

fore seem that the state of the S-S - SH equilibrium determines whether the cell at the moment functions proteolytically or oxidatively.

BUREAU OF CHEMISTRY AND SOILS  
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## NEW BOOKS

**Matière et Atomes. (Matter and Atoms.)** By A. BERTHOUD, Professor of Physical Chemistry at the University of Neuchâtel. Second edition. G. Doin et Cie, 8 Place de l'Odéon, Paris, France, 1932. 324 pp. 28 figs. 11.5 × 18 cm. Price, 26 fr.

This is a revised and enlarged second edition of "New Conceptions of Matter and the Atom." The earlier book has been conscientiously revised and brought up to date. The present chapters include: Historical Introduction, Classical Theories of Light and of Electrons, Theory of Relativity and Mass, x-Rays and Atomic Numbers, Radioactivity and Isotopes, Rutherford Atom and Transmutation, Bohr Atom and Quantum Theory, Complex Atoms, x-Rays and Chemical Affinity, Wave Mechanics.

The style is clear and readable throughout and the selection of material judicious. The book is addressed to "a wide circle of cultivated readers," and the plan is to present selected facts, intelligently grouped, and then to state the conclusions drawn from them. The names of Prout and Proust are frequently confused.

NORRIS F. HALL

**Gmelins Handbuch der anorganischen Chemie. (Gmelin's Handbook of Inorganic Chemistry.)** Edited by R. J. MEYER. Eighth edition. System-Number 7. Bromine. Issued by the Deutsche Chemische Gesellschaft. Verlag Chemie G. m. b. H., Corneliusstrasse 3, Berlin W 10, Germany, 1932. xxi + 342 pp. 17 × 25 cm. Price, to subscribers, M. 56; singly, M. 49.

This volume presents the chemistry of bromine itself and of its compounds with those elements of smaller System-Numbers (1-6): namely, chlorine, fluorine, nitrogen, oxygen, hydrogen and the inert gases. The relevant literature has been covered up to August 1, 1931.

The great extension of our knowledge of this element, since the previous edition, particularly as regards its physico-chemical properties and those of its compounds, is most impressive. Attention should also be called to the section on the history of our knowledge of this element and on its economics.

The present volume is a worthy addition to this invaluable encyclopedia of inorganic chemistry.

ARTHUR B. LAMB

**The Corrosion of Metals. Part II. Special Researches Concerning the Dissolving of Metals.** By Professor WILH. PALMAER, D.Sc. Proceedings of the Royal Swedish Institute for Engineering Research 100,108. Svenska Bokhandelscentralen A.-B., Stockholm, Sweden, 1931. 198 pp. 51 figs. 10 plates. 16.5 × 24 cm.

Part I of this Memoir (in English) dealing with the General Theory of Corrosion has already been reviewed in THIS JOURNAL [Vol. 51, p. 3172 (1929)].

In the present Part II (also in English) a further series of experimental investigations are reported which confirm the conclusions reached in Part I, namely, that the primary factor in the corrosion of metals is the activity of local galvanic elements. The specific materials studied here are malleable cast iron, soft iron, electrolytic iron and certain other pure metals and amalgams. Special chapters are devoted to the alleged formation of a hydrogen film on dissolving metals, the theory of resistance capacity, the theory of isohydric solutions, the occurrence of an induction period, the diffusion theory of corrosion and a criticism of the work in this field of Centnerszwer and his collaborators.

Part III, which is to deal with the special theory of the corrosion of iron, is being prepared for the press.

ARTHUR B. LAMB

**Chemisches Fachwörterbuch. Für Wissenschaft, Technik, Industrie und Handel.** (Chemical Dictionary for Science, Industry and Business.) Edited by A. W. MAYER. Vol. II. English-German-French. Verlag von Otto Spamer, Heinrichstrasse 9, Leipzig C 1, Germany, 1931. 943 pp. 18 × 25.5 cm. Price, Rmk. 70; bound, Rmk. 75.

