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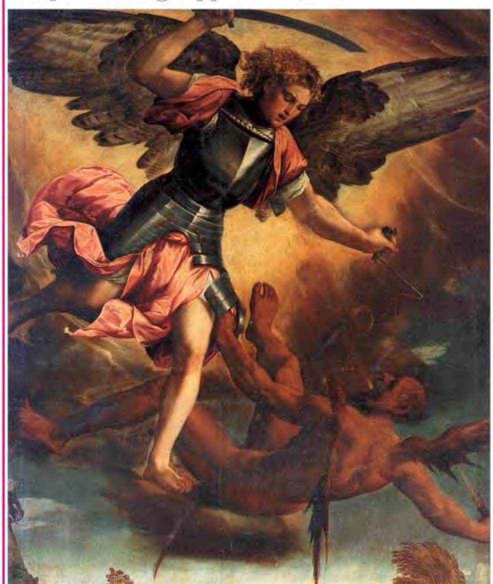

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Postpositivism: Extending the Field of Scientific Rationality

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Abstrac

Problematization of development of scientific knowledge was the turning point in the positivist philosophy and has led to the formation of a relatively independent area of philosophical studies connected with the development of postpositivist scientific concepts. Nowadays hardly anyone is content with the idea of absolute knowledge, forever remaining in the once achieved state of rest. Understanding the dynamics of knowledge can influence the interpretation of the nature of science. Leading representatives of postpositivism, including Karl Popper, Imre Lakatos, Thomas Kuhn, and Paul Feyerabend focused on the topic of development in science. Different priorities of their studies (from a focus on various practices of scientific research to comprehensive analysis of social and historical determinants of scientific cognition) did not undermine the common conclusion that purely methodological description of scientific activity is inadequate, and thus, the need to support it with sociological, psychological and culturological descriptions is recognized. The usage of comparativistics methods to describe a number of the main postpositivist scientific concepts also allows researchers to identify an additional criterion for their definition and differentiation. If we rely upon the interpretation of rationality as compliance with certain fixed rules and principles, then the model of science developed by Popper and Lakatos will be considered rational as opposed to other views, such as Feyerabend's theory, every detail of which contradicts this requirement. However, a more extended interpretation of scientific rationality as "reasonability" allows evaluating not only Popper's theory but also Kuhn's and even Feyerabend's models as rational, i.e. pursuing a particular goal. Therefore, the criterion for definition and differentiation of scientific concepts from the perspective of

their subjective centrality is effective.

Keywords: science, philosophy of science, development of science, postpositivism, subject of science, scientific rationality.

Postpositivismo: Extendiendo el campo de la racionalidad científica

Resumen

La problematización del desarrollo del conocimiento científico fue el punto de inflexión en la filosofía positivista y ha llevado a la formación de un área relativamente independiente de estudios filosóficos relacionados con el desarrollo de conceptos científicos pospositivistas. Hoy en día casi nadie se contenta con la idea del conocimiento absoluto, permaneciendo para siempre en el estado de descanso que una vez se logró. Comprender la dinámica del conocimiento puede influir en la interpretación de la naturaleza de la ciencia. Los principales representantes del postpositivismo, incluidos Karl Popper, Imre Lakatos, Thomas Kuhn y Paul Feyerabend, se centraron en el tema del desarrollo de la ciencia. Las diferentes prioridades de sus estudios (desde un enfoque en diversas prácticas de investigación científica hasta el análisis integral de los determinantes sociales e históricos de la cognición científica) no minaron la conclusión común de que la descripción puramente metodológica de la actividad científica es inadecuada y, por lo tanto, la necesidad de apoyar Se reconoce con descripciones sociológicas, psicológicas y culturológicas. El uso de métodos comparativos para describir varios de los principales conceptos científicos pospositivistas también permite a los investigadores identificar un criterio adicional para su definición y diferenciación. Si confiamos en la interpretación de la racionalidad como el cumplimiento de ciertas reglas y principios fijos, entonces el modelo de ciencia desarrollado por

Popper y Lakatos se considerará racional en lugar de otros puntos de vista, como la teoría de Feyerabend, cada detalle que contradice este requisito. Sin embargo, una interpretación más extendida de la racionalidad científica como "razonabilidad" permite evaluar no solo la teoría de Popper sino también los modelos de Kuhn e incluso Feyerabend como racionales, es decir, perseguir un objetivo particular. Por lo tanto, el criterio para la definición y diferenciación de conceptos científicos desde la perspectiva de su centralidad subjetiva es efectivo.

