

The chapter on cobalt is of the usual detailed character, but is largely occupied with co-ordination compounds. These are discussed under the simple salts from which they are derived, for example,  $\text{CoCl}_3$ ,  $\text{CoBr}_3$ ,  $\text{CoI}_3$ , etc., with the result that the different salts of a complex ion such as the hexammine  $[\text{Co.6NH}_3]^{+++}$  must be looked for in different sections. The red and blue colours of cobalt chloride are discussed in paragraphs extending over several pages; but in this case the author has given a clear lead by interpolating his own conclusions in paragraphs printed in smaller type. The structure of the anhydrous blue crystals is also discussed.

The well-established characteristics of the "Treatise" are retained in the present volume, and no further approbation is needed to commend it to those who are already familiar with the earlier volumes.

**A Systematic Handbook of Volumetric Analysis :**  
or the Quantitative Determination of Chemical Substances by Measure, applied to Liquids, Solids and Gases. By Francis Sutton. Twelfth edition, revised throughout, with numerous additions, by Dr. A. D. Mitchell. Pp. xvi + 631. (London : J. and A. Churchill, Ltd., 1935.) 35s.

"THE energies of scientific men have been taxed to devise new and rapid methods of chemical analysis to meet the wants of these high pressure times"—so wrote Francis Sutton seventy years ago : it might have been written by Dr. Mitchell to-day with equal truth. The output of analytical methods is more numerous than ever, and personal experience of all those described is no longer possible; but Dr. Mitchell's reputation is such as to ensure that all the methods described are trustworthy.

Readers may be reminded that the scope of the work is a wide one : it includes volumetric methods applied to inorganic and organic substances, to urine, blood and water and to gas. Many of the old methods are still practised, some new ones are creeping in, for example, potentiometric titration. The last "Sutton" is eleven years old, and must in most laboratories be very nearly worn out by constant use; there will be many who hasten to put the new volume in its place.

#### The Chemistry of Synthetic Resins

By Carleton Ellis. Vol. 1. Pp. 829. Vol. 2. Pp. iii + 830-1615. (New York : Reinhold Publishing Corporation; London : Chapman and Hall, Ltd., 1935.) 2 vols., £4 17s. 6d. net.

DR. CARLETON ELLIS is an indefatigable worker : his text-books in other fields of chemical technology are indispensable to the workers therein and the same will undoubtedly apply to these volumes which, although labelled second edition of a work which appeared twelve years ago, have, like the subject treated, grown from infancy to adolescence. To-day there is no end to the uses or importance of the various synthetic resins or plastics as they are also called.

It is perhaps opportune to summarise the development, for it is a striking one. To be able to make

constant products, often with very special properties, from semi-solid complex mixtures of amorphous organic substances, is no mean achievement. The original phenol formaldehyde condensation patents have now expired, with the result that such resins are made at less cost to the public and in greater diversity, including forms which have the property of dissolving in drying oils and yielding varnishes which dry with rapidity.

A second, now universal, type of resin is that made from a polybasic acid such as phthalic anhydride and a polyhydric alcohol such as glycerol, which produces durable plastic lacquers. A third type are the vinyl resins, and a fourth those represented by chlorinated rubber. Finally, there are the urea resins which are to-day developing so rapidly. The work deals exhaustively with these and many others in seventy chapters, in which the scientific and technical aspects of the subject are given equal weight.

#### Organic Solvents :

Physical Constants and Methods of Purification. By Arnold Weissberger and Erich Proskauer. Translated from the German Manuscript by Randal G. A. New. Pp. vi + 212. (Oxford : Clarendon Press; London : Oxford University Press, 1935.) 15s. net.

ALL sorts of organic solvents are now in use in the laboratory as well as in industry. The users often require to know something about their properties, and they will welcome the fact that, thanks to the collaboration of an organic and a physical chemist, a collection has been made of the physical constants in handy tabular form, separate for each substance, of 157 different solvents selected in an arbitrary fashion but covering a wide variety of requirements.

In addition, about half the book is devoted to a summary of the best methods of purification and often of preparation of the solvents, with copious references to the original literature—in all, 1,406 citations are given.

A very valuable book is thus put in the hands of the scientific worker, who will be able in future to make even better use of this large variety of solvents. In passing, it is to be hoped that efforts will be made by the chemical manufacturers to supply many of them in Great Britain at prices comparable with those charged in the United States and Germany.

#### Handbook of Chemistry and Physics :

a Ready-Reference Book of Chemical and Physical Data. Editor-in-Chief : Prof. Charles D. Hodgman. Twentieth edition. Pp. xiv + 1951. (Cleveland, Ohio : Chemical Rubber Publishing Co.; London : A. Harvey, 1935.) 6 dollars; 25s.

THIS volume, now in its twentieth edition, really needs little introduction to readers of NATURE. It gives in a most convenient form an excellent set of mathematical tables and mathematical aids to chemists and physicists. The data concerning the physical and chemical properties of the elements are well set forth, and the arrangement of data in connexion with inorganic compounds is most helpful.