

Only two references later than 1936, both dealing with the latter, are included. Thus the war and postwar years have not shown much activity in these interesting aspects. Chapter IV deals with the more or less classical problems of space quantization and magnetic deflection of beams. The more recent work of Friedburg and of Lemonick and Pipkin on focussing of neutral beams is discussed, otherwise experiments on direct magnetic deflection appear to have been confined for the most part to the years prior to 1940. Chapter V, on Atomic and Molecular Beam R.F. Spectroscopy, covers in 36 pages essentially material heretofore not covered in such a book and is undoubtedly the most important chapter. After the historical account and a discussion of the theoretical basis of the method, the author discusses the various kinds of experiments which have been done to obtain magnetic R.F. spectra of molecules and of atoms. Included are details of methods of obtaining nuclear g -values from unresolved molecular spectra, methods of obtaining quadrupole interaction constants, a discussion of the R.F. spectra of the hydrogen molecules, the Millman effect and the use of two R.F. fields in molecular experiments. The chapter also includes a description of the experimental arrangements and procedures for obtaining R.F. spectra of atoms of $J = 1/2$ and $J > 1/2$, also a discussion of the hyperfine structure anomaly, the electron magnetic moment and the Lamb shift. All in all the chapter is very meaty. The sixth and final chapter deals with the experiments on the electric deflection of molecular beams and includes a discussion of the electric R.F. spectra experiments concluding with a convenient and useful table of molecular constants of diatomic molecules measured by the electric resonance method.

I heartily recommend the book to anyone engaged in or interested in experiments on molecular beams.

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Advances in Virus Research. Volume III. Edited by KENNETH M. SMITH, Virus Research Unit, Molteno Institute, Cambridge, England, and MAX A. LAUFFER, Department of Biophysics, University of Pittsburgh, Pittsburgh, Pennsylvania. Academic Press, Inc., Publishers, 125 East 23rd Street, New York 10, N. Y. 1955. ix + 339 pp. 16 × 23 cm. Price, \$8.00.

Repeatedly emphasized by some individuals interested in chemotherapy has been the desirability, indeed the necessity, for collaboration of chemist and biologist in order to achieve effective advancement in this field. This need is reemphasized by the information in the chapter, "The Chemotherapy of Viruses," by R. E. F. Matthews and J. D. Smith, which is nearly one-third of Volume III of "Advances in Virus Research." Other chapters of particular interest to the chemist are "Comparative Biochemistry and Virology" by Seymour S. Cohen and "Current Status of Bacterial Transformations" by Harriet Ephrussi-Taylor. While these three chapters merit special attention of chemists and chemotherapists interested in the biological implications of nucleoprotein metabolism, all of the chapters comprising this volume are written so as to be intelligible and rewarding to the inquisitive chemist even though he possess no special knowledge of viruses. Such a reader of the entire volume will learn of the problems and the techniques in the conduct of research on bacterial, plant and animal viruses and of the importance of nucleic acids in such studies, particularly in considerations involving attempts at chemotherapy.

All of the chapters are excellently presented on the basis of content and manner of expression. To single any one out for special praise would be but to disclose one's particular interest. The chapter by Cohen presents the diversity of data on chemical virology which serve to illustrate that viruses do not constitute a homogeneous group. The chapter on Chemotherapy presents methods of testing for virus inhibition, the relationship of structure and multiplication of viruses to chemotherapy, the effects of purines, pyrimidines and other types of compounds on viruses and incorporation phenomena in relation to anti-metabolite action. As would be expected, some but not a serious overlap of material is to be found in these two chapters. A more extensive but probably unavoidable overlap is to be found in the chapters, "Multiplication of Plant Viruses in Insect Vectors" by Karl Maramorosch and "Cross Protec-

tion Between Strains of Yellow-type Viruses" by L. O. Kunkel. The former discusses the question of insect vectors as alternate hosts of a number of plant viruses while the other chapter presents the studies on one type of plant viruses, in which cross protection is revealed by the influence of prior infection on reproduction of the viruses in plants and in the arthropod carriers. The chapter by Kenneth M. Smith can best be summarized here by its title, "Morphology and Development of Insect Viruses." The chapter by Ephrussi-Taylor presents a general summary of the knowledge of bacterial transformation and of transformation factors.

