

anol-3 (b.p. 63° at 0.25 mm., n_D^{20} 1.4416) prepared from *n*-octylmagnesium bromide and butanone-2. Its allophanate (m.p. 76–77°; m.p. of mixture with authentic sample, 76–77°) was made.

Anal. Calcd. for $C_{14}H_{23}N_2O_3$: N, 10.29. Found: N, 10.44.

2:1 Product (6.2 g., b.p. 150–160° at 0.2 mm.;

n_D^{20} 1.4552; mol. wt. 311) and a residue (10.4 g., mol. wt. 518) were obtained. This work is continuing.

GEORGE HERBERT JONES LABORATORY
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RECEIVED DECEMBER 15, 1952

BOOK REVIEWS

Chemistry of Carbon Compounds. Volume I, Part A. General Introduction and Aliphatic Compounds. By E. H. Rodd (Editor), A.C.G.I., D.I.C., D.Sc., F.R.I.C. Elsevier Publishing Company, 402 Lovett Boulevard, Houston, Texas, 1951. xxv + pages 1–778. 16.5 × 23 cm. Subscription price, \$18.00. List price 15% higher.

The appearance of a publication of the scope and magnitude of "Chemistry of the Carbon Compounds," the initial volume of which is now available, represents a landmark in the history of chemical publishing.

Growing out of a clearly-recognized need for revision of Richter's "Organic Chemistry," the book maintains the general organization of its predecessor but is in every other way an entirely new effort. A group of distinguished advisors, headed by Sir Robert Robinson and including J. W. Cook, R. D. Haworth, Sir Ian Heilbron, E. L. Hirst and A. R. Todd, have presumably aided Editor E. H. Rodd in the organization of the work and the selection of authors, twenty-three of whom have contributed to this first volume.

The general organization of the work calls for five volumes as follows: I, General Introduction, Aliphatic Compounds; II, Alicyclic Compounds; III, Aromatic Compounds; IV, Heterocyclic Compounds; V, Miscellaneous.

This first book, part A of Volume I, is devoted to a general introduction and a survey of aliphatic compounds up to and including dicarbonyl compounds. The former gives short accounts of the history of organic structural chemistry, classification and nomenclature, and the literature of organic chemistry, as well as a more detailed discussion of analytical methods. Chapters on physical properties, crystallography, light absorption, the concept of acids and bases, stereochemistry, reaction mechanisms and free radical reactions complete the introduction. Although certain of these chapters are excellent, some are too short to be of real value; they serve merely to acquaint the reader with a few of the more important ideas and to provide him with a selected bibliography for further reading. Perhaps this reflects the intentions of the Editor and his Advisory Board; in justice it must be said that for adequate treatment some of the topics would require much more space than could be allocated in this work.

It is impossible to review adequately the remainder of the first volume on such short acquaintance. For one to acquire the intimate acquaintance necessary for authoritative comment, the book would have to remain at hand over a period of years, referred to continually and read occasionally in systematic fashion. All that can be said now is that a superficial scrutiny shows excellent organization and adequate coverage for the sections examined.

One is at first tempted to compare this work with its predecessor, Richter, and with that remarkable work of another generation, Meyer-Jacobson. In this reviewer's opinion, the latter has never been equalled, and in view of the enormously increased scope of the science, probably cannot be. It is this very increase in scope which renders such a comparison meaningless. The Editors, Advisors and Authors

of the present work faced a different and vastly more complex task than those of the earlier works, and are to be congratulated for the assumption of so formidable a burden.

The series is certain to become a standard reference work available in all libraries and occupying a position in the personal libraries of many organic chemists. The appearance of subsequent volumes will be awaited with interest.

UNIVERSITY OF ROCHESTER
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MARSHALL GATES

The Alkaloids—Chemistry and Physiology. Volume II. By R. H. F. MANSKE, Dominion Rubber Research Laboratory, Guelph, Ontario, and H. L. HOLMES, Riker Laboratories, Inc., Los Angeles, California (Editors). Academic Press, Inc., 125 East 23rd Street, New York 10, N. Y. 1952. viii + 587 pp. 16.5 × 23.5 cm. Price, \$14.50.

The first volume of this series was received with enthusiasm by organic chemists. The present work is equally deserving. It is the expressed intent of the editors "to present a readable and comprehensive work which will include all matters of importance in alkaloid chemistry." For the most part, this aim has been achieved very successfully.

