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On Primitive Notions as Foundation of Physics

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Abstract *Primitive notions* are essential features forming the foundation of every discipline of knowledge based on which further principles and concepts are derived. Very often the notions remain obscured whereas major advancements are achieved in knowledge and so the primitive notions of physics have been classified and interpreted herein in relation to creation of the universe. A supposed *state of nothingness* has been conceived from which a pair of an elementary particle and its anti-particle is spontaneously created out of two equal and opposite charges in conformity with *Euler's relation* along with the creation of space, time, motion, mass and energy; and thereafter everything else in the universe may follow through by means of mutual interaction and gravitation among various particles.

Keywords Primitive notion, State of nothingness, Spontaneity, Euler's relation

1. Introduction

The present publication is in continuation of my three previous articles in series starting with the motion of a particle in space including motion under gravitation leading to the fundamental concepts of physical science that shape our universe. Knowledge emanates primarily out of observation and inference. To that we may add our concepts some of which may turn into knowledge later and the rest may remain as mere assumptions. Observations are made by means of our physical senses, most often aided by contrivances and appliances. However, the sum-total of our knowledge along with assumptions are at all times based on a number of fundamental concepts which are strangely yet stolidly founded on a handful of *primitive notions* only.

In addition, analytical means are justifiably considered necessary and sufficient to proclaim laws of physics to be true while being limited by both available and prevailing mathematical tools; at times being seriously handicapped as it happened in the history of science in the past as may remain so at any time in the foreseeable future. Any physical theory even when analytically self-consistent ever remains as a compromise in relation with the real world, while as critters of a real world yet created out of the transcendental, we may comprehend the transcendental world truly by our consciousness only.

2. Axiomatic Principle of Physics

Before venturing into primitive notions we will introduce the axiomatic principle of physics, which is all about entity only. While the extant concept in physics delineates an *entity* as one that bears an existence in either physical or non-physical form, in view of constituent principle anything that is physical or real must be composed of constituents, whereas anything that is non-physical needs to be transcendental. Concepts of symmetry and possibility [3] demand that an entity must also assume a form in between, allowing a seamless transition from the transcendental to the physical form. Therefore, we may consider here the one and only axiomatic principle of physics as this: *Our universe is a continuum comprising of entities appearing in transcendental, transitional and physical forms*. All primitive notions of physics may follow thereof and be absolutely consistent with this lone axiomatic principle.

3. Primitive Notions

Primitive notions lie at the very foundation of our knowledge, whichever that discipline be. These notions are primarily *conceived only by and through themselves*. For physics these may be classified here as *Space, Time, Motion, Charge, Mass, Energy, Geometry and Interaction*. These primitive notions cannot be precisely defined by using independent terms or acuities as every such attempt would turn out to be circular only. Consequently respective analytical expressions and formulae also remain axiomatically interrelated. However, we will discuss their characteristics here by means of vocabularies that are interdepended albeit adequately articulate. Furthermore, we shall make use of the following few fictive concepts [1-3].

- *State of nothingness* as a transcendental entity being the source of everything that comes into being in conformity with the causality principle.
- *Slowness factor* being the inverse of speed $(1/v)$ causing motion inside space and generating time.
- *Lethargy* having an analytical expression $(L_e = m/c^2)$

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in symmetry with energy.

- *Elementary particle*, being an extended version of space unlike a point, created by localization of charge inside that space under a perpetual oscillatory transition between electrical and magnetic energy like a resistance-free LC circuit giving rise to intrinsic angular momentum and consequently creating its mass.
- *Quantum motion* of a particle, elementary or composite, to be a spectacle taking place in space by random exchange of its position with an adjacent virtual particle created out of the state of nothingness causing wave-particle duality, while motion of a larger object arises out of superposition and correspondence.

3.1. Space

Space is an entity that provides separation along with dimension allowing motion to take place inside it. It is neither transcendental nor physical yet an intervening state providing transition of an entity from transcendental to physical form. Since space allows motion of particles, which must be discrete, space itself must be a continuum [1, 3], without having a composition. This becomes possible when we consider space not as a pre-existing manifold but as a dynamic one being continuously created out of the state of nothingness due to spontaneous separation followed by the motion of a particle.

