



## Historical Epistemological Cycles of the Relationship Between Science and Philosophy

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### Abstract

*The close connection of philosophy with science and vice versa, of science with philosophy, makes necessary a brief analysis for the creation of epistemology as a special discipline of philosophy. The importance of this analysis is related to a number of reasons. On the one hand, because it has a long way to go as a separate discipline and that, in a way, even though it has clearly defined its field, and inherited many aspects of philosophy over the centuries. On the other hand, it appears to briefly show the complexity of knowledge, its flows and sources, as well as epistemological features. Therefore, in the following, the historical aspect as well as the establishment of epistemology as a philosophical discipline starts from the origin to the rationalist theories in epistemology. The common denominator of epistemological theories is that they all without exception derive from the history of the development of science, a history which serves to build relevant theories that cover the entire development of science, and at the same time explain that in terms of how the activity scientific should be developed in different researches. The purpose of this paper is to present the specific perspectives of each of the approaches, be they epistemological or scientific. Also, what features do they consider characteristic during the scientific development of science and how do they think that scientific research should be carried out as an activity of scientists.*

**Keywords:** Science, Verification, Scientific paradigm, Competition of scientific programs, epistemological anarchism

### 1. Introduction

As you know, philosophy - a theoretical reflection on the relationship between man and the world - deals with a number of problems: the essence of man and the meaning of life, the specifics of knowledge and activity, questions about God, death and immortality. These questions are relevant and interesting to every person, and such topics can attract and excite you even outside the classroom. However, now you have to meet that face of philosophy, which is extremely necessary for you as professional scientists, but is not yet known to you to a sufficient extent - with the philosophy of science.

Our real practice of working with a bachelor's degree shows that students sufficiently master the content of this discipline, provided by the state educational standard of higher education. They already have some philosophical erudition, a certain amount of knowledge acquired as students. In the historical and philosophical section, they got an idea of the structure and specifics of philosophy, examining its genesis and the main stages of its historical development. In theoretical (fundamental) philosophy, the problems of ontology, theory of knowledge and methodology are studied. In social philosophy, the main problems with which he came into contact were: man and society, social structure, civil society and the state, the role of values in human life, the future of humanity, etc.

All this volume of philosophical knowledge is quite enough for each of the graduate students to move on to a

deeper study of philosophy, to rise to another level of philosophical formation. The need for such "philosophical growth" arises among the graduate students themselves as soon as they touch the basic problems of their science.

The text provides a meaningful description of the requirements of the State Standard for the course of philosophy and methodology of science and fills the lack of educational literature in this discipline, as well as:

Draws a philosophical image of modern science and methodology; It shows the historical and ideological results of its development, which can be summarized today; Outlines the problems of the original texts of contemporary epistemologists; Introduces basic Western concepts of science.<sup>1</sup>

Considering these and other problems, we did not have in mind special sciences, which, of course, are very different from each other, but science as a special form of knowledge, a specific type of spiritual production and a social institution. We can say that it is about "science in general", which, with all the variety of its manifestations, is undoubtedly different from other areas of human life - production, religion, morality, art, everyday consciousness, etc.

## 2. The History of the Formation of Science and its Functions

Until the 20th century, the problem of the history of science was not the subject of a special consideration either by philosophers or by scientists working in a certain field of scientific knowledge, and only in the works of the first positivists attempts to analyze the genesis of science and the history of her, and the historiography of science is created.

The specificity of the approach to the emergence of science in positivism is expressed by G. Spencer (1820-1903) in his work "The Origin of Science". Arguing that ordinary knowledge and scientific knowledge are identical in nature, he declares the illegitimacy of raising the question of the emergence of science, which, according to him, arises together with the emergence of science, human society. The scientific method is understood by him as a natural way of looking at the natural world for man, unchanged in different periods. The development of knowledge occurs only through the expansion of our experience. Spencer rejected the fact that philosophical moments are inherent in thinking. Precisely this position of positivist historiography has been the object of harsh criticism from historians of science in other directions.

