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Postnonclassic epistemology and poststructuralism

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ABSTRACT

There is a significant difference between the classic, non-classic and post-non-classic epistemology. Briefly this difference can be formulated as follows: classic epistemology- there is place the unambiguous determinism of the content of scientific knowledge by the properties of cognizable objects; nonclassic epistemology – there is place only the probabilistic determinism of the content of scientific knowledge by the content of cognizable objects; postnonclassic epistemology – there is place the creative constructivism of researchers in relation to cognizable objects, the result of which is the pluralism of scientific hypotheses, models and theories in relation to the same objects. The article provides a rational reconstruction of the conceptual core of post-non-classic epistemology against the background of its comparison with the principles of classic and nonclassic epistemology. The result of this reconstruction is the proposed in the article understanding of the core of postnonclassic epistemology as a set of principles **"5 c":** 1) **constructivism** of scientific cognition, 2) **contextuality** of science knowledge (its conventional and metaphoristical character), 3) **cultural** and social conditionality of the dynamics science knowledge, 4) **communicative** nature of the process of scientific cognition, 5) **consensual** nature of scientific truths (their social expert nature). To according the poststructuralism all of the principles based on a general laws functioning language.

1. Introduction

stical Theosophy andThe subsequent development of Persian literature from the sixth century onwards, starting Sanai Ghaznavi can sing songs of my
The history of world science for 30 centuries of its existence has passed in the course of its evolution six qualitatively different stages or States: ancient Oriental science, ancient science, medieval European science, classic science, non-classic science and post-non-classic science. The development of modern science associated with the Renaissance and the modern period (16th-17th centuries). Its first stage was called classical science. It lasted more than three hundred years (17-19 centuries). The main difference between the classic new European science from all previous stages of development of world science was a new technology of scientific knowledge, which includes two mandatory conditions of knowledge in science of any objects: 1) their experimental study at the empirical level of knowledge and 2) mathematic description of their laws at the theoretical level. However, in the late 19th - early 20th century as a result of global revolutions in two main areas of science: mathematics (creation of non-Euclidean geometries) and physics (creation of the theory of relativity and quantum mechanics), classical science was replaced by non-classical science with a new ontology (new scientific picture of the world) and a new epistemology (new theory of scientific knowledge). The development of the non-classical stage of science lasted for almost the entire 20th century. However, gradually in the depths of non-classical science formed a new type of science – postnonclassic science, with ontology and epistemology qualitatively different not only from classical science, but also non-classical. Their ontological difference consisted, first of all, in the type of cognizable objects. If for classical science the predominant type of objects were macro-objects, and for non-classical – micro-objects, for post-non-classical – super-complex natural and social systems (from human to artificial intelligence, and from the technosphere to the biosphere and ecosphere). There was also a significant difference between classical, non-classical and post-non-classical science and epistemology, in understanding the nature of scientific knowledge, the methodology of scientific knowledge and the laws of the dynamics of science. The main difference between classical, non-classical and post-non-classical epistemology can be formulated in this way. Classic epistemology: the unequivocal determinism of the scientific content knowledge of the properties of knowable objects. Non-classical epistemology is a probabilistic determinism of the content of scientific knowledge by the

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content of cognizable objects. Postnonclassic epistemology is the creative constructivism of researchers in the process of creating models of objects, which resulted in the inevitable pluralism of scientific hypotheses and theories in the knowledge of the same objects.

2. Conceptual core of classic and non-classic epistemology

Within the framework of epistemology of classic science, two alternative concepts of the nature of scientific knowledge were proposed. This is empiricism (F. Bacon, I. Newton, J. H. Lock, Auguste Comte, John. St. Mill, E. Mach, etc.), and rationalism (R. Descartes, G. Galileo, G. Leibniz, I. Kant, G. Hegel, etc.). Supporters of empiricism (positivism) believed that the basis, source and criterion of the truth of scientific knowledge should be only experience, only the data of observation and experiment (bacon, Comte, mill, Jevons, Mach, etc.). Representatives of rationalism proceeded from the fact that the basis and source of true scientific knowledge, especially scientific theories, can and should be only thinking. The latter has as its task not only the description of theoretical reality, but also its critical analysis with the help of such powerful cognitive means as methodical doubt, intuition (a means of establishing the truth of the initial provisions of scientific theories), and logic as the only reliable means of unfolding the true content of scientific knowledge (Descartes, Leibniz, Kant, Hegel, etc.) (Lebedev,2014). However, neither the empirical nor the rationalistic paradigm of classical epistemology has withstood the test of the real history of science. And the main such test was the global scientific revolutions that took place in all areas of science in the late 19th - early 20th century. The main events of the global scientific revolution in mathematics was, first, the creation noneuclid geometries of Lobachevsky, Boyai and Riemann, which contradicted many provisions of the former Euclidean geometry, which existed almost unchanged for about 2000 years, and, secondly, the detection of logical contradictions in set theory, which became the basis of all classical mathematics by the end of the 19th century. These facts clearly did not correspond to both empirical and a priori interpretation of the nature of mathematical knowledge. The markers of no less global nature of the revolution in natural science were, firstly, the creation of non-classical theories in the Foundation of physical science theories (construction of the theory of relativity and quantum mechanics), and, secondly, the creation of new fundamental theories in biology and chemistry, alternative to their classical theories (genetics, molecular biology, structural chemistry, etc.). In the late 19th – early 20th century, an equally large-scale scientific revolution took place in the development of social and human Sciences (creation of alternative classical theories in Economics – Keynesian Economics, sociology – specific empirical study of various social structures and the laws of their functioning, psychology - behaviorism, theory of the unconscious , engineering psychology, socio-cultural determination of the psyche, linguistics – historical linguistics and structural linguistics, logic – mathematical logic and other Sciences) . It was a challenge not only to the classical ontology of science, thanks to the justification of alternative classical science ideas about the properties and laws of various objects, but also the classical epistemology, the basic idea of which was the belief in the ability of scientific knowledge to obtain through its methods absolutely - true and absolutely - objective knowledge about the world. By the very fact of their existence, the global scientific revolutions, so to speak, empirically proved the falsity of such epistemological faith. There was an urgent need to create a new epistemology, on the basis of the principles of which it would be possible, firstly, to explain not only the possibility but also the inevitability of scientific revolutions as a quite natural phenomenon in the development of science and scientific knowledge. And, secondly,- to abandon the clearly contrary to real science ideal of classical epistemology about the possibility (and practical necessity) of achieving in science absolutely true, absolutely proven and absolutely objective knowledge.

