

## MATERIAL IMATERIAL AND FORCE ESSENCE OF NATURE

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**Abstract:** The mass-( $m$ ) and energy-( $E$ ) are a pair of opposite quantities – material-immaterial (ideal). Therefore, they mutually determined:  $E=m.c^2$  – law of qualitative definiteness (particles with energy, no mass...complete absurdity). For a wave process:  $E=m.(\lambda.f)^2$ . The factor- $c^2=(\lambda.f)^2$  is mass-energy mediator. The formula-( $E=h.f$ ) admits of inaccuracy. The correct relationship is:  $P=h.f$  [watt] and  $h$ -[w.s]. The Planck constant represents:  $h=E_0=m_0.c^2$  – a boundary discrete portion of energy (from one wave period), and ( $m_0$ ) is a corresponding boundary discrete portion of mass (of the field matter). The quantitative ratios are in force:  $E=n.E_0$ ;  $m=n.m_0$ , where ( $n$ ) is a number-coefficient of proportionality – law of quantitative definiteness. Natural constants-scales for energy-( $E_0=h_E$ ) and mass-( $m_0=h_m$ ) are available. What has been said literally also applies to the pair of antipodes length-( $L$ ) and time-( $t$ ). Hence the dependencies:  $L=t.c$  (qualitative definiteness);  $L=n.L_0$ ;  $t=n.t_0$  (quantitative definiteness), where ( $L_0=h_L$ ) and ( $t_0=h_t$ ) are natural constants-scales for length (indivisible distance-( $R_0=L_0$ ) that is traveled at once) and for time (time interval, indivisible into subintervals). For a stationary system- $K$  and a system- $K'$ , moving along the ( $X$ )-axis, the Lorentz transformations are:  $x'=n.x$ ;  $t'=n.t$  (normal comparison;  $n=\sqrt{(1-v/c)/(1+v/c)}$ ). The following characteristics of matter become clear: Linear density-( $\rho_0=m_0/R_0$ ), united force- $F_0=(c^2/\rho_0).\frac{m_0}{R_0}.\frac{m_0}{R_0}$ . The expression-( $G=c^2/\rho_0$ ) is the gravitational constant-[ $m^3/kg.s^2$ ].

**Keywords:** principle of opposites, law of qualitative definiteness, law of quantitative definiteness, principle of similarity, natural constants-scales

### 1. Introduction

All the natural diversity that we explore, in fact, is reduced to two characteristic realities - material (physical bodies, space, etc.) and immaterial (ideal categories such as emptiness, time, etc.). We need to make sense of this fact. The indicated opposition is fundamental and gives reasons to speak of two primary sources of phenomena - material and ideal. Our experience shows that, as a consequence of their coexistence, a third, force reality also appears.

### 2. Higher natural legislation

#### 2.1 The three physical faces of nature

We know that the fragmentation of matter leads to the obtaining of ever-simpler structures - molecules, atoms, elementary particles. In the disclosing micro-world, the phenomenon of "plus-minus" polarity and the power between these opposing qualities begins to stand out

clearly. Reasoning in this direction leads to the conclusion of the existence of an starting substance composed of two opposite entities, each of which reproduces itself in the progression of development, namely:

- Material beginning: Physics reflects it with the quantities "mass, length, etc." It produces the spatial material nature – from the particles and their macro formations, to the living body and the male sex.
- Ideal beginning: Physics reflects it with the quantities "energy, time, etc." It produces the non-spatial ideal nature – from the vacuum around the particles, to consciousness and the female sex.

The co-existence of the material beginning and the ideal beginning gives rise, of a kind, to a third beginning:

- Force beginning: Physics reflects it with the quantity "force". It produces the immaterial force nature – from the typesetting of forces and interactions known to science to the male sex-female sex activity.

The material beginning, the ideal beginning and the force beginning are, metaphorically speaking, the Holy Trinity, dictating the arrangement and development of the Universe.

## **2.2 Principle of opposite**

Matter develops from the simple to the complex (material going section), and Cognition follows the reverse path from the complex to the simple (ideal returning section). It is a natural law – a convenient and generally accessible cognitive highway, along which research is purposeful, and progress and intellectual overtakings follow clear, objective criteria and evaluations (with the caveat that the complex is easily deciphered by the sensory system, and the simple is very difficult to detection). This factology is apparently unknown to physics, because we see it entangled in various unimaginable notions and abstractions.

