

## 1923, VOLUME 45

**The Action of Hydrogen Peroxide upon Certain Phenyl-Substituted Uric Acids. Fourth Paper on Purines**, by F. J. Moore and Elizabeth S. Gatewood.

P. 136. In the first line of the last paragraph after the words "shown that" insert "allantoxaidin, a close relative of."

P. 148. In the tenth line from the bottom of the page, for "p. 146" read "p. 140."

**The Interaction of Aliphatic Alcohols and Beta-Gamma-Dibromopropyl Isothiocyanate**, by Raymond M. Hann.

P. 483, line 19, and P. 486, line 1, for "5-bromomethyl-2-ethoxy- $\Delta^4$ -thiazoline" read "5(bromomethyl)-2-ethoxy- $\Delta^2$ -thiazoline."

P. 484, line 9, and P. 486, line 4, for "5-bromomethyl-2-hydroxyl- $\Delta^4$ -thiazoline" read "5(bromomethyl)-2-hydroxy- $\Delta^2$ -thiazoline."

**A Modification of Gillespie's Method for the Determination of Hydrogen-Ion Concentrations**, by William D. Hatfield.

P. 942. In the sub-heading of the first four columns in Table I, instead of "acid tube," "alk. tube," "acid," "alk." read "alk. tube," "acid tube," "alk.," "acid."

**The System, Calcium Oxide-Carbon Dioxide**, by F. Hastings Smyth and Leason H. Adams.

P. 1167. First paragraph of article, line 10, instead of "From systems" read "From such systems."

P. 1171. Ninth line from the bottom of the page, instead of "calcium oxide gas" read "carbon dioxide gas."

P. 1184. Summary, Paragraphs 2 and 4, for "1389°" read "1339°."

**The Use of Bromate in Volumetric Analysis. III. The Determination of Bromate in the Presence of Ferric Iron**, by G. Frederick Smith.

P. 1671. Line 1. Author's added note: The sodium oxalate used in these experiments was C. A. F. Kahlbaum's best product "for analysis."

**The Free Energy and Heat of Formation of Lead Monoxide**, by David F. Smith and Hubert K. Woods.

P. 2637. In the third line, instead of " $-0.000000257T^3$ " read " $-0.000000513T^3$ ." In the fourth line, instead of " $0.000000128T^3$ " read " $+0.000000257T^3$ ."

**Studies on Enzyme Action. The Relationship between the Chemical Structure of Certain Compounds and their Effect upon the Activity of Urease**, by Elbert W. Rockwood and William J. Husa.

P. 2678. In the first paragraph of the article, line 5, instead of "acids of amphoteric" read "acids or amphoteric."

P. 2682, line 28, and p. 2688, lines 32-33, instead of "effect increasing" read "effect decreasing."

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**NEW BOOKS**

**Konstanten der Atomphysik (The Constants of Atomic Physics)**. By Dr. WALTHER A. ROTH and Dr. KARL SCHEEL. Julius Springer, Linkstr. 23-24, Berlin, W. 9, 1923. 114 pp. 9 figs. 27.5 × 19.5 cm. Price \$2.00.

This is a separate printing of 32 tables (114 pp.) from the new fifth edition of "Landolt-Börnstein." As such it needs no introduction to the scientific public except to say that the same high level of thoroughness and accuracy has been maintained as in previous editions. The data purport to be complete to the end of 1921, and the many specialists who have made the selection seem to have done their work well. The German

Commission's atomic weights are used, "Avogadro's number" is called Loschmidt's, and other "scars of war" are apparent, but as a whole one feels only admiration for the achievement of such a task under the difficulties which must have beset it. The tables include among other things radioactive constants, ages of minerals, molecular magnitudes, selected wave lengths from all types of spectra, crystal structures, and many kinds of data concerning radiation. Some defective type has been used on p. 4, and at the top of Table 6, "8a," should read "6a."

NORRIS F. HALL

**Fluorescenz und Phosphorescenz im Lichte der Neueren Atomtheorie (Fluorescence and Phosphorescence in the Light of the Modern Atomic Theory).** By PETER PRINGSHEIM. Second Edition, revised. Julius Springer, Berlin, 1923. viii + 228 pp. 33 figs. 22 × 14 cm.

