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Encyclopedia of Metascience and Special Philosophy of Science



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The formal philosophy of science, its two components, conceptology, and methodology, as well as 21 varieties of special philosophy of science, are considered in a systematic theoretical form. All theories are interpreted within the framework of the main philosophical directions of modernity, in particular, analytical philosophy, hermeneutics, poststructuralism, phenomenology, and critical rationalism. An original theory of intratheoretical and intertheoretical transduction developed. Ethical representations are widely used. Exceptional attention is paid to the transdisciplinary approach, as well as the conceptual development of pluralism in modern science and the fullness of scientific knowledge. The book has no analog in literature. It is intended for researchers, university professors, graduate students, and undergraduates.

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Preface

The rapid development of science is the main achievement of the modern era. It brings the boldest hopes. Armed with science, humanity has become a planetary system. This fact is not only pleasing but also evokes a sense of unrelenting anxiety, especially in the face of growing technological, environmental, economic, political, and other disasters, which everyone knows. There is something wrong with the science. It seems to me that this fact should be analysed, first of all, by scientists. For it is unacceptable to transfer the problems caused by them onto the shoulders of people who are outside of science.

Science has a lot of problems.

Firstly, throughout its history, it has been forced to play an auxiliary role. A very common view is that science is needed mainly to achieve an abundance of material goods. This understanding of the meaning of science opens the gates to a wide range of misunderstanding

Secondly, scientists often focus their efforts primarily on some areas, in particular, physics, computer science, and biology. Such a one-sided concentration of social forces necessarily leads to a disharmony within the system of sciences, which is especially painful for the state of humanitarian knowledge.

Thirdly, the diversity of science is growing. Never before has it been so diverse and devoid of unity.

Fourthly, the possibility of awareness of modern scientific knowledge as a single whole with an integral meaning is being questioned so categorically as never before. It seems that scientists are not able to prevent the destruction of the integrity of science.

Fifthly, and perhaps most importantly, science, steadily increasing its power, has not developed effective ways to control its own development. There is no doubt that any force invented by man must be controlled by him. Unfortunately, with respect to science, this duty remains only a good wish.

The list of alarming symptoms of the evolution of modern science can be significantly expanded. However, it is quite enough to understand the need to develop ways to improve the situation under discussion. In my opinion, in this regard, the philosophy of science becomes the decisive factor, which, as the lessons of development of science show, does not condone either giving science only instrumental value or hypertrophy of its parts or moral indifference of knowledge and helplessness in the mastering of its diversity. It is the philosophy of science that gives science its existential pointedness. Ultimately, the most significant challenges facing scientists, are focused on the philosophy of science. It is designed to problematize and enhance the potential of science.

At this point, it is necessary to clarify the difference between philosophy, philosophy of science, special philosophy of science and metascience. Philosophy is usually understood as one of the branches of science. In modern knowledge, the status of any branch of science is determined only in unity with other branches of science. The possibility of such a definition did not appear immediately, but only after the formation of the whole complex of modern sciences was formed, not earlier than the 20th century. This possibility, in particular, was not in those ancient times when philosophy was passing the first phases of its development. In this regard, philosophy stayed in a purely speculative, metaphysical shell. This continued until the philosophy of science was developed. The overwhelming

majority of philosophers failed to correctly assess the cardinal change in the situation around the philosophy. They believed that the philosophy of science was part of philosophy. In reality, the philosophy of science replaced philosophy. The need for the latter ceased to be urgent. All those researchers who persisted in their commitment to traditional philosophy continued to pursue metaphysics, unsuccessfully trying to master the achievements of modern science.

So what is the philosophy of science? It expresses similar conceptual and methodological features of all branches of science. This means that it has a formal character. Of course, its development involves the development of provisions relevant to all sciences. Their use leads to special philosophies of science, for example, the philosophy of physics or the philosophy of economics. As we can see, the fate of the formal and special philosophy of science largely depends on an understanding of the status of individual sciences. In this regard, the relevance of metascience is revealed. The fact is that accessing of the philosophy of science to individual sciences requires a preliminary identification of their essential features not by philosophers but by representatives of these sciences themselves. As a result, a whole complex of metascientific disciplines appears, in particular, metamathematics, metabiology, metaeconomics, etc.

