Book Reviews

Progress in the Chemistry of Organic Natural Products. vol. XII. L. Zechmeister, Ed. Springer, Vienna, 1955. x + 550 pp. $19.80.

The present volume continues to fulfill the twofold purpose of the valuable collection, which is to present the latest views and reviews on newly developed or well-explored fields written by the chief investigators themselves and to tear down the artificial barriers between organic chemistry or biochemistry and biology. Coverage by contributors from all continents extends to the following topics.

"Sesquiterpenes and diterpenes," by A. J. Haagen-Smit, Pasadena, California (43 pp., 240 references). The tectonic and comparative aspects of the compounds of this group are presented in a succinct and lucid fashion. Our understanding of the building principles of terpenes began with the oversimplified isoprene rule followed by the "biogenetic modification of this rule" (1953). The chapter ends with the challenge to apply the recently developed analytic and biochemical microtechniques to the study of isotopic terpene precursors in living systems.

"Tetracyclic triterpenes," by E. R. H. Jones and T. G. Halsall, Manchester (87 pp., 174 references). Detailed knowledge of this particular group of about 20 terpenes came to us only within the past 5 years. Lanosterol, which is contained in the unsaponifiable portion of wool fat and was suspected long ago by Windaus and Wieland to be a link in the biogenesis of sterols, is the best-known representative of the group. Shortly after its recognition as 4,4,14-trimethylzymosterol came the ingenious synthesis (1954). This chapter gives an impressive account of the development and refinement of steric analysis and stereoselective synthesis in modern organic chemistry.

"Neuere Vorstellungen auf dem Gebiete der Biosynthese der Steroide und verwandter Naturstoffe," by R. Tschesche, Hamburg (38 pp., 113 references). It is encouraging to see that the theory of the biogenesis of cholesterol and its congeners rests on firmer experimental ground than that of the lower terpenes. In fact, development in this field has been so rapid that many of the biogenetic hypotheses reviewed or advanced in this chapter are largely of historic interest only, since the squalene → (dihydro)-lanosterol-agnosterol → cholesterol sequence gains experimental support.

"Some biochemical aspects of fungal carotenoids," by F. T. Haxo, La Jolla, California (28 pp. 116 references). The microbial colored polyenes, their relationship to colorless precursors or hydrogenation products (phytofluene), their role in sexual reproductive processes, inhibition and activation of chromogenesis are some of the interesting subjects taken up in this chapter.

"The Pyrrolizidine alkaloids," by F. L. Warren Pietermaritzburg, Natal (59 pp., 195 references). This exhaustive review lucidly presents the latest information on the structure, stereochemistry, and interrelationships of the unusual senecio alkaloids, in which the acid component is structurally and biogenetically as interesting as the basic moieties.

"Paper chromatography in the study of the structure of peptides and proteins," by E. O. P. Thompson and A. R. Thompson, Melbourne (57 pp., 428 references). The signal progress in the elucidation of peptides, enzymes, and hormones as a result of the separation of amino acids and peptides after hydrolysis and their identification on a microscale, using chemical marking or enzymatic selectivity, is the topic of this excellent and exhaustive review, which will serve as an indispensable guide to the techniques and methods in the field of protein analysis.

"Acides aminés iodés et iodoprotéines," by J. Roche and R. Michel, Paris (47 pp., 177 references). That this field is being reviewed for the third time in this series is ample evidence of its importance as well as of its rapid development, especially the area related to the biogenesis of thyroxin and its metabolites.

"Chemistry and biochemistry of snake venoms," by K. Slotta (48 pp., 240 references). Although enzymes, as components of toxins in general and L-amino acid oxidase, cholinesterase, phosphatases, and so on, in particular, have been reviewed repeatedly, a comprehensive and up-to-date survey of all aspects of snake venoms as presented in this chapter has been lacking.