The first edition of this excellent little monograph has been reviewed in *THIS JOURNAL*, 44, 1602 (1922). The addition of 60 references has again brought the bibliography up to date. The text has been revised and amplified throughout to bring it into conformity with the most recent conclusions of research. Consequently a number of provisional statements in the first edition now reappear as definite and dependable conclusions. The advantages of such a revision, though it has expanded the book by only 20 pages, need not be further emphasized. It is to be hoped that the author will be able to continue this policy in later editions.

G. S. FORBES

**Grundriss der Photochemie in elementarer Darstellung als Einführung in das Studium (Outline of Photochemistry, in Elementary Presentation, as Introduction to the Subject).**—By Prof. Dr. J. PŁOŃNIKOW, Professor and Director of the Physico-chemical Institute at the Royal Technical Hochschule at Agram. Walter de Gruyter and Company, Berlin and Leipzig, 1923. vi + 196 pp. 34 figs. 23 × 15 cm. Price \$1.00.

The misfortunes of the author between 1917 and 1920 due to political and economic convulsions in Russia and surrounding countries have been recounted in a review of "Allgemeine Photochemie," *THIS JOURNAL*, 43, 2260 (1921). Later he received news that "the exponents of the new civilization" in Russia had converted into cigarette wrappers the manuscript of his "Photochemisches Praktikum" which, ready for the press, had been stored in Moscow. Accepting a call to Agram with high hopes of resuming experimental research, he found the laboratory appropriated for other purposes. His inextinguishable creative impulse then found expression in the present work, which he describes as a summary of his previous books, but in elementary form, intelligible to all desiring to follow the newer developments of natural science.

The beginnings of photochemistry among the ancients and its progress down to recent times interest the author more than the theorizing of the

last ten years. The Bohr atom and Einstein's photo-equivalence are indeed more adequately treated than in "Allgemeine Photochemie." The author, however, frankly distrusts these as a foundation for photochemical theory. The complete omission of various hypotheses and theories which have recently been the subject of much discussion may have seemed necessary in view of the permissible size of the book and in view of the audience for which it is intended. Plotnikow's own well-known convictions regarding photochemical valence, kinetics, and temperature coefficients are developed at some length. The present divergence of opinion with regard to such matters might have been more distinctly stated. Examples and applications of photochemical action are given in quantity and variety sufficient to whet the reader's appetite for wider information along these lines. Considering the author's thorough knowledge of photochemical technique and his important contributions towards its improvement, an exposition in greater detail would have been welcome.

The author brought to his task the resources of a lifetime of experimental research, technical experience and deductive thought in this domain of science. He has triumphed over crushing anxieties and disappointments, and has produced a highly readable and instructive book which meets a real need in chemical pedagogy. For him, moreover, photochemistry is a passion as well as a problem, and his enthusiasm must infect the most casual reader.

G. S. FORBES

**The Determination of Hydrogen Ions.** An elementary treatise on the hydrogen electrode, indicator and supplementary methods with an indexed bibliography on applications. By W. MANSFIELD CLARK, Ph.D., Professor of Chemistry, Hygienic Laboratory, United States Public Health Service. Williams and Wilkins Company, Baltimore, U. S. A. Second edition, reprinted, June, 1923. 480 pp. 42 figs. 23.5 × 15.5 cm. Price net, postpaid, \$5.00, United States, Canada, Mexico, Cuba; \$5.50, other countries.

This second edition gives a detailed exposition of "the two methods which are in use daily by workers in several distinct branches of biological science." Colorimetric methods and the electrometric method for measuring hydrogen-ion concentrations and various forms of apparatus are described fully. Sufficient theory is presented to give the experimenter a good understanding of the meaning of his results. Supplementary methods are also briefly reviewed, with references, and an extensive bibliography on methods and applications of hydrogen-ion determinations is given.

Some of the chapters of the first edition have been rewritten and all have been brought up to date, resulting in a work of 480 pages as compared with 312 pages in the original issue. A number of additions are worthy of special mention. A long list of indicators with their colors and ranges of usefulness has been added. The chapter on approximate indicator

methods has been greatly expanded. An elementary description of the potentiometric method for measuring electromotive forces has been added to the description of the electrometric method with more or less repetition in a later chapter. However, according to the footnote on p. 149, this matter needs emphasis. Descriptions of the ballistic galvanometer and electron-tube methods of measuring electromotive forces have been added. The chapter on reduction potentials has been considerably extended and interesting relationships between the hydrogen electrode, metal electrodes in solutions of metal ions, and oxidation-reduction electrodes are pointed out. A description of the quinhydrone method brings the chapter on supplementary methods up to date. Over 900 references have been added to the bibliography, making a total of more than 2,000 references on hydrogen-ion methods and their applications in various branches of science.

