

Polychloroaromatics

Polychloroaromatic Compounds.
Edited by H. Suschitzky. Pp. viii+543. (Plenum: New York and London, 1975.) \$42.

Most readers will find this book of greatest interest if they read first the last chapter, which is a comprehensive and stimulating survey of polychloroaromatic and -heteroaromatic compounds of industrial importance, by M. B. Green of ICI Mond Division. Insecticides, fungicides, herbicides and others are covered together with certain polymers and dyestuffs. This material gives special point to the earlier chapters.

In the first of these, Ballester and Olivella provide a lengthy account of aromatic and alkaromatic chlorocarbons which is clear, comprehensive and well organised. It contains very interesting material on relevant radicals, reactive and inert, and on carbonium ions and carbanions. It is followed by similar chapters on polychloroheteroaromatic compounds and on polychloroaryl derivatives of metals and metalloids by Iddon and Suschitzky and by Chivers and Wakefield, respectively.

Idealised models

Branching Processes with Biological Applications. (Wiley Series in Probability and Mathematical Statistics.) By P. Jagers. Pp. xiii+268. (Wiley Interscience: London and New York, October 1975.) £10.50.

ALTHOUGH biological populations often develop in extremely complex patterns, we may imagine idealised situations in which the underlying reproductive process has a simple structure which is free from the usual dependencies of competition, predation and the limitation of natural resources. Such simplified models lend themselves to a mathematical analysis rich in results, and the conclusions drawn from them often give great insight into the behavioural structure of the more complicated processes to which they relate. This mathematical theory has been studied in great generality and the results may be easily interpreted in a practical context.

The basic structure of such idealised models involves the concept of a branching process, in which a population of identical individuals develops in time as the individuals multiply independently of each other and eventually die. As a thorough survey of problems involving multitype branching processes is already in existence (Mode, American Elsevier, New York, 1971), their existence is

The range of heterocyclic compounds covered is wide, including mainly mono- and bi-cyclic compounds containing one or two heteroatoms (nitrogen, oxygen and sulphur). Similarly, the coverage of metals and metalloids is comprehensive with major emphasis on alkali metals, group II metals, and group IIIA and IVA elements, particularly silicon.

The intrinsic chemical interest attached to all these compounds lies in an attempt to understand their unusual properties in terms of the cumulative electronic effects of the chlorine substituents and corresponding steric effects. Some progress in this direction has been made. The book has a traditional 'preparation and properties' flavour, but is a mine of information, indicative of many problems needing further research.

The book is well conceived and well produced, and each chapter has a full set of references. There is also a satisfactory author and subject index. It is, however, somewhat specialised for most organic chemists. Nevertheless they are all in Professor Suschitzky's debt for making available so conveniently a vast amount of useful and interesting information.

N. B. Chapman

mainly avoided in this book.

Within this framework questions may be asked which relate to the probability that a population becomes extinct, to the existence and structure of stable age distributions, to limiting rates of growth, and so on. The general theory surrounding such questions is developed in the first seven chapters, and applications are discussed in the last two. The reader is gently led into the text by way of a historical survey and an analysis of the simplest model available, namely the Galton-Watson process. Generalisations of this special case are considered and the first part of the text concludes with a short chapter on multi-type processes. In a brief interlude the reader is armed with the basic tools of martingales, renewal theory and point processes; and he is then presented with a full treatment of the general theory with all its attendant extensions and ramifications. These complex ideas are then illustrated by reference to several stimulating problems in the fields of demography and cell kinetics.

Dr Jagers writes in an extremely interesting literary style, rare for a mathematician, and his book is a delight to read. A high level of mathematical ability is required for full comprehension of all the theory contained in it, but it is to be hoped that biologists with little mathematical expertise will still find that his conclusions arouse considerable food for thought

E. Renshaw

Proteins

The Proteins. Volume 1. By Hans Neurath, Robert L. Hill and Carol-Leigh Boeder. Third Edition. Pp. xiii+547. (Academic: New York and London, 1975.) n.p.

THE two previous editions of *The Proteins* have achieved an honoured place in a literature that is fast attaining a complexity matched only by its subject. Is a new edition able to escape the ridicule that in these days such an all-embracing title immediately inspires? Only by the editors quickly informing the reader that generalities and unifying principles will be stressed. Eight volumes are envisaged, of which the first three will deal with general methods, and the remaining five with specific proteins that have unusual structural features or unique biological functions.

This first volume begins well with an admirable account of gel-chromatographic methods of analysis by G. K. Ackers. In view of the extent to which these methods have established themselves in protein chemistry, this seems a proper choice. In the next chapter J. Porath and T. Kristiansen describe the even more significant technique of affinity chromatography, which has achieved a major breakthrough in the last two or three years. The third chapter treats the electrophoresis of proteins in dissociated form in the presence of sodium dodecyl sulphate. A critical account is given by two of the most experienced workers in this field, K. Weber and M. Osborn. In a fourth chapter, K. E. van Holde considers sedimentation analysis. This is a topic where data analysis, and on-line computerisation, is proceeding apace behind the scenes, and we can regard this as a holding exercise for future developments. In chapter five, I. M. Klotz, D. W. Darnall and N. R. Langerman summarise what is known about the quaternary structure of some 300 proteins and describe new methods for chemically cross-linking subunits to detect near neighbours. They also bring the reader into contact with the flourishing study of protein hybrids.

The final chapter on electron microscopy by J. T. Finch provides a very thorough review of the application of image analysis to the determination of the quaternary structure of assemblies of protein molecules.

This is a very good book, written by experts who have had plenty of practice with earlier articles elsewhere.

G. A. Gilbert