fine splitting ≤1 Hz), 1, $J_{1',2'}$ = 5.0 Hz, $H_{1'}$], 5.27 (two t, 1, $J_{2',3'} = J_{3',4'}$ = 3.5 Hz, $J_{3',F}$ = 53 Hz, $H_{3'}$), 4.62 (two q, 1, $J_{2',F}$ = 16.5 Hz, $H_{2'}$), 4.3 and 3.6 (m, 3, $H_{4'}$ and $H_{5'}$). *Anal.* ($C_{10}H_{12}N_5O_3F$) C, H, N, F.

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Book Reviews

Biochemical Aspects of Reactions on Solid Supports. Edited by G. R. Stark. Academic Press, New York, N. Y. 1971. x + 233 pp. $13.50.

This very useful little book presents five chapters on the preparation and uses of solid-support systems in protein chemistry and enzymology. The recent applications of solid-support technology to nucleic acid synthesis and degradation are included only in the form of a short list of references. The first chapter, by R. Goldman, L. Goldstein, and E. Katchalski, Water-Insoluble Enzyme Derivatives and Artificial Enzyme Membrances, is the largest and broadest one with a complete survey of methods of preparation of both covalent and noncovalent solid-support–enzyme derivatives. It also contains a brief analysis of the kinetic behavior of immobilized enzymes and a discussion of enzyme membranes and columns and their physical properties. The second chapter, by P. Cuatrecasas, Selective Absorbents Based on Biochemical Specificity, covers the whole exciting area of affinity chromatography, from the methods of preparation of affinity absorbants to the many and varied uses of these absorbants in biochemical research. Both chapters include extensive tabulation of what has been done in these areas and, in addition to giving a solid basis for further work, also impart to the reader a strong awareness of the very impressive potentials of these techniques. The next two chapters focus more directly on single purpose goals. Solid Phase Synthesis: The Use of Solid Supports and Insoluble in Peptide Synthesis by G. R. Marshall and R. B. Merrifield and Sequential Degradation of Peptides Using Solid Supports by G. S. Stark reinforce the solid-support applications from the previous chapters with the spectacular successes achieved in these areas. The last chapter by J. A. Patterson presents a survey of the preparation and properties of one of the most commonly used types of polymer supports: Preparation of Cross-Linked Polystyrenes and Their Derivatives for Uses as Solid Supports and Insoluble Reagents. Whereas most of the other topics in the book have been reviewed before, this chapter appears to be quite unique in the biochemical literature, and its subject is certainly of fundamental value to the theme of the book.

This book should have a most stimulating impact on the reader. The individual authors, all of whom have been active in developing this new field, have presented an impressive volume of information and ideas in an effective and very readable manner. Although the individual topics have been subject to previous reviews, there is an obvious advantage in having all topics assembled and brought up to date in a single volume. The book should be useful to anyone who wishes to inform himself of the concepts and specific applications of solid-support reactions and should also serve as an excellent starting point for the person who wishes to use these techniques in his own work.

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Biochemistry and the Central Nervous System. By Henry McIlwain and H. S. Bachelard. Fourth Edition. Churchill Livingstone, Edinburgh and London (The Williams and Wilkins Co., Baltimore, Md.). 1971. 616 pp. 24 × 16.5 cm. $26.50.

This fourth edition by Professor McIlwain was written for the first time with a coauthor, Dr. H. S. Bachelard, who is a Senior Lecturer at the same institution, University of London. This edition, as with the previous ones, is a well-written, succinct introduction to the titled subject. The new edition has increased in number of pages by about 50%, which reflects the large number of biochemical studies on this subject in recent years. The book contains two new chapters, one on metabolic regulation and the other on the metabolism of nucleic acids and proteins. Much of the information in these chapters was consolidated from material which was spread throughout the old editions. The consolidated information together with much new information has resulted in not only very fine treatises on these topics but convenient ones for the readers. In one of the chapters, regulatory mechanisms of glucose transport, glycogen metabolism, glycolysis, tricarboxylic acid cycle, and oxidative phosphorylation are discussed. Adequate discussions of cerebral RNA and protein synthesis and turnover and the regulatory roles of cyclic AMP and cyclic GMP are included in the other new chapter. Although the reader must go to other monographs for more extensive details, the chapters are well referenced with pertinent scientific papers.

