

On the Necessity of Aprioristic Thinking in Physics

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The thinking which encompasses both reasoning-in-itself and reasoning-for-itself, called “aprioristic thinking” by Hegel, is the freest form of thinking. This form of thinking is imparted to the physical sciences by philosophy. Only under this condition can physics obtain deeper scientific knowledge.

In the beginning of the last century, the renowned scientist Anri Bergson [1] gave an advanced notice: “We experience now one of the greatest crises; all our thinking, all ethics, all life, all our spiritual and moral existence are in a condition of intellectual fermentation...”. This fermentation, according to the opinion of the known philosopher Edmund Husserl [2], occurs due to installation dominant in positivistic and naturalistic philosophy. This installation of ordinary consciousness contrasts the human consciousness and being to each other, and, therefore, not taking into account consciousness, can lead to more crisis the European sciences. As pointed out by Husserl, the sciences about the nature can be founded only by means of phenomenology, as a strict philosophy, which is oriented towards a first-hand experience of consciousness. Though many years have already passed since then, as these scientists have written, resolute turn in this question is not yet present. Even, in spite of the fact that in one of the achievements of modern physics — in quantum physics — the consciousness of the observer has found a place for itself. In the interpretation of quantum mechanics, the most important upshot of this for physicists is that this problem is related to the problem of consciousness — an interdisciplinary problem concerning not only physicists, but also philosophers, psychologists, physiologists and biologists. Its solution will result in deeper scientific knowledge. But all the same, for some reason, scientists very often in case of scientific cognition neglect questions of the interaction between our consciousness and the surrounding world. If we wish to reach fuller scientific knowledge, we should not deal with physical phenomena and thinking (consciousness) itself separately. The well-known physicist Wigner [3] maintains that the separation between our perception and the laws of nature is no more than simplification. And though we are convinced that it has a harmless character, to nevertheless merely forget about it should not be the case. It is clear that deeper scientific knowledge should include in itself a problem of the theory of cognition — a problem of the origin of knowledge and a logical substantiation of the relevant system of knowledge.

In deciding upon this problem, the cognition theory considers the connection between “I”, my consciousness and an external world, and says that the decision is concealed in the interaction between sensuality and reason. Reason transforms our feelings into thoughts and it means that the representa-

tions are replaced with concepts. If science does not wish to be, as it was described by Hegel [4], a simple unit of data then, of course, it should have concepts and should operate with them. But, if science also does not wish to be positivistic (all sciences, except philosophy, are positivistic) then it should have a rational basis and beginning. Only in this case, does the sole purpose (affair) of science become the concept of the concept. (Hegel has distinguished between the sciences as follows: 1) sciences, as a simple unit of data, 2) the extremely positive sciences, 3) positive sciences, 4) philosophy. Positivism of a physical science is that it does not know that its definitions are final).

Physics, certainly, has a rational basis which is intimately connected with philosophy too. But what prevents a physical science from becoming a “mere” philosophy? Hegel has elaborated on the notion of a positivistic side of the sciences. In physics, this positivism is characterized by the lack of knowledge that its definitions are final and therefore there is no transition into the higher sphere. This finiteness is connected with the finiteness of the cognition (feeling, belief, authority of others, and authority of external and internal contemplation).

However, it is perhaps meant so to happen, as described by Hegel, that thoughtful contemplation, lowering casual conditions and organizing everything, will present the general outline before a detailed intellectual exposition. It is clear then that an intellectual physical science will picture a rational science of Nature in the form of an image which is the external image of Nature. This image is called a physical picture of the world, or, as called by Max Planck [5], the world of a physical science. Planck has explained further about it: “... We are compelled to recognize behind the sensual world the second, real world which leads independent existence independent of the person, — the world which we not can comprehend directly, but we comprehend via the sensual world, via known symbols which he informs us, as if we would consider a interesting subject only through the glasses, optical properties of which are absolutely unknown for us”.

Thus, according to Planck, there are three worlds: the real world, the sensual world and the world of a physical science or a physical picture of the world. The real world is the world outside us, it exists irrespective of our understanding of its laws, i.e. irrespective of our consciousness and therefore it is the objective world. The sensual world is our world because

we perceive it through our bodies of perception: eyes, hearing, charm etc., and it is subjective (it is possible to tell that it is illusion). A physical picture of the world is the world in which can be reflected both real and the sensual world. This world is a bridge for us with which help we study the world around. Reflection of the real world in the world of a physical science is a physical picture of the real world; it is also possible to describe the quantum world and the science studying this world is the quantum physics. The reason why the real world is the quantum world is because the so-called world of atoms and electrons, as Planck has given above, exists independently of the person. Reflection of the sensual world in a physical picture of the world is a physical picture of the sensual world (the classical world) and the corresponding science is the classical physics. Thus, only in case of the thoughtful contemplation can the physics can be concerned with the philosophy of nature.

