceiling to the floor at infinite speed. On the other hand, how should we describe the horizontal length? We can think of an optical band as horizontal line of N light pillars. Since it is the result of traveling at the speed of light for a certain period of time, it can be expressed as " ct/N ". If so, then the optical band can be described as the product of the vertical length (l) and the horizontal length (ct/N).

In this regard, a single light pillar is composed of two parties that sandwich it from both ends, so the value of the number of parties (n) is always equal to twice the number of light pillars. Therefore, the relationship between the two can be expressed by the following equation.

$$2N = n \quad \text{①}$$

With the above discussion, the left-hand side in the equation to describe the optical band could be determined.

Now, how do we determine the right-hand side? At first glance, it may seem that it can be represented as a square with one side of equal length (i.e. " l^2 "), but this is not the case. This is because optical band formation is a type of formation that is always in progress and the edges are never closed. I coined the term "attempted optical band" for it. Since one of the two ends of the optical band is missing, we cannot call the members of it "both parties". It can be said that it is in a "semi-ripe" state as an optical band. Hence, it can be expressed as " $l^2/2$ ". Therefore, the equation describing the "attempted optical band (half optical band)" is given in the following form.

$$l \times \frac{c t}{N} = \frac{l^2}{2} \quad [\text{m}^2] \quad (2)$$

Then, substituting equation (1) into equation (2) and continuing the transformation, the relational equation between " c " and " n " is determined by the following process.

$$\frac{l [\text{m}] c [\text{m}\cdot\text{s}^{-1}] t [\text{s}]}{\left(\frac{n}{2}\right) [1]} = \frac{l^2 [\text{m}^2]}{2 [1]}$$

$$\frac{l [\text{m}] c [\text{m}\cdot\text{s}^{-1}] t [\text{s}]}{n [1]} = l^2 [\text{m}^2]$$

$$c [\text{m}\cdot\text{s}^{-1}] t [\text{s}] = n l [\text{m}]$$

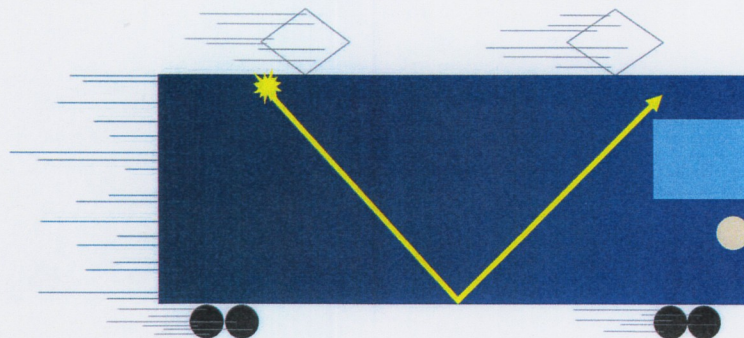
$$c [\text{m}\cdot\text{s}^{-1}] t [\text{s}] = n v [\text{m}\cdot\text{s}^{-1}] t [\text{s}]$$

$$c = n v [\text{m}\cdot\text{s}^{-1}] \quad (3)$$

This explains why light passing through water is slower than that in a vacuum [18]. This is because the number of " n " has increased with the addition of water as a party. The same is true for Fizeau's experiment [19]. The speed of light (c) is essentially infinite, but has been slowed down to about 3×10^8 [$\text{m}\cdot\text{s}^{-1}$] due to the extra interaction humans have added to the measurement by intervening parties such as

half-mirror, gear and reflector [20] to increase the value of "n". The concept of "c" is a result of the artificial finite nature of speed. At first glance, it may seem to represent photons in rapid motion, but this is not the case. Rather, it appears as a single "relationship" that originally connects the light source and its destination, as they are connected at infinite speed. In stead of a particle of energy (photon) moving from one end to the other, we should think of it as an energy (relationship) that originally connects both ends (between the two parties) in zero seconds. If we assume that photons travel through space with time at a finite speed, then the train experiment can be imagined in a completely defferent way (Fig. 6).

Figure.6



Comparing Fig. 4 and Fig. 6, you can clearly see the difference between the proximity theory and the remote theory. Now, if we take the remote theory, we will understand that the gravitational force between a star and a planet and the electromagnetic force between a proton and electron are both "relationships" that connect the two parties [21]. There is a difference in velocity, size, and mass

between them. In other words, there is a difference in attributes, or individuality, that can be seen. Conversely, a space filled with "relationships" will always have objects of different individuality at both ends of the space, and these objects will influence each other to create a force.

In this way, we can see "force" as an "attraction between individuality". The degree of this is inversely proportional to the smaller the distance between the two individualities. This is because the closer the distance is, the more intense the "relationship" becomes. Therefore, if we set the distance between individualities as " l ", both individualities multiplied together as " i^2 ", the force as " F ", and the proportionality coefficient as " k_a ", we have the following equation.

$$F = k_a \frac{i^2}{l} \text{ [N]} \quad \textcircled{4}$$

Here, we need to be clear about what "individuality" means. One thing that can be said is that as the number of members in a population increases, individuality decreases, and as the number of members in the population decreases, individuality increases. Also, since both the planetary model and the atomic model are models in which both move in different ways, it is certain that the factor of speed has an effect on the amount of individuality. Therefore, intuitively, we can derive the following equation.

$$i = \frac{1}{n v} \text{ [s} \cdot \text{m}^{-1}] (= [\text{Gp}]) \quad \textcircled{5}$$

As for units, following my introduction of a new quantity called " i ", I independently invented a unit called " G_p " (named "Galapagos"). Also, by substituting equation $\textcircled{3}$ into equation $\textcircled{5}$, we obtain the following form.

$$i = \frac{1}{c} \text{ [Gp]} \quad \textcircled{6}$$

Therefore, if we transform equation $\textcircled{4}$ using equation $\textcircled{6}$, we can complete the equation of electromagnetic force in the following form (the proportionality coefficient " k_a " has the assembly unit $[\text{N} \cdot \text{m}^3 \cdot \text{s}^{-2}]$,

but the value is "1").

$$F = k_a \frac{1}{r^2} \frac{[N \cdot m^3 \cdot s^{-2}]}{[m \cdot m^2 \cdot s^{-2}]} (= [N]) \quad (7)$$

This equation is a model of the electromagnetic force equation, but at the same time it corresponds to the strong force model. The reason is that the strong force is a "relationship" between objects that is established over a very small distance. In other words, the difference between electromagnetic force and strong force is determined only by the distance between objects. Therefore, the electromagnetic force and the strong force are the same force.

Now, let's move on to the discussion of gravity. In this regard, according to Newton's theory of gravity, gravity is a force that acts between objects with mass, and its magnitude is proportional to their mass [22]. The proportionality coefficient "G" introduced in the equation is called the universal gravitational constant, and its accuracy is said to have been confirmed by Cavendish's experiments [23] using a torsion balance. However, this raises a question. The two lead balls used in the experiment were extremely different in weight and size (the large ball weighed 160 [kg] and the small ball weighed 0.73 [kg]) [24].

According to Newton's theory, gravity should be proportional to mass, so if we want to exert a strong gravitational force between two lead spheres, it would be more efficient to use two equally large spheres. However, Cavendish did not so. This is because if both masses are aligned equally, the requirement for the generation of force in relational theory is not satisfied. In order for the force to arise, each of the parties that make it up must be unique.

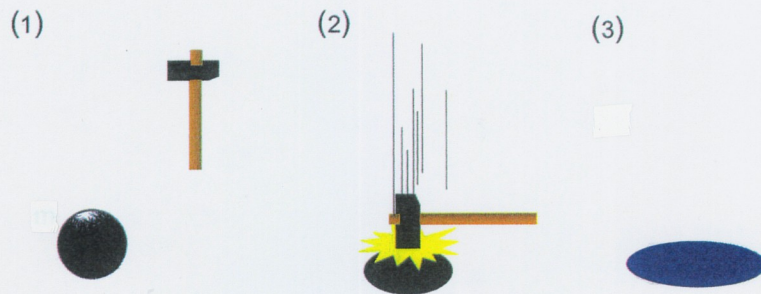
In other words, there needs to be a gap between each party in the size, mass and velocity of the object. That is why Cavendish used two lead balls of extremely different masses in his experiment.

Otherwise, the space between them will become an "unrelated world" and no attraction will occur, just like when two poles with the same sign of a magnet are brought close to each other.

