

## Book reviews

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*Progress in Stereochemistry: Volume IV*, edited by B. J. AYLETT and MARGARET M. HARRIS, Butterworths, London, 1969, vii + 389 pp., £7.50.

The first three volumes in this excellent series appeared at four-yearly intervals and now the fourth has appeared, with new Editors, after a lapse of seven years. The connecting thread throughout this series has been the interplay between stereochemical thought and advances in chemistry and biochemistry, and in this volume ten experts from a small part of the world contribute the eight chapters which cover a wide area in stereochemistry.

It is probable that the chapter entitled "Configurational Analysis in Carbohydrate Chemistry" (R. J. Ferrier) will be most of interest to readers of this Journal. In this chapter, the Author has surveyed methods that have been used to assign configuration to carbohydrates, with the major emphasis on physical methods, a section on chemical methods, and a brief account of enzymic methods; the space allotted roughly reflects the current significance of the various techniques. The decision to treat configurational analysis rather than conformational analysis is interesting and allows this chapter to be kept to a reasonable length. However, the claim that this division can be justified on the grounds that configuration is of more fundamental importance than conformation in controlling properties is open to question since the two are interdependent. Indeed, the section on the use of n.m.r. spectroscopy illustrates the generalisation that conformation must be considered in order to assign configuration by this technique. It is particularly disappointing in a book devoted entirely to stereochemistry that some diagrams (*e. g.* CXII) are misleading: one of the features of a regular chair form is that each bond is parallel to two vicinal bonds, and this is not adhered to in some cases. It is also unfortunate that some unsound examples are used to illustrate chemical correlation of configuration, which is one of the most satisfactory methods of correlation. For example, the presence of chemical evidence for a C-formyl group in a material that exhibits mutarotation but does not display spectroscopic features characteristic of a carbonyl group (p. 83) is not compelling evidence for an intramolecular hemiacetal ring and a *cis*-arrangement of groups, since intermolecular association, as in 2,4-*O*-ethylidene-D-erythrose which has *trans* groups, also confers these properties.

Despite these criticisms, this chapter is a valuable contribution which reviews the wide range of methods available to carbohydrate chemists for assignment of configuration.

Other chapters with particular emphasis on organic chemistry are devoted to "The Stereochemistry of 2,2'-Bridged Biphenyls" (D. Muriel Hall), an area where the distinction between configuration and conformation disappears, and to "Stereo-

chemical Correlation" (W. Klyne and P. M. Scopes) which modernises a review in the first volume. Aspects of inorganic chemistry are covered in chapters entitled "The Stereochemistry of Main Group IV Elements" (B. J. Aylett) and "Nuclear Magnetic Resonance Spectroscopy and Inorganic Stereochemistry" (R. F. M. White).

"The Stereochemistry of the Protein Myoglobin" (H.C. Watson) is a review of recent work that has enabled the co-ordinates of almost all of the non-hydrogen atoms in myoglobin to be determined, and it contains some discussion of the forces that stabilise the favored conformation. A general review of X-ray crystal structure analysis appeared in Volume II of this series and has now been brought up to date by H. H. Mills and J. C. Speakman.

A stereoviewer, for use with stereopair diagrams and photographs, is included with the book. Whilst the pair of colour photographs of the model of myoglobin are a little disappointing, the pairs of line drawings in the chapters on myoglobin and X-ray crystallography are beautifully produced and allow the reader to visualise clearly the three-dimensional structure of both simple and complex arrangements. The improvement over conventional perspective drawings in conveying to the reader these three-dimensional arrays is so marked that all stereochemical texts should include such a system.

Finally, in the chapter on the use of models in stereochemistry (Anne Walton), the scope and limitations of various commercial and home-made models, as aids to understanding spatial relationships in molecules, are discussed.

The Authors and Editors are to be congratulated on maintaining the high standard set by previous volumes in this series with this latest volume, which can be recommended to all with an interest in stereochemistry.

*University of Birmingham*

N. BAGGETT

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