

which they originally contained after only a few days of exposure. The volatilization of the nicotine from such mixtures was so rapid that it was only with great difficulty and care that a representative sample could be weighed from a tightly stoppered weighing bottle, and there was always a considerable loss of nicotine during the mixing of the ingredients, before a sample could be drawn for analysis.

Further, the hypothetical insoluble compounds of calcium with nicotine could scarcely escape decomposition in the alkaline distillation method for estimating nicotine. If such compounds were actually formed, the alkaline distillation method should give higher results on such mixtures than would the organic solvent methods. Whereas, we have always found that the two types of methods give satisfactorily comparable results on all kinds of nicotine-containing materials, provided proper precautions to prevent loss of volatile nicotine from alkaline mixtures during the early steps of the analytical process are observed.

Hence, it seems clear that the difficulty experienced by the authors of the above mentioned article is probably due to loss of nicotine in the preliminary steps of the analytical process and not to the formation of supposedly insoluble compounds of nicotine with calcium as suggested by them.

NEW YORK STATE AGRICULTURAL EXPERIMENT STATION
GENEVA, N. Y.

R. W. THATCHER

RECEIVED MARCH 27, 1924

NEW BOOKS

Building for Peace. II. International Letters. By WILLIAM ALBERT NOYES. W. Heffer and Sons, Ltd., Cambridge, England; The Chemical Catalog Company, New York, 1924. 78 pp. 22 × 14.5 cm. Price 1/6 net (35 cents).

All who read the collection of letters published earlier under the title "Building for Peace. I," and especially those who have a personal acquaintance with Dr. Noyes, will recognize the earnestness of spirit and purpose which led to their publication. This purpose is to place in the hands of men prominent in scientific fields who hold radically opposed views as to post-war conditions and policies, statements of the views of their opponents which are presumably the more frank and candid because originally written as a part of a personal interchange of correspondence, without expectation of publication. Dr. Noyes firmly believes that unless a better mutual understanding can be reached, especially between France and Germany, a further contest of arms is inevitable. There is appended to the collection of letters, which is, in general, similar to that in the first pamphlet, a proposal formulated by Dr. Noyes for the settlement of the reparations problem which would, if adopted, base the payments upon damages to the civil population, and would exclude all claims looking toward the payments of

pensions or the costs of the armies of occupation. This proposal has been submitted to M. Poincaré, Mr. Baldwin and Mr. Hoover.

Any effort which might serve to forestall future conflicts by substituting understanding for prejudice is obviously to be commended. How far the interchanges of correspondence which are compiled in these brochures have attained, or will attain, this end must necessarily be regarded as problematical for some time to come. Many of the letters are intrinsically interesting and help to clarify matters which are confused in the public prints.

H. P. TALBOT

The Domain of Natural Science. *The Gifford Lectures Delivered in the University of Aberdeen in 1921 and 1922.* By E. W. HOBSON, Sc.D., LL.D., F.R.S., Sadleirian Professor of Pure Mathematics, and Fellow of Christ's College, in the University of Cambridge. The Macmillan Company, New York, 1923. xvi + 510 pp. 25 × 15 cm. Price \$6.50.

In the final chapter of this book, Professor Hobson says, "My main aim has been, by means of a delineation of the domain of Natural Science, to vindicate the perfect freedom of Religious and Philosophical thought from any fear of destructive interference from the side of Natural Science, subject to the sole condition that no encroachment is made upon the autonomy of Natural Science in its own proper domain... The secret of the Universe has revealed itself neither to the Theologian nor to the Philosopher. The man of science, as such, is not even concerned with that secret."

While the announced intention of the book is to deal with the relation of science to matters of religion and philosophy, its principal value lies within the domain of natural science, in the methodological questions which it discusses and in the further discussions which this discussion will provoke.