Any motion of a particle resulting in an action is characterized by the initial and final space-time events or positions only. Now the total displacement (*ds*) covered by the particle is equivalent of moving first along a distance (*dx*), then by (*dy*) and finally by (*dz*) along any three mutually orthogonal axes originating at the initial position. Since each such motion is equiprobable and analytically tenable, we may accept that all such paths are real and existing too. Also since the particle is free to travel in any arbitrary direction and the set of orthogonal axes may be oriented in any way, all such possible paths together will simulate the *hollow of a domain*, the center of it corresponding to the initial position of the particle. Continued and multiple generation of particles in motion will create similar domains all being fused entirely with one another in one continuum. *This is the way space may be conceived being continuously generated*. This will also be true in case of motion of every particle as constituent of every macroscopic object.

In consideration thereof, space cannot have mass or a defined volume, boundary, shape or curvature, being continuously generated anywhere and everywhere, at all times remaining in dynamic equilibrium with the state of nothingness. Consequently the notion of geometry shall not apply in case of space albeit with everything else, real or virtual, contained or conceived within it. Similarly space cannot have any charge, a property associated with matter particles only, but can retain the charge at any position in space being carried by a matter particle.

On the other hand space is characterized by two uniquely fundamental properties e.g. *permittivity* (ϵ) and *permeability* (μ), interrelated by charge in place and in motion; and created as the result of an interfacing of charge with space. A dimensional analysis of them may reveal the following interesting properties.

$$[\epsilon] = \left(\frac{Farad}{metre}\right) = \left(\frac{Ampere}{Volt}\right) * \left(\frac{second}{metre}\right)$$

$$[\mu] = \left(\frac{Henry}{metre}\right) = \left(\frac{Volt}{Ampere}\right) * \left(\frac{second}{metre}\right)$$

Taking into account both possibilities of rest and propensity of motion together, the charge will simultaneously experience and encounter the equivalence of conductivity and resistivity along any two mutually orthogonal directions; and coupled with the slowness factor this will give rise to properties of permittivity and permeability as two natural constants. When a certain volume of space is devoid of all matter particles it assumes minimum non-zero values for both. Finally, the combined effect of permittivity and permeability will cause quantum motion of a particle along the remaining orthogonal axis thereby making up for the *three necessary and sufficient dimensions* of space.

3.2. Charge

Charge is a transcendental entity being an excitation created out of the state of nothingness and carried by a particle only in space, giving rise to an intrinsic property, by virtue of which it manifests electrostatic and electromagnetic phenomena in relation with another charged particle or magnetic field. On a fundamental level, a charged particle does exchange mediating particles, created out of the state of nothingness [3], thereby interacting with another charged or uncharged particle by conveying momentum. Accordingly it may exhibit two only possibilities e.g. attraction and repulsion, and consequently there are two kinds of charge only, called as positive and negative. Since two equal and opposite charges together will produce a nil effect, which is prevalent in the state of nothingness, we may infer that as every time elementary particles carrying charges are created out of the state of nothingness they must carry two equal and opposite charges, like a particle and anti-particle pair. Consequently, the total charge in the universe must always be zero. Charge is also conveyed piggybacked on a particle and therefore, is quantized and being created only out of nothingness remains a conserved quantity in space following the invariance principle.

Matter is composed of charge-carrying particles. Therefore a motion of particles, elementary or composite, is in effect the motion of charges only. When two equal and opposite charges move together, as being uncharged, we consider the physical motion as *mechanical*, whereas if opposite charges move separately we consider this as *electrical*.

3.3. Motion

Motion is change of position of a particle in space, while a particle only is capable of undergoing motion. Since any

particle is also a charge carrier, the motion of a particle is the result of an interfacing of charge with the permittivity and permeability of space. Now by taking into consideration the quantum effects in space we may rewrite the above dimensional analysis to get the following relationships.

$$\epsilon = (quantum\ conductivity) * (quantum\ slowness)$$

$$\mu = (quantum\ resistivity) * (quantum\ slowness)$$

Due to the resultant effect of simultaneous coupling of quantum conductivity and resistivity with $(quantum\ slowness = 1/c)$ along any two mutually orthogonal axes in space, the quantum particle will be subject to quantum slowness along the remaining orthogonal axis as per the analytical relation $(1/c = \sqrt{\epsilon\mu})$ being the *geometric mean* of permittivity (ϵ) and permeability (μ), which is the primary cause of quantum motion, since without this inherent slowness there would be no motion [3]. This is also the reason for a quantum particle to be in motion at all times in space, irrespective of any other exogenous cause.

