Book Reviews

SELECT METHODS OF METALLURGICAL ANALYSIS. By W. A. NAISH, Ph.D., A.R.S.M., B.Sc., F.R.I.C., J. E. CLENNELL, B.Sc., Assoc.Inst.M.M., and V. S. KINGSWOOD, M.Sc., B.Sc., F.I.M. Second Edition. Pp. xii + 660. London: Chapman & Hall Ltd. 1953. Price 75s.

The subject-matter in this book is divided into six parts. In the first part, sampling techniques and methods of taking materials into solution are covered. Some attention is also given to qualitative tests that can be applied when a preliminary examination of an unknown material is required. Part 2 deals with selected methods for the analysis of individual elements, and Part 3 covers the analysis of many non-ferrous metals and alloys, iron, steels and ferro-alloys. In Parts 4 and 5 the analysis of ores, slags, refractory materials and coal and coke is included, and modern physicochemical methods of analysis are discussed in Part 6.

An immense amount of information is contained in this book, but in certain parts very little reference is made to recent work. This criticism does not apply to some of the minor sections, which have been written by specialists. For example, in the treatment of zirconium in Part 2, no mention is made of the organic acids now widely used in the separation and determination of this element; yet in the section on the analysis of refractory materials in Part 5, reference is made to the use of mandelic acid for the determination of zirconium. This kind of discrepancy arises because several authors have contributed to the subject-matter. For the same reason the book is rather disjointed in parts.

It is disappointing that physicochemical methods of analysis should have been treated separately in the last part of the book. This kind of treatment often gives the impression that these newer techniques have still not been established and are not widely used. In fact, many laboratories nowadays possess equipment for physicochemical determinations and apply it widely to analytical work. It is noted with some satisfaction, however, that in the section on the analysis of aluminium alloys the specialist author was fully conversant with the modern techniques and is prepared to recommend methods in which these techniques are used. On the whole, however, reference to physicochemical methods has been avoided and most of the descriptive matter in the book deals with classical methods of analysis. In some of these methods important details are unfortunately missing—for example, volumes of reagents are sometimes omitted and strengths of acids occasionally confused. In spite of these shortcomings, some analysts will find plenty of useful information in this book.

G. W. C. MILNER

* Obtainable from H.M. Stationery Office, York House, Kingsway, W.C.2, or from any bookseller (price 1s. 0d. plus postage).

THE VITAMINS: CHEMISTRY, PHYSIOLOGY, PATHOLOGY. Volume I. Edited by W. H. SEBRELL, jun., and R. S. HARRIS. Pp. xiv + 676. New York: Academic Press Inc.; London: Academic Books Ltd. 1954. Price $16.50; 132s.

This is the first of three volumes in which it is intended to provide a comprehensive survey of the chemistry and physiology of all the known vitamins together with a less detailed account of their methods of assay and occurrence and of the effects of vitamin deficiency. The vitamins are arranged in alphabetical order, volume I covering vitamins A and carotenes, ascorbic acid, vitamin B_{12} and biotin. Each chapter comprises about a dozen sections in which the different aspects of the subject are discussed by experts in the particular field, many of them the research workers responsible for the original discoveries. In many instances two or more sections of a chapter are covered by the same author and in others one author has been responsible for equivalent sections in different chapters; but in no instance has a complete chapter been written by one contributor. The book has therefore been compiled entirely by specialists.

Analysts will naturally turn first to the sections on methods of assay. Although the methods are explicitly stated to be discussed only briefly and certainly are not covered with anything like the same detail as are the chemical aspects, for example, the sections are most useful summaries of the methods currently in use. In the chapter on vitamin A, for example, the Carr - Price method and the spectrophotometric method are outlined briefly, and there is a short account of the biological method of assay, although details of the Morton and Stubbs correction for irrelevant absorption have been omitted, the authors merely referring readers to the original papers. At the same time there is a well-documented account of the use of chromatography for purifying samples of vitamin A containing interfering substances.

The section describing methods of estimating ascorbic acid, due to Miss Olliver, is, as one would expect, very competently done. The author emphasises the importance of taking proper precautions in preparing samples for analysis to avoid loss of potency and she also deals with the effect on the assay of various types of interfering substances and methods of removing them. There is again a brief reference to biological methods of estimation. This section will be found particularly helpful to those analysts who have recently come to work in this field and who may not be familiar with the earlier work—going back for over 20 years—that led to the methods now in use.

The section relating to the assay of vitamin B_{12} is naturally still very topical and is particularly opportune in view of the complicated nature of the subject. The authors, Drs. Jukes and Williams, are well known pioneers in the field and are fully qualified to give a critical survey of the chemical and biological methods that have been proposed for determining this group of vitamins. They are at pains to emphasise the advantages and limitations of each of the methods discussed, and anyone wishing to have an up-to-date account could not do better than study this section. It is probable that the last word has not yet been said on the subject of vitamin-B_{12} assays; many of the results reported in the literature may not be as reliable as was once thought, owing to the more recent discovery of other factors that stimulate the test organisms used in the microbiological assays.

The main value of the book under review, even for the analyst, however, is not so much for the specific information it gives about his own field as for its authoritative account of the background of the subject, especially of the chemistry and physiological importance of each vitamin. One of the most fascinating sections of the book is that describing recent work on the structure of the isomers of vitamin A present in fish-liver oils and the way in which these are metabolised in the body. It has not been appreciated until comparatively recently that only one form of vitamin A functions in the rhodopsin system of the eye and that the body must convert the other isomers into the so-called neoretinene *b* (2:4-*cis*-vitamin-A aldehyde) in order that the eye may function properly.

Other sections that will be found of general interest and value are those in which the functions of the vitamins are discussed. It always comes as a surprise to find how little is known of the way in which certain of the older vitamins act. Vitamin C is an outstanding example of such a substance, for, although its powerful reducing properties were recognised long before its structure was known, and it therefore seemed likely that it might act as the coenzyme in a hydrogen-transfer system comparable with the cytochrome system, the precise role of ascorbic acid has not yet been established. By contrast, although our knowledge of the way in which vitamin B_{12} acts is still very incomplete, far more progress has been made with this vitamin in the few years since its discovery than has so far been made with vitamin C, and the book gives a good general account of the role of vitamin B_{12} in methylations *in vivo*.

Although biotin is of perhaps more academic interest than the other three vitamins reviewed in this volume, the chapter on biotin will nevertheless be found to be of considerable general interest, especially the account of the one known case of biotin deficiency in a human resulting from a prolonged diet of wine and raw eggs!

Each of the chapters has a useful section on the occurrence of the vitamin in a wide range of foodstuffs and the effect of canning and various methods of preserving on vitamin contents.

Together with the other two volumes that are to be published, this book will be a work of reference of the greatest importance for those who are concerned in any way with the vitamins. It contains few misprints and is very well printed and bound; it is most unfortunate that its high price will probably put it beyond the reach of the ordinary individual. F. A. ROBINSON