"The whole history of Natural Science," Hobson says, "tends to extend the scope of the ascertained fact that the perceptual domain is such that whole tracts of it, and processes in it, are capable of description by rational schemes." Guided by the ideal of the mathematician, believing that arithmetic and geometry are perfect sciences, he has undertaken to show in this book that the various sciences have become more developed as concepts have been found, and "conceptual schemes" have been devised, from which their data might be deduced. Thus, for chemistry, "complete success in devising a model of the atom which would make possible the calculation of the detailed varieties of configuration of which such a model might be capable would be a considerable step toward the goal of turning chemistry into a deductive science, in accordance with which all possible elementary forms of matter might be ascertained, and the possible nature of compounds with their chemical and physical properties, predicted."

Hobson has his own conceptual scheme of the methodology of science, and is therefore thoroughly scientific in showing that the data of the nat-

ural sciences conform more or less to conceptual schemes. There are many men of science, however, who believe that the Order of Nature is the Order which is found in Nature, regardless of its present or possible deducibility from postulates. And there are those who find that the history of science tends greatly to show the impertinence of man-made types of order.

The book is an important contribution to the methodology of science and deserves a place beside the works of Jevons, Poincaré and Peirce. It is scholarly and clear, and contains many passages that are penetrating and quotable. The chapters on the various sciences give brief, but accurate and incisive, accounts of their development. The book will interest all those who believe, as do author and present reviewer, that the procedure of science is two-fold, (1) the collecting of data, and (2) the thinking about them. It is a book "to be chewed and digested."

TENNEY L. DAVIS

A Comprehensive Treatise on Inorganic and Theoretical Chemistry. Vol. IV. By J. W. MELLOR, D.Sc. Longmans, Green and Company, 55 Fifth Avenue, New York; 39 Paternoster Row, London, E. C. 4; Toronto; Bombay, Calcutta and Madras, 1923. x + 1074 pp. 232 figs. 25 × 16 cm. Price \$20.00.

The fourth volume of Mellor's Treatise completes Group II of the Periodic Table. The chapter headings follow: Chapter XXV, The Structure of Matter; Chapter XXVI, Radium and Radioactivity; Chapter XXVII, The Architecture of the Atom; Chapter XXVIII, Beryllium or Glucinum; Chapter XXIX, Magnesium; Chapter XXX, Zinc and Cadmium; Chapter XXXI, Mercury.

Since the discovery of radium and the development of the study of radioactivity not one of the standard encyclopedic texts on chemistry has been issued, and Mellor's text therefore includes the first full discussion of those topics treated as a part of general chemistry. The 203 pages given to these topics in Chapters I, II and III are sufficient to permit an excellent and full presentation. They will be a boon to the chemist who has not specialized in that field and who desires to make himself cognizant of the work that has been done without spending the time necessary for study of the more technical monographs. Having been written by Mellor, the chapters are of course readable, and the references appear full enough to be of use to the specialist as well as the novice.

The remaining chapters on the better known elements of the group are similar in type to those of the previous volumes, and present the same virtues of clearness and completeness.

ARTHUR E. HILL

Abridged Scientific Publications from the Research Laboratory of the Eastman Kodak Company. Vol. VI. Eastman Kodak Company, Rochester, N. Y., 1923. vii + 238 pp. Illustrated. 24 × 17 cm.

"In our opinion," states the introductory note, "it is undesirable for a research laboratory to confine its publications to a privately owned special bulletin, and it is better for scientific papers to be published in the usual scientific and technical journals, where they are accessible to all those interested in the branch of science concerned. At the same time, it is an advantage for all the papers issued from one laboratory, which naturally have some common interest to be collected in some form or other." Volume VI inaugurates the annual appearance of these abridged publications. Thirty articles, which appeared in 1922, have been collected from fifteen journals in accordance with the above stated policy.