Newton's theory of gravity is a fatal logical contradiction in describing the relationship between force and mass. It is doubtful that such a thing is a faithful representation of the laws of nature.

If so, we will need to devise an entirely new equation to replace Newton's theory of gravity, and re-model gravity accordingly. So, I tried to derive my own theory of gravity through thought experiments. Please see Figure.7.

Figure.7



First, consider the mass of the entire universe as " m ". Then, God applies a hammering force (F) to stretch it thinly into a plane consisting of a great number of parties (n). I coined the term "mass sheet formation" for this. If we set the radius of the whole universe as " r ", then the area of the universe can be expressed as " πr^2 ". If we derive the model based on this point, the equation is given in the following form.

$$m \times F = \frac{\pi r^2}{n}$$

If we introduce a proportionality coefficient with the assembly unit [$N \cdot kg \cdot m^{-2}$] (the quantity symbol is " ϵ_6 " and the value is " 10^{-x} ") and transform it, we obtain the following equation.

$$F = k_b \frac{\pi l^2}{n m} \frac{[N \cdot kg \cdot m^{-2} \cdot m^2]}{[kg]} (= [N]) \text{ ⑧}$$

This is the new theory that correctly describes the relationship between gravity and mass (according to this equation, gravity is inversely proportional to mass). And in relational physics, gravity, electromagnetism and strong force are all the same in that they are all "relationship". Therefore, if we express this in terms of equations, the following form is completed.

$$k_a \frac{1}{l c^2} = k_b \frac{\pi l^2}{n m} \text{ ⑨}$$

This is the formula for the Theory of Everything, which can deal with all forces in a unified manner.

I originally modeled the left-hand side as the equation for the electromagnetic force and the right-hand side as the equation for gravity, but that I have unified them, we can calculate using either. For example, it is possible to use the left-hand side (equation ⑦) to calculate gravity and the right-hand side (equation ⑧) to calculate electromagnetic force. Furthermore, by transforming the equation ⑨, the mass, volume, and density of an object can be calculated. Let's derive them in order.

$$\frac{k_a [N \cdot m^3 \cdot s^{-2}]}{l [m] c^2 [m^2 \cdot s^{-2}]} = \frac{k_b [N \cdot kg \cdot m^2] \pi l^2 [m^2]}{n m [kg]}$$

$$\frac{n m [kg] k_a [N \cdot m^3 \cdot s^{-2}]}{l [m] c^2 [m^2 \cdot s^{-2}]} = k_b [N \cdot kg \cdot m^2] \pi l^2 [m^2]$$

$$\frac{n m [kg] k_a [N \cdot m^3 \cdot s^{-2}]}{\pi l^2 [m^2] k_b [N \cdot kg \cdot m^2]} = l [m] c^2 [m^2 \cdot s^{-2}]$$

$$\frac{k_a [N \cdot m^3 \cdot s^{-2}]}{k_b [N \cdot kg \cdot m^2]} \times n m [kg] = \pi l^3 [m^3] c^2 [m^2 \cdot s^{-2}]$$

Here, the relationship between "k_a" and "k_b" is expressed as a new proportionality coefficient "J" (called "Junichi Parameter" after me). Along with this, I will also introduce a new unit "Skr" (named "Sakura" after a flower that represents Japan).

To summarize these relationships, the quantities are given in the following form.

$$k_a = 1 \text{ [N} \cdot \text{m}^3 \cdot \text{s}^{-2}\text{]}$$

$$k_b = 10^{-x} \text{ [N} \cdot \text{kg} \cdot \text{m}^{-2}\text{]}$$

$$\frac{k_a}{k_b} = \mathcal{J} = 10^x \text{ [Skr]} (= [\text{m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}])$$

Now, let's continue with the derivation. Since " $k_a/k_b = \mathcal{J}$ ", the equation is formed by the following process.

$$\begin{aligned} \mathcal{J} [\text{m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}] n m [\text{kg}] &= \pi r^3 [\text{m}^3] c^2 [\text{m}^2 \cdot \text{s}^{-2}] \\ m &= \frac{\pi r^3 c^2}{\mathcal{J} n} \frac{[\text{m}^3 \cdot \text{m}^2 \cdot \text{s}^{-2}]}{[\text{m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}]} (= [\text{kg}]) \quad \textcircled{10} \end{aligned}$$

This is the formula for mass. If we transform it, we can get an expression for volume. The process is as follows.

$$\frac{4}{3} \pi r^3 = \frac{4 \mathcal{J} n m}{3 c^2} \frac{[\text{m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2} \cdot \text{kg}]}{[\text{m}^2 \cdot \text{s}^{-2}]} (= [\text{m}^3]) \quad \textcircled{11}$$

$$\pi r^3 = \frac{\mathcal{J} n m}{c^2} \frac{[\text{m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2} \cdot \text{kg}]}{[\text{m}^2 \cdot \text{s}^{-2}]} (= [\text{m}^3]) \quad \textcircled{12}$$

Equation ① expresses the shape of the volume of a spherical object, and equation ② expresses the shape of the volume of a cylindrical object. Now, let's derive the equation for density. Since volume is the amount of mass divided by density, the following equation can be used to express the relationship between them.

$$V = m \times \frac{1}{\rho}$$

Substituting equation ① into this model gives the following form.

$$\frac{4}{3} \pi r^3 = m [\text{kg}] \times \frac{1}{\left(\frac{3 c^2 [\text{m}^2 \cdot \text{s}^{-2}]}{4 \mathcal{J} [\text{m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}] n} \right)}$$

$$V = m [\text{kg}] \times \frac{1}{\left(\frac{3c^2 [\text{m}^2 \cdot \text{s}^{-2}]}{4J [\text{m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}] n} \right)}$$

Hence, the equation to express the density of a spherical object is given in the following form.

$$\rho = \frac{3c^2}{4Jn} \frac{[\text{m}^2 \cdot \text{s}^{-2}]}{[\text{m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}]} (= [\text{kg} \cdot \text{m}^{-3}]) \quad (13)$$

Substituting the equation (12) into the model described above, the equation for determining the density of a cylindrical object is given in the following form.

$$\pi r^3 = m [\text{kg}] \times \frac{1}{\left(\frac{c^2 [\text{m}^2 \cdot \text{s}^{-2}]}{J [\text{m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}] n} \right)}$$

$$V = m [\text{kg}] \times \frac{1}{\left(\frac{c^2 [\text{m}^2 \cdot \text{s}^{-2}]}{J [\text{m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}] n} \right)}$$

$$\rho = \frac{c^2}{Jn} \frac{[\text{m}^2 \cdot \text{s}^{-2}]}{[\text{m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}]} (= [\text{kg} \cdot \text{m}^{-3}]) \quad (14)$$

Furthermore, by substituting equation (13) into equation (14), we can derive an equation relating the speed of an object to its density.

$$\begin{aligned} \rho &= \frac{3c^2}{4Jn} \\ &= \frac{3c [\text{m} \cdot \text{s}^{-1}] n V [\text{m} \cdot \text{s}^{-1}]}{4J [\text{m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}] n} \\ &= \frac{3c [\text{m} \cdot \text{s}^{-1}] V [\text{m} \cdot \text{s}^{-1}]}{4J [\text{m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}]} \end{aligned}$$

$$4J [\text{m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}] \rho [\text{kg} \cdot \text{m}^{-3}] = 3c [\text{m} \cdot \text{s}^{-1}] V [\text{m} \cdot \text{s}^{-1}]$$

$$V = \frac{4J\rho}{3c} \frac{[\text{m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2} \cdot \text{kg} \cdot \text{m}^{-3}]}{[\text{m} \cdot \text{s}^{-1}]} (= [\text{m} \cdot \text{s}^{-1}]) \quad (15)$$

The above model will allow us to calculate various quantities about the object.

From here on, I would like to verify the correctness of my theory by applying specific data for each object to each model.

Now, let's examine the specifics. For example, the electromagnetic force between nucleon and electron in an atomic structure, or gravity on the earth's surface, have been calculated by many experts in the past, but they are only theoretical values and cannot be used as a standard for verification. Therefore, we should always try to compare our calculation results with some actual measured values. This is the best way to prove the correctness of the model I have built.

