

are followed by a detailed treatment of non-paraxial rays and aberrations, and of the simpler optical instruments. The full and critical discussion of colour and colorimetry and the two chapters on interference in thin films and in thick plates are good and up to date, as chronicles of progress. But it seems strange to find, in a book of this level, accounts of line spectra and photoelectricity that do not mention quanta or photons; a brief mention of the electromagnetic theory in the last chapter so that polarization by reflexion can be explained in terms of the Fresnel equations (quoted); and nearly everything that Michelson is known for except the Michelson-Morley experiment. It is almost as if the book had been censored; in which case a titillating phrase about the special theory of relativity on p. 35 has been missed.

One must of course be reasonable. The author has had to decide where and when in this monumental series he will introduce a given topic, and its very scale must lead to an almost ruthless compartmentalizing and some very difficult decisions. One thing has to be done thoroughly at a time, and the student who has worked through the text of this volume will have gained a very thorough grounding in optics. He should certainly never find himself at sea; so that this compartment really need not have been quite so watertight.

Thermodynamics

By Gordon J. Van Wylene. Pp. xxiii+567. (New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1959.) 64s. net.

PROF. VAN WYLEN'S book is directed to the engineer, and here the comparison would probably be with Roberts and Miller, or with Zemansky. The idea of temperature and the zeroth law of thermodynamics, and the properties of pure substances, are first discussed; entropy is treated as an important and exchangeable physical property of a system; and the concept of irreversibility is thoroughly explored. Practical power and refrigeration cycles, and the operation of turbines, are explained, with many examples. The interesting thing here is the emphasis on general principles and their applications to the real world; the older outlook was perhaps centred on the ideal gas and the reversible cycle and a mathematician's entropy that started as a perfect differential and ended up as the logarithm of a probability. Some of the revered conventional textbook material cannot be found here at all, and some is mentioned only briefly; this has made for a clearer and more attractive presentation of the macroscopic point of view.

G. R. NOAKES

Modern Physics

By Prof. H. A. Wilson. Fourth edition. (The Student's Physics.) Pp. xv+473. (London and Glasgow: Blackie and Son, Ltd., 1959.) 40s. net.

THERE must always be some doubt about the length of time for which a text-book should be kept alive. The first edition of this book was published in 1928, and it was then up to date and authoritative; now it is sadly behind the times. The author is, of course, an authority on the theoretical aspects of the physics he treats, but he does not seem to be

at home in the new sections on semi-conductors (6 pp.), low-temperature physics (11 pp.), and elementary particles (2 pp.). Some of the chapters such as that on X-ray crystallography look old-fashioned, and it is surprising to find a topic such as the *J* phenomenon still included.

The trouble is that a text-book cannot be kept up to date merely by adding sections "here and there" (the phrase used in the dust cover); there must be pruning and re-distribution as well. The author has sadly failed to live up to the title of "Modern Physics".

H. LIPSON

Methods of Experimental Physics

Vol. 1: Classical Methods. Edited by Immanuel Estermann. Pp. xii+596. (New York: Academic Press, Inc.; London: Academic Press, Inc. (London), Ltd., 1959.) 12.80 dollars.

THE series of volumes of which this is the first covers the whole field of experimental physics, and the term "Classical Methods" is explained in the preface as meaning the kind of experiment that is associated with the conventional subdivisions of macroscopic physics. It deals with the evaluation of measurements; the definitions of fundamental units and the determination of 'best values' of the fundamental constants; the mechanics of solids, of fluids, and of vibrations; heat and thermodynamics; optics; electricity; and magnetism. The authors, while working as a team and preserving a uniformity of style, have enjoyed considerable latitude in treatment; some, as P. M. Marcus on thermodynamics, have gone fairly deeply into the underlying theory; others, as J. R. Holms and G. L. Weissler on optics, have concentrated on a full discussion of experimental details. The result is a concise summary of modern techniques, which is in many places a good deal more readable than the usual kind of reference book. It is intended for the physicist who needs a concise and critical guide on matters outside his own special field, and should prove useful for this purpose.

G. R. NOAKES

Nuclear Reactor Materials

By Dr. B. R. T. Frost and Dr. W. B. Waldron. (Nuclear Engineering Monographs.) Pp. vii+79. (London: Temple Press, Ltd., 1959.) 12s. 6d. net.

THIS monograph is one of a very useful series dealing with the physics and engineering of nuclear reactors. It is intended for the use of university and technical college students, research assistants and qualified technicians who require a broad understanding of those topics of nuclear engineering outside their own particular field of study. Previous volumes in the series have dealt with basic nuclear physics, reactor theory, heat transfer, shielding, and reactor control and instrumentation. The present volume gives an excellent outline of the special physical and mechanical properties required of the structural and fuel materials used in reactors and of the recent metallurgical developments in order to provide these materials. The monograph is based on a series of lectures which was given by members of the staff of the Metallurgy Division, Atomic Energy Research Establishment, Harwell, to students in the Department of Nuclear Engineering, Queen Mary College, London, and both the authors are members of the staff of the Division.