There are other larger books and a few multivolume works on this subject but this reviewer heartily recommends this book as an excellent starting reference for students and research workers in neurochemistry and neurophysiology. The chapters involving acetylcholine, central biogenic amines, and neurotropic drugs should be of particular interest to the biochemical pharmacologists.

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Methods of Neurochemistry. Vol. 2. Edited by Rainer Fried. Marcel Dekker, New York, N. Y. 1972. ix + 294 pp. 15 × 22.6 cm. $18.50.

The minute amounts of neurochemicals obtainable from even large amounts of tissues, the instability of some of these materials, and the complexity of the tissue sources demand the greatest possible refinement of analytical methods for the detection and quantitative assays of neurohormones and similar substances. This volume presents a number of such methods for 5-HT, tryptophan-5-hydroxylase, cyclic AMP, and pyridoxal. Part of the analytical difficulties is the elaboration of source materials. Cell and tissue fractions must be prepared as closely circumscribed as possible so that contamination of the extracts with related substances is held to a minimum. How this condition is met is described in three chapters. One of them describes subcellular fractionation of brain tissue with special reference to the preparation of synaptosomes while another one discusses current approaches to the study of CNS receptors. An effort is made to differentiate between receptors and acceptors (other sites at which drugs can bind, be stored, and from which they can be released). Isotopically labeled nucleotides can be used to study incorporation into brain RNA and polysomes which are involved in short-term learning and training experiences in animals. Analytical techniques designed to follow the pathways of the isotope markers are described.

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Organic Reactions in Steroid Chemistry. Vol. 1 and 2. Edited by John Fried and John A. Edwards, with 23 contributors. Van Nostrand Reinhold Company, New York, N. Y. 1972. 16.5 × 23.5 cm. Vol. 1. XVIII + 510 pp. Vol. 2. XVI + 464 pp. $45.00 for both volumes.

The 1950's and 1960's were exciting years for steroid chemists. Spurred by the discoveries that cortisone had an ameliorating effect on arthritis, progesterone inhibited ovulation, and aldosterone was implicated in fluid retention, chemists throughout the world sought to modify the structures of the naturally occurring hormones in the hope of obtaining compounds which would be more potent and more selective in their biological activity or which would inhibit the activity of a specific hormone. Because the stakes were high and competition exceedingly intense, additional stress was placed on the synthesis of novel compounds, which could be patented, and on the development of facile procedures for the commercial preparation of these compounds.

The spectacular results achieved are a testimony to the ingenuity and creativity of the chemists involved, the contributors to the two volume set of "Organic Reactions in Steroid Chemistry" being among them.

This set of work, edited by the Director and the Associate Director of the Institute of Organic Chemistry, Syntex Research, covers 15 major topics. Many of these topics were reviewed nearly a decade ago in "Steroid Reactions–An Outline for Organic Chemists," which was compiled by Professor Carl Djerassi and his graduate students.

In the volume edited by Djerassi, transformations were entirely described with structural formulas, although brief introductory remarks were occasionally included. The present work follows more closely the format of *Organic Reactions.* Thus, each section begins with a review, albeit in a few instances the review was not very critical, of a particular subject and ends with a selection of experimental procedures. With a few exceptions, each of the 15 chapters comprises 50–70 pages, and every chapter is well written. The structures are attractively drawn and comparatively free of mistakes. Extensive references are listed at the end of each chapter. In most chapters, they are presented in alphabetical order. The references are fairly up to date. Some publications as recent as 1970 are included.

A wide range of topics is covered and many individuals contributed their efforts. To the credit of the editors, there is very little duplication of materials.

Among the topics included are metal–ammonia reductions, photochemical transformations, selective reactions of the carbonyl and hydroxyl groups, introduction of fluorine and deuterium into the steroid molecule, electrophilic and nucleophilic methylenation, and functionalization of nonactivated alkyl groups.

These transformations are extensively employed in organic chemistry. Hence, this set of work can be read with profit by all medicinal and organic chemists and not just by those who are engaged in steroid research.