With Volume III of "Advances in Virus Research" the editors appear to have continued well the progress toward their objective (as stated in the prefaces of Vols. I and II) of giving virus researchers a comprehensive up-to-date view of virology as a whole. The book is well constructed and has helpful author and subject indexes. A number of typographical errors, which were detected, should not be causes of confusion.

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Biochemistry and the Central Nervous System. By HENRY MCLLWAIN, Ph.D., D.Sc., Professor of Biochemistry in the University of London at the Institute of Psychiatry (British Postgraduate Medical Federation); Honorary Biochemist, the Bethlehem Royal Hospital and the Maudsley Hospital. Little, Brown, and Company, Boston, Massachusetts. 1955. vii + 272 pp. 16 × 24 cm. Price, \$9.50.

The growing burden of the care of mentally ill patients, which in New York State alone requires about one-fifth of the total state budget, is bringing about a greater recognition of the need for expanding research on the nervous system. The increasing support for such research both financial and otherwise is creating more favorable opportunities for biochemists who are interested in working in this area. Younger biochemists in particular, who may ask "Are there problems of biochemistry which are specific for the nervous system?" and "What is known so far?" will find this book very valuable.

In "Biochemistry and the Central Nervous System," Professor McIlwain presents in a most concise and factual manner a highly intelligent and readable summary of a good deal of modern biochemical thinking regarding the activities of the central nervous system. Under individual chapter headings are described the results of metabolic studies carried out with cerebral tissues *in situ* and *in vitro*, in development and in adult. Because of the obvious importance of glucose for the functioning of the central nervous system, much of metabolic work with brain has been concentrated on glycolysis and accordingly considerable space is given to this topic. Many of the author's own contributions are forcefully presented in the sections dealing with glycolysis and energy relationships. Other topics discussed in somewhat less detail include amino acids, vitamins and lipids. Separate chapters are also devoted to cytochemical and histochemical aspects, neurohormonal substances and drugs. Naturally no volume of this type can satisfy everyone. More experienced biochemists and pharmacologists will be aware of some uncritical presentation of unproven postulates or unconfirmed data, for example, the scheme of triosephosphate oxidation on page 72 or the reports of beneficial results in phenylpyruvica oligophrenia obtained by decreasing phenylalanine intake described on page 118. The necessity for condensing a complicated series of reactions into a terse summary has also resulted in occasional confusion. Thus, on page 194, the enzyme systems which oxidize glucose 6-phosphate are incorrectly referred to as glucose dehydrogenase; and the brief description of the pathway of pyruvate formation from malate on page 90 is not too clear without consulting the original papers. The lack of space available for development is evident and it is to be hoped that the ready acceptance of this volume will encourage the publishers to commission Professor McIlwain to considerably expand subsequent editions. Such expansion will also be of benefit to those psychiatrists and neurologists who, lacking biochemical training, may have some difficulty with this volume. On the whole though, Professor McIlwain and the publishers are to be commended for

providing a highly useful guide to biochemical research in the central nervous system.

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Methods of Enzymology. Volume II. Edited by SIDNEY P. COLOWICK and NATHAN O. KAPLAN, McCollum-Pratt Institute, The Johns Hopkins University, Baltimore, Maryland. Academic Press, Inc., Publishers, 125 East 23rd Street, New York 10, N. Y. 1955. xx + 987 pp. 16.5 × 23.5 cm. Price \$23.80.

This volume is dedicated to the memory of James B. Sumner (1887-1955). There are 5 sections dealing with enzymes in protein metabolism, nucleic acid metabolism, phosphate metabolism, coenzyme and vitamin metabolism and respiratory enzymes. The 5 sections are further subdivided into 152 contributions by as many authors, dealing with preparative procedures and assay methods.

