The biochemistry of plant galactomannans is then discussed by P. M. Dey. He describes the occurrence, isolation, structure, and biosynthesis of the various galactomannans, as well as their biochemical degradation.

Volume 35 of the *Advances* concludes with a short bibliography of crystal structures of polysaccharides. This is a continuation of an article that appeared in Volume 33 by R. H. Marchessault and P. R. Sundararajan that covered the literature between 1967 and 1974. The present article, by the same authors, treats the literature that appeared in 1975.

As a whole, Volume 35 of *Advances in Carbohydrate Chemistry and Biochemistry* constitutes a well balanced selection of topics ranging from monosaccharide synthesis and structure to polysaccharides and glycoproteins. As in previous volumes of this series, the articles are well written, and have been able edited by the Tipson–Horton team. The present volume is certainly worthy of the continued support that carbohydrate chemists and biochemists have given to the series. It maintains the high level of excellence to which users of these *Advances* have become accustomed. The volume should be in all chemical libraries, and is essential reading for all those who want to keep abreast of modern trends in carbohydrate chemistry and biochemistry.

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Carbohydrate Sulfates: edited by RICHARD G. SCHWEIGER, ACS Symposium Series 77, American Chemical Society, Washington, D.C., 1978, ix + 281 pages + Subject Index, $24.00.

The ACS Symposium Series constitutes a valuable source for workers unable to attend symposia in their particular fields, and this volume certainly fulfils this role. Interest in carbohydrate sulfates ranges from sulfates of sugars and sugar derivatives, through commercially important synthetic polysaccharide sulfates, to naturally occurring polysaccharide sulfates of biological interest. Reviews or original studies on each of these aspects are included in this volume, but, with fourteen of the seventeen chapters devoted to aspects of polysaccharide sulfates, there is no doubt where the emphasis lies. Although some attempt has been made to group the chapters so that related aspects occur contiguously, this is partly defeated by the heterogeneous nature and mode of presentation of the papers; a review on enzymic formation and cleavage of sulfuric esters is sandwiched between original papers on the chemical modification of heparin and the synthesis of carrageenan substitutes.

Review chapters cover glucosinolates, synthetic methods in sulfated glycolipids, polysaccharide sulfates of Chlorophyceae and Rhodophyceae, and fucose-containing polymers of brown algae. A comprehensive, but non-selective, review of the enzymic formation and removal of sulfuric ester groups by Whistler *et al.* is a timely contribu-

tion, and P. W. Kent *et al.* indulge in some interesting speculations on the role of sulfate groups in glycoproteins as potential, informational regulators. The chapters that describe original work, usually with full experimental detail, were of particular interest to the reviewer. The synthesis and properties of ascorbic acid sulfates, attempts at making heparin substitutes from amylose, and novel methods and results in sulfation of polysaccharides are all excellent chapters. For the industrial or pharmaceutical chemist, papers on the preparation of a uniformly substituted cellulose sulfate *via* the nitrite, the reaction of starch with chlorosulfonic acid and formamide, the cross-linking of heparin, and the graft copolymerization and sulfation of xanthan gum form worthwhile contributions. Another group of chapters, dealing with the methodology and theory of interactions between sulfated polysaccharides and inorganic ions or proteins, are important in helping our understanding of what is happening at the molecular level, and point the way to a field of study that should develop rapidly in the next few years.

Most of the chapters contain adequate, sometimes exhaustive, lists of references up to 1977. The volume suffers from the fact that the chapters are photocopies of the original authors' manuscripts, complete with typographical and other errors, of which there are far too many; proof reading must be a dying occupation. Nevertheless, the volume should certainly be purchased by the library of any academic or industrial laboratory interested in the chemistry or biochemistry of carbohydrate sulfates, and will, I suspect, find its way onto the bookshelves of many individual scientists.

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Nucleic Acid Chemistry, Parts 1 and 2, edited by LEROY B. TOWNSEND and R. STUART TIPSON, John Wiley & Sons, Inc., New York, N.Y., 1978, 2 vols., xv + 1122 pages, $70.00.

These volumes are an extension of the renowned two-volume set *Synthetic Procedures in Nucleic Acid Chemistry*, edited by W. W. Zorbach and the second of the present editors, which appeared in 1968 and 1973. The rapid progress in synthetic and analytical nucleic acid chemistry during the intervening period has created a need for a definitive compilation of sound, proven synthetic procedures, methods, and techniques. The present set meets this requirement admirably. The contributors comprise an international selection of experts in this field, and the broad range of compounds cited as starting materials or synthetic products ensures that the reader will find a reaction or technique which is applicable to his research needs.

These books contain 177 chapters on eight major areas of nucleic acid chem-