SCIENTIFIC BOOKS

PHYSICS AND PHILOSOPHY

Between Physics and Philosophy. By PHILIPP FRANK, visiting lecturer, Harvard University. 238 pp. Cambridge, Mass.: Harvard University Press; London: Humphrey Milford; Oxford University Press. 1941. $2.75.

THE book comprises a series of articles written for the most part during the last ten years. The writer describes the situation to-day as one in which, after the reign of materialism and naturalism in the nineteenth century, our twentieth century shows a trend away from these movements, and in which the emphasis on the irrational and on metaphysics, the idealistic and spiritualistic interpretation of nature and history are recognized more and more as the prominent features of the century. The author cites the principal aim of his essays as an endeavor to show that one can make use of the recent progress of the physical sciences to the end of supporting the twentieth century trend only if one interprets it according to the pattern of some cherished philosophy, disregarding the scientific meaning of modern physics. A second aim of the book is to make a contribution to the history of the development of "logical empiricism."

The essays center around the development in thought initiated by the "Vienna Circle," which formed about 1910, of which the author was one of the founders, and which sought a stand on which the essential points of Mach's positivism, and especially his stand against the use of metaphysics in science, were retained, while a reconstruction of his doctrines where they stood in opposition to the present course of development of science was attempted.

Following an Introduction in the form of a historical background, the essays comprise the following:

I. The Law of Causality and Experience (1908)
II. The Importance of Ernst Mach's Philosophy of Science for our Times (1917)
III. Physical Theories of the Twentieth Century and School Philosophy (1929)
IV. Is There a Trend To-day Toward Idealism in Physics? (1934)
V. The Positivistic and The Metaphysical Conception of Physics (1935)
VI. Logical Empiricism and the Philosophy of the Soviet Union (1935)
VII. Philosophical Misinterpretations of the Quantum Theory (1936)
VIII. What "Length" means to the Physicist (1937)
IX. Determinism and Indeterminism in Modern Physics (1938)
X. Ernst Mach and the Unity of Science (1938)

It is naturally impossible here to attempt anything of the nature of an exhaustive review of the contents of such a broad scheme of essays. In all of them, however, it is refreshing to find an author talking a language which can form the common ground of the physicist and the philosopher. For these two groups are frequently suspicious of each other, and the former often feels that the latter, having developed his concepts to a point where they cry for more precise meaning that they may take some action in the world, proceeds at this stage to group them into categories and give them names. A name covers a multitude of sins and shrouds its charges with a kind of veil in which they somehow or other seek to claim that all would be clear with regard to them if one had a more precise knowledge of the meaning of the dictionary. And so, even in Professor Frank's book, the physicist is inclined to shudder at so many "isms," but he is happy to find the author shuddering in some degree with him, and prepared occasionally to sympathize with even those whom the strict theoretical physicist must regard as materialistic sinners in his clan. Thus, in contrasting the direct and bold procedure of the practical scientific investigator with the doctrines of the less practical, but critical analysts of the meaning of things, the author very neatly defines the true function of the latter in the words: "My view is that their main value is not that they help the physicist to go forward in his physical work, but rather that they provide the means for defending the edifice of physics against attacks from outside."

In these days, when so much is said about the overthrow of mechanistic principles, it is very refreshing to read such phrases as:

> If we say, however, that the mechanical foundation has been replaced by a mathematical one (speaking of relativity and quantum theory), it is, in my opinion, a very inappropriate mode of expression. We ought to say, rather, that the place of a special mathematical theory, that of Newton, has been taken by more general theories, the relativity and quantum theories.

In conclusion, in collecting these essays into book form, Professor Frank is to be congratulated upon producing a work which will be of distinct value to the physicist and the philosopher alike, and one which should broaden considerably the common realms of understanding of these two fields of knowledge.

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