In the chapter on standardization of measurements of Sørensen values ( $P_H$ ) the author points out that the electrometric method measures only ratios between concentrations, so that for the calculation of  $P_H$  values a determination of one concentration by an independent method is required. Sørensen assumed that conductance data gave the correct degree of dissociation for 0.1  $M$  hydrochloric acid solution and based his  $P_H$  values on that. Recent work on activities has shown that Sørensen's assumption was undoubtedly in error, but in the meantime a vast amount of hydrogen-ion data has been accumulated in which Sørensen's value for the 0.1  $N$  calomel electrode has been accepted. In view of the still unsettled state of the newer conceptions of electrolytic dissociation and the possibility of further changes, and also in view of the large amount of data based on Sørensen's value for the calomel electrode, the author wisely recommends that Sørensen's value continue to be used for the present.

A few minor points where improvement could be made seemed worthy of mention. Some of the tables lack titles, notably Table 3. The first paragraph in small type on p. 44 seems out of place. The sections on the theory of concentration cells, pp. 144 and 154, should contain some mention of the liquid-junction potential difference, which is neglected in the treatment. The statement that no important chain can be constructed without involving liquid-junction potentials (p. 163) is too general.

This is a complete and useful book and should be in the hands of all who work on hydrogen-ion concentrations. That it fills a need is evidenced by the exhaustion of the reprint of the first edition and the second edition.

WARREN C. VOSBURGH AND MARION EPPLEY

**Oxidations and Reductions in the Animal Body.** By H. D. DAKIN. Second edition. Longmans, Green and Co. New York, London, Toronto, Bombay, Calcutta and Madras, 1922. ix + 176 pp. 24 × 16 cm. Price \$2.00 net.

Ten years have elapsed since the first edition of this Monograph appeared. For the most part, the addition of new experimental data and oc-

casional alterations in opinion are all that has been attempted in revising it, but the chapter on The Carbohydrates—the one most affected by progress made in the ten-year period—has been to a large extent recast. It is of interest that the new matter of this chapter deals chiefly with the earlier steps in the cleavage of glucose, before oxidation has become involved at all, for this seems to show that Dakin has already begun a task which, in his preface, he sets himself for the future. There he says: "It has become increasingly clear in recent years that the oxidations and reductions occurring in the living body are so closely interwoven with other types of reaction, especially condensation and hydrolysis, that it would seem that their consideration apart from other metabolic changes was becoming unduly artificial and could not be justified much longer." A section on the formation of sugar from fatty acids, and a few others not to be found in the original edition, also bear witness to the same tendency.

In the beginning, the author undertook to treat his subject almost wholly from the standpoint of the fate of organic compounds in the animal body, and little attention was paid to the mechanism of their oxidation or reduction. The space devoted to this question has now been about doubled; Wieland's dehydrogenation theory receives particular attention, and this and other developments relating to the participation of water in oxidation-reduction processes lead finally to an account of the remarkable catalyst (glutathione) recently discovered by Hopkins in animal and plant tissues.

The book will continue to be a mine of ready information to those interested in this field. It is to be hoped that the author can now find time to revise it at more frequent intervals, for no other publication covers the same ground.

CYRUS H. FISKE

*Chemie der Pflanzelle* (The Chemistry of the Plant Cell). By Dr. VIKTOR GRAFE, Professor of the Biochemistry of Plants at the University of Vienna. Gebrüder Borntraeger, Berlin, 1922. viii + 420 pp. 32 figs. 25.5 × 16.5 cm.

In this book the physiology of plants is treated from the point of view of the energy transformation involved, with the structural and chemical aspects of the subject as a background. There are three portions, the first of which includes a descriptive treatment of such fundamental physico-chemical processes as osmotic pressure, interfacial tension, and colloidal behavior; the second section treats of the structure of plants and the chemistry of their components, including enzymes, pigments and toxins; and the third and largest section deals with the dynamic chemistry of plants, particularly as displayed in the processes of photosynthesis and the perception of and response to stimulus.

