

already familiar with the methods and themes of image processing, extensively reviewed in single and multi-author volumes during the past few years, these will be the most valuable chapters of this volume. The authors explain how the particular requirements of image processing may be satisfied in recent and future generations of computer hardware.

Useful though some of the material in this book is, it can hardly be regarded as

indispensable in these days of rising book prices and dwindling library budgets. It is arguable that this particular volume would have been better published as a special number of a journal than in the present form. □

P.W. Hawkes is Maître de Recherches in the Laboratoire d'Optique Electronique du CNRS, Toulouse, France.

Organic chemistry

A.R. Katritzky

Physical and Mechanistic Organic Chemistry. By R.A.Y. Jones. Pp.357. (Cambridge University Press: Cambridge, UK, 1979.) Hardback £25; paperback £8.50.

THE author has attempted a synthesis of physical organic and mechanistic organic chemistry; thus the book occupies a position between those texts emphasizing the physico-chemical aspects, such as Hammett's *Physical Organic Chemistry* (McGraw-Hill: New York, 1970) and Wiberg's text of the same name (Wiley: New York, 1964), and those dealing more directly with mechanisms such as Ingold's classic (Cornell University Press: New York/Bell: London, 1969). To attempt all this within the confines of some 350 pages is a challenge indeed, yet I believe that the author has succeeded in producing a text which will be of great value.

Part I deals with the theories and techniques of physical organic chemistry in six chapters which cover structure and mechanism, kinetics, linear free-energy relationships, acids and bases, solvent effects and molecular orbital methods.

Part II (about two-thirds of the book) covers some carefully selected mechanism types. It commences with a survey of aliphatic nucleophilic substitution, proceeds to elimination and carbon-carbon double bond addition reactions and then to aromatic electrophilic substitution. This is followed by consideration of additions to the carbonyl group, the hydrolysis of esters and aromatic nucleophilic substitution. The book ends with chapters on molecular rearrangements and pericyclic reactions.

The great strength of this book lies in its clarity which is so important in a text intended for final year undergraduates or for graduate students. The sentences are short, to the point and unambiguous. Physical organic chemistry is a subject with many unresolved controversies: here the author presents both points of view with admirable detachment.

The production of the book is good (although there was a defect in the paper on p.88 of the copy examined), and there appear to be extremely few typographical errors. The book is logically put together

and most interesting to read. It has clearly been a labour of considerable magnitude but also a labour of love.

How could the next edition be improved? I would suggest that more graphs and diagrams be included. For example, at the bottom of p.255 and the top of p.256 the points dealt with could be understood even better with a suitable plot.

In summary, I consider that the stated aims have been fully achieved: "Advanced undergraduates and graduate students using this book will be able to understand the general principles on which the study of mechanism is based and to be able to apply them to most reactions of organic chemistry". □

A.R. Katritzky is Professor at the School of Chemical Sciences, University of East Anglia, Norwich, UK.

Past and future in microtubule research

H.P. Erickson

Microtubules. Edited by K. Roberts and J. Hyams. Pp.595. (Academic: London and New York, 1979.) £34, \$78.50.

THE intention of the editors was to summarize those results of microtubule research that are most exciting now and that will form the basis for the next big steps forward in the field. The authors of the 11 chapters, all of whom have made important contributions in their areas, were charged to present a critical review of the important discoveries of the past and also to stand back from their field and speculate about the important future directions. The editors have made efforts to cut overlap between chapters to a minimum so that the book would read as a coherent whole. The style and depth of coverage by the different authors varies considerably, however, and I feel that the work has to be considered as a collection of individual review articles. They are all related, more or less, but each has its individual character and some are much more successful than others.

For me the most useful chapters are in the area of cell biology. "Tubulin Pools, Synthesis and Utilization" by Fulton and

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Simpson is a nice example of a critical, rather than comprehensive, review. Topics discussed range from techniques for measuring tubulin to a variety of questions of cell biology. The authors avoid vague and inconclusive lists of contradictory reports and concentrate on presenting a limited number of well-established observations and conclusions. "Microtubule-associated Cytoplasmic Transport" by Hyams and Stebbings is written in a similar style and provides wide coverage of axonal flow, chromatophore movement and some other systems of particle transport. "Cell Division" by McIntosh presents a broad review of mitosis and discusses the more conclusive studies on the location and function of microtubules. Weber and Osborn present a readable review of the application of immunofluorescence microscopy to reveal microtubule arrays in cultured cells, discussing mostly their own work.

A short article by Warner reviews evidence for the sliding of microtubules as the mechanism for motility of cilia and flagella. "Microtubules and Cell Surfaces" by Berlin, Caron and Oliver is heavily weighted towards discussion of their own work and their rather speculative models. "The Spatial Organization of Microtubules" by Tucker is even more speculative and often difficult to read, perhaps reflecting the paucity of conclusive information about how the spatial organization is determined.