

that an amylopectin, which he had prepared by the oxidation of starch with chromic acid, consisted of a number of molecular groups of different complexity and density of internal structure. An erythropectin showed similar complexity, whereas an achropectin seemed to possess homogeneity. Chromic acid was used (1905) to solubilize starch. . . . On p. 458 of Vol. I we find the isolated sentence: "M. A. Swanson found the action of salivary amylase on starch to be more random than its action on glycogen and also examined other amylases." Where is the interpretative plum proffered in the editorial preface?

The source of material used is not always given. A passage of nearly one page (Vol. II, p. 364) seemed strangely familiar to this reviewer, and turned out to be a slightly abridged quotation from a section which he had written some 12 years previously for Kerr (1st ed., p. 125-126, 1944). While the reviewer is greatly complimented to see his writing quoted thus, it would have been more appreciated if adequate reference had been made, and if the printing error in the Freudenberg-Kuhn equation had been noticed and corrected before transcribing it into the 3rd ed. Other cases were noticed where passages, data and references seem to have been taken directly from Kerr, without bothering to check on the original source material.

There is an unfortunate abundance of errors, both in transcription and in interpretation. The optical rotations of some starches are listed as negative. A structural formula for starch is written using L-glucose residues. Specific volumes of starch are obtained from ultra centrifugal studies. The writer discussing periodate oxidation seems to have had a particularly bad day: periodate oxidation of methyl D-glucopyranoside gives formaldehyde, L-(+)-erythrose units are produced during the oxidation of starch by hydriodic(sic) acid, the terminal D-glucosyl unit in starch gives formaldehyde, and so on. Such errors of these indicate lack of care in the writing and editing of the book, or undue haste or pressure in some phases of its preparation.

Notwithstanding a substantial amount of well-written and useful material, and several pages of beautiful photographs of starch granules, the two-volume 3rd ed. of Radley cannot be recommended except with considerable reservation, and only to the reader who is already well enough versed in starch science that he can discern for himself that which is reliable and that which is not.

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Annual Review of Biochemistry. Volume 23. By J. MURRAY LUCK, Editor, Stanford University, HUBERT S. LORING, Associate Editor, Stanford University, and GORDON MACKINNEY, Associate Editor, University of California. Annual Reviews, Inc., Stanford, California, 1954. ix + 636 pp. 16 X 23 cm. Price \$7.00.

This volume continues the high standards set by preceding issues in outlining and evaluating recent advances in the chemical study of living matter. There are 19 chapters compared with 23 in each of the 1953 and 1952 editions. The prefatory chapter by Karl Thomas entitled "Fifty years of biochemistry in Germany" is chiefly an account of personal experiences, including those associated with political upheavals which plagued that country, and contains comments on factors which contribute to success in teaching and research. It traces the changing attitudes of investigators from the static to the dynamic approach to the study of metabolism, and contains many tributes to individuals in this "mother country of physiological chemistry."

Of the remaining 18 chapters, 12 are on the perennially recurring, but rapidly changing, topics: biological oxidation, proteolytic enzymes, non-proteolytic enzymes, chemistry of carbohydrates, chemistry of amino acids and proteins, nucleic acids, nutrition, fat-soluble vitamins, water-soluble vitamins (2 chapters), biochemistry of cancer, and carbohydrate metabolism. The other six topics are biochemistry of muscle, biochemistry of hormones, clinical application of biochemistry, mineral metabolism, thyroid hormone and iodine metabolism, and metabolic antagonists. All of these have appeared at various intervals in previous Annual Reviews.

The omission of the chapters of Lipid and Protein Metabolism and the inclusion of the material otherwise to be

found here under the headings of Carbohydrate Metabolism and Vitamins, is evidence of two trends in modern biochemistry: (1) the integration, overlapping and essential unity of all phases of metabolism and (p. 125) "that the traditional division of metabolism into carbohydrate, lipid, etc., is no longer entirely appropriate to modern Biochemistry" (2) the fundamental role of the vitamins, especially B vitamins, in metabolic processes. The space devoted to water-soluble vitamins is expanded to two chapters, and most of this is concerned with the metabolic reactions in which these vitamins participate. Although no single review can completely cover the subject whose title it bears, and, much less, can any annual volume adequately represent all the advances in the field during that year, the extent of coverage achieved is remarkably good especially when several volumes over a period of 3 or 4 years are taken together. The editors and authors are to be congratulated on the effectiveness, value and wide use of this publication.

The international character of the volume is well-maintained with chapters contributed by 3 British, 2 French, 1 Danish, besides the prefatory German, authors.

The publication is held in high esteem by biochemists throughout the world. It is a ready source of information and references on any aspect of this rapidly expanding subject which is fundamental to medicine and agriculture; it contains critical analyses of many perplexing scientific problems; it is a historical account of an important science during a period when its very foundations are being discovered.

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Organic Reactions. Volume VIII. By ROGER ADAMS, Editor-in-Chief. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1954. viii + 437 pp. 16 X 23.5 cm. Price \$12.00.

This is the eighth in a series of volumes dealing with organic reactions, issued under the direction of an Editorial Board headed by Professor Adams, together with an Advisory Board and the eleven Associate Editors who are the contributors to this volume. The chapters constitute complete and critical reviews, each one dealing with an important reaction or transformation of organic compounds.

Each chapter includes a brief historical introduction, followed by sections on the mechanism of the reaction, scope and limitations of the reaction, preparation of the reagents, related reactions, choice of experimental procedures. Each chapter includes a tabular survey of all the reactions to be found in the literature. The tables are exhaustive, and they list not only the compounds prepared, but also the reagents, reaction conditions, yields and references to the literature.

The writing is excellent, the style is uniform, clear and concise, yet the fields are covered thoroughly, each one by an authority in the field. It is impossible to single out any chapters as better than the others; all of them meet, in all respects, the very high standard set in the preparation of the earlier volumes. There is a cumulative index, and a cumulative list of subjects, which include all of the eight volumes in the series.

The book is printed on good paper, and the book-making and typography are excellent. The many complicated structural formulas are beautifully set and arranged on the pages; even in the tables, where smaller type is used, the formulas and the arrangement are first rate.

It is regrettable that modern costs of production make it necessary to price such a fine book beyond the means of most of the graduate students and younger chemists who would find it so useful.

The chapters are as follows:

1. Catalytic Hydrogenation of Esters to Alcohols. By the late Homer Adkins; 27 pages, 51 references, 13 pages of tables.

2. The Synthesis of Ketones from Acid Halides and Organometallic Compounds of Magnesium, Zinc, and Cadmium. By David A. Shirley; 31 pages, 146 references, 11 pages of tables.

3. The Acylation of Ketones to Form β -Diketones or β -Ketoaldehydes. By Charles R. Hauser, Frederic W. Swamer, and Joe T. Adams, Jr.; 138 pages, 572 references, 55 pages of tables.