Palabras clave: ciencia, filosofía de la ciencia, desarrollo de la ciencia, postpositivismo, sujeto de la ciencia, racionalidad científica.

Introduction

Nowadays science is often criticized for its allegedly impersonal character, logocentrism and wish to dissociate itself from all other areas of culture in the hope of preserving its autonomy. In connection with this attitude, the influence of other approaches to cognition based on anthropological and sociocultural aspects has dramatically risen. Within the context of the philosophical tradition of existential anthropology, the fact that science tends to seek the objective truth about the external world in isolation from the internal world of a person is evaluated in a negative way. The truth of the personal existence of a person, or the so-called existential truth, is considered more valuable than the truth as knowledge about an object.

Therefore, it is even more interesting to study the works by researchers of science who follow the rationalistic line in its interpretation, but at the same time take into account the significant role of sociocultural background. This refers to postpositivist philosophy of science represented by such established scientists as Popper, Kuhn, Lakatos, and Feyerabend. It is a known fact that while all these philosophers recognized the possibility of constructive participation of philosophy and other components of the cultural context in the cognitive process to the same extent, they had different views as to how definitive should such participation be in relation to the structure of scientific cognition. In other words, a division of postpositivist philosophers of science into two confronting directions based on the attitude to this issue is largely determined by differences between their ideas of the character of rationality criteria existing in science. Representatives of one of these directions equal rationality standards with logico-methodological criteria, and therefore, claim that rational reconstruction of the development of scientific knowledge is possible, but it should be performed only based on cognitive factors pertaining to science itself (K. Popper, I.

Lakatos). Supporters of the other direction, having encountered difficulties with formulating logico-methodological criteria of rationality, believe that using social factors to explain the process of development of scientific knowledge is inevitable. An extreme manifestation of this view is Paul Feyerabend's theory, according to which scientific knowledge by its epistemic status is in fact no different from such forms of intellectual activity as myth and religion.

Analysis of some main theories will allow us to identify stable invariant characteristics typical of each of the above-mentioned approaches.

In spite of the legitimate existence of narrow-specialized fields of study researched in connection with scientific cognition, science needs a most general philosophical reflection on its fundamentals. Philosophy of science is meant to reflect leading tendencies in the development of philosophical thought and interpret them from the perspective of its main subject matter. As Prof. Yury Petrov pointed out, "Philosophy which is genuine for the corresponding period of science development can be considered the philosophy of science. There were times when positivism or Soviet official philosophy were genuine, and now it refers to modern scientific foundations of natural sciences and humanities" (Petrov, 1995).

To paraphrase Hegel, it would be entirely logical to identify the philosophy of science as the essence of philosophical thought existing in the same historical period.

In the modern era, there has been a stable trend towards humanization and humanitarization of scientific knowledge, which means that axiological, sociological and culturological problematics penetrates into different areas, including the sphere of natural science, which has traditionally been considered to be beyond the reach of any "external" influence. In the context of the great interest, science takes in its own history; present-day philosophy of science turns out to be historically colored as well. Therefore, it can be identified as an interpretation of foundations underlying scientific cognition within a general sociocultural framework from the perspective of their historical development.

Typology of views on the nature of the philosophy of science suggests differentiation of its orientation, for example, methodologically oriented (K. Popper, I. Lakatos) and historically oriented (T. Kuhn, P. Feyerabend). The priority of the first approach is an examination of various practices of scientific research, such as justification, idealization and falsification, while the second approach focuses mainly on the social and historical determination of scientific cognition. However, the common conclusion is an acknowledgement of the inadequacy of a purely methodological description of the scientific activity and the necessity to support such description with sociological, psychological and culturological elements.

