

ful purification by standard methods, the samples of water were treated with a small amount of barium hydroxide and twice distilled in vacuum.

The final distillation in vacuum in which the water was evaporated without ebullition and passed through a meter of tubing to the measuring cell was found to effect considerable separation of the isotopic species present. The vacuum distillations were therefore carefully controlled and the densities measured were corrected to correspond to the rejection of equal light and heavy fractions. The corrections were all less than four parts in ten million. The vacuum distillation train was constructed with traps which could be closed by freezing plugs of ice in them so that the water which was measured came in contact with nothing but Pyrex glass. In the distillations at atmospheric pressure care was taken to reject small, nearly equal, light and heavy fractions.

Densities were measured by determining the pressure required for floating equilibrium of a thick-walled Pyrex float at 3.98° . The float was calibrated by means of a small glass rider.

Pressure was applied through water-filled capillaries to avoid the solution of air in the sample being measured. In twelve experiments to determine the equilibrium pressure in a standard sample prepared from Cambridge tap water the average deviation from the mean was equivalent to an error of one part in ten million in the density. Our method resembles that used by Gilfillan in determining the isotopic composition of sea water [E. S. Gilfillan, *THIS JOURNAL*, **56**, 406 (1934)]. In essential agreement with his results we found surface sea water collected a mile off shore at Gloucester, Mass., to have a density greater than Cambridge tap water by 1.8 p. p. m.

The water from the corn oil proved to have a density greater than ordinary water by 4.9 ± 0.1 p. p. m. (two experiments) and that from natural gas, a density greater by 5.7 ± 0.3 p. p. m. (four experiments).

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CHARLES H. GREENE
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RECEIVED JUNE 25, 1934

NEW BOOKS

Annual Survey of American Chemistry. Vol. VIII, 1933.

Edited by CLARENCE J. WEST, Director, Research Information Service, National Research Council. Published for National Research Council by The Chemical Catalog Company, Inc., 330 West 42d Street, New York, N. Y., 1934. 403 pp. 13.5 × 21.5 cm. Price, \$4.50.

The method adopted in reviewing the recent literature is the same as that used in the last volumes of the Annual Survey. The authors are well known in their several fields and have described the new work as fully as is possible in the limited space available. The policy adopted last year of covering only a part of the published work makes it desirable to list the fields reported on in the present volume. They are as follows: Theories of Solutions, Kinetics of Homogeneous Gas Reactions, Subatomic Phenomena, Thermodynamics and Thermochemistry, Colloids, Contact Catalysis, Structure Determination by X-Ray and Electron Diffraction, Electrochemistry, Analytical Chemistry, Compressed Gases, Aliphatic Compounds, Carbocyclic Compounds, Heterocyclic Compounds, Pharmaceuticals, Biochemistry, Ferrous Metals in 1932 and 1933, Insecticides and Fungicides, Chemistry of the Silicates, Ceramics, Petroleum Chemistry and Technology, Cellulose and Paper, Leather, Paints, Rub-

ber, Gaseous Fuels During 1932 and 1933. The book continues to be of great value to one who desires to obtain in a short time a general view of the advances made in Chemistry in America. It is also of value to the specialist as a source of references.

JAMES F. NORRIS

Manuel de Chimie Analytique Qualitative Minérale.

(**Manual of Inorganic Qualitative Analysis.**) By P. WENGER, D.Sc., Professor of Analytical Chemistry, and G. GUTZEIT, Lecturer, University of Geneva. Librairie Georg et Cie., Genève, 5, Corrairie, Switzerland, 1933. 496 pp. 13 × 19.5 cm. Price, argent Suisse frs. 16.

This manual is similar in arrangement to most of the American texts but is much more extensive. The first part is devoted to a brief discussion of the fundamental principles of general chemistry. The second part gives the most important characteristic reactions, with the equations, of the common cations and anions, and also those for the rare metals. The third part of the book is devoted to the systematic analysis of materials, including the different types of preliminary tests. Tables, showing the procedure for the detection of the common cations and anions, are also included. The last part is devoted

to a discussion of the methods of increasing the sensitivity of qualitative tests, and the most typical reactions used in testing for the various cations and anions by the spot method of Feigl, are also included. The only omission noted in the qualitative tests is that of the lakes in testing for aluminum and magnesium. The book is intended mainly for students but due to its completeness it should also be useful as a reference book for those engaged in analytical work.