Volume I (German-English-French) of this three-volume work was reviewed by the present reviewer on page 1614, Volume 53, 1931, THIS JOURNAL. Volume II (English-German-French) is fully as complete and more voluminous than the first volume, containing 943 pages, and is unquestionably well done. Little can be said that was not said about the first volume, for one will find here undoubtedly the best scientific chemical dictionary available. It should enable not only the scientific man but the industrial and technical expert to find quickly the equivalent German and French word or phrase for almost any like phrase in English, with various synonyms as well. It will be invaluable to any translator whether interested in scientific or chemical trade literature. Volume III (French-German-English) will appear later.

The reviewer has the greatest respect and wonder for the persistence, detailed investigation and untiring labor which the author has put into its production. The statement in the first review applies equally to this: *viz.*, those who are fortunate enough to have this volume in their libraries should have no difficulty in obtaining a correct French or German equiva-

lent for almost any English word or technical phrase required in chemical parlance.

CHARLES L. PARSONS

**Die Katalyse.** Die Rolle der Katalyse in der analytischen Chemie. (Catalysis. The Role of Catalysis in Analytical Chemistry.) By Dr. GERTRUD WOKER. II. Special Part, Second Section, Biological Catalysts. Second Half, Atmungsfermente. Verlag von Ferdinand Enke, Stuttgart, Germany, 1931. xix + 592 pp. 2 figs. 16.5 × 25.5 cm. Price, unbound, RM. 76; bound, RM. 79.

This is hardly a treatise on analytical chemistry, it is really a monograph on a special group of the enzymes, those which are associated with the mechanisms of fermentation and oxidation.

The first two hundred pages are devoted to zymase and the various enzymatic phenomena which are encountered in fermentation problems. In this section there is an extended discussion of the chemical mechanism of fermentation, including the intermediate products, methods whereby intermediate products may be isolated or identified and the inter-molecular and intra-molecular reactions which such products may undergo.

Those who are interested in the chemistry of the physiology of the action of insulin will find in this section an excellent discussion of certain theories of its action. Insulin is regarded as the "coenzyme" of tissue zymase. The mixture;  $\alpha, \beta$ -glucose +  $H_3PO_4$  + the synthesizing enzyme, phosphatase + insulin, results in the formation of  $\gamma$ -glucosediphosphate which breaks down in the organism to yield  $\gamma$ -glucose which, because of its great instability, is readily oxidized. Incidentally the graphic formulas of many of the sugars as given do not conform to our best present knowledge. Thus the normal form of glucose is given as containing the 1,4-oxide ring instead of the correct 1,5-oxide ring and  $\gamma$ -glucose is depicted as possessing the 1,6-oxide ring instead of the 1,4-oxide ring. Accordingly in the section on insulin action, the reader should recognize that while the discussion of the mechanism of the reaction may be correct, the formulas which depict the probable reactions are incorrect.

The second section of 335 pages deals with the oxidases, peroxidases and reductases, and here again all phases of the chemistry of the action of this important group of enzymes are considered in detail. The various theories of oxidation are considered at length and the evidence for or against each theory is excellently presented. The systems considered range in complexity from simple inorganic systems to such complex biological systems as the purines and amino acids. Here the reviewer notes an inexplicable omission. In spite of the fact that the cystine  $\rightleftharpoons$  cysteine reaction is considered at some length, glutathione is mentioned only once and that only casually in a footnote (p. 196) in the section on fermentation.

The book is not strictly up to date. The reviewer did not make a de-

tailed search to determine the date of the latest reference cited, but a general inspection failed to locate any references to literature later than 1928. As a monograph on this special group of enzymes prior to that date it is highly recommended.

ROSS AIKEN GORTNER

**Kapillarchemie. (Capillary Chemistry.)** A Presentation of the Chemistry of the Colloids and of Related Fields. By Prof. Dr. HERBERT FREUNDLICH, Member of the Kaiser Wilhelm-Institut für Physikalische Chemie und Elektrochemie. Vol. II. Fourth edition. Akademische Verlagsgesellschaft m. b. H., Markgrafenstrasse 6, Leipzig C 1, Germany, 1932. xi + 955 pp. 113 figs. 17.5 × 25 cm. Price, unbound, M. 60; bound, M. 69.

The first volume of the fourth edition of this handbook, treating the general principles of the subject, appeared in 1930 and has already been reviewed in *THIS JOURNAL* [52, 3033 (1930)]. The present second (and last) volume discusses the properties and behavior of individual, colloiddally dispersed systems.