The insight into the essence of nature leads to the conclusion that the Universe is subordinate to one supreme principle – the Principle of opposite. The same one outlines its organizational forms and transformations, as well as the eternal circle: From force rest, revolutionary (explosive) transition to maximum movement and slow evolution back to force rest (this development is familiar to us from dialectics). In evolution, the centrifugal internal motion in the Metagalaxy (Hypersphere, the absolutely stationary system  $K_0$ ), interpreted as expansion, is reversed into centripetal contraction.

The principle of opposite also appears as:

- Principle of dualism (of duality): Because the opposites are situated in the form of material-ideal pairs (other possibility no exists).
- Principle of definiteness: Because opposites are determined by each other (other possibility no exists).

## **2.3 Principle of definiteness**

### **2.3.1 Law of qualitative definiteness**

Directly to the question: Can the immaterial quantity (immaterial quality) energy-(E) be defined in any other way than by its opposite – the material quantity (material quality) mass-(m)? The answer is categorical: It cannot! This subordination is a natural law – a law of qualitative definiteness. Energy and mass, as a pair of opposite quantities, are mutually determined:

$$E=m \cdot c^2 ; m=E/c^2 ; E/m=c^2 \quad (1)$$

Other options are impossible (the idea of particles with energy but no mass is complete absurdity). For a wave process:

$$E=m \cdot (\lambda \cdot f)^2 \quad (2)$$

The factor  $c^2=(\lambda \cdot f)^2$  is mass-energy mediator (equalizer); (c) – speed of light;  $\lambda$  and  $f$  – length and frequency of the wave.

In the context of the said, how should we evaluate the dependence proposed by physics: <sup>[1]</sup>

$$E=h \cdot f \quad (3)$$

Expression (3) differs from the legal template (1) and (2). There is no room for hesitation here. This formula allows for inaccuracy. The correct connection is:

$$P=h \cdot f \text{ [watt]} \text{ or } dE/dt=h/dt \quad (4)$$

The Planck constant represents a boundary discrete portion of energy (of one wave period):

$$h=E_0=m_0 \cdot c^2 \quad (5)$$

Its opposite ( $m_0$ ) also appears – a boundary discrete portion of mass (of the field matter). <sup>[2]</sup>

The presented cogitations verbatim also apply to the length (L)-time (t) pair. To the question of whether the material quantity length (L) can be determined in any other way than through its opposite – the immaterial quantity time (t), the answer is again: It cannot! The law of qualitative definiteness is universal, inviolable. Length and time, as a pair of opposite quantities, are mutually determined:

$$L=t \cdot c ; t=L/c ; L/t=c \quad (6)$$

Other options are impossible. The factor (c) is a (L)-(t) mediator.

### 2.3.2 Law of quantitative definiteness

The legal provisions from point (4.1) lead to the quantitative ratios:

$$E=n \cdot E_0 ; m=n \cdot m_0 \quad (7)$$

Length and time are subject to the same dependence:

$$L=n \cdot L_0 ; t=n \cdot t_0 \quad (8)$$

Here (n) is a number-coefficient of proportionality. In most general plan, two different quantities of the same nature (Q1) and (Q2) step into the role of against-standing sides.

And if we ask ourselves now whether a quantity (Q1) can be determined in any other way than through the opposite quantity (Q2), the answer is unequivocal: It cannot! This subordination is a natural law – a law of quantitative definiteness. The quantities (Q1) and (Q2) are mutually determined:

$$Q1=n.Q2 ; Q2=Q1/n ; Q1/Q2=n \quad (9)$$

Other options do not exist.

