

INTRODUCTION TO THE RARER ELEMENTS. BY PHILIP E. BROWNING, PH.D., Assistant Professor of Chemistry, Kent Chemical Laboratory, Yale University. New York : John Wiley and Sons. 1903. 155 pp. Price, \$1.50.

To those interested in the chemistry of the rarer elements this compilation of the scattered and oftentimes difficultly accessible literature of the subject will prove most acceptable. In the treatment of each element the author discusses its discovery, its occurrence in nature, its extraction from these natural compounds, the preparation and properties of the element and of the typical compounds that it forms, the leading characteristics of these compounds, and the best methods for the determination and separation of the element. In addition to these details there is given, under each group of allied elements, a series of laboratory experiments to be performed with the members of that group.

The author's treatment of this quite intricate subject is clear and concise, and the book will form a most useful guide to those who wish to study these interesting groups of elements, and also to analysts who have to deal with the separation and determination of these substances.

The few errors that have crept into this first edition are of minor importance and do not seriously impair the value of the work. The usefulness of the experimental methods that are described would, however, be greatly increased if these methods were given in more detail, and it is to be hoped that in the second edition the author may so expand those portions of the work dealing with the extraction and separation of the rarer elements as to furnish to chemists more complete instructions for the performance of these processes.

L. M. DENNIS.

PROCEEDINGS OF THE CHEMICAL METALLURGICAL AND MINING SOCIETY OF SOUTH AFRICA—WITH APPENDIX. FEBRUARY, 1897, TO SEPTEMBER 18, 1899. R. W. HUNTER, Edinburgh; or Engineering and Mining Journal, New York : Price, 21s. net.

The publication of this volume was delayed because of the war, and though much of the contents has been more recently discussed in technical journals relating to metallurgy and mining, the contents of this volume will be found of particular value to those engaged in the metallurgy of gold.

In the Transvaal the cyanide process had its first practical application, and nowhere else, probably, has it received such

attention, or been carried out on such a large scale, so that in the papers read, and in the discussion of them, much valuable information on this subject is to be found, not only relating to the general application of the process, but to the more strictly chemical and electrochemical problems incidental to its application.

The book contains valuable papers on assaying and sampling, as well as upon the theoretical side of chemistry, and some of its more general applications.

Mr. Chas. Butters, in his presidential address, gives an extensive review of the metallurgy of gold, and Prister gives an extensive account of the manufacture of nitro-explosives. The Malay tin industry is discussed by Flower-Ellis.

Dr. J. Loewy, in his presidential inaugural address, discussed the influence of temperature on the cyanide process, in which he states that in treating pyritic ore containing 4 oz. of gold per ton with a solution of cyanide at 40° C., the extraction obtained after four hours' leaching was 14 per cent. higher than that obtained by leaching the same ore with the same strength of solution or 50 hours in the cold. The question of the difference in the percentage of the cyanide extraction in summer and in winter is discussed by various members, the tenor of the results indicating that a greater extraction is certainly obtainable in summer than in winter.

Mr. Chas. Butters, in a paper on the cyanide process, discusses at length the by-products from cyanide work.

Among the papers bearing on electrochemistry is one by Prof. A. Von Oettingen, Leipsic, on "Potential of the Electrodes in Solutions," in which he first reviews the modern theory of solutions, and then takes up the application of the electrolytic dissociation theory to the explanation of the action of galvanic solutions.

There is much discussion as to zinc *versus* electrolytic precipitation of gold from cyanide solutions.

The assaying of bullion and the discussion of assay differences, and liquation in gold bars, occupies considerable space.

Among the papers on analytical chemistry is that of Andrew F. Crosse on "The Estimation of Oxygen in Working Cyanide Solutions." Perhaps the most valuable part of this publication is the record of the discussion by the members of the various

papers presented. These discussions, as well as the papers, though largely bearing on the metallurgy of gold, and conditions incident to the location, are well worth careful study by those interested in gold mining or its metallurgy. WM. HOSKINS.

BENZOLTABELLEN. Darstellungsmethoden und Eigenschaften der einfacheren, technisch wichtigeren Benzolderivate. BY DR. CARL SCHWALBE, Privatdocenten an der technischen Hochschule zu Darmstadt. Berlin: Verlag von Gebrüder Borntraeger. 1903. 266 pp. Price, 15 Marks.

The book, as stated in the introduction, is primarily for the use of the technical chemist, who has little or no time to devote to the study of the chemical literature. The author has selected about four hundred benzene derivatives—sulphonic acids, aldehydes, amines, phenols, etc.—which he considers to be of technical importance, and has given, in condensed form, their methods of preparation and the characteristic properties that serve for identification. The references to the chemical and patent literature are very complete.

As the author clearly states in his introduction, he does not try to give a description of every benzene derivative which is of commercial importance, but only those that serve as "Ausgangsmaterial" for the numerous compounds that are produced in the technical works. In the opinion of the reviewer the selection made by the author in some classes of derivatives is good, in others, compounds have been omitted which, if enumerated, would enhance the value of the book. For example: Among the sulphonic acids of nitrobenzene the author mentions, together with other acids, "1 nitro-3-5-disulfonsäure and 1 nitro-2-4-disulfonsäure" with one chemical reference, and fails to recognize the two technically important sulphonic acids, "Paranitrobenzylsulfonsäure, Darst. D. R. P. 15138, Frdl. II, 386, and Orthonitrobenzylsulfonsäure, D. R. P. 48722, Frdl. II, 98; Marckwald, Ber. 31, 1855."

Another criticism that the reviewer has to offer is that the author has made no distinction between "Darstellungsmethoden and Bildungsmethoden"; where *darstellungs* and *bildungs* methods are both given, if each were classified by themselves it would save much unnecessary reading on the part of the inexperienced chemist.