In terms of philosophy, the second half of the 20th century is marked with a

discussion of a new extended concept of scientific rationality, escalating competition between different explanatory models of scientific knowledge development, and attempts to reconstruct the logic of scientific search. A deliberate aspiration for historicization of science appears along with the requirement for the philosophy of science to be correlated with its history. It should be noted that in the attempt to answer the question if historians use methods developed by the philosophy of science and how methodologists benefit from the philosophy of science, a kind of "forward movement" from the opposite direction has been observed. Thus, Kuhn started dealing with methodology, as a result, his work in the history of science, while Lakatos realized the importance of history for the philosophy of science and developed Popper's methodological ideas. As a Russian philosopher of science Alexander Nikiforov shrewdly remarked, "Represented by Kuhn and Lakatos, history and philosophy of science extended friendly hands towards each other" (Nikiforov, 2001).

Therefore, the aim of this research is to analyze historical and logical approaches to the reconstruction of science development suggested by the leading Western philosophers and methodologists of the second half and the end of the 20th century. This task, in its turn, actualizes the original problematics of the philosophy of science, i.e. analysis of worldview, methodological and social determinants of growth and development of scientific cognition.

2. From Karl Popper's falsificationism to Imre Lakatos's "sophisticated falsificationism"

It is held that Karl Popper started his scientific activity within the main ideas of logical positivism or neopositivism. However, later he departed from the foundations of positivist theory and brought the issue of growth of knowledge to the fore. In his book "The Logic of Scientific Discovery" published in London in 1959, Popper argues that epistemology should not confine itself to developing language models of existing (entrenched) knowledge, which was typical of neopositivist doctrine. "The issue of growth of knowledge has always been and still remains the central subject matter of epistemology... and the best way to study the growth of knowledge is to study the growth of scientific knowledge" (Popper, 1983).

Neopositivists declared that the main criterion of meaning was verifiability, i.e. judgments and hypotheses were considered to be meaningful only if they could be verified and proved by empirical facts. Reflecting on the potential of this criterion, Popper fairly notes that in that case, mathematical laws would have to be declared non-scientific and meaningless since they cannot often be verified in an empirical way. On the other hand, assumptions of pseudosciences, such as astrology, can be verified by any related empirical facts, thus matching the verifiability criterion

(Popper, 1961). Therefore, anything at all can be verified, but it does not testify its scientific character. What an assumption or a set of assumptions say about the real world is manifested not through their verifiability by practical experience, but rather through the fact that experience can refute them. If a system is refuted by practical experience, it means that it comes into conflict with the real situation, which in fact proves that it contains some information about the world. Popper writes, "We have realized that the problem of putting forward positive explanatory justifications, or the problem of justification, could be fully replaced by a completely different problem of explanation, putting forward critical arguments explaining why we prefer a particular theory over another one and, finally, by the problem of critical discussion of hypotheses in order to identify the one deserving preference compared to another one or others" (Popper, 1996).

Karl Popper suggests that potential refutability of a theory, its falsifiability, which has a finite character, should be considered an alternative to the verifiability criterion. According to Popper, the difference between assumptions made by genuine science and pseudoscientific assumptions is that the former allow potential falsifiability. With the help of falsifiability criterion, it is possible to identify false hypotheses and theories, but it provides no information about constructive ways of searching for truth in the context of science. The thing is that Popper does not set such an objective. He says that it is impossible to single out the truth in the scientific knowledge, but by identifying and eliminating false ideas, one can come closer to the truth (Popper, 2008). Thus, by dismissing from scientific cognition the first fundamental idea that science can provide us with the truth and actually does it, Popper finds an objective basis for his methodology in the second idea, which says that science frees us from fallacies and prejudices.