This is a timely monograph. A high proportion of the systems discussed are under intensive study at present. The list of chapter headings and authors include: Morphine I (H. L. Holmes), Morphine II (H. L. Holmes and G. Stork), Colchicine (J. W. Cook and J. D. Loudon), Alkaloids of the Amaryllidaceae (J. W. Cook and J. D. Loudon), The Acridine Alkaloids (J. R. Price), The Erythrina Alkaloids (L. Marion), The Strychnos Alkaloids II (H. L. Holmes).

The chapters are not of equal quality. The presentation of the stereochemistry of the morphine family deserves special praise; however, other sections concerning these alkaloids are at times both tedious and obscure. The section on colchicine makes fascinating reading. The biological effects of this substance are discussed in some detail—a subject largely neglected in the other chapters.

The discussion of the indole group is divided into three main sections: indole, Erythrina and Strychnos alkaloids. The chapter entitled "The Indole Alkaloids" contains the most complete discussion of these bases presently available. A number of ill-defined bases are included, presumably on a biogenetic basis, where the evidence for the presence of an indole system appears based on intuition rather than fact. Extensive recent developments in the chemistry of the Erythrina bases make that chapter seriously out of date. In the final chapter of the indole sequence, developments in the strychnine field which have appeared since the publication of Volume I are discussed.

The editors and authors of this series are to be complimented on the fine job that they are doing. They are filling a real need. That some portions of these volumes are out of date at the time of publication should not distress them.

It is only an indication of the extreme interest that exists in this field.

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STUART W. FENTON

The Pectic Substances. By Z. I. KERTESZ, New York State Agricultural Experiment Station, Cornell University, Geneva, N. Y. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1951. xvi + 628 pp. 16 × 23.5 cm. Price, \$13.50.

The term pectin, introduced by the Frenchman Braconnot in 1825, is derived from the Greek "πηχτος"—meaning to congeal or solidify.

Pectins are the substances responsible for the setting of jams and jellies. They occur in all fruits and in the middle lamella of the cells of green plants.

Their complex chemical structure, manifold physical properties and role in the plant tissues has been, still is, and will remain a challenge to the ingenuity, patience and skill of the chemist and botanist. Though many tons of pectic substances are consumed by man daily, their dietary and nutritive function still pass our understanding.

The pectic substances are carbohydrates, or, more exactly, carbohydrate derivatives. The main component is pectic acid. Associated with the pectic acid, which, in the natural state, is partially esterified with methanol, are a D-galactan and an L-araban. Emil Fischer gave the cue to the structure of pectic acid in 1892 when he reduced a γ -monolactone of mucic acid to "aldehyde schleimsäure"—or DL-galacturonic acid. But a quarter of a century passed before the work of Smolenski, Suarez and Ehrlich showed that the basic structure of pectic acid was the hexuronic acid D-galacturonic acid. Pectic acid is a chain of α -D-galacturonic acid units ($C_6H_8O_6$)_n, linked through the 1,4-positions. Though pectin is an important natural product, one would not reach that conclusion from today's textbooks on organic and biochemistry. Galacturonic acid, pectic acid, pectins, are words noticeably absent from the indices of the books used. Thus within the covers of one of the popular advanced texts, "Baldwin's Dynamic Aspects of Biochemistry," 2nd edition, (1952), galacturonic acid is not mentioned at all, and pectin once—on page 100 and I quote "Other polysaccharases include enzymes capable of splitting . . . pectins and so on, but we have only very scanty information about these."

After the ABC's of the aliphatics, aromatics, etc., our chemists are fed a classroom diet rich in hormones, vitamins, carcinogenic agents, antibiotics and enzymes. Pectin—thank heavens—is acquired in a natural form through the vegetables, fruits and fruit juices they eat. Who knows, perhaps the physical health of our students is maintained in part through "an apple a day keeps the doctor away." Apples are rich in pectin.

Dr. Kertesz has been an active contributor to pectin chemistry since about 1930. In the preface he indicated "This book was not written for the handful of specialists in pectin chemistry. Rather it is the author's hope that it will be helpful in the orientation of newcomers to the field and aid those interested in problems related in any manner to the pectic substances."

