



OPPENHEIMER

Five of J. Robert Oppenheimer's colleagues and friends have brought together their personal recollections of him in this distinguished volume: I. I. RABI, ROBERT SERBER, VICTOR F. WEISSKOPF, ABRAHAM PAIS, and GLENN T. SEABORG. The book, based on speeches given at the Oppenheimer Memorial Session of the American Physical Society Meeting, offers both a warm tribute to Oppenheimer's extraordinary achievements and a memorable portrait of a sensitive and brilliant man. Photographs from Mrs. Oppenheimer's private collection. *Reference Notes, Biographical Notes, Glossary, Chronology, Bibliography, Index.*

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SCRIBNERS

purely fictitious wave, and the other is a genuine electromagnetic wave that guides the photon and in which the photon is, so to speak, imbedded. The book contains a more detailed mathematical application of this fundamental idea to the relation between photons and the corresponding electromagnetic relation than the author has previously presented. Both incoherent and coherent sources of light are examined.

Adherents of Einstein's conception of what constitutes a complete physical theory will find de Broglie's arguments persuasive. It must be admitted, however, that there still remain formidable difficulties in the way of a thoroughgoing development of the author's proposal. For example the satisfactory incorporation of a detailed description in physical terms of quantum transitions is lacking. There also exist serious problems connected with the place of the photon in the guiding wave. de Broglie believes that these problems will demand the incorporation of nonlinear terms in the state equation; at the moment one remains ignorant of the form these terms should take.

Those who favor the conventional interpretation (Copenhagen school) of quantum mechanics will doubtless feel that such ventures as this of de Broglie are unprofitable. But the history of physics strongly suggests the value of pursuing alternative points of view. From this standpoint the latest of this distinguished author's many contributions to modern atomic physics is commended to the careful attention of theoretical physicists, as well as all who are interested in the philosophy of physics.

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Among the reviewer's own books are *Concepts and Methods of Theoretical Physics* (1951) and *Mechanical Radiation* (1960).

Sound work on sound

THEORETICAL ACOUSTICS. By Philip M. Morse, K. Uno Ingard. 927 pp. McGraw-Hill, New York, 1968. \$23.00

by R. S. SHANKLAND

Both the science and practice of acoustics have made great advances during recent years. These were in part stimulated by the role of underwater sound in World War II, by the many post-war building innovations presenting challenges to architectural acoustics and by the engineering applications of

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acoustics to many technologies.

This impressive book by two distinguished workers in theoretical acoustics brings together both standard and novel mathematical methods now available to workers in acoustics. The result is a masterful achievement that should be indispensable for research workers and teachers in acoustics and related fields in engineering and science. It is not, however, a textbook, as were the two elegant editions of Philip Morse's book on vibration and sound. It is rather a reference book for the serious student and advanced worker in the subject. The treatments of the classical dynamics of sound, especially those on radiation and scattering, are among the most notable presentations. The discussion of architectural acoustics will be less satisfying to active workers in this important field; although 87 pages are devoted to problems of ducts, only 23 pages are given to the central subject of room acoustics. Nevertheless, there are basic treatments here that many will do well to master. The book includes valuable discussion of autocorrelation methods and interesting sections relating acoustics to plasma, optical and magnetic phenomena. A distinctive feature of the book is its numerous challenging problems. These deal with important matters and are stated in sufficient detail to clarify the physics and provide hints for the solutions. The quality of the writing and the clarity of the exposition are up to the high standards that Philip Morse has achieved in all his writings, and he and Ingard are to be congratulated on this especially fine book.

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The reviewer is Ambrose Swasey Professor of Physics at Case Western Reserve University.

NEW BOOKS

CONFERENCE PROCEEDINGS

Reports of the 6th International Congress on Acoustics, Vols. 1-6. (Conf. proc.) Yutaka Kohashi, ed. (21-28 August, 1968, Tokyo). Maruzen, Tokyo and Elsevier, New York, 1969. \$69.50

Soft X-Ray Band Spectra and the Electronic Structure of Metals and Materials. (Conf. proc.) Derek J. Fabian, ed. (18-

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