

BOOK REVIEWS

SYMMETRY AND PARTICLES

Symmetry Principles and Fundamental Particles

Prepared and edited by Center for Theoretical Studies, University of Miami, Coral Gables, Florida. (NATO International Advances Study Institute, Istanbul, Turkey, August 1-19, 1966.) Pp. 531. (San Francisco and London: W. H. Freeman and Company, 1967.) 94s.

THIS volume contains the lectures presented at the summer school held in Istanbul during August 1966. As the title implies, the school concentrated on the application of group theory to elementary particle physics, and, taking a basic knowledge of group theory for granted, covered the main fields of activity which were popular at that time. The organizers certainly succeeded in assembling a remarkable collection of people who are well known both for their contributions to the subject and for their expertise at communicating ideas to a wider audience.

The first chapter deals with non-compact groups and dynamical applications. Coleman reviews the fundamental difficulties which have been encountered in non-trivial combinations of space time groups with internal symmetries. This clearly expressed nihilism is nicely balanced by an optimistic contribution from Fronsdal. Among other contributions there are lectures from Nambu describing the early attempts to obtain a mass formula from an infinite component field equation. This is an activity which has developed considerably in both the positive and negative sense since these courses were given.

The second chapter is devoted to quark models. High energy scattering is discussed by Van Hove, and there are also lectures on this approach to the hadron mass spectrum by Scheck and Sinanoglu.

The last main chapter is on current algebra and weak interactions, and includes courses from Fubini, Glashow and a further contribution from Nambu. The book concludes with reviews by Robinson and Olive on the more mathematical aspects of broken symmetries and S-matrix theory, respectively.

The editors, Behram Kursunoglu and Arnold Perlmutter, say that they hoped at one time that these lectures would comprise a reasonably complete text on this branch of the subject. They realize themselves that this has not been achieved. Even so, the book should be of value particularly to research students working in this field.

P. T. MATTHEWS

RARE PLATINUM METALS

Chemistry of the Rarer Platinum Metals

(Os, Ru, Ir and Rh.) By W. P. Griffiths. (Interscience Monographs on Chemistry.) Pp. ix+491. (London and New York: Interscience Publishers, a Division of John Wiley and Sons, 1967.) 120s.

THIS book presents a detailed treatment of the chemistry of the platinum metals other than palladium and platinum. Apart from the comprehensive work of Gmelin (in German) and Pascal (in French), both of whom are rather uncritical in their approach, there has been little available in the way of a detailed survey of the compounds of these fascinating metals. In English, the most exhaustive sources have been Sidgwick's two volume text (1950) and some older works. In the popular undergraduate textbook on inorganic chemistry by Cotton and Wilkinson, only

some thirty pages could be devoted to these four metals. There has therefore been a sore need for a work of reference in English, incorporating modern views on the chemistry of the less common platinum metals. This book fills the gap extremely well. Those research groups concerned with the chemistry of the platinum metals, and in particular with the four elements dealt with in this new book, will find it indispensable.

The six chapters comprise a short introduction, followed by a general comparative survey of the four metals (this could be very useful for undergraduates); the detailed treatment of each element is then given in the order osmium (83 pages), ruthenium (100 pages), iridium (85 pages) and rhodium (117 pages). Within each chapter, the co-ordination chemistry is discussed according to the ligand (groups VII, VI, V and IV, in that order). The literature is thoroughly covered up to the end of 1966; recent work is well represented. For example, complexes of molecular nitrogen, stannous chloride and the hydride ion are all described in detail.

The treatment is modern and highly physical: the significance of measurements of electronic, vibrational and resonance spectra and of other physical properties is clearly pointed out. The results of bond length studies are summarized, and the electronic factors responsible for polarographic and other behaviours are discussed. A good deal of kinetic and thermodynamic information is presented, and one of the many pleasing features of the book is that there are a large number of valuable tables. These are assembled at the end of each chapter (seventeen on osmium, twelve on ruthenium, thirteen on iridium and eight on rhodium) and collect information on the existence and physical properties (such as magnetic and polarographic data) of compounds of the particular metal.

This is a genuine work of reference, being extremely well indexed (author, subject and formula indexes total 50 pages) and cross referenced. The literature is indeed exhaustively covered. It is quite clear from this book that there are only a few fields in the chemistry of these metals which can be said to be well understood. The very critical approach will be useful in delineating areas for further research. The author has not been afraid occasionally to speculate in order to stimulate. There are a few trifling mistakes and some loose statements, which arise largely from the compression of a large amount of information into a small volume. The book is written in an attractive style; there are some very felicitous passages which remind us that platinum metal chemistry has a long and remarkable history.

It is a pleasant duty to be able to report with conviction that any new book is designed to meet an urgent need, and achieves its object. This is true of Dr Griffiths' fine study and inorganic chemists have reason to be grateful to him.

R. D. GILLARD

ANALYSING GAS EFFLUENT

Gas Effluent Analysis

Edited by William Lodding. (Thermal Analysis Series, Vol. 1.) Pp. xi+220. (London: Edward Arnold (Publishers), Ltd.; New York: Marcel Dekker, Inc., 1967.) 95s. net.

THE title of this publication did not convey to me a very clear idea of the contents. Fortunately, in the preface, gas effluent analysis is defined as being the detection and identification of gases evolved by substances when heated. This covers not only gas evolution as a consequence of chemical reaction or thermal decomposition, but also desorption phenomena.

A number of authors have contributed individual chapters concerned with a simple treatment of a theory of gas evolution from solids and a description of suitable heating and detecting devices such as the gas density,