

persons whose education was not scientific, or whose technical training was received when nuclear physics was an abstruse speciality, now find themselves compelled to understand and use a great number of terms which are defined in this volume. A work of this kind should therefore be clear, comprehensive and accurate, and should confine itself to its own subject. There do not appear to be many omissions in the fields of physics and engineering, though *nuclide* and *thermal column*, for example, are missing; I have the impression that the chemical and biological sciences are not so well covered. The standard of writing varies very greatly. The majority of the entries are well expressed and, considering the limits imposed by brevity and simplicity, are not misleading. Some parts, however, sink far below the standard required in a work of any scientific pretensions. Thus, the most important portion of the description of Geiger-Müller counters runs as follows: "The modern version of this counter is an oblong box with headphones attached to it. When a fast alpha or beta particle enters the apparatus, it produces ions in the gas contained in it, and ions cause a loud tick to be heard in the headphone; the ticks are counted automatically by a mechanical device. A modern Geiger-Müller counter can count several hundred thousand particles per minute." It is a pity that such careful work should be marred by such lapses.

The standard of accuracy is not as high as one has a right to expect; nine misprints or errors were found in fifty entries which had been selected more or less at random. Most of the information is creditably up to date; but it is not always as authentic as possible. For example, Seaborg and Perlman's Table of Isotopes (*Rev. Mod. Phys.*, 20, 585; 1948) is not mentioned, and the properties of the radioactive nuclei are quoted from a medical text-book. In a future work of this type, in which a really authoritative treatment is plainly impossible, it would probably be worth while to give references, wherever possible, to standard text-books or to review articles. At present a reader who wishes to inquire further has no idea where to begin.

The price of this volume is almost prohibitively high for the 'sterling' reader. It must therefore be regretted that so much space is devoted to duplicating information which can be found in any chemical dictionary. In so rapidly changing a field, and one in which the latest developments are of interest to a larger public, a smaller book, more easily renewed, would have been preferable.

W. J. WHITEHOUSE

PRESENTATION OF INORGANIC CHEMISTRY

The Chemical Elements and their Compounds

By N. V. Sidgwick. Vol. 1. Pp. xxxii+854. Vol. 2. Pp. vi+855-1704. (Oxford: Clarendon Press; London: Oxford University Press, 1950.) 70s. net.

THE presentation of inorganic chemistry to the undergraduate and research worker raises problems of peculiar difficulty, for the mass of factual detail which has accumulated tends to obscure the general principles which are gradually emerging. At the same time a certain amount of detail is inevitable, if only by way of illustration of principles. Prof. N. V. Sidgwick has approached this problem by

omitting almost completely mineralogy, metallurgy and technical and analytical chemistry. With this simplification, the elements are then dealt with in turn on the basis of the Periodic Table, those of Groups I-V in the first volume and the remainder in the second volume. Some of the elements, such as boron, phosphorus and a number of the metals, are treated individually; but certain groups of closely related elements, such as arsenic, antimony and bismuth, or the halogens, are taken together. This has enabled special emphasis to be placed on comparative chemistry and the variations in properties within the groups. Problems of interest in connexion with valency and structure are brought well to the fore, as are the many instances where further investigation is needed. The author has succeeded completely in his aim of emphasizing principles: the remarkable thing is that he has also included a tremendous amount of interesting descriptive chemistry without at any point overburdening the text with detail. The treatment of carbon is particularly valuable, for not only has it taken its place as a normal element, but also a good deal of space is devoted throughout the book to organic derivatives.

Numerous references are given and their arrangement at the foot of each page is very convenient. The literature survey has been completed up to the summer of 1948. Only in the case of a few topics, such, for example, as the chemistry of the transuranic elements and the use of lithium aluminium hydride, where recent progress has been unusually rapid, are there significant omissions. The index is good, though it would have been more convenient had it been printed in full at the end of each volume, instead of in the second only.

Criticism of the author's choice of material can only be a matter of personal opinion. Some readers may, however, regret that so little reference is made to the experimental aspects of inorganic chemistry. One finds very frequently, especially among undergraduates, a more or less adequate knowledge of facts and theories, but a complete ignorance of how any but the most elementary experiments are done. Another point on which comment is perhaps justified is the very slight emphasis which is placed on physicochemical aspects of the subject, such as the significance of oxidation-reduction potentials and equilibrium data. Structural inorganic chemistry is also given little prominence, but one feels here that the author may have expected the reader to have available A. F. Wells's excellent book on this subject, which was published in 1945 by the Oxford University Press.

The book reflects accurately Prof. Sidgwick's lifelong interest in chemistry as a whole. For undertaking this task and bringing it to so satisfactory a conclusion he deserves the particular gratitude of those who teach inorganic chemistry. The subject has long needed pruning, so as to separate much of the accumulated information which belongs properly to reference books, and reveal the underlying principles and the lines along which progress can be made. Few are better qualified to do this than the author: probably no one else could have produced in the process a book which, from cover to cover, is so readable. It is certain to be widely used by undergraduates, teachers and research workers, and to stimulate an interest which will lead to a more rapid advance in the correlation and interpretation of the facts of inorganic chemistry. H. J. EMELÉUS