As prostaglandins supplant steroids in interest, this set of work could conceivably serve also as a useful reminder of an illustrious period of research and as a harbinger of what will ultimately emerge from the efforts which are now being directed toward this new area of research.

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The Alkaloids. Chemistry and Physiology. Vol. XIII. Edited by R. H. F. Manske. Academic Press, New York, N. Y. 457 pp. Nov 1971. $24.00.

This thirteenth volume in the series "The Alkaloids. Chemistry and Physiology," edited by R. H. F. Manske, continues in the format and tradition of the previous twelve volumes. Nine chapter-subjects are presented, of which three concern new subjects not previously reviewed, five are supplemental to earlier volumes in this series, and one is Manske's usual and helpful compilation of alkaloids of new or unknown structural types.

All the authors have presented their material with skill and thoroughness, and the presentations follow the order: structure, synthesis, and biosynthesis. Physical methods of structure determination are heavily emphasized, in particular mass spectral data, and biogenetic hypotheses and biosynthetic data are discussed with great frequency. The literature has been covered through 1969 with a few scattered 1970 references. In only three chapters–Ipecac, Calabar Bean, and Tropane Alkaloids–are there discussions of pharmacological aspects.

The major portion of this volume is a supplemental review of the Morphine Alkaloids by K. W. Bentley which occupies about 40% of the book. This is an excellent, comprehensive review of the 1960–1969 period with an especially thorough treatment of the thebaine–Diels Alder products. The Ipecac Alkaloids are also reviewed for this ten-year period by Brossi, Teitel, and Parry. This chapter contains a good review of the extensive, recent synthetic work in this series. Other supplemental chapters include the Calabar Bean Alkaloids (B. Robinson) and the Tropane Alkaloids (G. Fodor), which are useful for their exhaustive treatments of stereochemical questions, and The Bisbenzylisoquinoline Alkaloids (M. Curcumelli-Rodostamo), which contains a comprehensive treatment of structural physical methods. A useful feature of this chapter is cross-referencing for individual compounds to previous volumes of this series (a la Beilstein).

Three new areas are reviewed for the first time in this series. The Spirobenzylisoquinoline Alkaloids (M. Shamma) discusses the seven characterized compounds in this group, and The Carbazole Alkaloids (R. S. Kapil) reviews this family of compounds first characterized as natural products in 1964. The Galbulimima Alkaloids by Ritchie and Taylor is a complete review of their work in this unique group of *trans*-decalinpiperidine alkaloids of which himbacine is the parent.

This volume contains a listing of the contents of the previous 12 volumes, an author index, and a subject index. The latter, however, is quite restricted in its use since it lists only compounds. Subjects other than compounds must be hunted through the individual chapters. Also rather inconvenient is the use of roman numerals for cross-referencing compounds in the text with structural formulas. When the number of compounds exceeds 20, as it does in each chapter, this numbering system becomes quite cumbersome.

As in the past, this is a useful volume to have in the library.

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Annual Review of Pharmacology. Vol. 12. Edited by H. W. Elliott, R. Okun, and R. George. Annual Reviews, Inc., Palo Alto, Calif. 1972. ix + 528 pp. 16 × 22.8 cm. $10.00.

There are 25 review articles in this volume, ranging from excellent and exciting accounts in several active fields of pharmacology to a poorly translated, egocentric autobiography of the German pharmacologist Eichler and a history of Finnish pharmacology. There would not be much point in giving here a table of contents. An annual review volume, although reaching back for more than 1 or 2 years, presents research areas in flux and cannot help but suggest new directions of investigation. For example, the common structures of sea snake and cobra neurotoxins are held in a semirigid conformation by four disulfide bridges which are essential for the toxic interference with cholinergic mechanisms by these polypeptides. Why should these conformations be necessary? Or in another case, what can we read into an excellent chart of points of biochemical interference by immunosuppressive agents, that would lead us to additional untried types of drugs with such activity? There are reviews of less widely studied areas such as developmental pharmacology, whose importance is being recognized in neonatal and pediatric conditions. Medicinal chemists and pharmacologists alike will enjoy this volume, even though they will have to overlook repeated inaccuracies in chemical formula design, nomenclature, misspelled authors' names, and typographical errors which the editors should have corrected.

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