

## REVIEWS.

PRINCIPES THEORIQUES ET PRATIQUES D'ANALYSE MINÉRALE. G. CHESNEAU.  
Ch. Beranger, Paris. 1912. Price 25 francs.

The author describes this book as a guide for engineers to the analysis of industrial minerals, but it is more truly a comprehensive treatise on inorganic analysis; and though written from the standpoint of the works manager or the mining engineer, it will be of considerable value to the professional chemist.

The first part, which deals with theoretical principles and general methods of analysis, is exceptionally good. It sets forth the *rationale* of analytical manipulation with a completeness and lucidity all too rare in professedly "practical" handbooks. The theory of washing precipitates is fully discussed, and the relation of solubility to size of particles is considered, and the reason why digestion usually diminishes the fineness of a precipitate is indicated. Gelatinous precipitates and the precautions necessary in dealing with them receive full consideration. The equilibrium conditions of the reactions suitable for analytical purposes are discussed with a view to the elucidation of the two fundamental problems—to produce a precipitate as little soluble as possible, and to dissolve insoluble bodies.

Qualitative analysis is next considered; general methods and a complete scheme for the detection of metals are given.

The first part closes with an excellent chapter on the general processes of quantitative analysis. The degree of accuracy attainable in volumetric processes is discussed, and emphasis is laid upon the advantages of the comparative method, in which a "standard" is treated in exactly the same way as the sample.

In the second part the elements are studied separately. The principal sources and uses are first given for each element and its industrially valuable compounds; then its distinguishing characteristics and the analytical properties made use of for its detection and estimation are described. This is followed by an account of selected methods for the separation and estimation of the element in question, and the application of these methods to minerals and manufactured products.

On the whole, the methods chosen are authoritative and reliable, though some are rather unfamiliar to English practice. All are very carefully described, with due attention to such points as concentration of solutions, temperature, strength of acid, etc. Following the treatment of hydrogen, the general question of acidity is dealt with and the theory of indicators outlined. A section is also devoted to water analysis. Phosphorus and phosphoric acid are well treated. Under "Arsenic" the method of Fresenius and Babo is given. This allows of the detection of one-thousandth of a milligram of arsenious acid, and its differentiation from antimony. The consideration of carbon is followed by methods for the estimation of common

hydrocarbons, elementary organic analysis, and the analysis of fuels. The chapter on the iron group opens with a clear discussion of the conditions necessary for the separation of the metals as sulphides and acetates. Somewhat surprising is the absence of any mention of the bichromate method for iron estimation.

The analysis of iron and steel is treated in considerable detail. Besides the usual dry and wet combustion methods for carbon, a volumetric method is described. The apparatus appears to be rather complicated, and, as only one determination can be made in two hours, its advantages are not very obvious. The Eggertz colour method is reviewed, with due warning as to its limitations. For sulphur, the only oxidation process described is the "Arnold" method, in which aqua regia is used together with bromine and potassium chlorate, and the precipitation with barium chloride is made in the cold. The molybdate method described for phosphorus, involving two precipitations of the phosphomolybdate, is decidedly tedious and complicated. No magnesia method is given. Several colour methods for manganese are described, including the persulphate process, which is certainly the simplest and most expeditious. In dealing with the "rare" elements, a preliminary treatment by the ether method of Rothe is recommended. This accomplishes a nearly complete separation of the iron from all the other elements except molybdenum. The estimation of nickel by means of dimethylglyoxime is described, but the cyanide titration in presence of ammonium citrate is not mentioned.

The metals of the copper and tin groups are well treated, and methods for the analysis of their alloys are given.

Like most French publications, the book lacks an index, but there is an alphabetical list of minerals of which the analysis is given.

The printing is good, and the diagrams are clear and well chosen.