With this stance, I will first determine the volume and size of the hydrogen atom, then the volume and size of the electron, and then calculate the ionization energy of the hydrogen atom based on the results of these calculations. This is because the ionization energy has been measured experimentally.

In order to calculate this, we need to know in advance about an important indispensable law. It is an original law in relational theory that I discovered while calculating many concrete individual objects in the macro world (it later turned out to be applicable to the micro world as well). It was about the proportionality coefficient "J", and I had initially thought of introducing it into the equation as a constant, but when I calculated it for each individual object, I was faced with the result that only the number of digits in the calculated value I derived did not match the actual measurement. To solve this problem, I treated "J" not as a constant, but as a parameter, and bundled it together as a product of the number of parties "n" (i.e., treated it as "Jn"), so that the number of digits in the calculated value would match the actual measured value. In doing so, I discovered the law expressed by the following equation.

$$Jn = N_{BR} \times 10^{x+y} \text{ [Skr]} \quad (16)$$

$$x + y = 13 \quad (17)$$

"Jn" is the product of the proportionality coefficient "J" and the number of parties "n", "N_{BR}" is just a number without unit, "x" is the exponential part of the quantity in "J" expressed to

the power of 10, and "y" is the exponential part of the quantity in "n" expressed to the power of 10. "Skr" is a unit that indicates the quantity of "Jn". The important point here is that the sum of "x" and "y" is always 13 and never exceeds it. Thanks to this law, I was able to determine the size of the electron, which was previously unknown.

First of all, let's calculate the volume of a hydrogen atom. The model we will use is equation ⑩. The reason is that it can be thought of as a spherical object. It is as follows.

$$\frac{4}{3} \pi r^3 = \frac{4 m J n}{3 c^2} \quad [m^3]$$

Here, the value for "m" is given in advance.

1.674×10^{-27} [kg] [25]. The value of "c" is a physical constant, so it is also given in advance. 299792458 [m·s⁻¹].

The question is how to determine the value of "n". At first glance, it seems as if the number of parties is "2" because the structure of the hydrogen atom consists of one nucleon (i.e., proton) and one electron. However, this is only the case in the macroscopic world, where objects are connected by an attractive force at some macroscopic distance, while the connection between microscopic objects in the microscopic world requires a different interpretation. This means that we should change the way we count the number of parties depending on whether we are talking about the interaction of objects in the macro world or the interaction of objects in the micro world. From this point of view, it is sufficient to interpret that there is one hydrogen atom as a microscopic particle here. In other words, the number of parties is "1".

And I have already mentioned that when the value of the number of parties "n" is determined, it automatically determines the exponential part "y" for "n" and the exponential part "x" for "J". The sum of "x" and "y" is 13, so in this case we know that " $n = 1 \times 10^0$ ", and in response, the other is absolutely " $J = 10^{13}$ ".

Now, let's substitute each number into equation ⑩ and calculate.

$$\frac{4}{3} \pi r^3 = \frac{4 \times 1.674 \times 10^{-27} [\text{kg}] \times 10^{13} [\text{m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}] \times 1 \times 10^0}{3 \times 299792458^2 [\text{m}^2 \cdot \text{s}^{-2}]}$$

$$= 2.4834 \times 10^{-31} [\text{m}^3]$$

This is the value of the volume of a hydrogen atom. Now that we know the value of the volume, we can also derive the value of the radius. The relationship between the two can be expressed by the following equation.

$$2.4834 \times 10^{-31} = 4.18 \times r^3 [\text{m}^3]$$

Solving this, the radius of the hydrogen atom is given by the following value.

$$r = 3.90206 \times 10^{-11} [\text{m}]$$

Next, let's calculate the volume of an electron. Let's substitute a number into equation ①. The value of "m" is given in advance. $9.109 \times 10^{-31} [\text{kg}]$ [26]. For the number of particles "n", it is sufficient to interpret "n = 1 × 10⁰", thinking that there is one electron as a microscopic particle. The value of "J" is automatically determined accordingly. It is "10¹³". So let's get to the math.

$$\frac{4}{3} \pi r^3 = \frac{4 \times 9.109 \times 10^{-31} [\text{kg}] \times 10^{13} [\text{m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}] \times 1 \times 10^0}{3 \times 299792458^2 [\text{m}^2 \cdot \text{s}^{-2}]}$$

$$= 1.3514 \times 10^{-34} [\text{m}^3]$$

This is the value of the volume of one electron. Now, let's derive the radius as well. We can do this by using the formula for volume and radius. The following process will give us the value.

$$1.3514 \times 10^{-34} = 4.18 \times r^3$$

$$r = 3.1858 \times 10^{-12} [\text{m}]$$

Now, let's move on to the calculation of the ionization energy [27] of a hydrogen atom.

The reason why I chose it as a material to test my theory is that it is a calculation that can be covered by the electromagnetic force model I have developed.

In the case of a hydrogen atom, the phenomenon of ionization means that an electron is ejected out of the atom, overcoming the captive force (= electromagnetic force) received from a single nucleon (= proton). Therefore, if we look at how the distance between the parties constituting the force changes before and after the ejection, we can determine the amount of force (ionization energy) that leads to the change.

If the size (diameter) of an electron is known, it is possible to describe how much the distance to constitute the force due to the loss of an electron from the atom has changed.

Let's try to model the phenomenon of ionization by rearranging equation ⑦.

$$F = k_a \frac{1}{l} c^2 \quad [\text{N}]$$

We can transform it into an equation to deal with energy.

$$E = k_a \frac{1}{l} c^2 \times l \quad [\text{N}\cdot\text{m}]$$

When the equation is further adjusted to a model for dealing with ionization, the following form is given.

$$E = k_a \frac{l_2}{(l_1 - l_2) c^2} \quad [\text{J}] \quad \textcircled{8}$$

In the above equation, " l_1 " is the distance before ionization (i.e., the radius of the hydrogen atom), " l_2 " is the distance for one electron, and " $l_1 - l_2$ " is the distance after ionization. The " E " is a quantity symbol that represents the value of ionization energy, and the unit used is the joule, which deal with energy.

For a single electron, the radius is already known, so we can determine its size by multiplying it by two and converting it to a diameter. This can be expressed as follows.

$$l_2 = (3.1858 \times 10^{-12} [\text{m}]) \times 2 = 6.3716 \times 10^{-12} [\text{m}]$$

We have already got values for the radius of the hydrogen atom.

$$l_1 = 3.90206 \times 10^{-11} [\text{m}]$$

Now, let's substitute each value into the formula (18) and perform the calculation. The ionization energy of a hydrogen atom can be calculated by the following process.

$$\begin{aligned} E &= \frac{1 [\text{N} \cdot \text{m}^3 \cdot \text{s}^{-2}] \times (6.3716 \times 10^{-12} [\text{m}])}{\{(3.90206 \times 10^{-11} [\text{m}]) - (6.3716 \times 10^{-12} [\text{m}])\} \times 299792458^2 [\text{m}^2 \cdot \text{s}^{-2}]} \\ &= \frac{1 [\text{N} \cdot \text{m}^3 \cdot \text{s}^{-2}] \times (6.3716 \times 10^{-12} [\text{m}])}{(3.2649 \times 10^{-11} [\text{m}]) \times 299792458^2 [\text{m}^2 \cdot \text{s}^{-2}]} \\ &= 2.1713869 \times 10^{-18} [\text{J}] \\ &= 13.5527 [\text{eV}] \end{aligned}$$

As mentioned above, the calculated results are consistent with the measured values.

This is one of proofs that my model is correct.

Now, let's continue with the verification of my theory.

From here on, I want to compare the mass and volumes of individual objects with the measured values (or theoretical value if they are not available) through clarification. The materials selected were a Japanese kilogram prototype, a bowling ball, the earth, the moon, the sun, Venus, and Jupiter.

First, let's calculate a Japanese kilogram prototype (No. 6) [28].

This is a replica (platinum-iridium alloy) of the International Kilogram Scale, a gift from France to Japan in 1889. This

cylindrical weight has the following data.

It has a radius of 0.039 [m], a height of 0.039 [m], and a mass of 1.000000176 [kg].

Since it is cylindrical, the model used for the calculation is the equation ⑫.