This volume follows closely the order of treatment and subdivisions of the previous edition. The revision has, however, been a thorough one. The many researches that have appeared in the intervening ten years have been thoroughly considered and incorporated. As a consequence many parts have been completely rewritten and many entirely new chapters or subdivisions have been added, such, for instance, as those discussing the anisotropy of colloidal solutions, the hydrosols of the proteins and the behavior of gels. All told, the number of pages in this volume represents an increase of more than fifty per cent. over the number of pages in the corresponding part of the last edition.

This edition, like its predecessors, is not merely a comprehensive survey of an immense field; it is a critical, thoughtful and penetrating discussion of that field, replete with illuminating deductions and suggestions. It constitutes an impressive intellectual achievement.

Needless to say, it remains an invaluable handbook of colloid chemistry and of related branches of our science.

ARTHUR B. LAMB

**A Shorter Course in Organic Chemistry.** By J. C. COLBERT, Assistant Professor of Chemistry in the State University of Oklahoma. The Century Co., 353 Fourth Avenue, New York, 1931. xviii + 352 pp. 15 × 22 cm. Price, \$3.60.

This is a book which both merits and needs another edition. The conversational tone of the book is in refreshing contrast to the proverbial dryness of textbooks; many charts are used to give the student a "birds-eye view" of structural relationships; and in the index when two names refer to the same substance, page numbers are given in both places. The author's judgment as to the division of space between the branches

of organic chemistry is good, and the illustrative material includes such up-to-date references as "Jake" paralysis and the Cleveland Clinic disaster.

On the other hand, the book is marred by a multitude of minor errors, not all of which can be blamed on the compositor. In a book particularly designed for premedical students it is strange to find no mention of carotene, and no reference to Vitamin D. The normal blood sugar content is stated on p. 203 to three significant figures, and the uses of hexylresorcinol as an external antiseptic and an anthelmintic are not only not mentioned, but are by implication disavowed, p. 308. The "hemlock" of Socrates is not the hemlock with which most readers of the book will be familiar.

The configuration of *d*-glucose on p. 199 is the enantiomorph of that on p. 195, and starch is pictured as derived from *d*-allose, p. 212, with the warning that no attention has been given to the position in space of the hydroxyl groups and the lactone rings. The discussion of the polariscope on pp. 160-161 gives the impression that tourmaline rather than calcite is used in Nicol prisms. The discussions of amino acids and of indicators could be improved if the author would recognize "intramolecular ionization," but the references to J. U. Nef on pp. 43, 44, 82, 128 and 285 are not calculated to help the student.

ELLIOT Q. ADAMS

**Ergebnisse der Enzymforschung.** (Reviews of Enzyme Research.) Edited by F. F. NORD and R. WEIDENHAGEN. Vol. I. Akademische Verlagsgesellschaft m. b. H., Markgrafenstrasse 6, Leipzig C 1, Germany, 1932. xi + 377 pp. 63 figs. 16 × 24 cm. Price, M. 27; bound, M. 29.

This book contains seventeen chapters on various phases of recent enzyme research. Each chapter is written by a different author and represents a critical rather than comprehensive treatment of a particular problem. Among a number of general problems considered are the thermodynamics of cell reactions; the significance of oxidation-reduction potentials; the physico-chemical mechanism of enzyme action; bacterial enzyme reactions; and the formation of enzymes. The more specific problems treated are alcoholic fermentation; proteolytic enzymes; carbohydrases and their specificity; acetic acid fermentation; tyrosinase; bone phosphatase; crystalline urease; crystalline pepsin; the oxygen-carrying ferment of respiration; and the biochemistry of the lower fungi. Additional volumes will presumably appear covering an expanded range of topics.

A highly commendable feature is that the collaboration is international, involving German, English, American and French workers. Leaders of the respective fields have been secured for the most part. The personal outlook of each collaborator is strongly emphasized, and very often a con-

siderable summary of his own work is reported. Willstätter, Euler, J. B. S. Haldane and Waldschmidt-Leitz do not write chapters in the present volume.

The book is written by the expert for the expert and will consequently be of greatest use to the research worker. It raises problems quite as much as it presents their solutions.

