

Book review

Advances in Carbohydrate Chemistry and Biochemistry: Volume 43, edited by R. STUART TIPSON AND DEREK HORTON, Academic Press, Orlando, FL and London, U.K., 1985, xii + 421 pages + Author and Subject Indexes, \$75.00.

It is difficult to review *Advances*. It appears, year after year, in the same format, in the same clear print and with well-drawn formulae, the same excellent choice of up-to-date subjects, and the same careful editing. Most reviewers simply state that the latest volume is as good as ever, and then list the contents of each chapter.

Carbohydrate chemists are fortunate in having such a series at their disposal. Thanks to the initiative and energy of Hudson, Wolfrom, and Pigman, and to the efforts of successive editors for 40 years, nearly all aspects of carbohydrate chemistry have been reviewed, many of them several times. The reviewer can think of only one relevant subject which has not yet been thus treated. A literature search in carbohydrate chemistry is easy: a relevant chapter of *Advances*, and then the volumes of The Chemical Society's *Specialist Periodical Reports* for the succeeding years, usually covers everything. Few fields in chemistry can boast of such information service. There are now many "*Advances*", but ours is one of the oldest (only *Advances in Protein Chemistry* preceded it, by one year) and has the largest number of volumes.

The editors of *Advances* do more than just commission the reviews: they edit them and correct them down to the last comma. It is remarkable how rarely a list of Errata appears in subsequent volumes and, then, how short it is.

The present volume differs somewhat from its predecessors because one chapter fills more than half of it (220 pages). This is the one entitled "Bibliography of Crystal Structures of Carbohydrates, Nucleosides, and Nucleotides for 1979 and 1980" by G. A. Jeffrey and M. Sundaralingam. Such a chapter has been a regular feature of *Advances* since 1974; it has summarized all the crystal structures determined for carbohydrates, over a two-year period, in a uniform manner, with the structures redrawn by a computer. The space taken up by this chapter has been steadily expanding, and now the stage has been reached where it can no longer be accommodated by *Advances*; at the same time, however, the activities of the Cambridge Crystallographic Data Bank have made it dispensable. This chapter appears now for the last time. The reviewer greatly regrets its passing; he is one of those who prefer to have the required data in their bookcase rather than in a distant computer, but he admits that this development was inevitable. On this occasion, the authors provide a real cornucopia of information. In addition to covering

developments in 1979 and 1980, they supply a list of addenda to the preceding years and a complete index to all carbohydrate, nucleoside, and nucleotide crystal structures over the period 1935–1980. This index (44 pages), covering nearly 1000 structures, will be invaluable for anyone studying the close details of carbohydrate structures.

The first chapter (50 pages) of the volume deals with ^{13}C -n.m.r. studies of carbohydrates linked to amino acids and proteins. It is written by three authors (K. Dill, E. Berman, and A. A. Pavia) distant from each other in space but close in interests, with Adam Allerhand looming in the background. Modern n.m.r. instruments and methods have made it possible to study the structures and the configurations of the carbohydrate components of glycoproteins without modification of the glycoproteins; the importance of this is obvious. This field is a recent development, and most of the references are to papers published in the last five years; and it is still developing rapidly. Hence, this chapter is a progress report, rather than a definitive review, in the spirit of the first editors who wrote, in the Preface of Volume 1 of *Advances*: "It may be found desirable to present several reviews . . . in fields undergoing a rapid state of development".

A prerequisite of such n.m.r. studies is the availability of suitable model compounds. The syntheses of *N*- and *O*-glycosyl derivatives of L-asparagine, L-serine, and L-threonine are described in a chapter (65 pages) by H. G. Garg and R. W. Jeanloz. A lot of useful information is presented in this chapter but the reviewer wonders whether tables extending over 20 pages are justified for the presentation of the m.p.'s and optical rotations of these synthetic derivatives. The compounds could have been listed, in groups, in the cursive text, and the m.p.'s and $[\alpha]_{\text{D}}$ values retrieved from the original papers when required.

The remaining chapter (80 pages), on the structure and biological activity of heparin, is a real *tour-de-force* by Benito Casu. Extensive work on this important and mysterious polysaccharide is collected, and presented in an integrated and clear manner. Knowledge of the structure and configuration of the active site of heparin is now extensive, but it is interesting to note that the conformation of the α -L-idopyranosyluronic acid residues is still not settled; in fact, this conformation may be variable. There are 525 references; it is worth noting that the longest chapter in Volume 1 had only 171 references.

Those who are in the habit of buying every volume of *Advances* should unhesitatingly buy this one too; those who are not, may change their habits or, at least, consult this volume in the library.

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