On the other hand a particle possesses mass by virtue of which it can carry energy and momentum. At the elementary level, motion therefore originates in a particle either by an interaction with an extraneous source of momentum or by the phenomenon of gravitation due to mass alone causing a spontaneous motion. As the particle undergoes motion it exchanges its position with a virtual particle in space adjacent to it, generated out of the state of nothingness, in view of its propensity to move in all possible directions conforming to equiprobability principle [1, 3]. This also results in the apparent dual particle-wave property of a quantum particle [1].

3.4. Time

Time is a measure of the slowness of motion as an inevitable spontaneous creation arising out of the mandatory *slowness factor* prevailing in nature, which is the inverse of speed, and so it always assumes a finite non-zero value. Since motion causes a particle to change from an initial to a final position, being necessarily separated in space, the particle undergoing motion cannot be in both places at the same time; thus motion can never be instantaneous. If an isolated system is without any motion inside it, time ceases to exist there also, whereas time may flow outside of the system associated with motion.

This notional view of time is based upon localized motion only, at a fundamental level, whereas actual observation and measurement of time over different locations in space will depend upon other considerations that will affect the motion over space.

3.5. Mass

Mass is an intrinsic property of an elementary particle which enables it to carry momentum and energy, consequently to undertake motion. It is created by virtue of the intrinsic spin angular momentum and angular frequency of the elementary particle caused by the oscillatory transition of a charge within an amount of space forming the particle [1]. Since an elementary particle can only be created out of the state of nothingness bearing the property of mass, every other phenomenon in space thereafter must retain its rest mass value unaltered, thereby making mass a conserved quantity obeying the invariance principle. For all matter objects comprised of composite particles, born out of elementary particles, mass manifests itself as an extensive property only.

3.6. Energy

Energy is the property of a particle (or of a system of particles) with respect to its state of motion, a higher state of motion accounting for a higher measure of energy and the other way too. While energy may appear in more than one form, ideally it is the kinetic energy of the particle(s) that determines the state of motion and hence the level of energy it is associated with. Energy manifests itself only during transit from one system to another, being piggybacked on particles and therefore it is quantized [1]. Like mass and charge, energy is associated with an elementary particle on creation out of the state of nothingness only. Thereafter the motion of a particle may go to a higher or a lower state but can never cease to exist, so energy cannot be destroyed albeit be dissipated away during transition from one system to another adhering to the invariance principle. Consequently, energy is a conserved quantity, and except when a particle enters into the state of nothingness, it is always associated with an amount of energy of non-zero value. Even at the *absolute zero* of the thermodynamic scale of temperature, since the particle possesses mass it will have the jittery motion due to the effect of self-gravitation [3] and the presence of electromagnetic four-potential.

3.7. Geometry

Geometry is founded on a set of axioms starting with an innocuous point and then extending through lines, angles, areas and curvatures various notions of geometry have played vital roles in understanding and elucidating all other primitive notions in physics. Co-ordinates, measurements and comparisons are carried out with the application of the concepts of geometry only. Ingenuous geometrical percepts assist in revealing fascinating profound insights of physical quantities out of their analytical relationships by making prudent analogies taking into consideration of symmetries. However, the notion of a point only may be precisely employed even within the state of nothingness.

3.8. Interaction

Interaction means two particles or systems of particles acting upon one another causing a change in the prevailing state of each, which in turn depends on the state of motion of the particle(s), and since particles only can undergo motion carrying mass, charge, energy and momentum two particles or systems of particles can interact through the *exchange of mediating particles* only. So an interaction essentially involves more than one particle or system of particles

exchanging some other mediating particles between them resulting in a mutual redisposition of their initial states of motion into final states. This may also cause interacting particles to metamorphose into other particles or generate additional or new particles [1-3].

However, gravitation is not an interaction as above, it being a phenomenon due to the particles having the property of mass, which may result in a spontaneous motion of the particles towards each other with a mass value equal to or more than the *Planck mass* [3]. All elementary particles and their stable composites, which may go on to produce atoms and molecules, are having mass values lower than the Planck mass while at the cosmological level objects are having mass values considerably higher than Planck mass; and so we may consider Planck mass to be on the threshold between the quantum regime and the macroscopic one, thereby purging out the concept and need of a *quantum gravity* in the true sense of the quantum realm.

