

per million. Assuming that the amount of O^{18} in ordinary water causes a density difference of 175 parts per million, these experiments indicate that the concentrations of O^{18} at the bottom and top of the column are nearly in the ratio 3 to 2, but do not show to what extent H^2 is concentrated. To answer this question Lewis and Macdonald are measuring the vapor pressure of water containing different amounts of H^2 . With water in which 66% of the hydrogen is H^2 the vapor pressure is below that of ordinary water by 3.5% at 100° and by 8.8% at 25° .

These large differences would at first sight indicate that large separation can be obtained by fractional distillation, but the system presents certain novel features. Consider the three species H^1H^1O , H^1H^2O and H^2H^2O . As a first approximation we assume that the three partial vapor pressures, p_{11} , p_{12} , p_{22} , are proportional to the mole fractions in the liquid, N_{11} , N_{12} , N_{22} , and further that there is a random distribution of the hydrogen atoms among the oxygen atoms so that $p_{12}^2 = 4p_{11}p_{22}$ and $N_{12}^2 = 4N_{11}N_{22}$. It follows that if y is the atomic ratio of H^2 to H^1 , and the vapor pressures of pure H^1H^1O and H^2H^2O are a^2 and b^2 , then $N_{11}:N_{12}:N_{22} = 1:2y:y^2$ and $p_{11}:p_{12}:p_{22} = a^2:2aby:b^2y^2$. Hence the equation for the total vapor pressure is $P = (a + by)^2/(1 + y)^2$. Or if x is the atomic fraction, $y/(1 + y)$, then $P^{1/2} = a - (a - b)x$. It is not the vapor pressure, but its square root, that is a linear function of the atomic fraction. Similarly, if y' is the atomic ratio in the gas, $y'/y = b/a$ (not b^2/a^2). While, therefore, these calculations are not favorable to a large fractionation of the hydrogen isotopes at atmospheric pressure, it appears that fractional distillation under reduced pressure should be effective, and this experiment is now under way.

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NEW BOOKS

Hommage a Henri Moissan, 4 Octobre 1931. Published by *Chimie et Industrie*, Société de Chimie Industrielle, 49 Rue des Mathurins, Paris VIII^e, France, 1932. 93 pp. Illustrated. 23 × 28.5 cm.

A monument and a plaque in memory of Henri Moissan were unveiled on October the 4th, 1931, at the Municipal College in Meaux. It was here that Moissan received his early education.

This volume contains an excellent account by Paul Lebeau of Moissan's life and scientific achievements, a bibliography of Moissan's publications, a description of the

unveiling ceremonies at Meaux and a collection of the addresses delivered on that occasion. It is a pleasing tribute to one of the great experimentalists of our Science.

ARTHUR B. LAMB

The Scientific Achievements of Sir Humphry Davy. By JOSHUA C. GREGORY, B.Sc., F.I.C. Oxford University Press, 114 Fifth Ave., New York, 1930. vii + 144 pp. 12.5 × 19 cm. Price, \$2.00.

This book is a succinct account of the scientific achievements of Davy, and properly includes only sufficient biographical detail to provide the framework for the narrative. Adequate treatment is given to Davy's major contributions—nitrous oxide, chlorine, isolation of potassium and sodium, and the safety lamp. The early and later work on the relation of electricity and magnetism is well developed, and a chapter is devoted to the fruitful years of research from 1812 to 1820.

Several excellent features of this book merit commendation. First, the book not only contains within moderate compass a superior account of Davy's discoveries and theories but it likewise provides the reader with a correlated view of the movement and progress of chemistry during the short but dramatic lifetime of this brilliant worker. Second, throughout the book there are short quotations in the text itself from Davy's papers, thereby connecting the story easily with authentic historical data without dismembering the narrative. Third, due credit is given Davy's contemporaries and in addition the bearing of their work on Davy's is unequivocally stated, especially in the case of Dalton, Berthollet, Faraday and Gay-Lussac. Finally, the book contains at intervals—perhaps too infrequently—wise statements which epitomize whole pages of ordinary history. We cite only a few:

The Royal Institution was threatened with inanition when Davy joined it; it was threatened by a flood of fashion when he lectured (p. 35).

[In naming the new elements potassium and sodium] Davy had again combined genuine scientific discovery with dramatic disclosure (p. 54).

The new version of chlorine [as an element] did secure rapid favor, though there was also casual recalcitrancy (p. 80).