The model of scientific knowledge development suggested by Popper is the result and concentrated manifestation of his falsificationism theory. It is a known fact that falsificationism prompted Popper to acknowledge the so-called "common-sense realism", i.e. assumption that the external world exists independently of consciousness, although it cannot be directly proved or denied as a metaphysical phenomenon. This nonprovability suggests that our knowledge is not impeccable. As, for example, an American philosopher Mark Notturno points out, "Scientific cognition, as Karl Popper sees it, is an ever-mistaken, never justified and prone to frequent changes result of a continuous process of assumptions and refutations — the process which involves making hypotheses aimed at solving our problems, empirical verification of these hypotheses and their specification in light of empirical data to bring both into

correlation" (Notturno, 1995).

Therefore, according to Popper, scientific research is a problem-oriented process, i.e. "it never starts from observations or accumulating empirical data — it is rather triggered by problems: either practical or theoretical problems encountering difficulties" (Popper, 2004). Apparently, the inductive method of analysis of scientific cognition is useless from this perspective, since induction always aims for the justification of theories through observations and experiment. That is why Popper dismisses it along with the verification criterion and suggests using a trial-and-error method instead. Thus, in Popper's opinion, scientific research is conducted according to the following pattern: understanding the problem that has emerged — developing an assumptive theory or hypothesis aimed at its solution — empirical falsification of this theory (in line with the principle of fallibilism, Popper supposed that all scientific theories are invalid, and their probability to be true is equal to zero whichever strong verification they have gone through) — emergence of a new problem. Meanwhile, scientific theories which have not been refuted or falsified always remain assumptions, but they should be constructed in a way that allows refutations.

Thus, the growth of scientific knowledge implies movement towards theories that describe the world in the fullest way, the ones the content of which is richer. It may seem that consistent change of scientific theories with increasing genuine content is accompanied by accumulating genuine knowledge about the world, but it is not true. K. Popper's epistemological position is fundamentally different from the standards of cumulativism. He is sure that the aim of science is constant self-renewal rather than the accumulation of knowledge.

It is a known fact that in the course of development of his own model of scientific knowledge, Popper used Darwin's theory of evolution, or to be more precise, its neo-Darwinist variant, hence the abundance of analogies with wildlife and nature in his theory. He writes, "I must say that I came up with some of my assumptions as a result of my attempts to use my methodology and its similarity with Darwinism to cast light on Darwin's theory of evolution" (Popper, 1995).

Highlighting the universal character of the trial-and-error method, Popper says that it is typical not only of scientific cognition but of any kind of cognition in general. Moreover, the trial-and-error method is the way in which any development takes place. In the process of creation and improvement of biological species, nature uses the trial-and-error method. Each individual is a separate trial; successful trials survive, while failures are eliminated as errors. According to Popper, the world of objective knowledge demonstrates the same picture (Popper, 1972). Scientific theories constantly compete with each other, replacing one another in a kind of Darwinist struggle for survival. Theories

that have proved their relative applicability add to our existing knowledge, while the others are eliminated from scientific cognition in the course of this struggle, or competition.

Is usage of the model of biological evolution justified for reconstruction of internal mechanisms of scientific development though?

Many researchers working in the spheres of epistemology and philosophy consider such analogy quite possible. For instance, a British philosopher of science Stephen Toulmin, who developed an evolutionary model of natural science, adhered to this view. According to this model, scientific theories and concepts are selected for survival and should get adapted to the intellectual "environment" which determines the success of selection and the emergence of conceptual innovations (Toulmin, 1981).

Apparently, evolutionary models seem to have encouraged a better understanding of mechanisms behind the growth of scientific knowledge. For example, analysis of genetic mutations in the course of biological evolution could have given researchers the idea that accidental thoughts that come to scientists are also valuable for scientific cognition.

Processes involved in the growth of scientific knowledge contain something similar to "natural selection": scientists definitely prefer theories and hypotheses that are more informative and provide more heuristic opportunities. In this respect, it makes sense to speak of "survival" of the most adapted theories. Nevertheless, as a Russian philosopher, Igor Merkulov writes, "... although it is hard to deny that in an abstract sense, mechanisms of natural selection and selection of conceptual changes in science really have a lot in common... the direct analogy between biological evolution and growth of scientific knowledge appears to be a fairly nominal" (Merkulov, 1999).