"Gene structure and gene action," by G. W. Beadle, Pasadena (16 pp., 52 references). This continuation of the fascinating story of the promising research on biochemical genetics shows the advances made during the 7 years since the author's last review in the same series. Although it is the briefest, this is the most exciting chapter, since it moves the frontiers of science so close to the very key problems of life, gene function and reproduction. The role of deoxyribonucleic acid is discussed from various viewpoints, with due emphasis on the bold and ingenious hypotheses of Watson and Crick.

We may look forward to many more excellent volumes in this series.

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Faune de France. 59. *Coleopteres Curculionides* (deuxième partie). Adolphe Hoffmann. Lechevalier, Paris, 1954. 722 pp. Illus. F. 6000.

This is the second volume by Hoffmann on the Curculionidae of France. It deals with the following groups as listed in the Junk *Coleopterum Catalogus*: Alophinae; Anthonominae; Baridiinae; Ceutorhynchinae; Cleoninae—Lixini and Rhinocyllini; Cossoninae; Curculioninae; Erirhininae—Acalyptini, Bagoini, and Tanysphyrini; Hylobiinae; Hyperinae; Magdalinae; Pissodinae; Raymondionyminae; Rhynchophorinae; Rhytirhininae; Trachodinae; Tychiinae; and Zygopinae.

There are recorded and described 563 species belonging to 96 genera. One species and one subgenus and many subspecies and varieties are described as new. The 438 text figures are excellent. Most are illustrations of the entire insect; at least one representative of each genus is illustrated. In some cases, male genitalia and other diagnostic characters are figured.

Keys to the tribes, genera, and species that are treated are presented, but no key to subfamilies is given, for this is in the first volume. The host plants, parasites, distribution, seasonal appearance, and relative abundance of each species are given. There is no bibliography; the references are listed after each taxonomic category with the exception of subfamilies. There is an index to subfamilies, tribes, subtribes, genera, and subgenera. The volume is paper bound and uncut, clearly printed on good quality paper.

It is interesting to note that the generic names *Hypera* and *Calendra* are used in the same sense as they are in the United States; while this usage seems to be correct, it has not been generally accepted in Europe.

Hoffmann uses *Curculio* Linn. in the sense that *Hylobius* Germar is generally used. For the nut-weevils generally known as *Curculio* Linnaeus, 1758, he uses *Balaninus* Germar, 1817, apparently overlooking Latreille's 1810 designation of a species of nut-weevil as type of *Curculio*.

Hoffmann differs somewhat from the generally accepted plan of arrangement of higher categories of Curculionidae. In this volume, he recognizes the Cleoninae, Curculioninae, and Calandrinae as subfamilies. The last two are about equivalent to Hylobiinae and the old Curculioninae, respectively. He treats as tribes groups listed in the Junk catalog as subfamilies. An interesting compromise is the use of the tribal name Bariini instead of Barini or Baridiini, the former based on *Baris*, the latter on *Baridius*.

Although the arrangement of subfamilies and tribes does not detract from the main value of the book, it tends to obscure the relationships of the French weevil fauna to that of the remainder of the world, thus making this a local faunistic work.

Hoffmann has done a fine piece of work on this very large and difficult family of beetles. In view of the damage that imported weevils can cause in the United States, this volume should be very helpful to quarantine officials and others in recognizing weevils that are accidentally introduced from France and Europe. It is hoped that the final volume on this family will soon be published.

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Chemical Methods of Blood Analysis. S. D. Balakhovskii and I. S. Balakhovskii. State Publishing House of Medical Literature, Moscow, U.S.S.R., ed. 3, 1953. 746 pp. Illus. (In Russian.)

This is a practical, well-illustrated laboratory manual carefully prepared by two outstanding Soviet clinical chemists. The procedures are clearly and logically presented and are followed by clinical interpretations. The sources of error in the various procedures are clearly indicated. All descriptions include precise presentations of methods of calculating the results and of comparing them with average standard values. The illustrations are technically excellent and include sufficient details so that a competent technician can easily comprehend and reproduce the instrumentation or procedures.