Let's calculate the volume. The following process is used to derive the value.

$$\begin{aligned}\pi r^3 &= 3.14 \times 0.039^3 \text{ [m}^3\text{]} \\ &= 1.8626 \times 10^{-4} \text{ [m}^3\text{]}\end{aligned}$$

Next, let's calculate the number of parties using equation ⑩. The value of "n" expected to be derived from this, based on the size and mass, is probably going to be in the single digits, so we can estimate the value of "J" to be "10¹³" at first, in anticipation of that. For "m", it is given in advance, so we can use the value as 1.000000176 [kg]. Let's substitute such a value. The process is as follows.

$$\begin{aligned}n &= \frac{\pi r^3 c^2}{J m} \\ &= \frac{3.14 \times 0.039^3 \text{ [m}^3\text{]} \times 299792458^2 \text{ [m}^2 \cdot \text{s}^{-2}\text{]}}{10^{13} \text{ [m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}\text{]} \times 1.000000176 \text{ [kg]}} \\ &= 1.674 \text{ [1]}\end{aligned}$$

This value is not strictly correct. This is because, theoretically, the number of parties is an integer. However, it is fine as long as it is used as a process (sort of like a "party rate") when calculating other quantities such as density or mass. Also, if we think of it as a combination with "J", it will always be an integer, so again, no problem. It only has to be treated as a decimal here for the reason that it is convenient for calculation. If you don't like it, you can look up the number of particles of platinum and iridium in the Periodic Table of Elements [29], and record the

number of parties as an integer from there. However, the setup would be more complicated.

Now, let's calculate the value of the density using equation (14). The value is given in the following process.

$$\begin{aligned}\rho &= \frac{c^2}{J n} \\ &= \frac{299792458^2 [\text{m}^2 \cdot \text{s}^{-2}]}{10^{13} [\text{m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}] \times 1.674} \\ &= 5.3689 \times 10^3 [\text{kg} \cdot \text{m}^{-3}]\end{aligned}$$

Here, the density and volume values are available. Since their product is mass, the following relational expressions can be used.

$$m = V \rho$$

Now, let's calculate the value of mass.

$$\begin{aligned}m &= V \rho \\ &= (1.8626 \times 10^{-4} [\text{m}^3]) \times (5.3689 \times 10^3 [\text{kg} \cdot \text{m}^{-3}]) \\ &= 1.000011314 [\text{kg}]\end{aligned}$$

As described above, the result was the same as the measured value. You can see from this how accurate the model I have created is.

Next, let's calculate the value of the volume and density of the bowling ball (16 pounds) [30] and see if the value of the actual mass and the calculated value match. The way is the same as for the kilogram prototype. The data required for calculation are as follows.

It has a radius of 0.1075 [m] and a mass of 7.25 [kg].

Since it is spherical, the value of the volume can be recorded as $\frac{4}{3} \pi r^3 = 5.2 \times 10^{-3} [\text{m}^3]$. The model for determining the number of parties is a variant of equation (10). My estimate is that the

value is likely to be one digit, so the value of "J" is naturally determined by equation ⑰ as "10¹³".

Let's assign each number to equation ⑩ and calculate it by the following process.

$$\begin{aligned} n &= \frac{\pi V^3 C^2}{J m} \\ &= \frac{3.14 \times 0.1075^3 [\text{m}^3] \times 299792458^2 [\text{m}^2 \cdot \text{s}^{-2}]}{10^{13} [\text{m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}] \times 7.25 [\text{kg}]} \\ &= 4.8357 \quad [1] \end{aligned}$$

Next, the value of the density given using equation ⑬ can be obtained in the following process.

$$\begin{aligned} \rho &= \frac{3 C^2}{4 J n} \\ &= \frac{3 \times 299792458^2 [\text{m}^2 \cdot \text{s}^{-2}]}{4 \times 10^{13} [\text{m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}] \times 4.8357} \\ &= 1.3939 \times 10^3 \quad [\text{kg} \cdot \text{m}^{-3}] \end{aligned}$$

Let's calculate the mass value by multiplying the volume and density value. It is the following process.

$$\begin{aligned} m &= V \rho \\ &= (5.2 \times 10^{-3} [\text{m}]) \times (1.3939 \times 10^3 [\text{kg} \cdot \text{m}^{-3}]) \\ &= 7.24828 \quad [\text{kg}] \end{aligned}$$

After all, the result became the same as the measured value. It speaks to the correctness of my theory.

Let's continue the calculation for various objects as it is.

I want to treat the earth a subject. The radius value is given in advance. It's 6378137 [m] [31]. Based on that, let's find the circumference length, and determine the rotation speed from there. Since the rotation

cycle is one day, it is converted to 86400 seconds. The whole calculation is as follows.

$$\begin{aligned} 2\pi l &= 2 \times 3.14 \times 6378137 \text{ [m]} \\ &= 4.00547 \times 10^7 \text{ [m]} \end{aligned}$$

$$\begin{aligned} v &= \frac{2\pi l}{t} \\ &= \frac{4.00547 \times 10^7 \text{ [m]}}{86400 \text{ [s]}} \\ &= 463.596 \text{ [m} \cdot \text{s}^{-1}] \end{aligned}$$

Since the speed is known, the number of parties can be clarified using equation ③. The following process gives its value.

$$\begin{aligned} n &= \frac{c}{v} \\ &= \frac{299792458 \text{ [m} \cdot \text{s}^{-1}]}{463.596 \text{ [m} \cdot \text{s}^{-1}]} \\ &= 6.4667 \times 10^5 \text{ [1]} \end{aligned}$$

Because the number of parties has been determined, the value of "J" is also automatically determined by equation ⑬ and ⑰. It's "10⁸".

Let's assign each numerical value to equation ⑩ and find the mass value of the earth. It is the following process.

$$\begin{aligned} m &= \frac{\pi l^3 c^2}{J n} \\ &= \frac{3.14 \times 6378137^3 \text{ [m}^3] \times 299792458^2 \text{ [m}^2 \cdot \text{s}^{-2}]}{10^8 \text{ [m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}] \times 6.4667 \times 10^5} \\ &= 1.1323 \times 10^{24} \text{ [kg]} \end{aligned}$$

Since the value of the mass has been clarified, the volume value

can be obtained. Since it is a sphere, let's calculate it by the following process using equation ⑩.

$$\begin{aligned} \frac{4}{3} \pi r^3 &= \frac{4 J n m}{3 c^2} \\ &= \frac{4 \times 10^8 [\text{m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}] \times 6.4667 \times 10^5 \times 1.1323 \times 10^{24} [\text{kg}]}{3 \times 299792458^2 [\text{m}^2 \cdot \text{s}^{-2}]} \\ &= 1.0863 \times 10^{21} [\text{m}^3] \end{aligned}$$

As described above, a solution which would be correct was derived. Next, I want to treat the moon as a subject. The radius value has already been given. It's 1738000 [m] [32]. Based on that, let's find the circumference length, and determine the rotation speed from there. The rotation cycle is 27.322 days [33]. Calculations can be performed in the following process.

$$\begin{aligned} 2\pi r &= 2 \times 3.14 \times 1738000 [\text{m}] \\ &= 1.09146 \times 10^7 [\text{m}] \end{aligned}$$

$$\begin{aligned} v &= \frac{2\pi r}{t} \\ &= \frac{1.09146 \times 10^7 [\text{m}]}{27.322 [\text{d}] \times 86400 [\text{s}]} \\ &= 4.6236 [\text{m} \cdot \text{s}^{-1}] \end{aligned}$$

Since the speed is known, the number of parties can be clarified using equation ③. The calculated value can be obtained by the following process.

$$\begin{aligned} n &= \frac{c}{v} \\ &= \frac{299792458 [\text{m} \cdot \text{s}^{-1}]}{4.6236 [\text{m} \cdot \text{s}^{-1}]} \end{aligned}$$

$$= 6.4839618 \times 10^7 [1]$$

Because the number of parties has been determined, the value of “ \mathcal{J} ” is automatically determined by equations ⑩ and ⑰. It's “ 10^6 ”.