F. W. HARBORD.

**THE ANALYST'S LABORATORY COMPANION.** Fourth Edition. By ALFRED E. JOHNSON, B.Sc. (Lond.), F.I.C., A.R.C.Sc.I. 1912. London: J. and A. Churchill. Pp. ix + 164. Interleaved with blank pages.

As a small work of reference for chemical and physical data, this edition of Mr. Johnson's book deserves commendation. The numerous tables have been revised where necessary, and some further tables have been added, the International Atomic Weights for 1912 being adopted. Considering, however, that refractometric methods of analysis are being employed to an increasing extent, it is rather surprising that space has not been found for tables showing the relation between refractive index and percentage content of solutions of various substances.

The notes on analysis have also been revised and amplified, some very useful additions being the standards for sewage effluents recommended by the Royal Commission on Sewage Disposal (Fifth Report, issued in 1908), and the chief provisions of the Draft of "The Public Health (Milk and Cream) Regulations, 1912," issued by the Local Government Board. In the section dealing with the cupric reducing power of the carbohydrates, a method for the gravimetric estimation of reducing sugars is described, but no mention is made of the volumetric method now so generally used.

Considerable space is devoted to chemical calculations. At p. 36, Mr. Johnson justly condemns the calculation of analytical results to an unwarrantable number of decimal places, but falls into the same error himself at p. 107, where the percentages of dextrose and maltose in a commercial "glucose" are given to the second decimal place.

On the whole, however, the revision has been done very carefully, the errors observed are few, and for the most part trivial, and the new material has been judiciously selected. The book is of a convenient size, and should prove very useful in the laboratory.

LEWIS EYNON.



## INSTITUTE OF CHEMISTRY.

### PASS LIST: JULY EXAMINATIONS, 1912.

Of thirty-five candidates who presented themselves for the Intermediate Examination, eighteen passed: C. A. Adams, B.Sc. (Lond.), Miss D. J. Bartlett, L. O. Brekke, B.Sc. (Leeds), H. B. Brown, F. G. Conyers, E. D. Goddard, B.Sc. (Lond.), J. R. Gray, F. A. Hatch, M. Howie, D. W. Kent-Jones, E. Marsden, Miss E. G. Mocatta, B.Sc. (Lond.), E. A. Rayner, B.Sc. (Lond.), W. S. Ritchie, B.Sc. (Lond.), W. G. Saunders, D. E. Sharp, B.Sc. (Aberdeen), T. F. Smeaton, and W. A. Storey. Of thirty-seven candidates who presented themselves for the Final Examination, twenty-eight passed. In the branch of Mineral Chemistry: C. R. Chown, A.R.C.S. (Lond.), B.Sc. (Lond.), H. Gilmour, W. P. Harmsworth, J. G. King, H. Knight, P. G. Knapman, B.Sc. (Lond.), and R. H. Truelove, B.Sc. (Lond.), A.R.C.S. (Lond.). In the branch of Metallurgical Chemistry: E. O. Jones, B.Sc. (Lond.), A.R.C.S. (Lond.), W. A. C. Newman, B.Sc. (Lond.), A.R.C.S. (Lond.), and E. W. Yeoman, B.Sc. (Lond.), A.R.C.S. (Lond.). In the branch of Physical Chemistry: J. I. Crabtree, B.Sc. (Viet.), and Miss A. M. Finney, B.Sc. (Birm.). In the branch of Organic Chemistry: J. L. S. Allan, J. Crawford, G. J. Eastburn, J. H. Naylor, M.Sc. (Manc.), F. G. Rawling, M.Sc. (Leeds), S. Robertson, A. Wilson, T. A. Wilson, and T. Wright. In the branch of the Chemistry of Food and Drugs, and of Water: S. W. Bunker, B.Sc. (Lond.), D. H. B. Cowman, B.Sc. (Lond.), A. Gemmell, B.Sc. (Edin.), C. L. Hinton, H. Raistrick, B.Sc. (Leeds), M. J. Robb, B.Sc. (Aberdeen), and S. B. Tallantyre.

