ATOMIC PHYSICS

An Outline of Atomic Physics. By O. H. BLACKWOOD, E. HUTCHISSON, T. H. OSGOOD, A. E. RUARK, W. N. ST. PETER, G. A. SCOTT, A. G. WORTHING; second edition, pages ix + 414, John Wiley and Sons, Inc., New York; Chapman and Hall, Ltd., London, 1937.

THIS volume, written by the members of the physics staff of the University of Pittsburgh, is designed as a text-book for those students who have completed one year of college physics and who, although desiring more knowledge of the subject, do not intend to specialize in it. The authors endeavor to acquaint the student with those branches of physics in which active progress is being made to-day, and to provide, at the same time, sufficient background to enable him to appreciate the significance of the more recent discoveries.

After a discussion of the atomic nature of matter and electricity, black-body radiation and the photoelectric effect are described to show the atomic nature of radiation. Then follow chapters dealing with the structure of atoms and molecules and their spectra. In this section there is attempted a reconciliation, or rather fusion, of the wave-like and corpuscular properties of matter and radiation by means of an introduction to wave mechanics and a discussion of the uncertainty principle. Although there are a number of points which might be criticized in this section, the degree of sophistication adopted is consistent with the remainder of the book, and is a very useful one.

There follow two chapters on nuclear physics, the first of which describes the natural radioactive elements and the properties of their radiations. The second chapter, which has been added in the second edition, contains an account of the discovery and properties of the neutron and the positive electron, the methods of producing charged particles of high energy and a survey of the artificial transmutations effected with them. Unfortunately, the chapter was written too soon to include any discussion of the concept of a compound nucleus, and no hint is given as to the origin of nuclear forces. Included also in this chapter are about twenty pages devoted to cosmic radiation. Here again the fact that the text antedates the discovery of heavy electrons somewhat mars the usefulness of the section.

The book is concluded by chapters on the theory of relativity and a long and very interesting survey of astrophysics. It is regrettable that physicists as a whole do not pay more attention to this important and fruitful field. The inclusion of it in this book is to be much commended. A surprisingly large amount of material is covered in this volume in a simple and straightforward manner. The style is remarkably uniform, considering the number of authors collaborating. The book should well serve the most useful function for which it was designed.

C. G. MONTGOMERY

BARTOL RESEARCH FOUNDATION OF THE FRANKLIN INSTITUTE, SWARTHMORE, PA.

THE MATHEMATICAL THEORY OF ELECTRICITY

Lectures on the Mathematical Theory of Electricity. By F. B. PIDDUCK. Oxford, The Clarendon Press, 1937. viii + 110 pp. $3.25.

THIS book is a series of fragmentary notes of a course of lectures which were themselves designed to supplement systematic reading by the student. It was evidently the author's chief aim to present in these lectures examples illustrating the application of certain formulae and methods of the theory to the solution of specific problems. Thus such problems as electrostatic shielding by plane and cylindrical grids, the space charge effect in thermionic vacuum tubes, the Aston mass spectrograph, the triod oscillator and the propagation of electromagnetic waves along wires are treated in adequate detail.

The book is of secondary value to an institutional reference library and may contain suggestive material useful to a teacher of the subject.

S. L. QUIMBY

COLUMBIA UNIVERSITY

STUDIES ON PTERIDOPHYTES

Manual of Pteridology. Edited by FR. VERDOORN. 640 pp., with 121 figures. Martinus Nijhoff, The Hague, 1938. Price, 24 guilders.

ACCORDING to its editor, "This book is primarily, but by no means exclusively, designed for the taxonomist who is anxious to improve his methods and broaden his outlook. At the same time it offers to the general botanist working on the Pteridophytes the necessary fundamental facts about the group, and a survey of the chief results of lines of investigation related to his own. . . . This manual is not, and never could be, an exhaustive monograph, it is rather a collection of essays. The editor has always urged his contributors to give more space to new ideas than to an academic summary of established knowledge. . . ."

The work comprises 23 chapters, covering a wide range of topics, some in English and some in German, written by the leading authorities on Pteridophytes. These essays furnish valuable summaries of the literature and discussions of the present state of our knowledge in the respective fields. Controversial subjects like the nature of the base of *Isoetes,* the tactic movements of spermatozoids and the phylogenetic relations between Bryophytes and Pteridophytes receive full and fair treatment. Especially noteworthy is a new classification of the *Filicinae* put forward by Christensen, on the basis of recent work on morphology.

Editing has been carefully done, and few misprints have escaped correction. Ample illustrations are included, and the printing and binding of the book are of high quality. Every institution where botanical research is carried on will need a copy in its library.

EDGAR T. WHERRY