From the categorical nature of expression (9) a problem arises for today's knowledge. At a stationary system K(x,t) and a system K'(x',t') moving inertially with speed (v) to the right along the (X)-axis, physics, we know, offers the Lorentzian transformations in the form:<sup>[3]</sup>

$$x'=(x-v.t)/b ; t'=(t-v.x/c^2)/b, \text{ where } b=\sqrt{1-v^2/c^2} \quad (10)$$

However, these formulas differ from the legal template shown (9). How should we evaluate this discrepancy? And now there is no room for hesitations. Formulas (10) admit inaccuracy (they are not completely solved). The correct Lorentz transformations are:

$$x'=n.x ; t'=n.t \text{ where } n=\sqrt{(1-v/c)/(1+v/c)} \quad (11)$$

This is the normal parallel between the various lengths and times.

### 3. Natural constants-scales

To determine arbitrary amounts of energy, mass, length and time, Consciousness has created the necessary macroscales-constants, respectively: joule, kilogram, meter, second. We will give an example with the founded constant-macroscale for length "meter": The length-(L) represents a certain number of meters, where the meter is a constant-scale for spatial measurement. Accordingly:

$$\text{Length-(L)}=(\text{number}).(\text{macroscale-constant meter}) \quad (12)$$

The possibility of using a macroscale-constant meter is due to the existence of a finite, indivisible natural spatial unit – an initial constant for length ( $h_L=L_0$ ). The constant- $(h_L=L_0)$  is a distance ( $R_0$ ) that can no longer to travel in parts, but only the whole, at once. Just this reality makes movement possible (this is precisely why Achilles catches up with the tortoise and this is precisely the solution to Zenon's famous aporia – 5th century BC).<sup>[4]</sup> Otherwise, the divisibility of the space tends to a limit value of zero, which cannot be integrated, i.e. from which no macro equivalent can be obtained. Macroscale-constant meter is a size multiple of ( $L_0$ ):

$$(\text{meter})=(\text{number}).(h_L=L_0) \quad (13)$$

From premises (12) and (13) we arrive at the syllogistic conclusion:

$$\text{length (L)}=(\text{number}).(L_0=h_L) \quad (14)$$

Ultimately, from points (4.1, 4.2) we conclude that the development of matter starts from certain natural constants-scales –  $(h_E=E_0)$ ,  $(h_m=m_0)$ ,  $(h_L=L_0)$ ,  $(h_t=t_0)$  for the main quantities. This circumstance is of particular importance, since the consequences of the determined beginning cannot be anything other than certain objects, phenomena, processes. Thanks to this all-encompassing determinateness, nature is knowable and a cognitive process takes place in which Consciousness creates the more convenient macroscale-constants. With them are handled in the same way as natural constants, since they are multiples (the zone from natural constants to zero itself is inaccessible to knowledge due to indefiniteness).

In addition, we will note that, quantitatively, mass  $(h_m=m_0)$  and energy  $(h_E=E_0)$  are true, absolute constants of matter (its main characteristics). While the length  $(h_L=L_0)$  and time  $(h_t=t_0)$  scales undergo changes, but over hundreds of millions of years, ie. are, of a kind, pseudo-constants.

#### 4. Primary cell of matter (nuclear model)

As we mentioned, in its essence, dualism comes down to a single regularity – "material manifestation-immaterial (ideal) manifestation". This natural phenomenon comes from the depths of matter – from some starting material-ideal structure that brings its duality into the whole variety of the next derivative production. The material gives rise to the material characteristics, the ideal – the ideals. And so until the appearance of the pairs "material body-ideal consciousness" and "material male sex-ideal female sex". In other words, the development of matter takes place on the Principle of similarity. The same allows the mind to penetrate to the very beginning of the process, guided by the structure and regularities of visible nature. In this attitude, we can offer the following considerations:

The natural constant-scale for mass  $(h_m=m_0)$  cannot represent anything other than the mass of an indivisible particle (the atom of Democritus – 5th century BC).<sup>[5]</sup> The possibility of the  $(m_0)$ -particles to oscillate, what is reality, suggests that there is the opposite quality around them – ideal emptiness. The immaterial, the empty, the "nothing" cannot be spatial. It would have to be stretched by the very presence of the material particle as a nucleus. Respectively, the ideal manifestation should be in a tense state – a source of force applied to the material (consciousness moves the body, ideas move the masses). In this sense, the material essence, the ideal essence, and the force between them (from which the different kinds of forces arise) are the source and the engine of development. There is no spirituality, no reason here. Everything is pure physics. Because of the ideal relationship between the nuclei, the available energy is eternal – uncreated and indestructible.