The development of the history of science began only in the 20th century, but then it was understood either as a part of philosophy, or as a part of the general theory of culture, or as a part of a special scientific discipline.<sup>2</sup> The recognition of the history of science as a separate scientific discipline occurred only in 1892, when the first department of the history of science was created in France.

The first historical and scientific research programs can be characterized as follows:

First, the task of chronological systematization of successes in each field of science was solved; Emphasis was placed on describing the mechanism for the progressive development of scientific ideas and problems; The creative laboratory of the scientist, the socio-cultural and ideological context of creativity was determined. One of the main problems characteristic of the history of science is to understand and explain how external conditions - economic, socio-cultural, political, ideological, psychological and others - are reflected in the results of scientific creativity: the theories created, the hypotheses presented, applied methods of scientific research. .<sup>3</sup>

The empirical basis of the history of science is the scientific texts of the past: books, journal articles, correspondence of scientists, unpublished manuscripts, diaries, etc. But is there any guarantee that the historian of science will have sufficient representative material for his research? Indeed, very often a scientist who has made a discovery tries to forget those wrong paths of research that led him to false conclusions.

Since the object of historical and scientific research is the past, such research is always a reconstruction that seeks to claim objectivity. Like all other historians, historians of science are aware of two possible biases on the basis of which research is carried out: presentism (explaining the past in the language of modernity) and antiquarianism (recovering a holistic picture of the past without any reference to modernity). By studying the past, another culture, another way of thinking, knowledge that is no longer reproduced in science today, is the historian of science not recreating something that is only a reflection of his era? Both presentism and antiquarianism face insurmountable difficulties, noted by many prominent historians of science.

1 Freud, S. 1910/1943. *Über der Gegensinn der Urworte*. Gesammelte Werke 8. London: Imago.

2 Gillett G. 2015. *Culture, truth, and science after Lacan*. *Journal of Bioethical Inquiry* 12(4): 633–644.

3 Beaney, M. 2013. *What is analytic philosophy?* In *The Oxford handbook of the history of Wellbeing: A cultural history of healthy living*. Cambridge: Polity Press.

### 3. Philosophy and Methodology of Science

Science has always been closely related to philosophy. Prominent scientists of all times have made a great contribution to its development. Pythagoras, Aristotle, N. Copernicus, R. Descartes, G. Galileo, I. Newton, G. W. Leibniz, A. Smith, W. Humboldt, C. Darwin, D. I. Mendeleev, K. Marx, D. Gilbert, LE-Ya. Brauer, A.Poincaré, C.Gedel, A.Einstein, N.Bohr, VIVernadsky, N.Wiener, I.Prigozhin, AJToynbee, JM Keynes, P. Sorokin, F. de Saussure, LS Vygotsky, Z. Freud, MM Bakhtin not only had outstanding achievements that determined the main directions of the development of science, but also significantly influenced the style of thinking of his time, his point of view.

The philosophical understanding of the achievements of science began to take on a particularly great cultural significance from the 17th century, when science began to turn into an increasingly significant social phenomenon. But until the second half of the XIX century. their discussion was not systematic enough. It was at that time that the philosophical and methodological problems of science became an independent field of research. The predominance of empiricism in natural science in the late 18th and early 19th centuries. led to the emergence of illusory hopes that the functions of the theoretical generalization in science can be taken over by philosophers.

However, their implementation, especially in the magnificent natural-philosophical constructions of F.V.I. Sheinin and G.V.F. Hegel caused scientists not only clear skepticism, but also hostility. "It is not strange," K. Gauss wrote to G. Schumacher, "that he does not believe the confusion in the concepts and definitions of professional philosophers. If you look at least at modern philosophers, your hair will stand on end from their definitions.