4. Spontaneity, Continuity and Reality

Spontaneity is a prime yet mysterious quintessence of nature. The reason why something may or should happen spontaneously may not be fully elucidated, however, if the outcome of a spontaneous action is something plausible, we may say spontaneity is justifiably vindicated too. Science is *all about what and how*, and *never ever for a why*, so the buck stops at the doorstep of the *ultimate query of a why*; and then spontaneity comes to its rescue. Since science is an organized knowledge only and not the occult, pursuing the principle of causality we may resort to spontaneity in order to reason out the happening, which cannot be warranted in any other known and possible way.

In our universe, other than space, which must be continuous without having any internal constituents, everything else including every property, at the elementary level, must be quantized, being implicitly related to motion of a particle in space. The concept of *continuity*, which in turn depends intimately on the concept of *limit*, is a necessary and sufficient condition imposed by mathematics solely due to analytical consideration. For every mathematical computation we must consider the observable in terms of segments or discrete elements only, while the corresponding function may be conveniently taken as continuous to allow performing both its derivative and anti-derivative, as necessary.

Reality should be considered as the one that may be perceived by one or more of our physical senses provided by nature, be that aided and complemented by contrivances, as may become necessary and applicable. On the other hand viewing a sculpture, portrait, photo print or a hologram is in actuality the mere act of looking at the thing that it is and not the real thing that it only emulates. Science shows us that our physical senses have limited selection and ranges when left only to natural and physiological means; whereas aided by instruments and transducers or following indirect simulations the same may be enormously enhanced and amended, albeit with the sole purpose of ultimately causing the observable to an outcome within the purview of our physical senses. Everything else is unreal in the above sense and out of the domain of physical science. Pursuing the same reasoning, the quantum state of nature is righteously a reality, which by virtue of natural measures of superposition and correspondence assumes a macro state to be perceived as reality by our conventional senses and means.

5. Euler's Relation

Euler's relation $(e^{i\pi} + 1 = 0)$ with usual notations carries a significant missive in the world of elementary particles. It represents a physical theory yet is fully consistent with the corresponding analytical expression. While the numeral (0) may represent the *state of nothingness*, it is in turn equivalent of the sum of two equal and opposite which are represented by (1) and $(e^{i\pi})$, at the two ends of a diameter, lying in opposite phases. This is a constant relationship, independent of the length and orientation of the diameter and the numerical value and the characteristic of the two quantities represented by them. Therefore, it may be considered as a pair of a particle and its anti-particle with the same mass but opposite quantum numbers or two entangled particles or simply as two equal and opposite charges. This gives us an interesting insight on the formation of elementary particles out of the state of nothingness and all other related sequels as well.

Considering an elementary particle to be formed by localization of an amount of charge held inside an amount of space and undergoing perpetual oscillatory transition between electric and magnetic energy, we may have a particle and its anti-particle thus spontaneously created out of two equal and opposite charges as above [1].

In case of two entangled elementary particles formed out of a single particle split into two, they may assume the above states with opposite phases while the total effect remaining nil independent of their physical locations. Each such elementary particle in its own new location will be surrounded by virtual particles [1] created out of the state of nothingness and be continuously exchanging positions with them thereby having all the equiprobable states of existence, however, when any one of the entangled particles comes under observation thereby occupying a definite state, the other particle entangled with it will simultaneously assume and depict the complementary state. For composite particles so entangled, each being composed of elementary particles, will behave in a similar way subject to the principle of superposition and correspondence at its own location.

6. Creation of Space, Charge and Particle with Energy and Motion

The state of nothingness being transcendental encompasses nothing including not even space, yet the

primitive notion of geometry permits us to conceive a single isolated point, its location being irrelevant, at the center with two similar other points equidistant from it, irrespective of orientation; representing (0), (1) and $(e^{i\pi})$ in conformity with the Euler's relation. This very feat will concoct the *concept of separation* and consequently create space the way we have elucidated earlier.

Now we consider two equal and opposite charges, being transcendental in origin and so conceived out of nothingness, their numerical values being immaterial, at the two positions (1) and $(e^{i\pi})$, without violating the eminence of the state of nothingness to be followed by *localization of the charges* transforming them into a pair of an elementary particle and its anti-particle, as enumerated above, tending to undertake motion in every possible direction all being performed absolutely spontaneously only. As an aside, while charge is created out of the transcendental state of nothingness in positive-negative pairs albeit must remain isolated being piggybacked on particles and so may exist as singles; the properties of magnetic poles appear mandatorily only in north-south pole-pairs of real entities, thereby barring the subsistence of magnetic monopoles.