Davy was relying more on squeezing than on cooling gases to liquefy them (p. 114).

The reviewer gladly commends this book to all who would learn about the specific contributions to chemistry made by one of its most brilliant expositors.

LYMAN C. NEWELL

Stereochemie. (Stereochemistry.) By STEFAN GOLDSCHMIDT, Professor of Organic Chemistry at the Technical High School of Karlsruhe I. B. Akademische Verlagsgesellschaft m. b. H., Markgrafenstrasse 6, Leipzig C 1, Germany, 1932. xiii + 311 pp. 87 figs. 17 × 25 cm. Price, M. 27.80; bound, M. 29.

On account of the increased interest in stereochemistry and the rapid and intensive developments which have taken place in this field during the past ten years this new volume covering the important literature through June, 1932, will be especially welcome.

The material presented is divided into seven sections: (1) General; (2) Stereochemistry of the carbon compounds; (3) Stereochemistry of nitrogen compounds; (4) Stereochemistry of other elements; (5) Optical rotation and chemical constitution; (6) Spatial configurations of molecules and their rates of reaction; (7) Stereochemical conclusions on the basis of crystallographic data.

Each section is carefully divided into various chapters and subchapters and the table of contents is so arranged that any subfield of stereochemistry may be quickly located. The book appears to be unusually comprehensive and complete in its scope.

It is a readable book. Each topic is presented clearly and concisely, without too much detail, so that the facts and theories may readily be understood even by a relatively inexperienced student. Numerous figures representing spatial configurations are excellently drawn and aid materially the clarity of presentation. A multitude of references is available for those who desire more detailed information. That typographical errors are not infrequent is excusable in a book of this sort and they detract little from its value.

The book is a distinct contribution to the literature of organic chemistry and should be in every chemical library. It is highly recommended to students or investigators in the field of stereochemistry.

ROGER ADAMS

Éléments de Pharmacodynamie Spéciale. Étude de l'Action des Divers Médicaments.
(Elements of Pharmacodynamics. A Study of the Action of Various Medicinals.)
By EDGARD ZUNZ, Professor at the University of Brussels. Masson et Cie., Éditeurs, 120 Boulevard Saint-Germain, Paris VI^e, France, 1932. vii + 1271 pp. Illustrated. 17 × 25.5 cm. Price, fr. 190.

This is the most recent and also the most comprehensive work on pharmacology at present available, Heffter's Handbuch not yet being completed. The scope and arrangement of the material is in general similar to that of Sollmann's Manual of Pharmacology and other works in English, but emphasis is placed upon somewhat different phases of the subject. The extent of the work is indicated by the fact that the subject index occupies 45 closely printed pages. Many tracings and protocols and descriptions of original experiments (especially upon the frog) are introduced.

A carefully selected bibliography of the more important papers in English, French, German and Italian follows each section.

REID HUNT

BOOKS RECEIVED

April 15, 1933–May 15, 1933

- HOMER ADKINS AND S. M. MCELVAIN. "An Introduction to the Practice of Organic Chemistry in the Laboratory." Second Edition. McGraw-Hill Book Company, Inc., 330 West 42d St., New York. 224 pp. \$2.25.
- KONRAD BERNHAUER. "Grundzüge der Chemie und Biochemie der Zuckerarten." Verlag von Julius Springer, Linkstrasse 23-24, Berlin W 9, Germany. 365 pp. RM. 32; bound, RM. 33.80.
- H. BRASSEUR. "Structures et Propriétés Optiques des Carbonates." Hermann et Cie., 6 Rue de la Sorbonne, Paris V^e, France. 27 pp. Fr. 7.
- L. BRILLOUIN. "La Diffraction de la Lumière par des Ultra-sons." Hermann et Cie., 6 Rue de la Sorbonne, Paris V^e, France. 32 pp. Fr. 10.
- J. C. COLBERT. "Laboratory Technique of Organic Chemistry." The Century Co., 353 Fourth Ave., New York. 341 pp. \$2.50.
- RUDOLF DEGKWITZ. "Lipoide und Ionen. Eine allgemein biologische und ärztliche Studie über die physiologische Bedeutung der Zelllipoide." Verlag von Theodor Steinkopff, Residenzstrasse 32, Dresden-Blasewitz, Germany. 323 pp. RM. 28; bound, RM. 29.20.