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IN CONTEMPORARY PHYSICS

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BOSTON STUDIES IN THE PHILOSOPHY OF SCIENCE

EDITED BY ROBERT S. COHEN AND MARX W. WARTOFSKY

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PREFACE

In this volume of the *Boston Studies in the Philosophy of Science*, we present a collection of articles on philosophical issues in contemporary physics. The principal domain of these investigations is quantum physics. There are also articles on questions in classical mechanics (Hooker), and relativity theory (Papapetrou and Stachel), as well as a monographic essay in evolutionary epistemology (Yilmaz), applying the conceptual and mathematical understanding of special relativistic quantum field theory to set forth a theory of the evolution and adaptation of perceptual structures. Finally, in addition, there are two essays on classical issues in the philosophy of nature – one, on types of continuity (Čapek), which suggests an analogy between the perceptual and the quantum domains; the other, on causality, the first translation into English of a minor classic in the philosophical understanding of modern physics, H. Bergman's well-known but little-read *Der Kampf um das Kausalgesetz in der jüngsten Physik* (Vieweg, Braunschweig, 1929). On the occasion of this publication, Professor Bergman has kindly contributed an introductory essay, 'Personal Remembrances of Albert Einstein'.

Of the seven essays on quantum mechanics, four are on quantum logic (Marlow, Heelan, Bub and Demopoulos, Van Fraassen), the last being a critical survey of various current proposals for quantum logics; the remaining three (MacKinnon, Stachel and Van Fraassen) are concerned with both the formal issues and the ontological commitments of quantum physics.

All but two of these contributions were originally presented as working papers to the Boston Colloquium for the Philosophy of Science during 1969–72. The exceptions are Van Fraassen's 'Labyrinth of Quantum Logics', originally read at the first biennial meeting of the Philosophy of Science Association (Pittsburgh, 1968) and, of course, Bergman's monograph.

A companion volume from the same period (*Boston Studies*, Vol. XIV) is devoted to methodological and historical essays on the natural and social sciences.

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