The thing is that when one looks at the process of development of scientific knowledge, it is necessary to take into account the ability of people to make conscious choices, their ability to consider suggested theories critically and prefer one or another theory consciously. However, it is conscious criticism, which substantially distinguishes science from the so-called prescientific "knowledge" and conditions the evolution of scientific cognition that Karl Popper insists on in his methodological theory.

Evaluating Popper's theory in terms of correlation between philosophy of science and history of science, one can repeat the words of a German publicist Manfred Geier, who studied the works of Popper (Geier, 1994), that Popper's methodology already "turns away" from logic, but is not based on history of science yet. Having given up on the problem of justification of the genuine and reliable character of knowledge and emphasizing the hypothetical and unreliable nature of scientific assumptions as well as the risks connected with scienti

fic development, Popper aimed to draw attention to the actual process of such development. The fact that Popper replaces establishing a priori standards of scientificity with analysis of knowledge development as the main task of the philosophy of science proves how far Popper has moved away from logical positivism. Nevertheless, although Popper draws the attention of philosophers of science to the history of scientific development, he stays in the framework of methodology and builds his ideas almost exclusively on logical and philosophical assumptions.

Later Popper's theory was creatively transformed by his student, Imre Lakatos, according to his own view on the growth of knowledge. He substantiates the opinion that the key factor underlying scientific development is competition between research programs. He writes, "My approach suggests a new criterion for demarcation between "mature science" composed of research programs and "immature science" which consists in the worn-out trial-and-error samples" (Lakatos, 1995). According to Lakatos, a research program is the main unit of scientific knowledge development, which, in its turn, is represented by changeover of research programs. A scientific research program is understood as a set and succession of theories connected by continuously developing basis, common underlying ideas and principles.

A research program is determined by its positive and negative heuristics. The positive heuristic is a program indicating which problems should be studied and how further research should be conducted. The negative heuristic is the hard core of the program represented by a set of specifically scientific and ontological assumptions that remain the same in all theories comprising the scientific program. Since the rules of negative heuristic do not allow redefining the hard core of a research program, even if it faces anomalies, it is characterized by some sort of dogmatism. In its turn, it encourages a more comprehensive understanding of the benefits of a particular theory. Around the hard core a "protective belt" is formed which consists of auxiliary hypotheses that can evolutionize and adapt to anomalies. In this way, Lakatos tried to overcome the extremes of falsificationism in terms of evaluating theories.

At least two important components, which constitute advantages of Lakatos's methodology of research programs, can be identified. First, he seems to have established a more or less fixed mechanism providing relative steadiness of basic structures of scientific development that guarantee the sustainability of scientific theories, so that they cannot be destroyed at the very moment when some "inconvenient facts" emerge. Second, it opens a new interesting perspective for the history of science: by studying the hard core of a program, it is possible to establish the internal connection of science existing in a particular historical period with a system of philosophy, since a research program absor

bs some invariants from philosophical intuitions of its time through its hard core. This is becoming especially up-to-date in light of the recent trend towards studying scientific knowledge in a broad cultural context.

Evaluation of Imre Lakatos's methodological theory suggests that it is a "sophisticated", or "refined" variant of Popper's falsificationism. In terms of some aspects, Lakatos definitely sticks to Popper's methodology. He perceives the whole world of science as a gigantic scientific research program that follows the main K. Popper's rule: suggesting hypotheses, empirical contents of which are larger than that of previous ones. However, there is a significant difference between these approaches. It is well known that, according to Popper's view, detection of contradictions between theory and empirical facts leads to renouncing the theory. As for Lakatos, he believes that sufficient inventiveness allows a scientist to defend any theory for a long time even if it is false. As he sharp-wittily says, "Nature can shout, "No!", but human inventiveness can always shout even louder" (Lakatos, 1978). Lakatos thinks that there is always an opportunity to reformulate some assumptions within a theory so that empirical facts transform from refutation into confirmation or can be just ignored. After examination of anomalies, they are forgotten in the hope of turning them into examples supporting the program.