The first section is the least satisfactory: the explanations are often cumbersome and the examples poorly chosen; it is often difficult to under-

stand the author's meaning. The chapters on stimulation and response show the author at his best.

The book as a whole is poorly organized, and reflects by its errors of citation and its neglect of recent important researches the author's lack of foreign periodicals. The author displays a not unusual fault in being hypercritical of theories which cannot conveniently be reconciled with those which he himself supports.

All life processes are considered first of all as transformations of energy; every theory to be acceptable to the author must account satisfactorily for the intake, storage or release, and outgo of energy. This alone makes the book unusually suggestive; the treatment of photosynthesis, and of stimulus and response is well worth a thoughtful perusal, even though the reader may remain unconvinced or even at times doubtful of the real meaning. Another striking feature of the book is the constant invocation of vaguely defined surface phenomena as explanations of vital phenomena.

The author does not successfully generalize his conclusions; in fact, he seems to despair of the ultimate solution of many problems: The book will appeal to those who insist upon meticulous observance of detail; those who ruthlessly demand clear and concise generalizations will hardly be satisfied.

S. C. BROOKS

**Practical Bacteriology for Chemical Students.** By DAVID ELLIS, Ph.D., D.Sc., Head of the Department of Bacteriology and Botany in the Royal Technical College, Glasgow. Longmans, Green and Company, 55 Fifth Avenue, New York; 39 Paternoster Row, London, E. C. 4; Toronto, Bombay, Calcutta and Madras, 1923. viii + 136 pp. 55 figs. 19.5 × 13 cm. Price \$1.50.

David Ellis, the author, is already known to American workers in the field of bacteriology through the medium of his textbook, "The Outlines of Bacteriology," and a later work, "The Iron Bacteria." He has also contributed numerous monographs on the subject of the iron bacteria which have special interest for the waterworks biologist and engineer. In all of these he has shown an ability to present fundamental information in an effective way.

His reason for compiling the little volume which is here reviewed is that "in the study of Chemistry there are many avenues of research which are closed to the intending investigator owing to a lack of knowledge of the elementary principles of bacteriology." If the book is an aid to overcoming this deficiency, it is a real contribution to scientific literature. It is the judgment of the reviewer that the book does this and that it will appeal most strongly to the class it seeks to reach.

There are twelve chapters of about equal length, each of which takes the form of a series of laboratory exercises designed to acquaint the beginner with fundamental principles and procedures in bacteriology and to famil-

iarize him with the working tools of the science. Discussion of the subject matter of chapters and explanation of results are interspersed with the exercises. The latter are clearly set apart, each step is numerically indicated, formulas are given for solutions and examples presented for the calculation of results. There are 55 figures, most of which are conventionalized drawings designed to set forth essential details. The book is a manual of elementary procedures amplified by the minimum of discussion and designed to serve as a guide to the acquisition of more complete knowledge.

The first eight chapters deal with such subjects as bacteriological apparatus, culture media and their use, staining, morphological and physiological characteristics of bacteria, biochemical activities and methods of isolation and numerical estimation. The ninth and tenth chapters deal with the examination of water and sewage. Usual procedures are given and also confirmatory tests for *Bact. coli communis*. The latter do not include some of the more recent tests which have largely supplanted, at least in this country, the older tests and which give a far better idea of the fecal or non-fecal origin of colon forms. Methods for the identification of *Bact. enteritidis sporogenes* are also given in detail. The two concluding chapters deal with yeasts and moulds. The novice in the science will find a great deal in these chapters which will acquaint him with the principal types of these organisms, methods for their culture and their biochemical reactions.

There are certain omissions in information which, if added, would not greatly increase the size of the book and would add considerably to its value.

A short description of the microscope would be of great value to many students of chemistry. The writer has found that a great number of such students are entirely unfamiliar with this delicate instrument which is so invaluable in many branches of science. The different morphological groups of bacteria could well have been described to acquaint the new student with the exterior appearance of these cells as seen under the microscope.

No mention is made of the adjustment of culture media reaction by means of hydrogen-ion determinations, nor of the use of hydrogen-ion concentration in determinations of acidity of cultures. This practice has almost displaced former titration methods, which deserve mention only as secondary procedures.

The book as a whole merits approval from the standpoint of what it purports to be. Many of the exercises will provide teachers as well as students with suggestions for laboratory work.