Then, I want to apply each numerical value to equation ⑩ and produce the mass value of the moon. It is the following process.

$$\begin{aligned} m &= \frac{\pi \mathcal{J}^3 c^2}{\mathcal{J} n} \\ &= \frac{3.14 \times 1738000^3 [\text{m}^3] \times 299792458^2 [\text{m}^2 \cdot \text{s}^{-2}]}{10^6 [\text{m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}] \times 6.4839618 \times 10^7} \\ &= 2.285 \times 10^{22} [\text{kg}] \end{aligned}$$

Since the mass value has been clarified, the volume value can be obtained. Since it is a sphere, let's calculate using equation ⑪. It is the following process.

$$\begin{aligned} \frac{4}{3} \pi \mathcal{J}^3 &= \frac{4 \mathcal{J} n m}{3 c^2} \\ &= \frac{4 \times 10^6 [\text{m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}] \times 6.4839618 \times 10^7 \times 2.285 \times 10^{22} [\text{kg}]}{3 \times 299792458^2 [\text{m}^2 \cdot \text{s}^{-2}]} \\ &= 2.1979 \times 10^{19} [\text{m}^3] \end{aligned}$$

As mentioned above, the solution which would be correct was derived. Next, I want to treat the sun as a subject. The radius value has already been given. It's 6.96×10^8 [m] [34]. Based on that, let's find the circumference length and determine the rotation speed from there. The rotation cycle is 27 days [35]. Let's calculate it in the following process.

$$\begin{aligned} 2 \pi \mathcal{J} &= 2 \times 3.14 \times 6.96 \times 10^8 [\text{m}] \\ &= 4.371 \times 10^9 [\text{m}] \end{aligned}$$

$$\begin{aligned}
 v &= \frac{2\pi l}{t} \\
 &= \frac{4.371 \times 10^9 \text{ [m]}}{27 \text{ [d]} \times 86400 \text{ [s]}} \\
 &= 1874 \text{ [m} \cdot \text{s}^{-1}]
 \end{aligned}$$

Since the speed is known, the number of parties can be clarified using equation ③. The calculated value can be obtained by the following process.

$$\begin{aligned}
 n &= \frac{c}{v} \\
 &= \frac{299792458 \text{ [m} \cdot \text{s}^{-1}]}{1874 \text{ [m} \cdot \text{s}^{-1}]} \\
 &= 1.5997 \times 10^5 \text{ [1]}
 \end{aligned}$$

Now that the number of parties has been determined, equations ⑬ and ⑭ automatically determine the value of "J". It's "10⁸". Then, I want to assign each numerical value to equation ⑩ and find the mass value of the SUN. It is the following process.

$$\begin{aligned}
 m &= \frac{\pi l^3 c^2}{J n} \\
 &= \frac{3.14 \times 696000000^3 \text{ [m}^3] \times 299792458^2 \text{ [m}^2 \cdot \text{s}^{-2}]}{10^8 \text{ [m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}] \times 1.5997 \times 10^5} \\
 &= 5.948 \times 10^{30} \text{ [kg]}
 \end{aligned}$$

Since the mass value has been clarified, the volume value can be obtained. Since it is a sphere, let's calculate using equation ⑪. It is the following process.

$$\begin{aligned}
 \frac{4}{3} \pi l^3 &= \frac{4 J n m}{3 c^2} \\
 &= \frac{4 \times 10^8 \text{ [m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}] \times 1.5997 \times 10^5 \times 5.948 \times 10^{30} \text{ [kg]}}{3 \times 299792458^2 \text{ [m}^2 \cdot \text{s}^{-2}]}
 \end{aligned}$$

$$= 1.4116 \times 10^{27} \text{ [m}^3\text{]}$$

As mentioned above, the solution which would be correct was derived. Next, I want to treat Venus as a subject. The radius value has already been given. It's 6052000 [m] [36]. Based on that, let's find the circumference length and determine the rotation speed from there. The rotation cycle is 243.02 days [37]. Let's calculate it in the following process.

$$\begin{aligned} 2\pi r &= 2 \times 3.14 \times 6052000 \text{ [m]} \\ &= 38006560 \text{ [m]} \end{aligned}$$

$$\begin{aligned} v &= \frac{2\pi r}{t} \\ &= \frac{38006560 \text{ [m]}}{243.02 \text{ [d]} \times 86400 \text{ [s]}} \\ &= 1.81 \text{ [m} \cdot \text{s}^{-1}\text{]} \end{aligned}$$

Since the speed is known, the number of parties can be clarified using equation ③. The calculated value can be obtained by the following process.

$$\begin{aligned} n &= \frac{c}{v} \\ &= \frac{299792458 \text{ [m} \cdot \text{s}^{-1}\text{]}}{1.81 \text{ [m} \cdot \text{s}^{-1}\text{]}} \\ &= 1.65631192 \times 10^8 \text{ [1]} \end{aligned}$$

Now that the number of parties has been determined, equations ⑬ and ⑭ automatically determine the value of "J". It's "10⁵". Let's assign each numerical value to equation ⑩ and find the mass value of Venus. The calculation value is given in the following process.

$$\begin{aligned}
m &= \frac{\pi l^3 c^2}{J n} \\
&= \frac{3.14 \times 6052000^3 [\text{m}^3] \times 299792458^2 [\text{m}^2 \cdot \text{s}^{-2}]}{10^5 [\text{m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}] \times 1.65631192 \times 10^8} \\
&= 3.7768 \times 10^{24} [\text{kg}]
\end{aligned}$$

Since the mass value has been clarified, the volume value can be obtained. It is the following process.

$$\begin{aligned}
\frac{4}{3} \pi l^3 &= \frac{4 J n m}{3 c^2} \\
&= \frac{4 \times 10^5 [\text{m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}] \times 1.65631192 \times 10^8 \times 3.7768 \times 10^{24} [\text{kg}]}{3 \times 299792458^2 [\text{m}^2 \cdot \text{s}^{-2}]} \\
&= 9.2803 \times 10^{20} [\text{m}^3]
\end{aligned}$$

As mentioned above, the solution which would be correct was derived. Finally, I want to treat Jupiter as a subject. The radius value has already been given. It's 71492000 [m] [38]. Based on that, let's find the circumference length and determine the rotation speed from there. The rotation cycle is 0.414 days [39]. Let's calculate it in the following process.

$$\begin{aligned}
2\pi l &= 2 \times 3.14 \times 71492000 [\text{m}] \\
&= 448969760 [\text{m}]
\end{aligned}$$

$$\begin{aligned}
v &= \frac{2\pi l}{t} \\
&= \frac{448969760 [\text{m}]}{0.414 [\text{d}] \times 86400 [\text{s}]} \\
&= 1.2552 \times 10^4 [\text{m} \cdot \text{s}^{-1}]
\end{aligned}$$

Since the speed is known, the number of parties can be clarified

using equation ③. The calculated value can be obtained by following process.

$$\begin{aligned} n &= \frac{c}{v} \\ &= \frac{299792458 [\text{m} \cdot \text{s}^{-2}]}{1.2552 \times 10^4 [\text{m} \cdot \text{s}^{-2}]} \\ &= 2.3884 \times 10^4 \quad [1] \end{aligned}$$

Because the number of parties has been determined, the value of "J" is automatically determined by equations ⑬ and ⑭. It's "10⁹". Then, I want to assign each numerical value to equation ⑩ and find the mass value of Jupiter. It is the following process.

$$\begin{aligned} m &= \frac{\pi l^3 c^2}{J n} \\ &= \frac{3.14 \times 71492000^3 [\text{m}^3] \times 299792458^2 [\text{m}^2 \cdot \text{s}^{-2}]}{10^9 [\text{m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}] \times 2.3884 \times 10^4} \\ &= 4.3175 \times 10^{27} \quad [\text{kg}] \end{aligned}$$

Since the mass value has been clarified, the volume value can be obtained. Since it is a sphere, let's calculate using equation ⑪. It is the following process.

$$\begin{aligned} \frac{4}{3} \pi l^3 &= \frac{4 J n m}{3 c^2} \\ &= \frac{4 \times 10^9 [\text{m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}] \times 2.3884 \times 10^4 \times 4.3175 \times 10^{27} [\text{kg}]}{3 \times 299792458^2 [\text{m}^2 \cdot \text{s}^{-2}]} \\ &= 1.5298 \times 10^{24} \quad [\text{m}^3] \end{aligned}$$

As mentioned above, the solution which would be correct was derived.

Then, let's cut into the maximum conundrum in modern physics from here.

