

antioxidants has led to important industrial developments. Physiologists discovered that carbohydrates and fats, especially the former, can preserve the body proteins. This is also a part of the phenomenon of negative catalysis. Similarly carbonaceous substances preserve the soil nitrogenous compounds by acting as negative catalysts in the soil oxidation reactions.

Hence there is a great rush for the discovery of suitable positive and negative catalysts. The discovery that vanadium pentoxide can replace the costly element platinum in the manufacture of sulphuric acid has been a great boon to the sulphuric acid industry. The replacement of platinum in the oxidation of ammonia to nitric acid by air is a big problem for workers on catalytic reactions and if a cheap substitute is discovered it is likely to revolutionise the nitrogen industry. The authors have attempted to bring order in this subject which has developed at a tremendous speed during the last hundred years and they have been successful in presenting the subject systematically. This book will prove useful not only to academic chemists but will be largely utilised by industrial and manufacturing chemists.

N. R. DHAR.

An Introduction to the Chemistry of Cellulose. By J. T. Marsh and F. C. Wood, with foreword by Sir Kenneth Lee. (Chapman & Hall, London), 2nd edition, 1942. Pp. xv + 512. Price 28s.

This new book on the subject of cellulose chemistry has been written by two of the most successful scientific workers in the field of textile chemistry, who have to their credit the distinction of having achieved marked developments on the commercial side also. The subject has been dealt with not only to cover the latest researches in the subject from the point of view of the academician, but also to provide a guide book for the practising technologist, though for the latter, it would have been more useful if some information regarding the nature and types of plant commonly used had also been included. The authors however did not propose to include them as is evident from the title of the book.

The subject-matter has been divided into five distinct parts. In the first part, details have been given of the various types of impure celluloses obtaining in nature, their occurrence, quality, and methods of com-

mercial purification. The general physical properties of cellulose, particularly those having a bearing on moisture absorption, and some optical, electrical, and mechanical properties have been fully discussed. In the second part dealing with the constitution and structure of cellulose, the authors have compiled complete evidence to establish the final chain structure of the cellulose molecule. The molecular weight data obtained by various investigators using diverse physical and chemical methods including some of the latest work involving the use of ultracentrifuge, X-rays, or viscosity studies have been taken into consideration. Allied studies regarding the structure of synthetic fibres such as Vinyon, and Nylon, and of regenerated fibres have been included, along with information regarding the chain structure of molecules in animal fibres such as silk and wool, to establish the final structure of the cellulose molecule by comparison. The important work of Meyer and Mark, and the data obtained in the X-ray examination and swelling studies of celluloses in their relation to establishing the molecular structure of cellulose, have all been fully dealt with. The subject of dispersed cellulose dealing with Neale's Theory, mercerisation using various alkalis and organic bases, dispersion of cellulose using hygroscopic substances—inorganic acids and salts,—dispersion using specific reagents such as cuprammonium hydrate, carbon bisulphide and sodium hydroxide, and chloral, and finally the properties of the dispersed celluloses have been exhaustively considered in part three. The subject has been specially considered not only from the scientific point of view but also from the technological aspect, giving details of manufacturing conditions. Part four deals with the modified celluloses—hydro-cellulose and oxy-cellulose—and their properties. Some of the industrially important cellulose derivatives have been described in part five. The esters of inorganic acids, particularly the cellulose nitrate and its derivative rayon, the organic esters, with special reference to cellulose acetate, mixed esters, ethers, amino-celluloses and finally the most important soda cellulose and cellulose xanthate have all been described giving each the importance it deserves. The book has been nicely concluded with detailed description of the manufacture of viscose and some general considerations about cellulose and its rôle in our daily lives.

Close co-operation between the science and technology of textiles has had already a profound effect on the development of the textile industry and further advances can be ensured only by knitting a closer bond between the two. For persons engaged in industrial production and process control, who do not ordinarily have sufficient time to keep abreast with the theoretical developments in the subject, this book satisfies a real need, giving not only a connected account of the latest developments but also a complete bibliography. For the research worker just entering the field, the book is valuable in enabling him to pick out the important previous investigations without having to wade through the maze of patent specifications and diffused scientific literature.

The authors themselves being successful practising technologists working on the commercial side, details of technical processes given by them should be trustworthy and form a useful guide to the practical man. The book has been well planned and written in a readable style, although the very frequent introduction of references in the middle of sentences leads to rather discontinuous reading. But possibly the extensive literature cited by the authors could not be compiled at the end of chapters without causing other difficulties. It may have been better to insert them in the form of foot-notes in each page, with corresponding reference numbers only in the body of the text.

The X-ray and micro-photographs given in the book are about the best that have been so far published anywhere on the subject.

Although the first edition of the book was published only in 1938, extensive investigations on the subject during the last three years have made it necessary for the authors to bring out the new edition which they have done both justifiably and creditably.

A. N. RAO.

The Chemical Analysis of Ferrous Alloys and Foundry Materials. By E. C. Pigott. (Chapman & Hall, London), 1941. Pp. xv + 362. Price 28sh.

This is an excellent book on the technical chemical analysis of iron and steel and foundry materials. It covers 28 elements including the so-called rarer alloying elements like Beryllium, Boron, Cerium, Selenium, Tellurium, Columbium and Tantalum, which are now being used with

sufficient frequency to merit inclusion of methods for their determination. Incidentally the introduction of more complex ferrous alloys had rendered some of the old standard methods of analysis obsolete and necessitated revision to meet the modern practice.

The book under review while meeting this need has some special features. The methods have been judiciously selected and brought up to date, several comparatively modern methods also finding their place. A discussion of the properties of each element and its relevant compounds and the theoretical considerations on which the principle methods of separation and determination are based precede the methods in the selection of which preference has been given to those methods which are of direct nature or of wider application. The methods of analysis which are given in sufficient detail are followed with explanatory notes giving the reactions involved in each step and the exact importance of various stages, thus giving the analyst a thorough grasp of the subject.

The chapter on definitions, many of which are very elementary, could have been usefully omitted. The generous use of equations, again many of which are too elementary, could have also been avoided. The publication is compact and almost free from errors.

MOHAMED ALI.

Intermediate Quantitative Analysis. By Welch. (University Tutorial Press, Oxford), 1941. Pp. 128. Price 3sh. 6d.

As usual this book describes the century-old (the so-called standard) exercises in volumetric and gravimetric analysis that form part of the curricula of studies for the undergraduate in all universities. It can at once be said that Section 2 is an apology for gravimetric analysis, despite the fact that gravimetric analysis lends itself to high order of accuracy. The author cannot be oblivious to this fact as is evident from his remarks in the introduction to the work and yet has caused a paucity of exercises in this branch.

The book opens with a description of the analyst's tools, such as the balance, burettes, pipettes, weighing bottles, etc., followed by exercises in acidimetry, alkalimetry, oxidation and reduction principles, iodimetry and precipitation methods. They are of a very representative character; additional exercises are appended to each chapter, which