

Book reviews

Complex Carbohydrates: Their Chemistry, Biosynthesis, and Functions, by N. SHARON; Addison-Wesley Publishing Company, Reading, Mass., 1975, xix+466 pages, £8.15 paper back, £15.05 hard cover.

This volume is one of a collection in an Advanced Book Program and is based on a series of lectures presented by the author at the Feinberg Graduate School of the Weizman Institute. During the past decade, research on the carbohydrates has continued to expand rapidly and, as a result of many new developments, it is generally accepted that they are intimately involved in many vital areas of biology and medicine. Many detailed reviews of particular aspects of these areas exist, but no up-to-date, unified presentation suitable for students or newcomers to the field is available. The publication of this book is valuable in bringing together data up to the beginning of 1975 and in presenting complex theories in a clear, comprehensible fashion. The book is not comprehensive, and certain complex carbohydrates of importance, *e.g.*, glycolipids, are omitted. However, these omissions do not detract seriously from the usefulness of the book, because ample illustrations of the chemistry, isolation procedures, purification methods, and chemical characterization of sufficient of these important biochemicals are provided to give the reader a good insight into the methods currently available for the study of all complex carbohydrates. A useful collection of abbreviations is given at the beginning of the book and an adequate index is provided. A useful adjunct to the main text is provided by a selection of current references at the end of each chapter together with some cryptic comments by the author on their particular value.

The first chapter is introductory, and the succeeding ones are concerned with the glycoproteins, carbohydrate-peptide linkages, glycopeptides, glycoprotein biosynthesis, and the sialic acids. Particular emphasis is provided here on the occurrence, the purification methods, and the chemical and biochemical methods available for studying the structures and biological synthesis of these complex carbohydrates. The various structures are compared and contrasted, so that common features are readily apparent, and the problem of microheterogeneity is discussed from the viewpoint of the biosynthetic machinery and its regulation. In this section, a particularly useful description of the role of lipid-linked intermediates is given. Chapters 10 and 11 provide a carefully considered discussion of the functions of the carbohydrates bound to proteins, their effect on the survival of glycoproteins in circulation, and the role of cell-surface saccharides. The chemistry of blood-group substances and their genetic control and biosynthesis form a further section of two chapters. Subsequently, the anionic proteoglycans are discussed, and their detailed structures, biosynthesis, and genetic defects of metabolism are admirably described. However, the regulation

of the biosynthesis of these polymers and their normal degradation receive only cursory attention.

The remainder of the book is devoted to five chapters on complex carbohydrates from bacteria. The lipopolysaccharide, teichoic acid, and mucopeptide constituents of the Gram-positive and Gram-negative bacterial cell-wall structures are described in some detail, and the methods used to study these complex materials, *e.g.*, the use of mutants, are given. In the sections on the biosynthesis of bacterial cell-wall components, the mode of action of certain antibiotics and the obligatory participation of lipid carriers in the biosynthetic processes are clearly demonstrated. The book ends with a speculative section on architectural relationships in peptidoglycan synthesis.

The author is a distinguished research worker in carbohydrate biochemistry and has succeeded in presenting much complicated information in a clear, comprehensible fashion. In addition, he has managed to convey the feeling of excitement and fascination which exists among workers in these lively and exciting areas of biochemical research. The author has provided a very readable book, which is recommended highly both to undergraduate and graduate students, as well as to teachers in these areas of chemistry and biochemistry that have moved on apace over the last few years.

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Carbohydrate Chemistry, Volume 8, J. S. BRIMACOMBE (Senior Reporter), A Specialist Periodical Report of the Chemical Society, London, 1976, xii+485 pages, £18.00 (Chemical Society Members).

The compilers have again made a magnificent effort in this comprehensive review of carbohydrate chemistry and biochemistry, covering the literature between January 1974 and January 1975, though some earlier references have been included. The book is well produced and has again been divided into two sections. Part I deals with mono-, di-, and tri-saccharide chemistry; a larger Part II deals with macromolecules, and this section should be of particular interest to biochemists. Each reference is dealt with in a concise manner and the reader is left in no doubt as to the salient points. The structural formulae are clear, and Tables are used sparingly and only where appropriate. An author index is included, but there is no subject index; however, with 970 references in Part I and 2090 in Part II, such an index would require a book of its own. Instead, a detailed contents list is included at the beginning of the book, and particular subject matter is quite easy to find.

This book must be an essential reference work to all who deal with carbohydrates, whether from the point of view of synthetic organic chemistry or that of the more biologically orientated disciplines. The reporters deserve our thanks for the great deal of time and effort that they must have put into this work. J. F. Kennedy, for example, reports on two sections covering over 600 references.