In his evaluation of Imre Lakatos's theory, a famous Canadian philosopher of science Ian Hacking says that most critical comments about it are connected with its retrospective character, i.e. with the fact that this approach provides hardly any information about further development of competing theories. According to Hacking, Lakatos's methodology appears to be confined to suggestions of modesty in terms of our hopes for our own programs. Competing programs can still have the final say (Hacking, 1981).

It should be pointed out that Lakatos, as a rationality philosopher, was unlikely to be interested in the procedures of evaluation and adoption of scientific theories, at least in the psychological and sociological aspects of this activity. He focused his efforts on understanding how the objective contents of knowledge function. Later Lakatos was blamed for striving for excess rationalization of the scientific research process and attempts to narrow it down to logic while neglecting other aspects of considering knowledge. However, in spite of these accusations — fair though they may be — it is impossible to deny the obvious advantages of this methodological theory, a substantial part of which is still used by modern philosophers of science.

3. Reflection on the role of the subject in Thomas Kuhn's philosophy of scien

ce

As opposed to the theories of scientific rationality described above, Thomas Kuhn's irrational model of scientific development is an attempt to transfer examination of knowledge from the methodological context into the sociocultural framework. According to Kuhn, analysis of the "subjective" side of scientific activity, i.e. major motives and underlying reasons that impel scientists to make certain scientific decisions, will allow getting a clear idea of the real processes taking place behind the scenes of science.

Thus, Kuhn's model of scientific knowledge is built around the main idea that science is not a system of knowledge, but rather an activity of scientific communities conditioned by special features of corresponding paradigms.

In Kuhn's understanding, a paradigm is a very particular vision of the world. In its turn, it determines the idea of how the world should be described and which tasks should be achieved through such a description. Kuhn wrote, "These [paradigms] I take to be universally recognized scientific achievements that for a time provide model problems and solutions for a community of practitioners" (Kuhn, 2003, p. 243). Therefore, a paradigm sets a kind of standard or sample of the scientific description of the world and scientific activity in general. Accordingly, the views or actions that do not meet the requirements of this paradigm are dismissed as non-scientific or even pseudoscientific. According to Kuhn, a paradigm is a factor that constitutes science. It should be noted though that Kuhn did not come to such understanding of a paradigm at the very start of his career — initially, the meaning of this term was more "sociological". For example, judging by the words of a well-known specialist in philosophy of science Hanne Andersen, who studied Kuhn's works, the term "paradigm" used to denote some common set of beliefs, values, and technical means typical of members of a certain community. It testifies that the notions of a paradigm and scientific community were not yet so clearly explicit in Kuhn's methodology (Andersen, 2001).

Kuhn's model of scientific knowledge defines the development of science as a change of fundamental paradigms, which happens because of competitive struggle among various scientific communities. Kuhn calls science, which develops within a generally recognized paradigm "normal" because he believes that this state is the most typical for it. He specifies, ""Normal science" means research firmly based upon one or more past scientific achievements, achievements that some particular scientific community acknowledges for a time as supplying the foundation for its further practice" (Kuhn, 2003, p. 67).

The stage of "normal science" is replaced by the period of paradigm disintegration, or paradigm shift, which is reflected in the term "scientific revolu

tion". Revolutionary periods, or scientific revolutions, lead to changes in the structure of science, cognitive principles, categories, methods and forms of organization. They are accompanied by different kinds of anomalies, crises in terms of explanation and substantiation of new facts, the struggle between old knowledge and a new hypothesis. Each scientific revolution changes the existing worldview and discovers new patterns that cannot be understood within previous frameworks.

Drawing attention to revolutionary periods of scientific development, Kuhn thus focuses on the differences between science before the revolution and after it, and individual features characteristic of the science of a particular historical period. Perception of science as a cumulative, continuous and progressive process is impossible within this approach. Different types of scientific knowledge acquire equal historical significance.

