V.K. Nurmukhametov

Inorganic world: physical and metaphysical aspects

Thanks to the efforts of many generations of researchers the physical picture of the world has been created – the concept of the world and its processes, worked out on the basis of empirical research and theoretical understanding. The subject of the present paper is the Inorganic world (N-world), its basic structure, physical and primarily metaphysical aspects. There is the doctrine of the layers in natural philosophy - the understanding of reality as the order of the layers of being. Respectively, the N-world can be imagined as the order of three physical layers:

- Micro-particles,
- Physical fields and
- Radiation.

Meanwhile space and time are the fundamental structures of the world. Matter consists of mocroparticles. The physical fields are gravitational, electrostatic and magnetostatic fields. The Layer of Radiation includes all types of radiation with the propagation speed equal to the speed of light.

In physics force and energy also belong to the fundamental physical categories. Energy characterizes the "general quantitative measure of motion and interaction of all forms of matter" [1]. The energy conservation law is fulfilled in isolated systems. In physics different categories of force are used depending on the type of physical interactions: the force in mechanics, force of inertia, electric current, and others.

All kinds of physical interactions can be divided into four groups: gravitational interaction, electromagnetic interaction, strong interaction and weak interaction. The central element in the methods of analysis of physical interactions is the causal principle according to which every physical phenomenon has a cause.

Historically, physics has been developing in breadth and depth. The stages of the development of physics may be found, for example, in [1]. Of the greatest interest for us are the issues of its development in depth, associated with the comprehension of physical concepts and paradigms, with the development of the physical worldview. The analysis shows that in modern physics there are a number of paradoxes of ideological level, such as the paradoxes of the gravitational, electric and magnetic fields, the paradox of wave-particle duality of light and micro-particles. In modern physics the active principle in the N-world is represented by the categories of energy and force. The question about the grounds and mechanisms of the implementation of the energy conservation law in closed systems seems natural. The category of force is the most problematic, as it cannot be sorted out from physical interactions as an independent phenomenon. It is interesting to note that the second law of Newtonian mechanics allows a dual interpretation. The first interpretation implies that force is primary, and acceleration is secondary. A second possible interpretation implies that acceleration is primary, force is only a secondary category and represents only a brief notation for the product of mass and acceleration.

To overcome the above-mentioned paradoxes of the ideological level, in our opinion, the existence of a comprehensive active principle in the N-world should be recognized. It requires to generalize the physical layers of the N-world as follows:

- Microparticles, ⟶ Micro-objects,
- Physical fields and ⟶ Active Ether and
- Radiation, ⟶ Radiation.

The basic micro-objects are electrons, protons and other atomic nuclei, they are active objects of nature. They possess a system of algorithms, according to which they interact both with each other and with the layer of the Active Ether and with the Radiation. Their cyclic activity consists in monitoring the external environment within a sphere with a radius

of the order $10^{-7} cm$, processing received information and making a decision, implementing this decision. Micro-objects are able to self-motion and to change of their spatial orientation. The motion of material bodies in the world is reduced to the stepwise motion of micro-objects.

The Active Ether (AE) is present everywhere in the world, it can be called, following Aristotle, the Entelechy of the N-world. It is characterized by a universal system of algorithms, according to which it performs its activity. It uses its immaterial absolute coordinate system. Every celestial object is provided by its own local immaterial coordinate system. The AE governs their motion in the absolute coordinate system. Micro-objects of celestial bodies follow the motion of their local coordinate systems, which are known in physics as the inertial coordinate systems. The AE governs immediately the motion of small celestial bodies and individual micro-objects. All the laws of celestial mechanics go back to the corresponding algorithms of the AE. It also provides all the gravitational, electrostatic and magnetostatic interactions.

The layer of Radiation plays the role of the carrier of physical information in the N-world. In the framework of generalized layers we have to admit that the optical and electromagnetic radiations are of different nature. First of all, let's note that a light wave can not exist in nature as a physical reality. Micro-objects form the photons as the light quanta. A beam of light is a flux of photons. All the photons in the world are governed by the AE from their formation by microobjects to their absorption. All optical phenomena and interactions are provided by the AE, both purely corpuscular interaction and wave-particle interaction. The latter are implemented in two stages. First the AE makes a plan. Meanwhile it describes the flux of photons in the form of an imaginary mathematical light wave. The Planck's formula relating the photon energy with an imaginary wave-length originates in the appropriate AE algorithm. In the second stage the AE realizes the plan of the optical phenomenon by means of the appropriate governing of the photon flux. The main types of control are the insurance of the linear motion in space, change of the direction of motion, providence of the reflection and refraction at the boundaries of different media, motion in a material medium. The AE can annihilate photons in some places and produce them in other places, what ensures the redistribution of light beams.

Note that the wave characteristics of micro-objects are treated similarly.

The formulation of the problem of the active principle in the N-world and the above prerequisites of its interpretation may be considered as an attempt to develop philosophical aspects of physics. Historically, physics has been developing mainly in the framework of the following methodology: first a hypothesis was made, then it was tested experimentally and if it was confirmed, it became a theory. At the same time the development of physical views had a more complicated character, what was associated with the generalization of accumulated knowledge, development of new physical categories. The transition from the physical layers of the N-world to generalized layers allowed to solve the paradoxes of physical fields, as well as the paradox of wave-particle duality of light and micro-particles. However, the consequences of such a generalization of the N-world layers have been essentially greater. It allowed to represent the functioning of the N-world both in whole and in parts by three obligatory components – the System of algorithms, the Means and Methods of their realization. Every physical phenomenon can be analyzed in the framework of this triad.

In contrast to the physical layers of the N-world its generalized layers contain invisible components in which the force interaction is replaced with the informational interaction. Informatics of micro-objects and the AE is introduced. We are not able to imagine the mechanisms for the generation, storage, transmission, reception and processing of information, inherent in micro-objects. The mechanisms of the comprehensive AE activity are out of our understanding. Note, that historically the area of the AE being has been perceived as emptiness.

In our view the supposed invisible substances of the generalized N-world layers exist in the reality. In order to distinguish between these invisible substances and the physical

ones, let's denote them as metaphysical realities. It should be noted that the gravitational, electric and magnetic fields in physics are also the examples of invisible substances. The cognition of the N-world can be realized at the level of the metaphysical reality (MR). Meanwhile physics and its research methods remain the basic type of the N-world cognition. The metaphysical level of the N-world cognition covers the problems which are "beyond physics", "after physics" and "above physics".

The results of our understanding of various aspects of the physical picture of the N-world at the metaphysical reality level are presented in [2, 3, 4].

References

1. Physics Encyclopedia, five-volume edition, Moscow, the 1990s.
2. V. Nurmukhametov. Notes on metaphysics of the Inorganic world, Kazan, 2010 (248 p.), www.nurvasil.narod2.ru.
3. V. K. Nurmukhametov. Gravitational, electrostatic and magnetic interactions: interpretation at the metaphysical reality level. www.nurvasil.narod2.ru
4. V. K. Nurmukhametov. Photon: physical aspects and interpretation at the metaphysical reality level. www.nurvasil.narod2.ru.