The question is how accurately we can predict how the current position and speed of an object will change in the future by applying existing laws that humanity has learned in the past. In this regard, physics has succeeded in predicting the behavior of objects in the macro world. However, physics was powerless about grasping the movement of the particle in the micro world. The reason is simply in the point that light and electrons have a strange feature of duality in the double-slit experiment. The processing of duality in which physics describes the behavior of microparticles means that it has given up predicting the fate of objects as deterministic. It is clear from the fact that quantum theory makes certain predictions impossible in principle through the idea of uncertainty principles [40]. Even though there is always only one trace of particles on the screen behind the double-slit [41]. In that case, it is scientifically obedient attitude to always interpret only as a particle about the real image of the electron.

Certainly, if you repeat a lot of experiments to fire a single electron from an electron gun, it is no wonder that you want to associate it with interference of the waves because it will eventually form stripes on the screen. But nothing, it's just because we overlook the initial conditions that must be found first in looking at a series of experimental process.

In the first place, I entered the world of physics research when two original ideas flashed in my head. One of them is the idea of energy, and the other is the idea of the real image of an object. The former has already been explained by the model "relationship". I will explain the latter from now on.

When the object is subdivided into the root level, it ultimately arrives at the particle. Up to this point, it is a common recognition that everyone has. I think so, but what's unique is the basic form of existence for a particle. It is a picture that is described as "object expansion and contraction" in my coined word, and that individual objects continue to change in shape and size at all times within that range as long as the volume is the same. And, the "expansion and contraction" has a peculiar feature for each object.

I would like to explain electronic information as an example. The model for describing the volume of an object has already been introduced in equations ① and ②. It was described above that the former is a model of the sphere type, and the latter is a model of the cylindrical type. Here, let's think about the pattern of "expansion and contraction" of shape and size between the sphere type and the newly assumed cube type.

First of all, let's transform equation ①, which is a model of the sphere type. I want to assign equation ③ to the right side. It is the following process.

$$\begin{aligned}
 \frac{4}{3} \pi l^3 &= \frac{4 J n m}{3 c^2} \\
 &= \frac{4 J [m^5 \cdot kg^{-1} \cdot s^{-2}] \times n m [kg]}{3 c [m \cdot s^{-1}] \times n v [m \cdot s^{-1}]} \\
 &= \frac{J [m^5 \cdot kg^{-1} \cdot s^{-2}] \times m [kg]}{c [m \cdot s^{-1}] \times v [m \cdot s^{-1}]} \times \frac{4}{3} \\
 &= \frac{J [m^5 \cdot kg^{-1} \cdot s^{-2}] \times m [kg] \times t [s]}{l [m]} \times \frac{4}{3c [m \cdot s^{-1}]} \\
 &= \frac{J [m^5 \cdot kg^{-1} \cdot s^{-2}] \times m [kg] \times t [s]}{l [m]} \times (4.44752 \times 10^{-9} [m^{-1} \cdot s]) \\
 &= 4.44752 \times 10^{-9} \times \frac{J m t}{l} [m^3] \quad \text{⑨}
 \end{aligned}$$

The volume value of electron has already been calculated. It is $1.3514 \times 10^{-34} [m^3]$. After assigning it to the left side of the upper expression, for each numerical value, let's assign the value already calculated to the above equation. When calculated, the time value is given in the following shape (it is called "potential time" in my coined word).

$$t = 1.06271 \times 10^{-20} [s]$$

Now that the time value has been clarified, the speed value

(called "potential speed" in my coined word) can be obtained. The radius value used for the calculation (called "potential distance" in my coined word) has already been given. 3.1858×10^{-12} [m]. Now, let's calculate. It is the following process.

$$\begin{aligned} v &= \frac{l}{t} \\ &= \frac{3.1858 \times 10^{-12} \text{ [m]}}{1.06271 \times 10^{-20} \text{ [s]}} \\ &= 299780749 \times 10^8 \text{ [m} \cdot \text{s}^{-1}] \end{aligned}$$

This is the potential speed value inherent in one electron, and it can be found that it almost matches the rotation speed calculated using equation ③.

Next, let's derive the expression which can describe the object of the cube type. Let's assign equation ③ to transform equation ⑫. It is the following process.

$$\begin{aligned} \pi l^3 &= \frac{J h m}{c^2} \\ l^3 &= \frac{J [\text{m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}] \times h m [\text{kg}]}{\pi c [\text{m} \cdot \text{s}^{-1}] \times h v [\text{m} \cdot \text{s}^{-1}]} \\ &= \frac{J [\text{m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}] \times m [\text{kg}]}{\pi c [\text{m} \cdot \text{s}^{-1}] \times v [\text{m} \cdot \text{s}^{-1}]} \\ &= \frac{J [\text{m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}] \times m [\text{kg}] \times t [\text{s}]}{\pi c [\text{m} \cdot \text{s}^{-1}] \times l [\text{m}]} \\ &= \frac{J [\text{m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}] \times m [\text{kg}] \times t [\text{s}]}{l [\text{m}]} \times \frac{1}{\pi c [\text{m} \cdot \text{s}^{-1}]} \\ &= \frac{J [\text{m}^5 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}] \times m [\text{kg}] \times t [\text{s}]}{l [\text{m}]} \times (1.06231 \times 10^{-9} [\text{m}^{-1} \cdot \text{s}]) \\ &= 1.06231 \times 10^{-9} \times \frac{J m t}{l} \text{ [m}^3] \quad \textcircled{20} \end{aligned}$$

Then, when the volume value of the electron is assigned to the left side, the radius value, the mass value, and the proportional coefficient are assigned to the right side, and the potential time value is given in the following shape.

$$t = 4.4492 \times 10^{-20} [s]$$

Since the time value has been clarified, the potential speed value can be obtained. Before that, I want to derive the potential radius value of the cube type electron. It can be calculated by the following process.

$$l^3 = 1.3514 \times 10^{-34} [m^3]$$

$$l = 5.1317 \times 10^{-12} [m]$$

Using these values, the potential speed value is given in the following process.

$$\begin{aligned} v &= \frac{l}{t} \\ &= \frac{5.1317 \times 10^{-12} [m]}{4.4492 \times 10^{-20} [s]} \\ &= 1.15339836 \times 10^8 [m \cdot s^{-1}] \end{aligned}$$

This is the potential speed value inherent in a single cube electron. Compared to that of the sphere type, it can be seen that it decelerates to less than half. Let's express that by the acceleration. Since "expansion and contraction" consists of both "expansion action" and "contraction action", it is necessary to determine the acceleration for each. First, the acceleration value for the expansion action is given in the following calculation process.

$$a = \frac{\Delta v}{\Delta t}$$

$$\begin{aligned}
&= \frac{(1.15339836 \times 10^8 [\text{m} \cdot \text{s}^{-1}]) - (2.99780749 \times 10^8 [\text{m} \cdot \text{s}^{-1}])}{(4.4492 \times 10^{-20} [\text{s}]) - (1.06271 \times 10^{-20} [\text{s}])} \\
&= \frac{-1.84441 \times 10^8 [\text{m} \cdot \text{s}^{-1}]}{3.38649 \times 10^{-20} [\text{s}]} \\
&= -5.446377 \times 10^{27} [\text{m} \cdot \text{s}^{-2}]
\end{aligned}$$

Next, let's calculate the acceleration value for the contraction action by following process.

$$\begin{aligned}
a &= \frac{\Delta v}{\Delta t} \\
&= \frac{(2.99780749 \times 10^8 [\text{m} \cdot \text{s}^{-1}]) - (1.15339836 \times 10^8 [\text{m} \cdot \text{s}^{-1}])}{(1.06271 \times 10^{-20} [\text{s}]) - (4.4492 \times 10^{-20} [\text{s}])} \\
&= \frac{1.84441 \times 10^8 [\text{m} \cdot \text{s}^{-1}]}{-3.38649 \times 10^{-20} [\text{s}]} \\
&= -5.446377 \times 10^{27} [\text{m} \cdot \text{s}^{-2}]
\end{aligned}$$

As described above, in both the expansion and contraction action, it is considered that one electron changes shape and size while significantly decelerating. And, as long as friction and external force are not applied, one electron repeats such expansion and contraction forever. That is, it keeps transforming alternately in the sphere, the cube, the sphere, and the cube. This is an overview of my original particle image, "object expansion and contraction". Thus, considering the deformation process from the sphere to the cube, it can be said that it is possible to calculate the fate of it deterministically if the firing angle, direction of travel, speed, and position of one electron are determined at any size of any shape when interacting with the object of the macro. In other words, unlike quantum theory, my relational theory does not stand in the position of thinking of electronic movements as indeterminate in principle. An electron is a particle itself. It's not a wave.

