Books

Atomic Physics and Human Knowledge. By Niels Bohr. 101 pp. John Wiley & Sons, Inc., New York, 1958. $3.95. *Reviewed by J. C. Polkinghorne, University of Edinburgh.*

The middle essay of the seven here reprinted is Professor Bohr's account of his discussions over the years with Einstein. A charming feature is the illustration of "apparatus" proposed by Einstein and reanalyzed by Bohr in their debate about the validity of the uncertainty principle. Never before were thought experiments performed with such robust and satisfying clocks and measuring rods! The essay is an exciting account of the interaction of two great men and great physicists.

The other six essays are accounts, mostly addressed to congresses of nonphysicists, of the epistemological revolution brought about by the quantum theory and its implications for other fields of human knowledge. In particular Professor Bohr believes that the idea of complementarity gives new insight into such problems as the relation between living and inanimate matter. An essential feature of living matter is its continual interaction with its environment and this places limits on the degree to which it or its parts can be isolated and subjected to experiment. He refers to "the obvious exclusiveness between such typical aspects of life as self-preservation and self-generation of individuals on the one hand, and the subdivision necessary for any physical analysis on the other hand. Owing to this essential feature of complementarity, the concept of purpose, which is foreign to mechanical analysis, finds a certain field of application in biology." However he decidedly rejects the point of view that supposes the uncertainty principle to provide scope for the will to tamper with the laws of physics. His position is a synthesis transcending the opposing attitudes of mechanism and vitalism.

Professor Bohr has maintained his position with such consistency that there is necessarily a good deal of overlap between these essays.

The Preparation of Programs for an Electronic Digital Computer (2nd Revised Edition). By Maurice V. Wilkes, David J. Wheeler, Stanley Gill. 238 pp. Addison-Wesley Publishing Co., Inc., Reading, Mass., 1957. $7.50. *Reviewed by F. J. Corbató, Massachusetts Institute of Technology.*

When the first edition of this book appeared in 1951 it represented a valuable documentation of how to use one of the early high-speed digital computers. As such the first edition was basically a handbook for the EDSAC computer; however, despite the attempt of the authors to generalize their coverage, the second edition is still such a handbook. The contents of the present edition arise from two sources. First, there has been a polishing and revision of the material of the first edition so as to keep pace with the evolvement of both EDSAC and present-day computer practice. Second, there has been the insertion of a few short chapters on more recent topics, in particular, Chapter 3, Programming for Other Machines (15 pp.) and Chapter 8, Automatic Programming (12 pp.); but in both instances the treatments given can only be considered sketches. As in the first edition there are numerous programming examples given in the awkward mnemonics of the EDSAC code. All told it is felt that the authors have done a good job of updating the first edition, but that in the subject of programming their book has been eclipsed by the more recent *Digital Computer Programming* by D. D. McCracken (Wiley).

Water Waves: The Mathematical Theory with Applications. By J. J. Stoker. 567 pp. Interscience Publishers, Inc., New York, 1957. $12.00. *Reviewed by R. Bruce Lindsay, Brown University.*

No one who has observed the breakers on an ocean beach can fail to be interested in water waves, and perhaps the same can be said in a somewhat different context for those who have experienced the effects of such waves aboard a ship at sea. The problems connected with them have fascinated generations of mathematicians and mathematical physicists beginning with Lagrange in the eighteenth century and extending through the nineteenth-century investigations of scientists like Kelvin, Stokes, Rayleigh, and Lamb to the present-day applied mathematicians and oceanographers. A vast literature and numerous books devoted to water waves exist and the natural question arises: why another book devoted to this field? The answer lies in the never-ending and ever-increasing curiosity of man about complicated natural phenomena coupled with his desire to accomplish more and more decisive control of the technological applications connected therewith. For this purpose the mathematicians are steadily providing more powerful techniques, notably in the field of nonlinear differential equations. The author of the present work has been in the forefront of the modern attack on the problems of waves in incompressible fluid media, and the present book, which provides a connected account of the contemporary treatment of wave motion in liquids with a free surface, will be cordially welcomed by mathematicians, physicists, and technologists alike.

The book consists of four main parts devoted respectively to the fundamental hydrodynamic theory of nonviscous incompressible fluids, the small amplitude theory of wave propagation, the approximate nonlinear theory for waves of larger amplitude in shallow water, and finally some considerations on the exact nonlinear