A German philosopher of science Paul Hoyningen-Huene notes that the Kuhnian way of historical reconstruction of scientific knowledge had largely determined the trend, which emerged in science at the end of the 20th century (Hoyningen-Huene, 1989). Philosophers and historians of science narrow their focus on separate episodes, which are individual, special, standing out from the common development pattern, unique not least because they exist in the context of social, cultural, psychological, and economic connections and relations existing in a particular place and at a particular time.

Together with the notion of scientific community Kuhn introduces a fundamentally new element into philosophy — a historical subject of scientific activity. By doing that, he goes beyond the purely immanent interpretation of scientific development as the development of ideas. While Popper's theory of the "third world" as well as Lakatos's methodology neglect the subject to a certain extent, Kuhn believes that knowledge is always determined subjectively. From his point of view, knowledge is not an ideal logical world, but the immediate thoughts of people living in a certain historical epoch and, as such, it is conditioned by their prejudices, ideas, and beliefs. Therefore, Kuhn expresses a distinct idea of social, psychological, sociological and cultural conditioning of scientific rationality criteria.

4. Specific features of Paul Feyerabend's methodology

It is well known that the image of science cultivated by Paul Feyerabend is radically different from the "conventional" approach to science. The so-called "conventional" approach follows the traditionalist idea of scientific knowledge and describes science as a relatively isolated system characterized by completeness, integrity and self-sufficiency. Such vision can be traced back to the ideal of science, which developed in the European culture in the Modern

period and implied total logization and rationalization of scientific cognition. Based on such fundamental beliefs, science appears to be an isolated entity, representing an independent area of human activity. Possessing the necessary scientific rigor and coherence of narration, it is the only sphere, which receives the exclusive right of stating the truth, the attainment of which in fact becomes a function depending on clarification of science's fundamentals.

Paul Feyerabend tried to overcome such understanding of the essence of nature and functioning of science by bringing an anarchistic element into his methodology. Extrapolating the characteristics of social and political relations onto the subject matter of epistemology, Feyerabend justifies the necessity and reasonability of such move by pointing out the specific features of scientific knowledge development. In this case, this process should not be perceived as an isolated area; rather, the context of general historical and sociocultural transformations should be taken into account, since, as Feyerabend was himself deeply convinced, it is the way things are in real life.

He writes, "History, generally, and the history of revolution, in particular, is always richer in content, more varied, more many-sided, more lively and subtle than even the best historian and the best methodologist can imagine... History is full of accidents and conjectures and curious juxtaposition of events" (Feyerabend, 1986). Unpredictable changes and twists, which, according to Kuhn, trigger scientific revolutions in the history of scientific development, require corresponding various actions and discard analysis based on rules established beforehand regardless of ever-changing historical circumstances. Therefore, instead of facilitating real solutions of emerging scientific problems, certain theoretical and methodological paradigms established by scientific community impede this process. It happens because there is no finite set of research methods to study the continuously changing historical reality unpredictable in its variations. Each researcher claiming the cognitive value of their studies chooses their own way to comprehend what they consider genuine since there is no absolute universal truth as well as there is no universal way to find it. This is Feyerabend's view with a relativist overtone, reflected in his theory of methodological and worldview pluralism.

As the philosopher himself notes, any attempt to subject research to strict methodological rules and compulsory principles without due regard to empirical reality will invariably lead to narrowing of the area of research and is therefore not aligned with the free creative spirit of scientific cognition (Feyerabend, 1989). Thus, Feyerabend rightfully concludes that any methodology suits the purposes of science if it solves the problem of scientific cognition. The value of method and the very right of its existence are determined not

by its logical consistency and reasonability, but by its ability to solve an emerged problem in the case at hand.

Apparently, by his innovations, Feyerabend aims to expand the subject matter of scientific research and enhance the spirit of criticism. However, while justly pointing out the subjective component in the structure of scientific knowledge, he appears to place excessive emphasis on this aspect. Actual historical practice shows that in most cases lack of organization and systemic approach does not act as a source of additional stimulation of scientific creativity, but rather leads to various obstacles, which slow down the process of knowledge growth. Thus, the following question arises: taking into account the specific features of Feyerabend's theory of science, should it be considered irrational, or is it possible to call it rational in a certain sense?