M. L. NICHOLS

The Cotton Effect and Related Phenomena. By STOTHERD MITCHELL, D.Sc., Lecturer in Physical Chemistry, University of Glasgow. G. Bell and Sons, Ltd., Publishers, York House, Portugal Street, London W. C. 2, England, 1933. vii + 92 pp. 34 figs. 14 × 22 cm. Price, 7s./6d., net.

In this small book the author gives a more or less elementary description of optical phenomena connected with the Cotton Effect or the circular dichroism of optically active substances. The first chapters are devoted to an historical description of the discovery of polarized light. There follow brief descriptions of spectrophotometric technique, polarimeters and devices for determining circular dichroism. A short discussion of the Drude, Born and Kuhn theories of optical activity is given. The more important equations are included but no attempt is made to derive them. The last chapters deal with some of the experimental work on anomalous rotary dispersion and circular dichroism and, in particular, with the photochemical production *in vitro* of optically active substances by means of circularly polarized light. The latter work is discussed in more detail. Although the discussion is conducted throughout in an elementary fashion, a reader unfamiliar with the elements of optics will find some parts of the book difficult to follow.

G. B. KISTIAKOWSKY

Kursus der Kristallometrie. (Course in Crystal Measurement.) By VICTOR GOLDSCHMIDT. Edited by Dr. Hans Himmel and Dr. Karl Müller. Verlag von Gebrüder Borntraeger, Schöneberger Ufer 12a, Berlin W 35, Germany, 1934. viii + 167 pp. 183 figs. 16.5 × 25.5 cm. Price, RM. 10; bound, RM. 11.50.

Those who have occasion to examine and describe crystalline material should be familiar with and have available three coöperating techniques, namely, those of the polarizing microscope, the reflecting goniometer, and the several methods of x-ray diffraction photography. As these three techniques have been developed and are described for the most part independently, it remains for the crystallography of the future to give a synoptic view of them; for the present one must refer to separate sets of sources for each of them and learn by experience its application to the best advantage.

The two-circle reflecting goniometer and the methods of crystal measurement and crystal drawing based on it, as developed in the past forty years by the late Victor Goldschmidt of Heidelberg, embody the second of these techniques in its most practical form. The present *Kursus*, a

concise convenient introduction to this instrument and its methods in the words of its master, should be of value to many. It is similar in scope to "The Goldschmidt Two-Circle Method" edited by Wherry and Palache and published in this country in 1921.

C. D. WEST

Soil Analysis. A Handbook of Physical and Chemical Methods. By C. HAROLD WRIGHT, M.A., F.I.C., Formerly Senior Agricultural Chemist, Nigeria. Thomas Murby and Company, 1 Fleet Lane, London E. C. 4, England, 1934. viii + 236 pp. 14 × 22 cm. Price, 12s./6d.

The material presented by Mr. Wright is designed to fill a long felt want in soil study. It presents a résumé of the analytical methods for soil work, both physical and chemical, and will be useful to students in agricultural colleges and elsewhere where it is of interest to compare different analytical procedures. As a laboratory guide it leaves much to be desired in that the author does not discriminate between useful and less useful or undesirable methods. Essentially, the material consists of abstracts of published literature on the topics treated. These include a number of general physical methods of examination, such as moisture relationship, mechanical analysis and the extraction of colloids. General methods of chemical examination are also given, both for particular components of the soil and for general examination of soils, soil extracts and soil solutions. A number of special chemical methods are presented though a number of other special methods of perhaps equal importance are omitted. Perhaps the subject best treated in the book is base exchange. The book will be found exceedingly useful by students of soil science and soil workers as it brings together in one volume the methods which otherwise must be collected from widely distributed sources.

HORACE G. BYERS

Practical Physiological Chemistry. By SYDNEY W. COLE, M. A., Trinity College, Cambridge, University Lecturer in Medical Chemistry, Cambridge. Ninth edition. W. Heffer and Sons, Ltd., Cambridge, England, 1933. xi + 419 pp. 71 figs. 14.5 × 22.5 cm. Price, 12s./6d., net.