As a rule, metascience is identified with a special philosophy of science. However, such identification is untenable. To illustrate this, let us consider the relationship between metamathematics and the philosophy of mathematics. Metamathematics is a theory of conceptual and methodological features of mathematical theories irrelevant to the content of the formal philosophy of science. Metamathematics does not go beyond mathematics. On the contrary, the philosophy of

mathematics evaluates the content of mathematics in terms of the achievements of the formal philosophy of science. Thanks to the philosophy of mathematics, mathematics is embedded in the unity of all sciences. The story that I described in relation to mathematics is repeated in basic terms with other sciences. Each time it makes sense to distinguish from each other metascience and the special philosophy of science.

My book is an encyclopedia of, above all, metascience and the special philosophy of science. Of course, it also does not do without considering the formal philosophy of science. In modern science, attention to the formal philosophy of science prevails. To the best of my modest ability, changing this situation, I pay due attention to both metascience and the special philosophy of science. This feature of my research defines the title of the book — “Encyclopedia of Metascience and the Special Philosophy of Science”.

In addition to the above, I note the need to discuss the problem of the encyclopedic training of a modern scientist. According to a very common opinion, due to the versatility of modern science, the age of encyclopedists has become a thing of the past. I think this view is deeply flawed. Great encyclopedists were, for example, John von Neumann, who made a significant creative contribution to the development of mathematics, computer science, physics, economics, and George Gamow, known among other things for inventing the concept of the hot universe and decoding the genetic code. Is not cultivated encyclopedic scale in the training of students and schoolchildren studying not one, but many disciplines? In my opinion, encyclopedic awareness is desirable for any scientist. It was this belief that prompted me to create this encyclopedia.

My scientific and pedagogical destiny has developed in such a way that already in the young years I was vigorously engaged in the study of physics, economics, and philosophy. At the age of 40, I learned how to use effectively ideas from one of these three branches of science in the other two. I never used to try to put my interlocutors in an uncomfortable position, but I naturally noticed that their narrow professional orientation often limited their creative possibilities. Many years of work with graduate students contributed to the significant development of my philosophical and interdisciplinary capabilities. With them, each time in separate groups, I discussed the philosophy of mathematics, computer science, physics, chemistry, biology, psychology, technology, and economics. Classes with graduate students have become a wonderful cure for alienation of sciences from philosophy. Over the years, I have been convinced that science without a pronounced special philosophy of science is a form of underdeveloped knowledge, in a word, nonsense. The other thing I came to was that the scientific orientation of both philosophy and formal philosophy of science, in particular, needed substantial development. The quasi-scientific shell of modern philosophy limits its effective use in sciences.

On the other hand, reading the course of formal philosophy of science to graduate students, I became more and more convinced that it was inappropriate to present them truths regardless of the sciences and explain them exclusively by achievements of some selected sciences, for example, physics. There was an urgent need to develop provisions that would be relevant to all individual sciences. In this regard, I have developed a theory of intratheoretical and intertheoretical transduction. I hope that the reader of the encyclopedia will be convinced that the theory of conceptual transduction is a real basis for understanding all existing sciences as a vast ordered

whole. This theory forms the methodological framework of the entire encyclopedia. It is summarized in the first chapter. Of course, the theory of conceptual transduction should not be perceived dogmatically. Nevertheless, checking its content in a wide variety of sciences for decades, I do not see a worthy alternative to it.

One more leitmotif of the whole book is the pluralism of the main modern philosophical systems, its interface with the content of various sciences. I sought to avoid two undesirable extremes: both philosophical isolationism, and philosophical indifferentism. In the first case, the material is presented exclusively from the standpoint of one philosophical direction, for example, analytical philosophy, hermeneutics or poststructuralism. In the second case, the author's philosophical position is not clear at all. Such indifference, in the book devoted to special and formal philosophy of science, is obviously unacceptable.

The actual idea of the encyclopedia is to understand ethics as the pinnacle of science. It is not introduced to science from outside but is formed in it in the process of rising to conceptual and existential heights.

I briefly described the main leitmotifs of the encyclopedia. To describe many other ideas, in fact, there is no printed space. I tried to justify the priority of the conceptual development of modern scientific pluralism. To the best of my ability, I tried to destroy the eclectic shell of philosophy and any other branch of science.

When writing this book, I was guided by diverse interests of intellectuals, be it a scientist, a philosopher, a graduate student or an inquisitive reader. The direct addressees of the

encyclopedia are researchers, university professors, graduate students, and undergraduates.