DEAN BURK

**Ergot and Ergotism.** A Monograph Based on the Dohme Lectures Delivered in Johns Hopkins University, Baltimore. By GEORGE BARGER, F.R.S., Professor of Chemistry in Relation to Medicine in the University of Edinburgh. Gurney and Jackson, 33 Paternoster Row, E.C., London, England, 1931. xvi + 279 pp. 15 × 23 cm. 41 figs. Price, 15 s., net.

In the preface the author remarks that "this book was planned more than twenty years ago during a happy partnership in research" (with H. H. Dale) but that other activities caused its abandonment. It is most fortunate now that the author has returned to this plan by taking the opportunity to expand his recent Dohme Lectures into the present invaluable monograph. There is now placed at our disposal a work in which for the first time the essential facts about ergot and ergotism have been gathered together and critically presented by the outstanding authority on the subject. The book is gracefully dedicated to the memory of Charles Tanret, the discoverer of ergotinine, ergothioneine and a pioneer worker with ergosterine. In spite of the diversity of the topics and the compactness of presentation, it is written in a most interesting, clear, readable and scholarly fashion.

The first chapter deals with the history and distribution of rye and of ergot and the early obstetrical use of ergot which resulted eventually in its introduction into official medicine first in the United States and later in European countries. The second chapter discusses the two types of ergotism—convulsive and gangrenous—from descriptive, historical and geographical standpoints. The interesting suggestion is developed that deficiency in Vitamine A is a probable factor in convulsive ergotism. A third chapter is devoted to the botany of the ergot fungus, its life cycle and its relation to agriculture. There follows a description of the numerous species of *Claviceps* and of the so-called "biological" races characterized by their infectiousness for definite hosts.

This is followed by a chapter on the chemistry of ergot—brought right up to date—containing the essentials of what is known concerning the substances peculiar to it, *viz.*, the alkaloids ergotoxine, ergotinine, ergotamine and ergotaminine, and which are responsible for its characteristic physiological action. Discretion is used in regard to the space devoted to other constituents.

The fifth chapter discusses fully the pharmacology and the toxic effects of the alkaloids and of the other active amines, such as histamine, which are found in ergot. The last chapter is devoted to ergot in the pharmacopoeias and to the methods of making extracts and assays and finally to ergot in forensic medicine.

A most valuable feature is the extensive bibliography which ends the volume and which bears witness to the industry and thoroughness of the author in preparing this work. Because of the complexity of the material presented, the plan of dividing the various chapters into paragraphs with appropriate headings has been found most useful to the reader. These together with the page headings are distinct aids for ready reference. Finally, excellent judgment has been used in the inclusion of the illustrations to be found in the book.

WALTER A. JACOBS

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### BOOKS RECEIVED

March 15, 1932–April 15, 1932

- C. DRUCKER AND E. PROSKAUER. "Physikalisch-chemisches Taschenbuch." Akademische Verlagsgesellschaft m. b. H., Markgrafenstrasse 6, Leipzig C 1, Germany. 546 pp. M. 27.50; bound, M. 29.
- WILLIAM T. HALL. "Treadwell-Hall. Analytical Chemistry. Qualitative Analysis." Eighth English Edition. John Wiley and Sons, Inc., 440 Fourth Ave., New York. 640 pp. \$4.50.
- ARTHUR HARDEN. "Alcoholic Fermentation." Fourth edition. Longmans, Green and Company, 55 Fifth Ave., New York. 243 pp. \$5.50.
- JITENDRA NATH RAKSHIT. "Association Theory of Solution and Inadequacy of Dissociation Theory." S. C. Auddy & Co., Booksellers and Publishers, 58 & 12, Wellington St., Calcutta, India. 298 pp.
- LEON B. RICHARDSON. "General Chemistry." Revised edition. Henry Holt and Company, One Park Avenue, New York. 779 pp. \$3.50.
- Recueil des Travaux Chimiques des Pays-Bas. "Tables Générales des Tomes 1-50." Vol. I. Tables des Tomes 1-38. Édition de la Société Chimique Neerlandaise. Imprimerie de la Soc. an. de Erven Loosjes à Haarlem, Holland. 416 pp.