In general, the book includes descriptions of numerous modern methods of blood analysis, many of which are not available in clinical laboratory manuals or hematology handbooks. Some notable omissions, however, should be mentioned. There is no reference to flame photometry methods of analysis of sodium and potassium, and there is no utilization of chromatography.

The book as a whole is done unusually well and is beautifully organized. The index is good. The appendix includes 16 extensive tables containing laboratory data on various blood constituents in man as well as in many laboratory animals.

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Fibrous Proteins and Their Biological Significance. Symposia of the Society for Experimental Biology, No. IX. Academic Press, New York, 1955. vi + 370 pp. Illus. + plates. $8.

Progress in knowledge of fibrous proteins has been phenomenally great in recent years, and many of the most exciting developments are discussed in detail in this valuable book, based on papers that were presented at a symposium in Leeds in September 1954.

The opening introductory review is appropriately by W. T. Astbury, who has probably done more than any other individual to advance our knowledge of fibrous proteins. F. Sanger gives an excellent discussion of the chemistry of simple proteins, with emphasis on the determination of end groups and of amino acid sequences, including several valuable tables. E. Chargaff gives a brief, but authoritative and provocative, discussion of deoxypentose nucleoproteins. Most of the other papers deal with two great classes of fibrous proteins—the collagens and the muscle proteins.

The structural chemistry of collagens is intensively discussed by R. S. Bear, by J. T. Randall and his collaborators, and by F. O. Schmitt, J. Gross, and J. H. Highberger; the metabolism of collagen is well treated by A. Neuberger; various aspects of the biology of collagens are considered by K. M. Rudall, by D. Carlström, by A. Engström and J. B. Finean, and by S. F. Jackson and R. H. Smith; and collagen diseases are discussed by J. H. Kellgren. The structure and functions of the muscle proteins are considered by K. Bailey and S. V. Perry, while J. Hanson and H. E. Huxley describe in detail their fascinating studies on the fine structure of muscle and its possible significance for contraction. B. R. Malcolm provides some observations on the infrared spectrum of muscle. H. H. Weber discusses the link between metabolism and motility of cells and muscles, with stress on the free energy released by the breakdown of adenosine triphosphate as the inferred source of the driving energy for these processes.

There are two excellent papers on flagella and cilia of bacteria and animals—one by W. T. Astbury, E. Beighton, and C. Weibull and the other by J. R. G. Bradfield. Only one paper, by J. B. Speakman, discusses keratin, and this paper is extremely interesting. In the last two contributions, D. Mazia discusses the organization of the mitotic apparatus and J. G. Gall discusses the amphibian oocyte nucleus.

The whole symposium is on a very high level, and the papers that were presented are indispensable to anyone who is seriously concerned with understanding the nature of the fibrous proteins and their functions in biology. The illustrations are numerous and excellent. The discussion reveals our ignorance of both the structures of collagen and the true molecular basis of cell motility and muscular contraction in spite of all the fascinating information that has been obtained. Recent studies by Rich and Crick [*Nature* **176**, 915 (1955)] and by Cowan, McGavin, and North [*Nature* **176**, 1062 (1955)] may represent major steps in the elucidation of the former problem. In any case, those who are still searching for the answers to such problems will find the material presented in this book indispensable.

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Dielectric Behavior and Structure. Dielectric constant and loss, dipole moment and molecular structure. Charles Phelps Smyth. McGraw-Hill, New York–London, 1955. x + 441 pp. Illus. $9.

The last two decades have been marked by rapid growth in both theoretical and experimental knowledge of dielectric behavior. As a result, the field of dielectrics has reached a point where it is no longer convenient to treat thoroughly both aspects in a single concise volume. Several authoritative textbooks have appeared recently in which major emphasis has been devoted to general foundations and theory. *Dielectric Behavior and Structure*, on the other hand, has been written primarily from the viewpoint of the experimentalist who is concerned with utilizing dielectric measurements to obtain specific information regarding the structure of liquids and solids and of individual molecules. In subject matter, it bears little resemblance to the author's earlier monograph. Progress during the intervening years, to which Smyth and his associates at Prince-