There are 29 chapters, an author and subject index. The authors index has a feature that will save the reader and/or specialist much time. Those authors cited frequently are essentially cross cited, for the page number and the number of the literature citation are both given in the index.

The 29 chapters are grouped into five parts:

- (I) The Chemistry of Pectic Substances (253 pages)
- (II) The Botany of Pectic Substances (66 pages)
- (III) The Biochemistry of Pectic Substances (65 pages)
- (IV) The Manufacture of Pectic Substances (119 pages)
- (V) Some Functions and Applications of Pectic Substances and Pectic Enzymes (70 pages)

I found the treatment of the strictly scientific matters accurate, objective and fair. Indeed on the significant issues (see for instance, pp. 48-49 Structure) the work of those who preferred facts to theory or dogma have been correctly evaluated. Throughout the book Dr. Kertesz writes with authority and in an up-to-date manner.

The problem of organization of subject matter and nomenclature without doubt plagued him. As I see it he has achieved a good adjustment to this difficult task. Repetition, hard to avoid when the subject cuts across organic and biochemistry as well as botany and the technological art, is not excessive.

As indicated *supra* Dr. Kertesz has contributed many original papers to the field of pectin chemistry. But insofar as his work bears on the debatable issues of fine structure, enzyme action and technology he has made no attempt to lead the reader to the belief that the Lord exhausted all HIS creative powers in this field *via* Kertesz.

Perhaps few users of this book will appreciate that it is not a hasty compilation gleaned from the recent "advances" or "reviews." By virtue of his ability to use all the critical foreign languages, the pertinent world literature on pectins is assembled and weighed. Only those who have taken the time, and had the patience to struggle through the massive writings of Felix Ehrlich who stimulated and dominated the pectin field in the 1920's with pretty formulas of polygalacturonides that reproduced nicely in the textbooks then current, will be able to appreciate the sifting and winnowing done by Kertesz.

Anyone who might wish to become informed on any of the manifold aspects of the pectins (structural, biochemical, technological or botanical) will either find what is known or where it can be found. Industrial uses and statistics on pectin products are included and will, I am certain, serve as an eye-opener to many. I think "The Pectic Substances" will stand for many years as a monument to the industry, judgment and objectivity of Dr. Kertesz. He has advanced the pectin frontier through his labors. To him and his publishers my congratulations and thanks. I feel certain others will feel likewise, even some of the "handful of specialists" whom he feared he could not or would not please.

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KARL PAUL LINK

BOOKS RECEIVED

November 10, 1952–December 10, 1952

- R. C. L. BOSWORTH. "Heat Transfer Phenomena—The Flow of Heat in Physical Systems." John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1952. 211 pp. \$6.00.
- C. J. F. BÖTTCHER. "Theory of Electric Polarisation." Elsevier Publishing Company, 402 Lovett Boulevard, Houston, Texas. 1952. 492 pp. \$10.00.
- SAMUEL GLASSTONE AND MILTON C. EDLUND. "The Elements of Nuclear Reactor Theory." D. Van Nostrand Company, Inc., 250 Fourth Avenue, New York, N. Y. 1952. 416 pp. \$4.80.
- W. L. GORE. "Statistical Methods for Chemical Experimentation." Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1952. 210 pp. \$3.50.
- ROBERT S. HARRIS, G. F. MARRIAN, AND KENNETH V. THIMANN (edited by). "Vitamins and Hormones—Advances in Research and Applications." Volume X. Academic Press, Inc., 125 East 23rd Street, New York 10, N. Y. 1952. 421 pp. \$8.00.
- INTERNATIONAL COMMITTEE OF ELECTROCHEMICAL THERMODYNAMICS AND KINETICS. "Proceedings of the IIIrd Meeting—Berne 1951." Carlo Manfredi, Editore, Viale Papiniano 57, Milano, Italy. 1952. 495 pp. Lire 8000.
- J. R. PARTINGTON. "An Advanced Treatise on Physical Chemistry. Volume Three—The Properties of Solids." Longmans, Green and Co., Inc., 55 Fifth Avenue, New York 3, N. Y. 1952. 639 pp. \$14.00.
- K. E. ZIMEN. "Angewandte Radioaktivität." Springer-Verlag, Reichpietschufer 20, Berlin W 35, Germany. 1952. 124 pp. DM 18.80.