Energy is similarly created out of nothingness from lethargy by decoupling of the combined effect of permittivity and permeability $(E = L_e/(1/c)^4 = L_e/(\epsilon\mu)^2)$, also in a spontaneous way. In space, a spontaneous process is the time-evolution of a system from its prevailing state to a thermodynamically more stable state by releasing free energy to the surrounding space across its boundary. The spontaneous process of particle creation out of the state of nothingness will likewise create energy carried away by the particles into space. Energy so generated will appear as kinetic energy added to the rest mass of the particles and will set them in motion creating space and time. Furthermore, a true singularity always prevails at the state of nothingness where every other primitive notion assumes a null value barring energy, which replicates as the transcendental entity of lethargy, and thereafter by virtue of the slowness factor being zero, assumes an infinite potential. The state of nothingness will therefore, acquit itself as an *unlimited source of supply of energy* for the universe at all times without violating the causality principle.

Moreover, the state of nothingness provides energy, charge, space and time to appear in space as the necessary ingredients for the *electromagnetic four-potential* to be created and thereby deriving the *electromagnetic field* and bringing *interaction* into play. A dimensional analysis shows this potential as [(*Energy*/*Charge*)/(*Space*/*Time*)]. Accordingly, both electric and magnetic fields will be generated simultaneously by each of the charge in place and the charge in motion independent of one another instead of as an interaction between the electric and magnetic fields.

7. Universe out of Nothingness

Creation instates out of the state of nothingness with spontaneous generation and separation of two equal and opposite charges ensuing Euler's relation, inducting space having its intrinsic properties of permittivity (ϵ) and permeability (μ) allowing motion to take place, being followed by localization of charges forming elementary particles under motion carrying kinetic energy and momentum and thus creating more space and time.

The *state of nothingness* is all-pervasive, therefore prevailing at all times, with no beginning and end, as it does not exist with any characteristic that we are familiar with. Thus it is equivalent of an *empty set* with the *vacuous truth* of having the sole property of lethargy as a *presupposition* only. It includes nothing and as such possesses no property except that all three principal dimensions of space, mass and time are coupled together in the analytical form for *lethargy* $(L_e = m/c^2 \ or \ L_e = m * \epsilon\mu)$.

However, *spontaneity* plays its predominant role in nature, and in conformity with Euler's relation, two equal and opposite charges are spontaneously created, which in turn may produce a pair of particle and anti-particle having mass; while a further spontaneous de-coupling of lethargy produces energy imparting momentum and setting the particles in motion thereby generating space in a form that we are aware of.

Whereas permittivity (ϵ) and permeability (μ) are related to the inherent quantum slowness $(1/c)$ of nature, they create capacitance (C) and inductance (L) in free space in association with an intrinsic linear dimension (r) inside the volume of space concerned as $(C = \epsilon r)$ and $(L = \mu r)$. Thereby two equal and opposite charges (q) forming the pair of a particle and its anti-particle will have the rest mass of the particle proportional to the square of the amount of charge $(m \propto q^2)$ [1]. With spontaneity playing the statutory role in creation of the charge out of the state of nothingness, we may intuitively expect the phenomenon of particle creation to be associated with as low as possible values of rest mass of an elementary particle, a fact that is excusably true in nature.

The particles will now enter into the space of $(\hbar)$, (G) and $(1/c)$, respectively of *quantum action*, *gravitation* and *quantum slowness*. These are the three prime natural attributes of space e.g. a motion resulting into an action, a phenomenon of gravitating of a mass freely towards another and the separation causing mandatory slowness in motion. Consequently each particle will have its rest mass, charge and kinetic energy together generating the electromagnetic four-potential which will create the electromagnetic field in space along with the resultant interaction and motion. Elementary particles so created will interact with one another forming composite particles, which will also endure motion under gravitation and thereafter over a long period of time will create everything else that our universe is found to be comprised of.

Within the state of nothingness, no primitive notion may be conceived except the one that of charge, as two equal and opposite, which may go on to create a pair of real elementary particle and anti-particle coming out of nothingness into space. The particle may also carry with it an additional amount of charge, positive or negative, which will be manifested as electric charge as it enters into space having

the properties of permittivity and permeability.