Continuity and correlation of problems attacked, logical conceptions developed by ingenious methods and enormous labor, together with unusual material facilities, have inevitably led to important advances in various directions, especially in the structure and properties of photographic emulsions. The presentation is clear, the illustrations are well chosen, and the mechanical execution of the book is beyond criticism. This collection, like its predecessors, will be highly valued by all who are concerned with the theory or practice of photography.

G. S. FORBES

Quantitative Analysis, Containing Theory, Laboratory Directions, Problems, Explanations of Calculations and Special Topics in Analytical Chemistry. By STEPHEN POPOFF, Ph.D., Acting Head of Analytical Chemistry, State University of Iowa. P. Blakiston's Son and Company, 1012 Walnut St., Philadelphia, 1924. xiii + 342 pp. 28 figs. 20 × 14 cm. Price \$2.25.

"The object of writing this book has been three-fold: First, to incorporate in a single book the theory, laboratory instructions, and explanations for the calculations of these problems; second, to emphasize the law of mass action and the theory of equilibrium to quantitative reactions; third, to incorporate some of the more recent advances in analytical chemistry."

The theory included in Part I contains much material which is, as a rule, given in courses such as general chemistry, qualitative analysis, and physical chemistry and not in quantitative analysis, as for example, the gas laws, law of mass action, osmotic pressure, Van der Waals' equation, etc.

The laboratory instructions in Parts II and III are in general very well presented and abound with study questions, problems and numerous references which should be of great value to students using this text. Some of the theoretical distinctions, however, seem to be erroneous, as when on p. 165 the author states, "By occlusion is meant the formation of a complex or double salt with the precipitate" and that "adsorption is only a surface phenomena, however."

Part (IV) "Special topics in Analytical Chemistry" is devoted to electro-analysis, the analysis of foods and iron and steel, and electrometric titrations. A bibliography is given for the latter, of which many of the references are to conductivity titrations, but no mention is made of this method in the text.

This book will undoubtedly find favor with those who consider it necessary to incorporate such a variety of material in a course in quantitative analysis.

M. L. NICHOLS

Analytical Methods for Certain Metals, Including Cerium, Thorium, Molybdenum, Tungsten, Radium, Uranium, Vanadium, Titanium, and Zirconium. By R. B. MOORE and S. C. LIND, J. W. MARDEN, J. P. BONARDI, C. W. DAVIS and J. E. CONLEY. Bulletin 212, Department of the Interior, Bureau of Mines, H. Foster Bain, Director. Government Printing Office, Washington, D. C., 1923. xviii + 325 pp. 4 figs. 23 × 14.5 cm. Price 40 cents.

The present widespread use of the rare metals makes this publication of extreme value and a very welcome addition to the information available. "No claim for much originality is made, although some published methods have been modified, and some new ones have been developed by the members of the staff. The principal methods available were studied critically, and it is to be hoped that the work will assist those interested in the analytical work in connection with the metals named."

The publication admirably fulfils all the hopes of the authors, and no one who is interested in this subject can afford to be without this bulletin. It contains very exact methods for the quantitative determination of the rare metals discussed besides abundant references and a fund of valuable information with respect to these metals.

M. L. NICHOLS

Supplementary Notes on Gravimetric Analysis for Beginners. By W. LOWSON, Lecturer in Analytical Chemistry, University of Leeds. Longmans, Green and Company, 55 Fifth Avenue, New York; 39 Paternoster Row, London, E. C. 4; Toronto; Bombay, Calcutta and Madras, 1923. v + 58 pp. 12 × 18.5 cm. Price 80 cents.

These notes, according to the author, are "not intended to take the place of a textbook, but are designed for use as a supplement to this, and were commenced with the object of drawing special attention to a number of errors to which beginners in this subject appear to be very susceptible." The book deals with the precautions necessary in the ordinary processes of gravimetric analysis with the addition of more specific information with regard to various typical determinations. The object has been "to collect and present in a more concise and available form certain information which occurs scattered throughout various books, and some of which, in consequence, is at times overlooked."

M. L. NICHOLS