G. Helmholtz noted that in the first half of the XIX century. "Uncomfortable relations have been created between philosophy and the natural sciences under the influence of the Schelling-Hegelian philosophy of identity". He believed that this kind of philosophy is absolutely useless to natural scientists, as it is meaningless. "It is believed," wrote the famous historian of philosophy K. Fischer, "that at that time a witchcraft was developing in the natural sciences, and Schelling was a wandering light, followed by many; now this dream of Walpurgis night is gone, and has left nothing but the usual consequences of a feast. At the same time, science gradually began to overcome the lack of theoretical ideas. Literally in all its fields and, above all, in mathematics and natural sciences, fruitful scientific theories began to appear, significantly expanding the horizons of science, there was a significant enrichment of the tools of scientific knowledge, its apparatus conceptual.

Thus, for example, in mathematics the foundations of mathematical analysis and probability theory were formed, fundamental results were obtained in algebra and non-Euclidean geometry was created.

In biology, the theory of the cellular structure of living matter was developed, the theory of the evolution of species was built, the concept of the origin of man from monkeys was developed, and the widespread use of physical and chemical methods for the knowledge of life processes.

Scientists began to apply the methods of phenomenological description, mathematical analogy and modeling to the knowledge of physical phenomena. Along with the methods of mathematical analysis and differential equations, the methods of probability theory and mathematical statistics began to have increasing success. Various theoretical constructs were constantly discussed in the pages of magazines, and no one was surprised either by their abundance or by the short life span of many of them.

It is not surprising that scientists themselves, and especially physicists, in an effort to understand what is happening in their science, are increasingly turning to philosophy. Interest in it, extinguished as a result of the collapse of the claims of natural philosophy, in the second half of the 19th century. reborn with renewed energy.<sup>4</sup>

The attention of scientists again began to attract the problems of the philosophy and methodology of science.

- What is the content of the concepts number, function, space, time, law, causality, mass, force, energy, life, species, etc.?
- How are analysis and synthesis, induction and deduction, theory and experience combined in scientific knowledge?
- What determines the descriptive, explanatory and predictive functions of the theory?
- What is the role of empirical and theoretical hypotheses?
- How do scientific discoveries happen and what is the role of intuition in gaining new knowledge?
- How should the concept of theory be interpreted?
- What gives science the opportunity to know the truth and what is it in scientific knowledge?

These and similar questions are actively discussed by scientists in reports and public disputes, special articles and

monographs. All of them arose from the progress of science and its needs required their quick solution.

#### 4. Conclusions Related to Philosophical Analytical Activity

So philosophy is fundamentally impossible as a separate science. Any aspiration to build a system of proper philosophical statements about reality or the process of knowing it, in whatever form they may be, is doomed to failure.<sup>5</sup> Is this the end of the history of philosophy?

No, this is not the end, say the neo-positivists. On the contrary, it is appropriate to talk about its beginning. After all, only now has the real possibility of creating a genuine scientific philosophy appeared. We are witnessing a real revolution in philosophy, which, as is inherent in any radical transformation, not only breaks the old foundations, but also establishes new ones.

Yes, philosophy is impossible as a science. But it does not follow that it is impossible and unnecessary.

But what is it then?

"Well, though not a science," wrote Schlick, "but, nevertheless, something so significant and magnificent that it may henceforth, as before, be honored as the queen of sciences; is it worth writing that the queen of science should be science. We now recognize in it - and this positively marked the great reversal of modernity - instead of a system of knowledge, a system of actions: it is the very activity due to which the meaning of utterances is created or discovered."<sup>6</sup>

A new look at the essence of philosophy was presented by B. Russell, and then developed by L. Wittgenstein. In the *Tractatus Logico-Philosophicus*, published in 1921, Wittgenstein expressed all the main provisions of the future doctrine of logical positivism.

"All philosophy is a 'criticism of language.'

- "The goal of philosophy is the logical clarification of thoughts."

- "Philosophy is not a theory, but an activity".

- "Philosophical work essentially consists of explanations."