Apart from having its rest mass, the particle will have kinetic energy associated with it created out of nothingness, and every other attribute in the form of a property or a specific quantum number will be endorsed to it thereafter, due to combinatorics in view of its being in perpetual motion, which is the primary cause. Consequently, every such attribute adhered to an elementary particle shall always remain a conserved quantity as a follow up of any phenomenon that it may go through later in space.

The phenomenon of gravitation follows the formation of particles, elementary and composite, as a natural consequence of the property of mass when it attains the requisite quantum value. Interestingly, considering Planck length (l_P) and Planck mass (M_P) as equivalent of *quantum length* and *quantum gravitational mass* we may express all of the primary attributes of $(\hbar)$, (G) and $(1/c)$ in relation to the properties of permittivity (ϵ) and permeability (μ) of space as shown below.

$$\hbar = (l_P M_P)/\sqrt{\epsilon\mu})$$
$$G = (l_P/M_P)/(\epsilon\mu)$$
$$1/c = \sqrt{\epsilon\mu}$$

While numerous physical observations lead to the *big bang* concept in physics, it still does not satiate the causality principle and leaves open the query about the system periphery, if any, or beyond it, during the transitory phases of inflation, considering both ways, at least theoretically. The concept of nothingness buries these reservations entirely. Moreover, the notion of the *heat death of the universe* shall also no more be pertinent since the universe, in association with the state of nothingness, shall be considered as an *open system*, rather than an isolated or closed system. Another interesting observation is that creation of *multi-verses* as more than one universe out of the state of nothingness shall be absolutely ruled out as there can be nothing between and among them resulting in one only universe in its entirety.

Since spontaneity plays the solitary role in creation out of nothingness, which acts as the necessary and sufficient condition, precise instants of the beginning and end of the process of creation of our universe do not exist, remaining on a circular trail. However, based on our physical concept of time we may mark the beginning and the predictable end of our observable universe from the *mini-bang* scenarios as discussed in my previous article [2]. Moreover, the discovery of non-uniformity and intrinsic anisotropy of cosmic microwave radiation duly supports the concept of numerous mini-bangs as opposed to a sole big bang. In view of spontaneity, symmetry and possibility, the elementary particles created out of the state of nothingness will conform to having all possible combinations of angular frequency and mass along with corresponding values of various intrinsic spin angular momentums. However, the quantity of charge remaining the same for matter particles [1], those with relatively low intrinsic angular frequency ensuring stability will sustain and so both *dark matter* and *observable matter* particles shall only endure [3]. On the other hand, the observable matter particles may possess relatively higher values of intrinsic angular frequency compared to dark matter particles and so are proportionately less abundant being less prone to spontaneous generation. Similarly, nothingness along with spontaneity plays an evocative role in keeping the cosmological constant or *dark energy* with an extremely low value, which acts as a buffer or barrier only between the state of nothingness and free space [3].

With a backdrop of the state of nothingness, and spontaneity being at the heart of creation, with seemingly an eternity before and after our present epoch, we may consider our observable universe to be certainly not prevailing during any unique era or for the same reasons to have come into being due to astounding fine tuning of a few universal constants of physics; rather we may positively look at and illuminate all observable facts and phenomena based on organized knowledge and reasoning, albeit at times being more tuned to philosophy due to lack of adequate analytical support, yet not without firm logic.

8. Conclusions

Our universe endures as a *continuum* in the milieu of a transcendental *state of nothingness* having all three principal dimensions of space, mass and time coupled together in the form of *lethargy* due to the properties of *permittivity* and *permeability* of a transitional entity known as free space. A *spontaneous creation* of two equal and opposite charges in conformity with *Euler's relation* followed by localization of charges may in turn create a pair of a real particle and its anti-particle having mass, which by acquiring kinetic energy and momentum undergo motion creating space and time; and then through mutual *interaction* produce composite particles and thereafter by means of *gravitation* create all that we find in our observable universe, continuing over a very long time. This concept or seemingly knowledge is based on our understanding of a few *primitive notions of physics* hitherto elucidated in this treatise. *Knowledge founded on notions endorses them to be true*! As an aside yet faithfully allied to this treatise betide these supervening quotes:

- Although to penetrate into the intimate mysteries of nature and thence to learn the true causes of phenomena is not allowed to us, nevertheless it can happen that a certain fictive hypothesis may suffice for explaining many phenomena - Leonhard Euler.
- Your manuscript is both good and original. However, that which is good is not original, and that which is original is not good - Samuel Johnson.

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