

many other theories of plane (that is, two-dimensional) flow, even of inviscid, and even more of plane viscous flow. One has very serious doubts as to whether the methods advocated in this book for aiding the solution of real flow problems are, or even will be, in use to anything but a negligible extent.

Nevertheless, this is a fascinating book. The author has indefatigably applied and extended his central idea—namely, the determination, Cauchy-like, of the value of a function in an infinite strip given its real part on one boundary and its imaginary part on the other—to almost every conceivable aeronautical application. It requires considerable discernment to disentangle the wheat from the chaff, the mathematics from the pseudo-physics, which is why I would have preferred a frankly mathematical treatise from Dr. Woods; but the effort is always worth while, and I, for one, am more than grateful for this addition to my shelves.

B. THWAITES

AN INTRODUCTION TO THE ATOM

Modern Atomic and Nuclear Physics

By C. Sharp Cook. (University Physics Series.) Pp. x+296. (Princeton, N.J.: D. Van Nostrand Company, Inc.; London: D. Van Nostrand Company, Ltd., 1961.) 58s. 6d.

THIS interesting book, the fifth in Van Nostrand's *University Physics Series*, is intended, we are told in the preface, "for the college or university student who has completed at least one year of classical physics and mathematics through calculus". It attempts to present in a relatively compact book a wide coverage of atomic and nuclear physics.

For the most part it succeeds in giving a clear and up-to-date account of the subject, beginning with gas-kinetic theory, properties of the electron and proceeding by the wave-particle dualism, the Bohr theory and elementary quantum theory to atomic structure and spectra. The coupling of angular momenta of atomic electrons is especially well described. There follows a brief but illuminating introduction to the theory of molecular structure. Solid-state physics and the emission of electrons from solids are described very briefly. The four final chapters deal with nuclear properties, nuclear reactions and elementary particle physics. It is refreshing to find an introductory book on this subject which leads up to the concepts of isotopic spin and strangeness. The only significant omissions are the methods of production and detection of nuclear particles.

However, the inevitable consequence of such coverage is that basic ideas are lost and the reader is forced to be content with much that is empirical. Relativistic mechanics is dealt with in less than eight pages in which we learn little more than the rules of the Lorentz transformation. The book aims to provide "at least a speaking acquaintance with the atom". It is difficult to see what value this has in a physics course in Britain, where emphasis is placed on basic understanding of the subject rather than superficial acquaintance with it. Perhaps it is best recommended as background reading for sixth formers.

The book is marred by a looseness of style and expression, with sometimes unnecessary repetition. Some details should be amended: the mathematical background assumed is sufficient to avoid the use

of the Joule classification in the treatment of gas-kinetic theory; a well-known law is incorrectly attributed on page 27; the force on a moving charge is deduced from the force on a current-carrying wire—surely a tautology.

There are 23 pages of problems in the 280 pages of text, and these are probably of little value unless the book is studied in a class. The references given at the end of each chapter are excellent and the keen student will be wise to follow them up.

This is a stimulating and readable book, well illustrated and with clear typography. The subject is presented in an interesting manner, but it is a pity that the author has sacrificed the thorough development which is perhaps more essential in physics than in other sciences.

G. DEARNALEY

ECONOMIC MALACOLGY

The Giant African Snail

A Problem in Economic Malacology. By Albert R. Mead. Pp. xvii+257. (Chicago and London: University of Chicago Press, 1961.) 7.50 dollars; 60s.

STARTING on what may well eventually prove to be a world-wide journey, the giant snail of East Africa, *Achatina fulica*, appears to have reached Madagascar and then Mauritius about the beginning of the last century. From the latter it was carried, presumably by accident, to the Seychelles, but quite deliberately into India by a conchologist, W. H. Benson, who released specimens near Calcutta in 1848. Separate entry from Mauritius took the snail to Ceylon at the beginning of this century and this proved a stepping stone to Malaya and Indonesia. Before the Second World War it had reached the Far East from south China to Japan and had been deliberately introduced into Hawaii and the islands of Micronesia. During the War the Japanese carried it still further.

This was no inconspicuous incomer, unrecognized until too numerous to combat, but a creature worthy of its name, the largest individuals reaching almost 1 ft. when fully extended. With the sole exception of Japan, where winter cold was possibly the deciding factor, attempts at extermination have everywhere failed before reproductive powers potentially capable of producing in three years eight billions (American) from a single gravid snail. In Java more than two million snails and half a million of their eggs were collected by hand in a few weeks.

Dr. Mead has produced a fascinating book of the widest biological interest. He has studied these snails in Africa, Asia and on many Pacific islands. He has also digested relevant information from nearly 900 listed references. He may fairly claim to have succeeded in his declared attempt to produce the first major work on economic malacology. His chapters cover dispersal, economic status, chemical, mechanical and biological control (with enemies ranging from predacious snails to beetle larvæ, giant toads and even hermit crabs) as well as control by human use and legislative action. The problem might be solved if the vast quantities of mucus-encumbered animal protein could be suitably utilized. Dr. Mead comes finally to an interesting consideration of population decline, most probably the result of disease. Taken at the right time, this appears to offer the best hope, if not of extinction, at least of permanent control.

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