Nonclassic epistemology replaced classical epistemology in the 20th century. It is based on the following principles, largely alternative to the core of classical epistemology : 1)the recognition of the hypothesis as not only the main form of development of scientific knowledge, but also its existence; 2) the recognition that experience, as well as the method based on induction, in principle, is not able to be methods of proving the truth of scientific laws and theories; 3)the recognition of probabilistic scientific knowledge in science as legitimate as the necessary and universal knowledge; 4) the denial of the existence of a universal method of knowledge in science and the recognition of methodological pluralism in science as a completely natural state (recognition of the legitimacy in science of a variety of means of knowledge depending on the content of the object under study, types and levels of knowledge, the purposes of knowledge) . Categorical markers of non-classical epistemology are such new categories as scientific pluralism, relative truth, openness of knowledge to changes, scientific revolutions, potential falsifiability and real refutability of scientific knowledge, competition of scientific theories and research programs, non-cumulative nature of scientific knowledge development, multicomponent nature of evaluation and criteria of truth of various units of scientific knowledge (Klein, 1984; Lebedev, 2009). The main contribution to the development of non - classical epistemology was made, first of all, by scientists themselves-leaders of non-classical science (Lobachevsky, Riemann, Hilbert, Poincaré, Einstein, Bohr, Heisenberg , etc.), and, secondly, by representatives of a number of new philosophical epistemological concepts, such as pragmatism, instrumentalism, logical positivism (Russell, Carnap, Nagel, Reichenbach, etc.) and post-positivism (Popper, Lakatos, Polani, Tulmin et al.) (Lebedev, 2018; Stepin, 2006).

3. Conceptual core of postnonclassic epistemology

By the end of the 20th century epistemology of non-classical science was replaced by an alternative paradigm – post-non-classical epistemology. The new paradigm better corresponded to the latest stage of development of science, its goals, objectives and opportunities. This stage has received in contemporary philosophy of science called "post-non-classical science". Its main ontological difference from classical and non-classical science was that post-non-classical science radically changed the type of its subject orientation. In post-non-classical science, priority is given to the study of complex socio-natural, biosocial, technical and human information systems rather than purely natural or social systems. The research of structure and regularities of such super complex objects of reality as for example biosphere, hydrosphere, atmosphere, geographical environment, space, man as biosocial system, his brain, artificial intelligence, robots, computers, medicine came to the fore, geopolitics, environmental problems, technosphere, culture, highly complex physical, chemical and information systems with nonlinear dynamics, etc. it Turned out that all of these types of objects and systems require for their research a fundamentally new, namely , interdisciplinary research methodology (V. S. Stepin)(Stepin, 2006). But this type of methodology is possible only

within the framework of a new epistemology, a new philosophy of scientific cognition, the conceptual core of which should be based on qualitatively different principles, in comparison with both classical and non-classical epistemology.

The contribution in the content postnonclassic epistemology was made by the representatives of the following modern concepts of the structure and dynamics of scientific cognition and knowledge: 1) sociology of scientific knowledge (Malka, Gilbert and others) (Malkay, 1983; Lebedev, 2018; 2) the theory of scientific communication (Latour, etc.) (Latour,2002, 2014) ; 3) a pluralistic methodology of scientific knowledge (Feyerabend, etc.) (Feyerabend, 1986); 4) paradigmatic theory of dynamics of scientific knowledge (Kuhn and others) (Kuhn, 1975); 5) radical constructivism (by the name of Maturana, Watzlawick, Glaserfeld, etc.) (Tsokolov, 2000); 6) poststructuralism and postmodernism (Foucault, Liotard, Deleuze, Baudrillard) (Baudrillard, 2017; Ilyin, 1986) . The axioms of postnonclassic epistemology are the following principles:

1. Structural pluralism of scientific knowledge. The system of scientific knowledge is a super complex pluralistic system consisting of qualitatively different areas, levels, types and units of scientific knowledge, different not only in content, but also in logical form and functions performed in an integrated system of scientific knowledge (Lebedev, 2016).

