BOOK REVIEWS

Essays 1958–1962 on Atomic Physics and Human Knowledge. By Niels Bohr. 100 pp. Interscience, New York, 1963, $5.00.
Reviewed by R. B. Lindsay, Brown University.

The interest of the founder of the quantum theory of atomic structure in the philosophical aspects of physics has been well known to all who followed his researches and publications. Though Niels Bohr was by no means a prolific writer in this field, his earlier essays contained in the two volumes *Atomic Theory and the Description of Nature* (1934) and *Atomic Physics and Human Knowledge* (1958) made a considerable impact on the scientific and philosophical community. We have now the privilege of examining a posthumous volume of essays dating from 1958 to Bohr's lamented death in the fall of 1962. Five of the seven articles in the book are based on lectures given in the time interval in question, all save one worked over with the very great care the author always insisted on devoting to all his published writings. The article entitled "Light and Life Revisited", based on an address at the inauguration of the Institute for Genetics in Cologne in June, 1962, was in process of revision and elaboration at the time of Bohr's death. It continues the theme of an earlier essay of the date 1932 and in view of this interest, it was decided to include it in the present selection, even though incomplete.

All admirers of Bohr and indeed all students of atomic physics will read with fascination this volume which in a certain sense constitutes a last testament of Bohr's views on the philosophy of physics and science in general. In almost every article there is emphasis on the principle of complementarity, which played such an important role in his interpretation of quantum mechanics. This concept, which seemed to Bohr to evolve so naturally from the indeterminacy principle of Heisenberg, was extended by him to large segments of the life and social sciences. Here it acts as a kind of principle of renunciation in which the thoroughgoing use of one of two complementary points of view involves the renunciation of the simultaneous use of the other. The principle has naturally attracted the attention of philosophers and other scholars, and its significance will undoubtedly continue to be debated in the future. Some will undoubtedly see in it a highly questionable extrapolation into the biological and sociological fields of a principle originally based on the existence and value of pairs of noncommutative operators in the theory of quantum mechanics. However, no one can question the ingenuity and clarity of Bohr's exposition. In several of the articles, he stresses the connection of the principle with the view that quantum mechanics must be considered as fundamentally nondeterministic in character, even if the basic principle of causality is still implicit in it.

Many readers will probably find the most interesting essay in the book the elaboration of the Rutherford Memorial Lecture at the Physical Society of London in 1958. This is a delightful collection of reminiscences about the inventor of the nuclear atom model woven into a highly informative survey of the history of the whole development of atomic structure theory from 1910 on to the present. No important contribution has been overlooked.

Another attractive historical summary is contained in the address given at the 12th Solvay Meeting in Brussels in October, 1961. Here, Bohr surveyed the whole series of conferences which began in 1912, and which have played such a significant role in the clarification of new concepts in physics. One cannot read Bohr's illuminating account without realizing what a mine of information is available in the reports of these conferences for the historian of the physics of the last half century.

The book has as frontispiece an excellent photograph of the author as he was in his later years. The preface is contributed by his son, Aage Bohr of the Institute of Theoretical Physics in Copenhagen.

Nobel Lectures Including Presentation Speeches and Laureate's Biographies. Physics 1942-1962, Volume 3. 619 pp. Elsevier, Amsterdam, 1964. $27.50
Reviewed by Robert Weber, The Pennsylvania State University.

Accounts by winners of the Nobel Prize of the significant influences in their lives and of the preparation and effort which led to their celebrated achievements provide inspiring reading. One welcomes the series of Nobel lectures now being made available in English by the Elsevier Publishing Company, arranged chronologically and in volumes according to the prize fields: physics, chemistry, medicine, literature, and peace. The address of each laureate is preceded by the presentation address to the prize winner and is followed by a biography.

Prepared for an intelligent lay audience, the lecture of each physicist generally places his work in broad perspective. Thus these volumes should be of special interest to students and teachers of physics. Repeatedly one finds new light on the mainstreams of physics. Even the digressions are often arresting, as for example Bothe's tribute to Geiger's desire to keep scientific work within economic bounds.

The Elsevier volumes are handsomely prepared and include illustrations relevant to the lectures. One might hope that future editions would also include portraits or photographs of the Nobel laureates, such as are available in the Nobel Foundation's annual publication *Les Prix Nobel.* These paperbound books, while not entirely in English, deserve to be more widely available in American libraries. Relatively inexpensive, they provide a current record of Nobel