- "The results of philosophy are not a number of "philosophical propositions", but a clarification of propositions."

- "Philosophy must clarify and strictly limit thoughts, which without this are, so to speak, dark and unclear." The

most important feature of the logical positivists' interpretation of the nature of philosophy is their emphasis on its scientific nature.

Philosophy must necessarily be scientific. But how is this possible if it cannot be science?

It turns out that there is nothing contradictory in this request. The scientific nature of philosophy is determined by the fact that it has the statements of science as the object of its analytical activity, and in addition, this activity itself is carried out by means of completely scientific methods - the methods of modern mathematical logic.<sup>7</sup>

R. Carnap sees in this the two most important features of the new philosophy, which distinguish it from the traditional one.

"The first distinguishing feature," he writes, "is that this philosophizing is carried out in close connection with empirical science, and even generally only in it, so that philosophy as a separate field of knowledge along with or above empirical science is no longer . known. The second distinguishing feature shows what the philosophical work in empirical science consists of: in the clarification of its propositions through logical analysis; in particular, in the decomposition of sentences into parts (concepts), the gradual reduction of concepts to basic concepts and reduction gradual transformation of sentences into basic sentences. From this statement of the problem follows the importance of logic for the philosophical work; it is no longer just a philosophical discipline along with others, but we can directly affirm:

The logical analysis of the propositions of science has two functions: negative and positive.

- The first is aimed at eliminating meaningless concepts and propositions from scientific use, eliminating pseudo-problems and preventing various modifications of metaphysical thinking and its products from penetrating science.

- The second, positive function is to clarify the logical structure of theories of science and empirical mathematics, through their axiomatization to reveal the real empirical content of the concepts and methods used in science, to clarify real scientific statements.

5 Culbertson C. 2019. *Words under way: Continental philosophy of language*. Lanham: Rowman and Littlefield.

6 Heidegger M. 1954/2002. *Was heißt denken? [What is called thinking?]*. Gesamtausgabe, Band 8. Frankfurt am Main: Vittorio Klostermann

7 Lafont, C. 2015. *Continental philosophy of language*. In *International encyclopedia of the social and behavioral sciences*, 2nd ed., edited by J. Wright, 790–795. Amsterdam: Elsevier.

8. *Hyrje ne Epistemologji*, Aleksander Kocani, fq 22

The need for these functions arises due to the fact that scientific activity is a natural process, characterized both by the appearance of various types of spontaneity within science itself, and by the influence of various external factors on it.

The scientist makes extensive use of everyday language, which includes a significant component of uncertainty.

His activity always has a certain psychological color.

For various socio-historical reasons, it turns out to be burdened with the affiliations of the concepts and problems of traditional philosophy.

Science is constantly under the influence of religious and political interests external to its essence.

The task of the philosopher is to discover what is inherent in science as such in accordance with its nature. But it can be achieved, logical positivists believe, only on the path of logical reconstruction of science.

The need for a logical analysis of science has become, in the opinion of logical positivists, especially clear at the present time. His isolation was a direct result of the natural differentiation of a scientist's work, created by the rapid development of science.

"Before our generation," wrote H. Reichenbach, "there did not exist a new class of philosophers trained in the technique of the sciences, including mathematics, and focused on philosophical analysis. These men saw that a new division of labor was needed, that research scientific did not leave enough time for one person to do the work of logical analysis, and, conversely, logical analysis required a concentration that left no time for pair work—a concentration which, because of its desire for clarification, more too many discoveries can also interfere with scientific productivity. Professional philosophers of science are the product of its development.

This is how the most prominent representatives of logical positivism prove their new philosophy. In this case, logic plays a completely extraordinary role. As Reichenbach said, philosophical anxiety "can only be soothed by a lesson in logic." Let those who do not like it not try to succeed in philosophy. Their part is different. Let these people try to apply their skills "to less abstract applications of the power of the human mind."

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