This is how the idea of a dualistic, force-stressed primordial cell – a material core-empty surroundings – arises. All mass is concentrated in the nucleus – the natural mass-scale constant  $(h_m=m_0)$ . And the pair of opposites appears to be charged with energy – the natural constant-scale for energy  $(h_E=E_0)$  – Planck's constant). On the other hand, the linear dimension of this cell represents a finite spatial unit – the natural length-scale constant  $(h_L=L_0)$ . This is

the distance ( $R_0$ ) between the centers of two adjacent cores, which can no longer be traversed in parts ( $R_0=h_L=L_0$ ).

The primary cell thus situated is the "brick" of the Universe - a structural prototype of all subsequent formations, creating all of nature exactly in its own image and likeness ("one is all, all is one" – Parmenides – VI-V century BC.).<sup>[6]</sup> Videlicet, the Principle of similarity is in action. Its product is the nuclear model – massive core-empty surroundings (or loose). We see it in the atoms (the electron layers are surrounding), the solar-type systems (the planetary space is surrounding), the galaxies (the stellar shell is surrounding), the spherical Metagalaxy itself (the galaxies are surrounding). The same arrangement is followed by the cells of living matter, the family cell of Society (the female nature is an enclosing surrounding), the cell of governance (the Parliament is an enclosing surrounding), and so on.

These cogitations are of principle without aiming at accuracy and comprehensiveness. They simply outline the legal direction that we must be aware of and abide by (and not rely on subjective notions and opinions).

## 5. Linear density of matter

On the basis of natural constants, we introduce the important quantity "linear density of matter" ( $\rho_0=m_0/R_0$ ). This is the linear density of the primary cells, respectively, of the lines of force composed of them. The change of this quantity reflects the circular states of the substance. Its maximum fixes the moment of critically stressed rest, after which an explosive transition into centrifugal movement occurs. In a word, the energy of the primary cell goes from entirely potential ( $E_0=E_p=F_0.R_0$ ) to entirely kinetic ( $E_0=E_k=m_0.c^2$ ), with no possibility of intermediate values. Hence the following energetic dependence:

$$F_0.R_0 - m_0.c^2 = 0 \text{ or } F_0.R_0 = m_0.c^2 \quad (15)$$

## 6. Unity of forces

Force ( $F_0$ ) is the only possible and available force in nature – the mentioned third, force beginning. Its formulation follows directly from (15):

$$F_0=c^2.\rho_0 \text{ or } F_0=(c^2/\rho_0).\frac{m_0}{R_0}.\frac{m_0}{R_0} - \text{prototype of the law of gravity} \quad (16)$$

The expression in brackets should be the gravitational constant:

$$G = c^2/\rho_0 \quad [m^3/kg.s^2] \quad (17)$$

## 7. Conclusion

The Principle of opposite, the Principle of quantitative-qualitative determination and the Principle of similarity are the basis of the normal cognitive activity of Consciousness. However, modern physics develops views and interpretations far outside this normality.

## References

- [1] Джианколи Д. – Физика, Москва 1989, част 2, стр. 500-503  
(D. Giancoli – Physics, Moscow 1989, Vol. 2, pp. 500-503)
- [2]. Николов А. – Към смяна на идеите във философията и физиката, С. 1999, част II, стр. Стр. 296-310  
(A..Nikolov – Towards a change of ideas in philosophy and physics, Sofia 1999, part II, pp. 296-310)
- [3] Джианколи Д. – Физика, Москва 1989, част 2, стр. 481-484  
(D. Giancoli – Physics, Moscow 1989, Vol. 2, pp. 481-484)
- [4] Радев Р. – Антична философия, С.1988, стр. 104-108  
(R. Radev – Ancient Philosophy, Sofia 1988, pp. 104-108)
- [5] Радев Р. – Антична философия, С.1988, стр. 132-148  
(R. Radev – Ancient Philosophy, Sofia 1988, pp. 132-148)
- [6] Радев Р. – Антична философия, С.1988, стр. 101-104  
(R. Radev – Ancient Philosophy, Sofia 1988, pp. 101-104)