
Summaries

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Tekst jest udostępniony do wykorzystania w ramach dozwolonego użytku.

Summaries

Michał Heller

Philosophy of physics before the new millennium

Physics is inseparably connected with western philosophy. From the seventeenth century, physics began to play the role similar to that of ontology. Moreover, many notions and problems moved from philosophy to physics. That way it came into being something that is now called „philosophy in physics”. It means that some traditional philosophical questions, like for example the problem of individualization, emerge in physics in a new, exact and mathematical form. Therefore, physics will in the future become gradually philosophy.

Jan Czerniawski

Negative consequences of the quantum-relativistic breakthrough in the philosophy of nature

The quantum-relativistic breakthrough in physics has radically changed the scientific worldview. Several basic intuitions, which underlie traditional philosophy of nature, has been abandoned. As a result of this fact, scientists started to pronounce themselves as the highest authority in the philosophy of nature, leaving for the philosophers only the role of commentators. However, it is not physical theories, but their certain interpretations, or disinterpretations, which contradict common intuitions. In the case of relativistic theory, there is an alternative interpretation which allows us to reconcile its content with pre-relativistic intuitions. Therefore it suggest that we should be critical also to other alleged consequences of the «new physics».

Andrzej Łukasik

The notions of „objectivity”. Classical physics, quantum physics, philosophy

It is commonly held that the rise and development of quantum mechanics forces us to reject the idea of objective knowledge and the notion of truth in science. In the article I critically analyse arguments against possibility of objective knowledge in quantum mechanics, which were formulated by philosophizing physicists (Bohr, Heisenberg, Weizsäcker). I point out that the term „objectivity” used by those physicists, is ambigu-

ous. They do not distinguish epistemological and ontological notions of „objectivity”, different meanings of the ontic objectivity itself, and they do not separate the objectivity of cognitive acts from the objectivity of cognitive results.

Danuta Sobczyńska

The idea of complementary experiments

J. Such first introduced the notion of „complementary experiments”, referring to the decisive situations in science. The similar notions appears in the discussions of new experimentalists. For example, I. Hacking writes about complementarity of different types of microscopy, A. Franklin distinguishes technically good and conceptually important experiments, and P. Galison analyses examples of complementarity of two different approaches to the problem of cosmic radiation. In the article the notion of „complementarity” is extended as to cover the cases of complementarity of method, complementarity of scientific teams *etc.* As an illustration it is used the case of discovering new type of carbon — called „fulleren”.

Jarosław Mrozek

Mathematics — a tool or description? Instrumentalistic and realistic interpretations of the applications of mathematics

In the paper there are presented two proposals of the interpretations of the applications of mathematics in the natural sciences — realistic and instrumentalistic. The realistic conception, in accordance with the successes of science, maintains that there exists some kind of correspondence between the mathematical structures and the internal structure of the world. It is expressed in the thesis of the mathematicality of nature. The instrumentalistic approach separates the cognitive content of the scientific theory from the mathematical means of expression of the content. In this approach the mathematical categories do not represent any aspect of the modelled reality. In the final part of the paper the author undertakes such an attempt of approaching the applications of mathematics which, while combining the advantages of the above discussed conceptions, would be devoid of their disadvantages.

Wojciech Sady

Four great streams in twentieth-century methodology

All significant methodologies of the XX century accept conventionalistic philosophy of science. The main question for such methodologies is: are there universal criteria, allowing to choose these conventions, which are the best from the cognitive point of view? There are four classical answers to this problem: anarchism, sociology, elitism and demarcationism. In the article the main dilemmas of demarcationist program are considered.

Elżbieta Pietruska-Madej

Metaphysics through the neopositivistic filter

In Polish philosophical literature, especially didactic, a stereotype of Popper as a neopositivist is surprisingly stubborn. This stereotype does not help in understanding the relation between Popper and Vienna Circle, and the evolution of Popper's own views. Antimetaphysical bias of the neopositivists stands in evident contradiction to Popper's approach, who based his conceptual system on metaphysical ideas. In the article I argue that «late» Popper did not contradict himself from the Vienna period. I show that *Logik der Forschung* is usually read through the neopositivistic filter, and that is why Popper's statements are so often misinterpreted.

Adam Grobler

Better explanation

Like most realistically oriented philosophers, I accept that the growth of explanatory power of cognitive system is a sign of the cognitive progress. In other words, I assume certain version of the principle of «inference to the best explanation». In the paper I propose a unified and more sophisticated criterion for the «betterness» of explanation, which is formulated in van Fraassen's terminology.

Ryszard Kleszcz

Criteria of rationality

The standard model of rationality points to the following criteria of rationality: appropriate articulation, obeying the rules of logic, and proper justification. These criteria however cause troubles, when they are used in particular cases. In the article it is proposed two-level model of rationality. The first level would comprise four meta-principles: linguistic exactness, obeying the rules of logic, criticism, and ability to solving the problems. The second level would refer to certain types of beliefs, building models for them.

Józef Misiek

Crisis in methodology?

The great vision of logical empiricism brought up a hope for ultimate solving the problem of understanding our knowledge. Starting, for the first time in the history of empiricism, from a point of view typical for mathematicians not empiricists, i.e. from the program of logicism, the philosophers of Vienna Circle aimed at creating a consistent philosophy which makes possible both mathematics and empirical knowledge. Today, after more than a half century, their efforts seem to be completely futile. The topic of the paper is to find out the reasons why the program failed. It seems that the deepest reason for the failure lies in the philosophy of mathematics adopted by logical empiricists — namely logicism. The main problem of the contemporary methodology is to find a remedy for this illness. The paper suggests some ideas in this direction. One of

them is more serious approach to the philosophy of mathematics. Another is the recognition of the crucial role epistemic and other values play in scientific research.