2. Pluralism of methods of scientific knowledge. Different areas of science, individual Sciences, different levels of scientific knowledge in each of the disciplines, different types of scientific knowledge differ significantly not only in content but also in the methods of its receipt and justification (Lebedev, 2018).

3. Pluralism of scientific truths. The system of scientific knowledge in General and any individual science consists of qualitatively different types of scientific truths, including the opposite in content (alternative concepts, theories and research programs) (Lebedev, 2017).

4. The plurality of criteria of validity of scientific knowledge. In science is not there universal of the criterion of truth. For qualitatively different knowledge either in content, or in form, or in functions of units of knowledge, there are special criteria of truth. As a rule, all truth criteria are multicomponent and include a consensual component or the consent of the scientific community (Lebedev, 2018).

5. Any truth in science has the subject-object nature (Tsokolov, 2000).

6. The process of scientific knowledge, the activities of scientists for the production and justification of knowledge has a social character (Latour,2002, 2014; Lebedev, 2018];.

7. The main subject of scientific knowledge is such a social system as a disciplinary scientific community (Gilbert& Malkay, 1987; 9; Lebedev, 2015).

8. The communication component of the process of scientific knowledge is no less important than the subject-object interaction of scientists with cognizable objects. And the latter type of relationship is always mediated by communication links between members of the scientific community. Effective scientific management (effective management of scientific research and development) is one of the important factors in the productivity of scientific research and the dynamics of scientific knowledge (Lebedev, 2012).

9. A scientific revolutions are a natural and necessary stage in the development of scientific knowledge. In General, the development of scientific knowledge is non-cumulative (Kuhn, 1975; Lebedev, 2013).

10. The successive new fundamental theories not only deny each other, but are only partially commensurate with each other. Therefore, there is no purely rational criterion of preference for one of them. The choice between them is based on the cognitive will of the scientific community and scientific consensus (Lebedev, 2018).

11. Despite the creative nature of scientific knowledge at all its levels, as well as the fundamental pluralism of the structure, methods and criteria of the truth of scientific knowledge, the system of scientific knowledge and knowledge as a whole is internally interconnected, where some elements affect others. Therefore, the slogan of the anarchist concept of the post-non-classical methodology of science "Everything will come down" (P. Feyerabend), asserting the value of the absolute freedom of cognitive activity in science contradicts real cognitive practice, abstracting from the social and systemic nature of scientific knowledge (Feyerabend, 1986).

12. On the other hand, such a concept of post-non-classical methodology of science as structuralism is equally incorrect, the representatives of which absolutize the relationship of various elements of scientific knowledge and, as a consequence, the contextual nature of scientific knowledge and the subjective nature of scientific truths. The interrelation of various elements of scientific knowledge among themselves does not cancel the fact of their discreteness, relative independence and dependence of their content on the content of cognizable object (Ilyin, 1986).

13. Each of the different concepts of the post-non-classical methodology of science has in its content a certain rational grain. The synthesis of these rational grains is a necessary condition for the creation of a sufficiently complete and adequate to modern science postnonclassical methodology 9 Latour, 2014).

14. The all dichotomies of the methodology of science(theoretical-empirical , axioms - theorems, a priori - a posteriori , analytical-synthetic , natural-scientific – social , intuitive-discourse , explicit-implicit , text-context, probable-reliable , conditional - unconditional, etc.) have a strict distinction only within the framework of methodological theory. However, when applied to real scientific knowledge, they are all relative (Lebedev, 2016).

4. The conclusion

the core of post-non-classical epistemology can be described as **"epistemology 5 C**": 1) **constructiveness** of scientific knowledge and knowledge (scientific knowledge is a special kind of artifact reality created by scientists) , 2) **contextuality** of scientific knowledge (any unit of scientific knowledge is always an element or part of a broader system of knowledge – its context, which is never fully defined), 3) **culturology** of scientific and cognitive activity (real science and its results are always part of a certain type of culture and depend on it), 4) **communication** of scientific knowledge (communication between scientists - the most important component of the process of scientific knowledge, affecting both the production of scientific knowledge and the evaluation of the results), 5) **consensual** scientific truths (the decision on the truth of a particular unit of scientific knowledge is always consensual and expert in nature, being the prerogative of the disciplinary scientific community as the main subject of scientific activity). The essence of

post-non-classical epistemology is the idea of scientific knowledge as a highly complex, pluralistic, developing and social system. This nature of scientific knowledge is determinate the general laws of functioning science language as discourse.

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