

The book will be of some value to everyone interested in cell fine structure, providing a timely review of some important topics for those with a particular interest in the organization of the nucleus and allowing others with a more general interest to keep in touch with the views of the leading workers in the field.

COLIN R. HOPKINS

COORDINATION CHEMISTRY

An Introduction to Coordination Chemistry

By D. P. Graddon. Second edition. (International Series of Monographs in Inorganic Chemistry, Vol. 3.) Pp. vii + 164. (Pergamon: Oxford, London and New York, 1968.) 42s 6d.

THE first edition of this book was published in 1961, and the demand for a second edition is a sign of its value. It is a straightforward account, with very few frills, of an increasingly important field of chemistry. The present edition is about fifty per cent longer than the earlier one. It gains by this, because rather more attention can be given to the historical development of the subject and to the stereochemistry of the transition metals. New, and useful, material has been added in the description of electronic absorption spectra, and there are more tables of stability constants and oxidation potentials.

The author is clearly most at home when describing experimental results. He is less sure about their theoretical explanation. A few errors still remain (for example, neither the d_{z^2} or d_{xy}^2 subgroups are spherically symmetrical, as stated on page 39; and in ferrocene (page 134) there is no Σ -orbital that can be made up out of atomic π -orbitals). In this aspect Orgel's book is still the better. But these are minor blemishes, and the new edition can be recommended to those who want a clear experimentally based account of this highly important and exciting field of modern chemistry. The presentation is very clear, and the printing is an improvement on that of the first edition.

C. A. COULSON

ORGANIC MOLECULES

Properties and Reactions of Bonds in Organic Molecules
By K. F. Reid. Pp. xiii + 556. (Longmans: London, 1968.) 60s.

Molecular Orbital Theories of Bonding in Organic Molecules

By Robert L. Flurry, jun. (Applied Quantum Chemistry Series.) Pp. x + 334. (Arnold: London and New York, 1968.) 160s.

AN interesting feature of the publishing scene in recent years has been the very considerable increase in the number of relatively elementary organic chemistry texts that have been produced, so that books are now available to supplement almost any kind of approach that a teacher may care to use. It is equally interesting that the majority of these texts have come from the United States, so much so that it has been all but impossible in the past few years to recommend to students at this level any text of United Kingdom origin; this makes K. F. Reid's book, designed for part 1 degree courses, particularly welcome.

The general construction and arrangement of the book are admirable; the detailed discussion of the behaviour of organic compounds is preceded by a very thorough theoretical introduction (230 pages) covering atomic structures, dimensions and electronegativities, bonding, stereoisomerism, electronic movements in molecules and ions, physical properties (including nuclear magnetic resonance, infrared and electronic absorption spectra), general principles of organic reaction mechanisms (71

pages), and mass spectra. The arrangement of the detailed discussion of organic compounds is also to be applauded in that there is no specific separation into aliphatic and aromatic, acids and their derivatives are treated as variant carbonyl compounds, there is a chapter on compounds containing sulphur, also a brief one on heterocyclic compounds and an interesting final chapter on intramolecular group interactions. The way the material is arranged, principally according to reaction type, under each of the chapter headings is also much to be commended. For all this, and for seeking to relate the properties of compounds to the types of bonds present in them, one can have nothing but praise; it is only when one comes to some of the detailed arguments and explanations offered in interpreting the behaviour of individual organic compounds that enthusiasm may begin to wane a little; for here the treatment does not always quite live up to what has gone before.

The text is fairly neatly set out, but the structural formulae are not always as good as they might be, and curly arrows go awry in a number of places. In its general order, structure and arrangement this book is absolutely first rate; a good deal of the detailed explanatory matter is also of high standard. Unfortunately, the working out, page by page, of the author's ideas does not quite live up to the excellence of his overall conception. The book should, nevertheless, be looked at closely by anyone engaged in teaching organic chemistry at this level.

The element of theory that has proved most fruitful in recent times in interpreting the structure and properties of organic compounds has almost certainly been that of molecular orbitals. Despite its avowed success and utility, most organic chemists have remained rather chary about using molecular orbital theory in other than the broadest qualitative contexts: R. L. Flurry's book is designed to assist them in doing rather more than that. It seeks to provide a conceptual understanding of the principles of chemical bonding as explained by molecular orbital theory, and then goes on to establish a working knowledge of the methods most commonly used in carrying out semi-empirical molecular orbital calculations on the normal range of organic molecules. The author's approach breaks away to some extent from a purely rigorous and formal treatment, and this, coupled with his emphasis on the actual use of working methods, will recommend the book to many organic chemists. The author suggests that the text can be used by undergraduates as well as by graduate students, but I feel that most of the former are going to find parts of it difficult going. PETER SYKES

POWDER TECHNOLOGY

The Packing of Solid Particles

By W. A. Gray. Pp. 134. (Chapman and Hall: London, June 1968.) 35s.

THIS book can be recommended to all in the field of powder technology. It is doubtful whether the appeal will extend to the wider audience who could use the principles involved but are unaware of the scope of powder technology.

The author has attempted to provide a critical review of the information available on packing and leaves the reader to infer that which is not. As the majority of the text is concerned with published work on close packing in ideal systems and only ten pages are devoted to industrial applications, the reader may be disposed to draw the erroneous conclusion that it has limited practical application. The opportunity of directing attention to the qualitative results which have been obtained on real systems has been missed.

Although the literature has been competently summarized, there is little constructive criticism. We read that a vacuum of 70 to 75 cm Hg assisted White and