But when will it be possible to tell, whether the physical science is not simply concerned with philosophy, and even enters into it, to a certain extent it? Based on a well-known classification of all sciences by Hegel, the nature philosophy is a science about an idea in another-being. Hegel has thus said: “what is real, is reasonable”, referring to understanding in the context of the reality of a reasonable idea. Such a reality is the maintenance of Hegel’s philosophy. Hegel writes that phenomena, being unstable (random) and existing in continuous fluidity, are in contrast to the idea and do not enter into it. Therefore Hegel takes the idea as the maintenance of his philosophy. In the ancient time, Plato too spoke about ideas [2]. He wrote: “In a horse, in the house or in the fine woman there is nothing real. The reality is concluded as a universal type (idea) of a horse, the house, the fine woman” [6]. Plato confirms the continuous fluidity of all existing forms and asks the question: can the philosophy be within continuous and chaotic fluidity? As a result, the human knowledge is possible only under the condition of the existence of steady ideas, and with the help of it, is possible to distinguish between things based on fluid validity and to plan in it any logical order. Hegel understands that an idea will be steady, if it will be the reality of a “reasonable”. After all, only reason is steady, absolute. But this is not only because it is so ingenious to define ideas in the way Hegel did it. In “Metaphysics”, Aristotle, criticizing Plato, asserts that the idea of a thing explains nothing in the thing itself, even provided that the idea relates to the thing, as found for example, in the fact that whiteness concerns a white subject. Aristotle did not actually deny the independent existence of ideas, but attributed to them the existence within things themselves. Namely, Hegel’s idea — the reality of the “reasonable” — satisfies Aristotle’s requirement. Because, in such determination, the idea is taken from the reality itself. But against Hegel’s reality the mind at once acts. The mind says to us that ideas are no existing chimeras. If science does not want to conceptualize its concept then it, of course, will agree with the mind. Then, very figuratively, it

is described by Hegel as follows: just as meal process is ungrateful to the meal (simply eats it, not giving instead of anything), similarly, thinking process will be ungrateful to a posteriori experience, and will simply give nothing in exchange. In order to receive something from thinking process, it is necessary to make the thinking itself by the subject of thinking. Reflection transforms our representations into concepts. And further reflections of concepts transform concepts into concepts, i.e. it becomes clear as a concept. Only under such conditions can the science understand its concept. However, only in philosophy do we find that the subject of thinking is the thinking itself (for example, for the mathematician, it is numbers, spaces etc.). The thinking, opposing with itself to itself, is the reasoning-for-itself. Process thinking nevertheless is inside and consequently it is the reasoning-in-itself. As a result, the “in itself” and “for itself” reasoning is the most substantial form of free thinking and it is defined by Hegel, as aprioristic thinking. Only by aprioristic thinking can the generality and authenticity be found. Namely, in this thinking, philosophy informs the maintenance of empirical sciences. The obligation of the sciences is not to refuse this process, because it is a very noble act for a science to reach the concept of the concept. But the mind, objecting again, speaks to us: “But what it can give to the physics? ”. At all times, there have been physicists who, knowing about the finiteness of the knowledge of their science, have spoken about deeper scientific knowledge [8–15]. They envision when it will be possible to speak about the physicist and about the consciousness of the observer simultaneously.

Hegel has very interestingly written: “In the physicist we too get acquainted with the general, with essence, the only distinction between physics and the philosophy of nature is that the philosophy of nature leads up us to the comprehension of the true forms of the concept of natural things”. But doesn’t it mean that in deeper scientific cognition the physical science has transited into a higher circle which is not present in physics because of its positivism? And the answer to this question is, of course, yes, it does. Thus, only under the condition of deeper scientific knowledge can we claim that the physical science is the philosophy of nature (in the sense that, for example, the apple is a fruit).

Hegel defines the philosophy of nature, as a science about an idea in its another being. As he writes, in philosophy we do not learn anything else, except ideas, but the ideas exist here as exterior forms. An exterior form of an idea is its another being. Because the being of an idea (reasoning-in-itself and reasoning-for-itself) takes place in the reason itself. Nature receives its exterior, that exterior which we see, in the exterior process of an idea. In fact, Hegel’s slogan “what is reasonable, is real” is confirmed.

Unwittingly, we could as well resolve one more problem. The maintenance of philosophy, as Hegel writes, is an idea which excludes from itself, the phenomenon, chance. But the maintenance of physics is Nature, its phenomena. At the

same time we may ask, “when can the physical science become the philosophy of nature?” All becomes clear when we agree with Hegel, that Nature is connected with an idea, in the sense that it is an idea in its another being. The laws of Nature, discovered by our thinking about physics, are also ideas – reasonables of reality.

Thus, as in the past, philosophy will continue to play an important role related to the necessity for the sciences to enter a higher level. Only in this case can the sciences avoid the crisis about which Husserl has always warned us. As Bergson continues that which has been said in the beginning of this article: “... The new system, more general, wider should become the doctrine for many decades and even centuries. These new principles should direct all our life on a new way on which the mankind will approach to cognition of true and to happiness increase at the Earth”.

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