

PHILOSOPHICAL COMPREHENSION OF NATURAL-SCIENCE UNDERSTANDING OF THE MATTER AND ITS TYPES (FORMS)

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Being guided by the achievements of natural science, the matter (in the sense of all material world as all nature or all natural world) can be defined as an objective reality, which is in contrast to the subjective reality, first, exists by itself, naturally, regardless of cognizing subject (irrespective of whether is the subject, which capable to cognize the matter, or he not exist, and if he exist, regardless of whether known to him something about the matter or unknown), and, secondly, is capable directly or indirectly psychically be reflected (on based sensitivity) and may thus be subjectively cognizable. This definition of the matter has a universal value as for the natural science, so for the philosophy, because it encompasses:

1) all *the objectively existing* material objects (as already reflected psychically and known, so and another psychically not reflected and known);

2) as those material objects, which are reflected psychically *directly* and accordingly are known by man or animal, so and those which are reflected psychically and accordingly are known by man *indirectly* through specially created devices that convert impacts to feelings, and in addition those material objects, that can be opened in the future due to their impact on the devices (as converters effects) specially created for this purpose.

It turns out that the matter as an objective reality is primary, and all the things that does not belong to the matter – is secondary to it, because something not material is generated in the process of psychically reflected, is a subjective reality, a derivative of the matter as an objective reality.

It should be clear, that the matter is a substantialnost in relation to everything that is in the world the tangible and intangible. Substantialnost of the matter is understood in the sense that the matter is a universal basis, a substantiality or a substrate for all that is in the world, but not the space, not the energy or any another property of the matter, and certainly not the spirit or something intangible (unnatural or supernatural, including mysterious). This substantialnost of the matter manifests itself in any place of its spatial extension, at all levels of its organization, at any moment of its existence. Assumption of another substantialnost except the matter is in contradiction with natural science knowledge.

It is believed that the matter can appear in different types (forms). Building on the achievements of natural science (addressing, at first, to the standard model of elementary particle physics), can be distinguished two types (forms) of the matter:

quantum fields and substance (in the sense of stuff or material). And to the principal type (form) of the matter should be referred quantum fields, because substance – a derivative of quantum fields. Quantum fields describes all the matter, including substance.

The quantum field – has no rest mass, continuous with indistinct borders and fully permeable types (form) of the matter. To visualize the quantum field you can imagine a sort of continuous environment having spatial extent in all directions at once.

Among the quantum fields a relatively small amount of the free fundamental fields is allocated. Free fundamental fields are include fermionic (spinor) and boson (calibration). Fermionic fundamental fields are the physical basis of the description of the substance. Bosonic fundamental fields are involved in the fundamental interactions of substance objects (first of all, the gravitational field, secondly, the electroweak field, which is divided into the electromagnetic field and the field of the weak interaction, and the gluon field), as well as in the formation of mass (the Higgs field). Gravitational and electromagnetic fields extend to any distance, and other bosonic fields – for short distances, typical for microworld. The normal state of free fundamental fields in the absence of substance is also called the physical vacuum.

Substance – is a type (form) of the matter having a rest mass. The rest mass may characterize substance quantitatively. Substance is discrete, it is divided into separate bodies (with or without properties of living or social) with clearly discernible boundaries. Any body consists of particles. And bodies, and particle of substance poorly permeable.

References

1. Цюпка В.П. О понимании материи, вечности ее бытия, а также единства ее прерывности и непрерывности в современном естествознании // Научный электронный архив Российской Академии Естествознания: <http://econf.rae.ru/article/7488>. Reference date: February 25, 2013.