On p. 48 in the discussion of trypsin inhibitors the findings of Tauber, Kershaw and Wright [*J. Biol. Chem.*, 179, 1155 (1949)] have been misrepresented. The fact is, Tauber, Kershaw and Wright found (as shown in Table III) the crude Lima bean inhibitor to be 4.5 times more active than the crystalline fraction. It is obvious that the author of this review did not check the original paper but used another source material. On p. 475 the preparation of non-specific adenosine deaminase from Takadiastase is described. Commercial Takadiastase which contains a large quantity of inert material is not good starting material for the preparation of highly active mold enzymes. Natural mixtures of concentrated enzyme products produced from *Aspergillus oryzae* type mold cultures are now commercially available. Methods have been described for the preparation of soluble enzymes from mold bran cultures. These too are mixtures of a large number of enzymes and are suitable for the preparation of non-specific adenosine deaminase. On pp. 776 and 777 two methods for the preparation of crystalline beef liver catalase are described in detail. These procedures, however, are not the easiest for the crystallization and recrystallization of catalase. The more recent methods of Tauber and Petit are now in general use [*J. Biol. Chem.* 195, 703 (1952); 205, 395 (1953)]. On p. 791 under the heading "Peroxidase (liver)," the preparation of a fraction containing liver proteins is described. This fraction having both catalase and peroxidase activity is said to contain a specific peroxidase because it oxidizes guaiacol. This conclusion, based on optical measurements, may be correct. It has been shown, however, that crystalline catalase can also oxidize large molecules and this fact should have been mentioned by the author. In this volume peptide bond synthesis and transpeptidation by proteolytic enzymes are presented. In this connection the reviewer wishes to call attention to the recent test of Haurowitz and Horowitz [*THIS JOURNAL* 77, 3138 (1955)] which employs isotopically labeled substrates to determine enzymatic transpeptidation.

Enzymology has grown to enormous proportions in the past 30 years. A large number of important discoveries have been made. The reviewer's few critical remarks intend to show that even an expertly prepared work such as this does not include all the facts and all of the literature. It requires careful supplementing with past and current source materials. It is the reviewer's opinion that this volume, similar to Volume I, will be gratefully received by enzyme investigators everywhere.

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BOOKS RECEIVED

May 10, 1956-June 10, 1956

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- J.-P. MATHIEU AND A. PETIT. "Constantes Sélectionnées Pouvoir Rotatoire Naturel. I. Stéroïdes." Tables de Constantes et Données Numériques Organisme Affilié de L'Union Internationale de Chimie Pure et Appliquée. Volume 6. Masson et Cie, Éditeurs, 120 Boulevard Saint-Germain, Paris 6, France. 1956. 507 pp. Volumes brochés 12000 Frs, Volumes reliés 12900 Frs.
- F. F. NORD (edited by). "Advances in Enzymology and Related Subjects of Biochemistry." Volume XVII. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1956. 556 pp. \$11.00.
- G. H. OSBORN. "Synthetic Ion-Exchangers. Recent Developments in Theory and Application." The Macmillan Company, 60 Fifth Avenue, New York 11, N. Y. 1956. 194 pp. \$6.00.
- G. N. PATTERSON. "Molecular Flow of Gases." John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1956. 217 pp. \$7.50.
- M. CANNON SNEED AND ROBERT C. BRASTED, Editors. "Comprehensive Inorganic Chemistry." Volume Five. "Nitrogen, Phosphorus, Arsenic, Antimony, and Bismuth." By Harry H. Sisler. "Non-aqueous Chemistry." By Alfred R. Pray. D. Van Nostrand Company, Inc., 120 Alexander Street, Princeton, New Jersey. 1956. 214 pp. \$5.00.
- ARNOLD WEISSBERGER, Consulting Editor. "The Chemistry of Heterocyclic Compounds." Volume IX. "Acridines." By R. M. Acheson, with a chapter by L. E. Orgel. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1956. 409 pp. \$12.50, \$11.25 Subscription price.