Evidently, Feyerabend's methodology is not aligned with universalist, "logico-methodological" interpretation of scientific rationality. A Soviet philosopher Boris Gryaznov was a follower of this theory and stated that "... it is totally reasonable to think that rationally organized knowledge should meet the criteria of modern logical theory... the rational system of scientific knowledge should be homogeneous, closed... representing a cause-and-effect structure" (Gryaznov, 1982).

Feyerabend strived to refute the statement about the "eternal" and universal character of logical and methodological standards. At the same time, in his understanding, scientific activity does not lose its point. On the contrary, Feyerabend emphasizes that scientists always try to achieve their goals no matter what these goals are. It must be said that Kuhn also believed that in the course of creative scientific activity scientists are much more often guided by practical considerations.

Therefore, if the notion of scientific rationality is expanded and considered as reasonability, for instance, then Kuhn and even Feyerabend can undoubtedly be called rationalists. In this context "only the one who claims that science in its development moves away from its goal rather than approaches it, could be called an irrationalist" (Nikiforov, 1998), whereas the above-mentioned philosophers, in spite of the differences in their understanding of means and methods, unanimously agree that scientific activity is reasonable. In this relation, they share the views of such recognized rationalists as Popper and his immediate associates.

5. Conclusions

One of the main tasks set in this research was to identify the criterion, which draws the conventional borderline between the so-called logical and historical

versions of the philosophy of science within the general historical school of thought.

Judging by the results of the conducted research a conclusion can be drawn that distinction between these conceptual approaches, which is traditionally based on the rational-nonrational (or irrational) opposition, mainly relies on a number of methodological features typical of these approaches in terms of their attitude to the idea of scientific rationality itself. So, if we use the "logico-methodological" interpretation of rationality as the basis, then the model of science developed by Popper and Lakatos will be considered rational as opposed to Feyerabend's theory. However, taking into account the fact that scientific rationality does not always mean logical consistency or apodictic accuracy, since a lot depends on the point of view from which it is examined, another criterion for making a distinction between the above-mentioned approaches can be selected, namely their subjective centrality.

What is meant by this? The role played by the subject of cognition, or anthropological aspect, in philosophical scientific assumptions grows along with a gradual loosening of the hard logico-methodological "skeleton" of knowledge. If one puts scientific theories developed by Popper, Lakatos and so on, up to Feyerabend, into one line, the trend towards displacement of Logic and Method by Human will be apparent.

In Karl Popper's methodology a particular person, the scientist who accepts and fulfils methodological requirements posed by science, is present, but his figure is quite blurred. It seems that he is hiding behind the "screen" of the objective process within the scientific activity.

Imre Lakatos tries to bridge the gap between logic and history and bring his methodology as close as possible to real scientific practices, but he does not move much further than Popper. In his theory, actions of a particular historical subject of scientific cognition are still fully determined by methodology claiming universal status.

Thomas Kuhn openly breaks up with such ideal, introducing "collective subject" (the scientific community) into the structure of scientific knowledge and indicating it as the main figure in it. This subject makes decisions in the context of competitive struggle with other scientific groups and is influenced by the whole sociocultural environment, which includes the sphere of scientific activity. Therefore, Kuhn expresses a distinct idea of social, psychological, sociological and cultural conditioning of scientific rationality criteria.

Finally, Feyerabend's model of science is characterized by an extreme degree of anthropologism and relativism. The process of scientific development is totally conditioned by individual "capabilities" and "inclinations" of scientists.

However, they are not governed by any common rules or principles.
Therefore, a short review of some major postpositivist models of the philosophy of science vividly demonstrates the significance gained by the subject of scientific cognition in philosophical scientific assumptions. Postpositivist philosophical tradition, which is usually given credit for the so-called turn of science towards its history, reveals the essence of the relationship between Human and Science, Method and Human. Apparently, a solution to any problem which arises nowadays in the sphere of scientific cognition requires due regard to the "human factor" in one way or another.

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