MELVILLE C. WHIPPLE

**Rhus Dermatitis from Rhus Toxicodendron, Radicans and Diversiloba (Poison Ivy). Its Pathology and Chemotherapy.** By JAMES B. MCNAIR. University of Chicago Press, Chicago, Illinois, 1923, xi + 298 pp. 18 figs. 23.5 × 5 cm. Price \$4.15 postpaid

With the exception of Chapter XII, the remaining fifteen chapters of this book represent a collection of reprints of papers previously published by the author in various botanical and medical journals. The guiding aim is to establish a scientific basis for the treatment of dermatitis produced by the poisonous constituents of the rhus species (poison ivy, poison oak, etc.). It is stated in the preface that "The investigation of this poison has been carried on from the standpoint of pharmacology, of botany and of chemistry." The botanical and pharmacognostic features are considered in the first eight chapters, which abound in historical reviews and summaries of the literature. The original work along botanical lines is found in these chapters and appears to be sound. Probably the best part of the book is in Chapter X, which deals with the "Chemistry of the Poisonous Principle." This is claimed to be a polyhydric phenol, named by the author "lobinol" (from *Rhus diversiloba* or poison oak). It is not a definite chemical substance, but appears to be a yellowish-brown, viscous (oily?) residue (p. 93, analytical scheme) with phenolic properties, and neither a protein nor a glucoside. It may be a mixture, similar to or identical with *toxicodendrol*, the oily constituent of *Rhus toxicodendron* (poison ivy), first described by Pfaff. Hence, the reader is left in doubt as to the real identity of the constituent, and as to the justification of coining a new name ("lobinol") for it.

Chapter XIV deals with immunity to the poison and consists almost entirely of a review of the literature. The author argues against the production of immunity by the administration of the poison, but is of the opinion that natural immunity exists against it, though this is usually relative and seldom absolute.

Coming to Chapters XV and XVI, which deal with remedies for and treatment of the dermatitis, disclosure of the rational remedy would be expected, for the author states in the preface "Botany and pathology combined with a chemical knowledge of the structure of the poison have yielded a rational remedy for Rhus dermatitis." However, this is not the case, and for the following reasons: (1) The structure and nature of the poison remain unsolved. (2) Erroneous speculations in pharmacology cannot furnish the basis of a rational treatment. For instance, it is stated on pp. 113-114 that "The erythrocytes contribute hemoglobin the iron of which has the power to combine with lobinol. Likewise the blood brings glucose which on its conversion into glucuronic acid, probably has power to combine with the noxious properties of lobinol." Similar ideas are reiterated on p. 176. Moreover, if it is true that "There is reason to



believe that Rhus poison is not transmitted by body fluids....." (p. 114), these speculations could have been omitted. (3) Out of a long list of therapeutic agents and trials, the most suitable remedy settled upon by the author is a lotion containing ferric chloride. This is not new. Metallic salts (lead acetate, etc.) are well known to be effective precipitants of the poison and useful in treatment of the dermatitis. (4) The remaining measures and adjuncts in the treatment proposed by the author are familiar and largely empirical, inclusive of the paraffin treatment, which had been exploited during the World War for severe skin burns from flame projectors, etc.

From what is known of skin irritants ("dermitant," used by the author presumably means the same) in general, including war compounds, etc., the designation of rhus dermatitis as a "specific disease" is not justified. The use of the heading, "Chemotherapy . . . .," for the various and mixed treatments outlined in Chapter XVI is not in accordance with the accepted meaning of the term.

On the whole, this book will furnish interesting and profitable reading for the general reader. However, for the physician and investigator the inclusion of considerable irrelevant and redundant material reduces its usefulness. This exists on pp. 109, 110, 122, 132, 138, 142, 144, 146, in most of Chapter XV which contains a six-page list of remedies, most of which are obsolete, and among the 34 pages of "abstracts," really detailed descriptions, of clinical case histories in the Appendix. In the Appendix there are 77 pages of a systematized bibliography pertaining to rhus and other matters, a good part of which will be useful to future students of the subject. In view of the great difficulties of investigating skin irritants and the practical nature of the problem of rhus dermatitis, the efforts and aim of the author are laudable. However, it may be doubted if our knowledge of rhus dermatitis has been advanced since the work of Pfaff in 1897.

P. J. HANZLIK