This latest edition of Cole's well-known textbook is thoroughly revised and modernized. It describes clearly, and in sufficient detail for beginners, no less than 439 different experiments ranging from simple tests to rather advanced biochemical preparations. The procedures described for the preparation of a number of amino acids are excellent, except for that dealing with cystine. The use of sodium hydroxide prescribed for neutralizing the acid digest in this preparation is not suitable, either from the standpoint of yield or of the purity of the cystine obtained.

Some of the methods described in the chapters on urine analysis are not the best. The two pages devoted to the old hypobromite method for the determination of urea might as well have been omitted. The names attached to some of the methods seem inaccurate or at least unscholarly.

The author is evidently more interested in urine analysis than in blood analysis, and the chapter on the latter subject is inadequate.

As a brief reference book this volume should prove valuable in any department of biochemistry.

OTTO FOLIN

BOOKS RECEIVED

May 15, 1934–June 15, 1934

- HAROLD A. ABRAMSON. "Electrokinetic Phenomena and their Applications to Biology and Medicine." American Chemical Society Monograph Series. The Chemical Catalog Co., Inc., 330 West 42d St., New York. 331 pp. \$7.50.
- MEYER BODANSKY. "Introduction to Physiological Chemistry." Third edition. John Wiley and Sons, Inc., 440 Fourth Ave., New York. 662 pp. \$4.00.
- P. W. DANCKWORTT. "Luminescenz-Analyse im filtrierten ultravioletten Licht. Ein Hilfsbuch beim Arbeiten mit den Analysen-lampen." Third, revised edition. Akademische Verlagsgesellschaft m. b. H., Markgrafenstrasse 6, Leipzig C 1, Germany. 190 pp. RM. 8.50.
- VICTOR GOLDSCHMIDT. "Kursus der Kristallometrie." Edited by Hans Himmel and Karl Müller. Verlag von Gebrüder Borntraeger, W 35, Schöneberger Ufer 12a, Berlin, Germany. 167 pp. RM. 10; bound, RM. 11.50.
- S. J. GREGG. "The Adsorption of Gases by Solids." Methuen & Co., Ltd., Publishers, 36 Essex St., London W. C. 2, England. 120 pp. 2s./6d., net.
- ARTHUR HAAS. "Materiewellen und Quantenmechanik. Eine Einführung auf Grund der Theorien von de Broglie, Schrödinger, Heisenberg und Dirac." Fourth and fifth editions. Akademische Verlagsgesellschaft m. b. H., Markgrafenstrasse 6, Leipzig C 1, Germany. 299 pp. RM. 7; bound, RM. 7.80.
- J. KOETSCHET. "Aide Mémoire de Chimie Organique et Essai de Synopsis de la Chimie Organique (Classification, Nomenclature, Stoechiométrie, Bibliographie)." Section 1. Impr. Emile Birkhaeuser & Cie., Bâle, Switzerland. 70 pp. 5 frs. Swiss.
- E. KOHN-ABREST. "Précis de Toxicologie." G. Doin & Cie., Éditeurs, 8 Place de l'Odéon, Paris VI^e, France. 388 pp. 50 fr.
- JAMES MURRAY LUCK, Editor. "Annual Review of Biochemistry." Vol. III. Stanford University Press, Stanford Univ., Calif. 558 pp. \$5.00.
- WILLIAM NORMAN RAE AND JOSEPH REILLY. "Physico-Chemical Practical Exercises." Methuen & Co., Ltd., Publishers, 36 Essex St., London W. C. 2, England. 276 pp. 7s./6d., net.
- E. W. K. SCHWARZ AND HERBERT R. MAUERSBERGER, Editors. "Rayon and Synthetic Yarn Handbook." Rayon Publishing Company, 303 Fifth Ave., New York. 420 pp.
- H. A. STUART. "Molekülstruktur. Bestimmung von Molekülstrukturen mit physikalischen Methoden." Verlag von Julius Springer, Linkstrasse 23–24, Berlin W 9, Germany. 388 pp. RM. 32; bound, RM. 33.80.
- "Mineral Resources of the United States, 1931. Part II, Non-Metals." Superintendent of Documents, Government Printing Office, Washington, D. C. 675 pp. \$1.00.
- "The Scientific Journal of the Royal College of Science. Vol. IV." Edward Arnold & Co., 41–43 Maddox St., London W 1, England. 171 pp. 7s./6d.