possibility of growing algae on human wastes and using them as food is being considered. In the article on combustion and flames account is taken of high temperatures, and it is emphasized that much information about the properties of substances is still required. As for detonation phenomena, it is said that the old Chapman–Jouguet theory remains a satisfactory approach but in spite of much recent research very much remains to be done. The volume is one which physical chemists will welcome.

J. R. Partington

A Guidebook to Mechanism in Organic Chemistry

By Dr. Peter Sykes. Pp. xiii+247. (London: Longmans Green and Co., Ltd., 1961.) 21*s*. net.

THE teaching of organic chemistry has been undergoing a revolution, and this excellent paper-backed guide-book reflects the way in which a synthesis between the experimental, factual approach essential to organic chemistry and the application of electronic theories to bring an understanding of the mechanism of reactions involving carbon compounds is being achieved at Cambridge. Much experience of lecturing and supervising undergraduates has tempered this lucid exposition of the essentials of the subject. The author has had in mind the needs of the scholarship candidate, undergraduate, technical college student and professional chemist of classical upbringing. He is rather optimistic about the sixth-form boy who will not have the necessary background of atomic and molecular orbital theory, but undoubtedly there is much here to stimulate and excite the intellectual curiosity of the more able boy.

After a brief description of valency theory in relation to organic compounds, reactivity is discussed in terms of relative electron density and the operation of steric factors. The energy changes associated with reactions and the principles underlying the investigation of their mechanism are clearly explained. The relative strengths of organic acids and bases are considered at length in terms of electronic theory and separate chapters are devoted to each of the more important types of organic reaction in such a way as to make this a most useful reference work. In addition, the printers of this most attractive book have produced (to quote the author), "that rare phenomenon, structural formulæ that are both clear and æsthetically satisfying".

B. J. Moody

Introduction to Mechanics, Matter and Waves

By Prof. Uno Ingard and Prof. William L. Kraushaar. Pp. xv+672. (Reading, Mass., and London : Addison-Wesley Publishing Company, Inc., 1960.) 53*s*.

IN general the standard of this work, which deals with the mechanics of solids and fluids, heat and wave motion is that of the first year of an honours-degree course in physics. There is, unfortunately, a lack of balance in that two-thirds of the book is devoted to mechanics with the inevitable consequence that the remaining two topics are highly condensed and, indeed, the section on heat suffers also from an incompleteness of presentation. While applauding the determination of the authors to bring out the experimental aspects of mechanics, it seems likely that the student who possesses the knowledge of calculus and vector algebra which is required later will find the earlier discussion of force, motion and momentum frustrating, and that his interests would be better served by the omission of the more elementary illustrations in favour of an extended discussion of heat and wave motion. This apart, the treatment of mechanics is excellent, and the basic concepts of energy, and of both linear and angular momentum, are illustrated by numerous examples which range from the motion of projectiles and oscillating bodies to planetary orbits and spinning symmetrical bodies.

In the section devoted to heat the macroscopic and microscopic points of view of thermodynamics have been dovetailed into a united whole, but this commendable approach has been marred by omissions, such as the failure to present the modern definition of the absolute scale of temperature and by several errors, particularly in connexion with specific heats and with relationships involving the laws of thermodynamics. The final three chapters comprise a study of wave pulses in solids and gases, and include a treatment of both progressive and standing waves.

H. Steeple

Microwave Ferrites

By Dr. P. J. B. Clarricoats. Pp. xi+260. (London: Chapman and Hall, Ltd., 1961.) 50*s*. net.

THE class of non-reciprocal microwave components which has emerged as a result of the use of magnetized ferrites has given the microwave circuit designer a new degree of freedom. Even a casual perusal of recent literature on microwave work will indicate the impact which these devices have already made, and Dr. Clarricoats's book on the subject is valuable and timely.

The subject-matter of the book includes three main topics: ferrite materials, ferrite-loaded waveguides, and ferrite components. After a brief introductory chapter, the second is mainly devoted to the structure and fundamental magnetic properties of ferrites. In the third chapter an account of the microwave properties of ferrites is given, and the fourth chapter gives a more detailed account of the loss mechanism on a physical basis, rather than phenomenologically as in the third chapter.

Chapter 5, which represents more than a third of the book, deals clearly with the very complicated problems associated with the propagation of electromagnetic waves in ferrite-loaded waveguides. Although this chapter is primarily an account of the fundamental theory, to which Dr. Clarricoats has himself made some important contributions, it is written with applications in mind, and for this reason will be particularly useful to the microwave engineer.

A final chapter gives a useful review of various non-reciprocal microwave ferrite components. In such a rapidly developing field, any review is inevitably a little out of date by the time it is published, but examples of most of the important devices developed by the end of 1959 are included. The chapter forms a very useful introduction to the extensive literature on the subject.

The book is warmly recommended as a valuable addition to the literature of microwaves.

A. L. Cullen

Elements of Modern Physics

A Course in those aspects of Modern Physics that underline important Engineering Developments. By Paul L. Copeland and William E. Bennett. Pp. x+507. (New York and London: Oxford University Press, 1961.) 68*s*. net.

THE publication of a volume such as this is sure evidence of the tremendous and rapid growth of atomic physics since the days of J. J. Thomson and Prof. E. Rutherford, and as the results of the more