The particle only changes its shape and size as particle, and does not change to a physical existence other than a particle. That's why when we do a double-slit experiment, it always leaves a trace as a single particle on the screen. Each shot fired from an electron gun interacts with other objects, such as the muzzle and air molecules floating in space, and should form various angles depending on the timing and fly in different directions, so the passing slit and landing points on the screen are also different each time. Therefore, if we repeat many launch experiments, the total result will be a stripe pattern that looks like interference.

It is true that stripes do form. However, it is too early to interpret this as an indication that a single electron is a wave and non-existent. This is because, as mentioned earlier, we will miss the essence of things if we do not seriously consider the initial conditions further back than the screen or the double-slit.

The "initial conditions" are "the essence of things that should be the starting point of thought" and "the basic image of matter and energy that scientists should stand on". The most important thing in overcoming a difficult problem is to be keenly aware of this.

What is required here is the discovery of such a view of matter and particles, and the concrete manifestation of this view is the new concept of "object expansion and contraction". Since the action takes place within the same volume and mass, it would be acceptable way of thinking about physics. Of course, it may not be a strange idea to think that a single electron always maintains a fixed shape and size. However, there is a profound reason why I dared to introduce the idea of "expansion and contraction" into it. I would like to discuss it in detail.

The world is an aggregate or complex made up of many parties. All members have an irreplaceable individuality, and when they come face to face with other parties, they create energy (relationship). And individuality is inversely proportional to the number of parties. The more parties there are, the weaker the individuality becomes. For example, if you roll the dice a huge number of times, you will always have a 50% chance of getting an even number [42]. If you throw the dice just once, it is difficult to predict exactly

which number of eyes will appear on the dice, but if you throw the dice 10000 times, you can predict with certainty that an even number of eyes will make up 50 % of the total. The reason why this is so is easy to understand if we think about it from the angle of "individuality". The dice are regular hexahedrons with one eye each from "1" to "6". Each eye is a unique and irreplaceable number. This is nothing less than individuality. If you roll the dice once and once you get some kind of an eye, it means that it is the only unique eye. Being unique also means being unstable, difficult to handle by others, and difficult to predict how one will behave. It is also a troublesome subject that is not straightforward to deal with. However, when a large number of individualities come together to form an aggregate or complex, each individuality cancels each other out and turns into a featureless, ordinary, and commonplace existence. As the number of parties increases, each member loses its individuality and becomes more level and homogenized. The reason why 10000 dice rolls are more predictable is that the increased number of throws loses the individuality of each throw, making it a more manageable target. In other words, not being unique can be seen as being stable. Classical physics was able to describe the motion of macroscopic objects because these objects were stable and tractable objects that formed aggregates. However, microscopic particles are difficult to predict because of their large individuality, small number of parties, and unstable behavior.

The idea of "expansion and contraction" was newly created to express this unpredictability and unwieldiness.

From the perspective of the entire universe, one electron is an element that constitutes it. The universe is the "whole", and one electron is a "part". The "whole" and a "part" should be in harmony. Heraclitus, an ancient Greek philosopher, said "Everything flows". As the universe continues to change, it is natural that one electron continues to change accordingly. Only the result derived logically from there is a picture "expansion and contraction".

At the beginning of this paper, I stated that this universe is an "clockwork organism". One electron is a "part" that constitutes it, and it is necessary to think by linking "space image as a whole" and

"particle image as part". They should always be treated in harmony. In other words, it is impossible to capture the essence even if we focus only on electrons, and it is necessary to consider their behavior in the balance with the universe as a whole.

While considering the contrasting structure of such "whole" and "part", the viewpoint of contrast such as "macro" and "micro", "aggregate" and "single", "stable" and "unstable", "non-individual" and "individual", is born, which leads to the discovery of a new view of materials such as "non-telescopic object" and "telescopic object". Fortunately, such images seem to be a very compatible idea in theoretically explaining the results obtained in the double-slit experiment. Moreover, it is possible to explain the reason why the light velocity slows down from " ∞ " to " c " by the interaction with the object only after the idea of such "object expansion and contraction" is introduced, and it is a big advancement for physics. It can be said that it is an image opposite to the uncertainty principle of Heisenberg.

The argument is that when we hit light to determine the position of electrons, it becomes indeterminate, but in the theory of "object expansion and contraction", it is only that it becomes difficult for us to determine the position in order for electrons to hit light while expanding. At that time, there is not always one electron that goes toward. Let's remember Fizeau's experiment. The parties there have reached a large number of light source, half mirror, reflector, lenses, gear, and observation device. The light fired should interact with all of it. I would like to consider the interaction with one of them, a reflector. The moment when light hits the mirror surface is the moment of interaction. A mirror as a macro object is a complex of many micro objects. As mentioned above, such objects are stable by losing individuality, even though they are inherent individual atoms and electrons. However, by touching the energy of light, those objects regain individuality, and all particles within the range that interacted with light revive "expansion and contraction". Individual particles have their own rhythm, but depending on the timing, two or more parties may synchronize "expansion and contraction". If multiple particles expand and lunge into light and immediately turn

into shrinkage, they can drag into the material constituting the mirror surface as if grabbing light. The reflection of light is slightly delayed by the action. Therefore, the light speed which was originally infinite slows down to the level of "c" with a finite value.

"Interaction between matter and energy" is literally a "mutual" action. In other words, energy also affects objects, but objects also affect energy. The reason why light slows down from " ∞ " to "c" and becomes a wave or becomes a particle according to the type of experiment is because it was all influenced by objects. In relational physics, energy and force are considered to be "the relationship between objects", so as objects change, energy and force also change. The individuality of an object is a source of force and energy, and force and energy are also sources that make objects "individuality". Objects that are "individualized" by force and energy transition from "stable" to "unstable". Specifically, it shifts from a "non-telescopic object" to a "telescopic object". It means that because it was separated from the surrounding objects, it was liberated from counteracting "individuality" and was able to move freely. Since a single micro particle is extremely "unique" and "unstable", it is difficult to predict how it will move. Quantum theory has denied the existence of objects because of this (uncertainty principle). However, it is not "indeterminate" but only "unstable", and if the substance of the particle is even seen as a "telescopic object", there is room which can be predicted by calculation how it behaves for the future. Of course, calculations are complex and will not be easily answered, but unlike quantum theory, which does not mean that it is impossible in principle. For the almighty God, in principle, the future can be predicted. In a word, the law which determines the movement of the particle which is not easy to read at first glance in the place hidden from man's view exists in this world undeniably. This is synonymous with the theory of hidden parameters [43] of David Bohm. And, "hidden parameter" is nothing but a model corresponding to "expansion and contraction" action that I derived. Taking beta decay (weak interactions) [44] as an example, if we don't understand such hidden mechanisms that are not visible to

the human eye, we will misunderstand the real image of nature. In other words, a quantum theory that does not focus on this is not a faithful description of the laws of nature. It is true that it is not easy to detect hidden messages from nature that are not apparent in experimental results. But it's not entirely without clues. It is possible to arrive at the idea of "object expansion and contraction" by induction, since the size of an object can change if its volume is the same, and the physical laws of this universe are that the "whole" and the "parts" are in harmony.

Now, let's apply this picture of "expansion and contraction" to the type of beta decay. In this case, the imbalance between the number of neutrons and protons in an atomic nucleus CAUSES the bonds between the nucleons to become unstable, and in an attempt to stabilize the nucleus, the number of particles in the nucleus is increased, resulting in the release of radioactivity. However, the number of particles will only increase for a moment immediately after the collapse, and will soon return to the original number of particles again, so the unstable state (imbalance in quantity) will not be resolved. Hence, the decay and radioactive release will continue until it is completely resolved. In other words, the weak force is the force that keeps the nucleus decaying until it reaches a sufficient number of particles to stabilize the nucleus.

