

(and possibly too many) topics between its covers. Passive direct- and alternating-current circuits are treated from a relatively elementary point of view, with a limited discussion of modern network topology. Such active circuit elements as solid-state and thermionic diodes, transistors, and vacuum tubes are discussed; and finally the author treats noise in electrical circuits and the principles of modulation.

This is a sort of in-between text. Since an elementary knowledge of the calculus is required for its understanding, it is not suitable for high-school nor for many technical institute graduates. On the other hand, it is by no means sufficiently meaty for use even in a first-year college course; but it should be ideal for the true amateur (in the fundamental meaning of that word).

There are a number of typographical errors in the first printing of *The Algebra of Electronics*. This reviewer understands that there have been extensive corrections in the second printing. Consequently, there seems to be little point in discussing this aspect of the book.

Soviet Research in Fused Salts, 1956. Part 1, Systems; 146 pp.; paperbound \$30.00. Part 2, Electrochemistry; 268 pp.; paperbound \$20.00. Translated and published by Consultants Bureau, Inc., New York, 1958. 2-vol. set \$40.00. **Transactions of the First Conference on the Spectroscopy of Light-Scattering Media** (Moscow, Mar. 1956). 77 pp. Translated from the Bull. Acad. Sci. USSR, Physical Series, Vol. 21, No. 11 by Columbia Technical Translations, White Plains, N. Y., 1958. Paperbound \$20.00. Reviewed by *Stuart A. Rice, University of Chicago.*

THERE is little that can be said for or about the first two translations listed above. The cross section of papers represented in these volumes is, on the average, neither better nor worse than a random sampling of similar American or European literature. Most of the studies are of phase equilibria and of interest only to a few specialists. The more general questions of the theory of molten salts, solutions of metals in salts, equation of state, etc., are unrepresented. It appears to the reviewer that in the general hysteria to translate "anything Russian" insufficient selectivity has been used. There is little justification for this compilation. Moreover, since the articles come from previously translated journals, there seems very little argument for the very high price.

In contrast, the last translation listed, the proceedings of a conference, is a welcome addition to the English literature since it deals with a subject rarely represented in American journals. There is little point in listing the titles of the contributions. Suffice it to say that there is discussion of both theory and experiment with particular application to photographic emulsions. Although the articles are short, the literature references will be helpful in tracking down the previous Russian work on scattering from inhomogeneous media.

Physics for Engineers and Scientists. By Richard G. Fowler and Donald I. Meyer. 546 pp. Allyn and Bacon, Inc. Boston, Mass., 1958. \$8.00. Reviewed by *Lawrence H. Bennett, National Bureau of Standards.*

THE title of this book might lead one to expect that it is intended for engineers and scientists. In fact, it is an introductory textbook in physics for science and engineering students. Its 30 chapters cover much of the traditional material of freshman or sophomore physics such as resolution of vectors, heat, electricity, and mechanics. In addition are included topics in modern physics not found in all elementary texts, e.g., electron spin, elementary particles, and special relativity. The modern work is not simply "tacked-on", however, but forms an integral part of the text. Room was made for the newer material by a skillful reduction of the older.

Each chapter has problems, graded according to difficulty. Answers to some of the problems are included. The book is replete with clear illustrations, averaging one every other page. Calculus notation is used, but the text is readable if these are omitted.

Among the minor objections to the textbook may be cited the use of *centigrade* temperature, without even passing reference to *Celsius* temperature, although it has been ten years since the newer terminology was adopted by international agreement.

The symbol B is used for magnetic induction and magnetic field intensity interchangeably and no mention of H or the unit oersted is made.

Fast Reactions in Solids. By F. P. Bowden and A. D. Yoffe. 164 pp. (Butterworths, England) Academic Press Inc., New York, 1958. \$7.00. Reviewed by *Paul W. Levy, Brookhaven National Laboratory.*

BY "fast reactions" Bowden and Yoffe mean the various "chemical" and "physicochemical" processes involved in the explosions of solids. Considering that explosive technology is relatively "old", that it has obvious military applications, and that it has application to propellants, which depend on "slow" fast reactions, it is surprising how little is really understood in this field. The initiation and eventual detonation of an explosive may be roughly divided into three steps: first, the initiation of a reaction, second, the growth of this reaction to a steady state, and third, the steady-state propagation of the detonation through the remaining explosive. The steady-state propagation, which can be described by the thermohydrodynamic theory, is the best understood step. It is the first two steps which are the primary concern of *Fast Reactions in Solids*.

Although not arranged in the following order the subjects discussed include:

- (a) The physical and chemical properties of materials which can explode.
- (b) The conditions necessary to initiate an explosive with emphasis on "hot spots".



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- (c) Initiation by heat, light, shock, also spontaneous explosions.
- (d) The growth of an explosion after initiation.
- (e) Techniques such as the study of thermal decomposition which elucidate aspects of the explosive process.
- (f) The effects of energetic particles and photons (α , β , γ rays, etc.) on explosives and related substances.

To a large extent the method of presentation used by these authors is to consider the pertinent references and since they include the most recent ones as well as a good deal of unpublished material, this book is a valuable statement of the current status of this field. In some instances, however, the synthesis of this material into a coherent description might be improved. One can conclude that researchers now in this field, having been unable to explain all of the phenomena associated with explosives in terms of classical chemistry, now hope to obtain explanations using the concepts of solid-state physics. Since explosives are after all nearly always solids, this approach must be successful to some extent as is indicated by some of the text. One particularly impressive example is the evidence supporting the role of excitons in the thermal decomposition, optical absorption, and photoconduction in the explosive silver azide. It matters little whether one approaches explosives from the point of view of chemistry or solid-state physics, since there is no discernible dividing line between the two; what does matter is that this book discusses topics that must be understood by anyone attempting to make basic contributions in this field.

Books Received

SEMICONDUCTOR ABSTRACTS: Abstracts of Literature on Semiconducting and Luminescent Materials and Their Applications, Vol. 4, 1956 Issue. Compiled by Battelle Memorial Inst. Edited by E. Paskell. 456 pp. John Wiley & Sons, Inc., New York, 1959. \$12.00.

THEORY OF RELATIVITY. By W. Pauli. Translated by G. Field from 1921 German article, with 25 pp. of supplementary notes by Pauli. 241 pp. Pergamon Press, London & New York, 1958. \$6.00.

ELECTROMECHANICAL ENERGY CONVERSION. By David C. White and Herbert H. Woodson. 646 pp. John Wiley & Sons, Inc., New York, 1959. \$12.50.

METHODS BASED ON THE WIENER-HOPF TECHNIQUE FOR THE SOLUTION OF PARTIAL DIFFERENTIAL EQUATIONS. By B. Noble. 246 pp. Pergamon Press, London & New York, 1958. \$10.00.

A GUIDE TO NUCLEAR ENERGY. By R. F. K. Belchem. 77 pp. Philosophical Library, Inc., New York, 1958. \$3.75.

STAR '58 ABSTRACTS: 1958 Science Teacher Achievement Recognition Program. By Chrissie Peters and Iris B. Marcus. Edited by Abraham Raskin. 44 pp. Nat'l Science Teachers Assoc., Washington, D. C., 1959. Paperbound \$1.00.

PROGRESS IN METAL PHYSICS, Vol. 7. Edited by Bruce Chalmers and R. King. 408 pp. Pergamon Press, London & New York, 1958. \$16.00.