However, increasing the number of particles is not the only way to achieve stability. As long as they can be stabilized, it does not matter how they do it. Here, I would like to consider the "expansion and contraction" of particles. Every particle in a nucleus has a unique "expansion and contraction" rhythm. Protons have their own rhythms, neutrons have their own rhythms, and whole nucleons have their own rhythms, and these rhythms are being played together like a concerto. If each "expansion and contraction" rhythm is in harmony with each other, then the nucleus is in a stable state, and there is no need to mobilize energy to collapse it. However, if each rhythm is dissonant, it can never be stable. That is why it tries to stabilize itself by disintegrating its nucleus and emitting radioactivity. And the only way radioactive materials can be stabilized is through decay. According to quantum theory, it is impossible in principle to predict

with certainty when radioactivity will be released, and it can only be described as a superposition of "released" and "not released" states. It is true that it seems difficult to find some regularity in the individual decays and radiations. However, as mentioned earlier, if we treat radioactive materials as an aggregate of a large number of particles, rather than as a single unit, we will be able to handle them more easily and predict their half-lives [45], and this is due to the loss of "individuality" caused by the increase in the number of parties.

However, even if we look at each particle individually, if we have information on the total number of members in the nucleus, their type, and their "expansion and contraction" rhythms, we can in principle calculate the timing of decay and radiation from the viewpoint of the combination of these factors. In other words, in this way of thinking, the overlapping of states does not occur in the first place. It's not that they are unpredictable, it's just that prediction is complicated. In this section, I would like to consider whether there is any common regularity in the phenomenon of "expansion and contraction" which has different characteristics for each object. I have already introduced a "expansion and contraction" image (potential speed, potential time, potential distance, acceleration) of one electron using equations (19) and (20), but there, I would like to explain the "expansion and contraction" width when one electron are transformed from spherical to cubic. In the following calculation process it is described.

$$\begin{aligned} \zeta &= (5.1317 \times 10^{-12} [\text{m}]) - (3.1858 \times 10^{-12} [\text{m}]) \\ &= 1.9459 \times 10^{-12} [\text{m}] \end{aligned}$$

One electron stretches and shrinks between this width . In addition, let's think about the circumference length when the electron is seen here as a sphere. It can be calculated in the following process.

$$2\pi\zeta = 2 \times 3.14 \times (3.1858 \times 10^{-12} [\text{m}])$$

$$= 2.0006824 \times 10^{-11} \text{ [m]}$$

The above values have come out, but what we are concerned about is the relationship between the two. Let's derive the ratio of the circumference length and the expansion and contraction width. It is given in the following relation.

$$2\pi l : l = 10.28 : 1$$

It was found that the circumference length was about 10 times the expansion and contraction width. That is, one lap of one electron corresponds to the total (10 times) of the expansion action and the contraction action.

The detailed calculation process is omitted, but the expansion and contraction data of hydrogen atoms and the sun will be put up. Let's express the spherical potential time as " t_{p1} ", the cube-type potential time as " t_{p2} ", the spherical potential speed as " v_{p1} ", the cube-type potential speed as " v_{p2} ", the acceleration as " a ", the spherical circumference length as " $2\pi l$ ", the expansion and contraction width as " l ", and the circumference length/expansion and contraction width ratio as " $2\pi l : l$ ". The models used for the calculation are equations (19) and (20).

First, I would like to list each numerical value for hydrogen atom. It is as follows.

$$\begin{aligned} t_{p1} &= 1.30159 \times 10^{-19} \text{ [s]} \\ t_{p2} &= 8.778 \times 10^{-19} \text{ [s]} \\ v_{p1} &= 2.99791793 \times 10^8 \text{ [m} \cdot \text{s}^{-1}] \\ v_{p2} &= 7.161 \times 10^7 \text{ [m} \cdot \text{s}^{-1}] \\ a &= -3.052 \times 10^{26} \text{ [m} \cdot \text{s}^{-2}] \\ 2\pi l &= 2.4505 \times 10^{-10} \text{ [m]} \\ l &= 2.3836 \times 10^{-11} \text{ [m]} \\ 2\pi l : l &= 10.28 : 1 \end{aligned}$$

Next, I would like to enumerate each numerical value for the sun. It is as follows.

$$\begin{aligned}
t_{p1} &= 3.7139 \times 10^5 \text{ [s]} \\
t_{p2} &= 2.5061 \times 10^6 \text{ [s]} \\
v_{p1} &= 1.874 \times 10^3 \text{ [m} \cdot \text{s}^{-1}] \\
v_{p2} &= 4.476 \times 10^2 \text{ [m} \cdot \text{s}^{-1}] \\
\mathbf{a} &= -6.682 \times 10^{-4} \text{ [m} \cdot \text{s}^{-2}] \\
2\pi l &= 4.37088 \times 10^9 \text{ [m]} \\
l &= 4.2578 \times 10^8 \text{ [m]} \\
2\pi l : l &= 10.2656 : 1
\end{aligned}$$

The above calculation results were derived.

What can we see from these results? One thing I can say is the circumference length / expansion and contraction width ratio is always "10:1" for any object, such as one electron, hydrogen atom, or SUN. From here, this ratio probably applies to all objects.

If so, a new hypothesis will be derived with a logical leap, and the potential speed of the object will become the rotation speed or the "expansion and contraction" speed depending on the situation. In other words, it should no longer be sublimated into one law. It will be expressed as follows.

"Equivalence between rotation and expansion and contraction".

It is this.

In both the macro world and the micro world, how many parties are around, how far they are facing each other, and how much interaction occurs determine whether each object will rotate, stretch, or not. It can be thought that all objects are moving in such a mechanism. As mentioned above, the "expansion and contraction" width of the sun is large, but such a movement of the sun has not been observed. Only rotation has been observed. From this, it can be inferred that the sun is rotating by choosing rotation by interacting with other planets. Because rotation and "expansion and contraction" are equivalent.

As mentioned above, I have roughly explained the outline of "object expansion and contraction". When the radioactive material causes the beta collapse and the radioactivity is put out should be entirely thought by the balance with such an action, and if even

it can be succeeded, it does not fail into a strange explanation of coexistence of the state.

For example, let's take "Schrodinger's cat" [46] as an example and explore the root of the strangeness. This is a thought experiment created by physicist Schrodinger to criticize the idea of coexistence of states in quantum theory (probability interpretation) [47], and it is a major challenge that has not yet been given a unified view among scholars. I would like to consider it from now on, but even though it is a thought experiment, it is pitiful to put a cat at risk of death, so instead, let's experiment with curry rice as a material. Its name is "Schrodinger's Curry". The content is as follows.

A box is prepared. Radioactive elements are put in it. It has a 50 % chance of radioactivity within an hour. Then, a detector for detecting it is put. Furthermore, rice served on a plate, retort curry, and the heating and opening device are put together, and if radioactivity is detected in the detector, curry is applied to rice. If the device does not detect it, the rice will remain as it is.

In doing so, if we stand in the idea of quantum theory, since radioactivity emission is a phenomenon in the micro world, it becomes a probabilistic behavior, it is treated as a coexistence of the "release state" and "unrelease state", and it is linked to the macro world, so it is considered that the "rice state" and "curry rice state" overlap. In other words, it can be said that it is in the state of "half rice half curry". However, that does not mean half-serving rice or curry, which is often found in restaurants and cafes. It is "Something quantum theory which is neither rice nor curry rice". Such a superposition condition is not determined until the observer opens the box and sees the contents, and only after visualizing the box does the wave bundle shrinks and is confirmed in one state. This is a very strange reason. Strange events in the micro world are reflected in the macro world, and phenomena in the macro world are also strange. To break this strangeness, the interpretation of the microparticle must be modified to begin with. It is natural to think that the phenomenon of coexistence of the state in the micro world cannot fundamentally occur unless the eye

mask patron who met the quantum theory "half rice half curry" in the macro world actually eats it.

Then, I devised a new particle image "object expansion and contraction". This is a different image from de Broglie's material waves [48].

Material waves are a way of thinking that an object is both a particle and a wave, but "object expansion and contraction" is a way of thinking that particles change shape and size but do not become waves. Since it is not regarded as a wave, it is not necessary to bring the theory of coexistence of the state there in the first place. So, the radioactivity release from the radioactive material can be understood deterministically. Therefore, in "Schrodinger's curry", since it develops logic from the stage where the future of radiation is determined, the success or failure of curry rice only has to be treated definitively according to that.

Then, let's proceed to the conclusion of this paper.

This universe is, so to speak, a "clockwork organism". The emphasis on concepts such as "relationship" and "number of parties" in my physical research is based on such a view of nature (organism model).

The reason I created relational physics was that the "unification of the four force" by the proximity theory was at a standstill, but the biggest opportunity for it was that such a view of the universe was always in me.

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