

is a pity, therefore, that the book shows evidence of being hastily assembled with careless cross indexing and listing of references, and that there is some uncertainty as to exactly what audience is being addressed.

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## Organic Reactions

*The Search for Organic Reaction Pathways.* By Peter Sykes. Pp. xii+247. (Longmans: London, 1972.) £1.90.

*Mechanism in Organic Chemistry.* By R. W. Alder, R. Baker, and J. M. Brown. Pp. x+378. (Wiley Interscience: New York and London, 1971.) £5 cloth ; £3 paper.

PETER SYKES has produced a good companion to his widely-acclaimed *Guidebook*. In his *Search for Organic Reaction Pathways* he explains the experimental approaches currently applied to the exploration of a reaction pathway and begins, logically, with an uncomplicated view of the interpretation of kinetic data. He then describes the different uses of isotopes—both as labels and kinetic probes—explores the study of reactive intermediates, presents a wide-ranging survey of stereochemical criteria, and completes this description of methodology with a satisfactory account of structure-reactivity correlations. He devotes the book's last chapter to five specific case studies of reaction pathways, selected to illustrate the interplay and combined power of these techniques and the degree of sophistication which is currently attainable in mechanistic organic chemistry.

While I have always felt that Sykes's *Guidebook* was at its best as an adjunct to the more compendious introductory texts on organic chemistry, making good their explanatory inadequacies by its direct communication of basic ideas, his *Pathways* stands on its own, tackling at a similar level the subject of organic reaction mechanism from an angle which is rarely given due prominence. Not surprisingly, then, the later book delves a little deeper and is aimed a little higher than its predecessor. Both are clearly from the same stable and of the same pedigree: by clear, forthright exposition out of tried teaching experience. Consequently they share many of the same, excellent qualities and some of the same defects.

*Pathways* is a most readable book, clearly illustrated, well indexed, and endowed with an adequate reference list for further reading. It gives a very fair presentation of the subject and only occasionally does Sykes's penchant for didactic simplicity commit him to statements of dubious value. Even then they are rarely misleading. I am sure that the book will be of wide service to students and teachers of first-year

university and polytechnic standard onwards and I recommend it warmly. I suspect that it is likely to be of less use to sixth-formers than the *Guidebook*.

The second volume under review, *Mechanism in Organic Chemistry*, is larger in every dimension: scope, depth of treatment, breadth of illustration, sophistication, size, cost, even multiplicity of authorship. It is, of course, designed for a different market, but in many ways and at a more advanced level it will serve a similar purpose to *Pathways*—that being the redirection of contemporary teaching on mechanisms of organic reactions back to a factual data base and away from the simplistic rational characterized by the "curly-arrow" approach.

In the introductory chapter, its authors survey those sources of chemical reactivity of which the analysis assists in formulating reaction mechanisms: kinetics, structure-reactivity correlations, solvent effects, and catalysis. This prepares the reader for a systematic examination of organic reactions grouped according to a classification which is one of the book's main features. Four categories are adopted: *associative* and *dissociative* processes relate to reactions for which the transition state involves the formation or rupture of but one bond to carbon. *Synchronous* reactions, in which dissociation and bond-forming occur concertedly, are designated as a category distinct from *multicentre* processes, in which several bonds are changing at once. There is some artificiality in this last distinction and, since in practice it is determined by the ionic (synchronous) or non-ionic (multicentre) character of a given reaction; perhaps it is really a Trojan horse to introduce a chapter devoted solely to the treatment of orbital symmetry-controlled processes. Nonetheless, this scheme works well overall and does establish fundamental relationships not otherwise apparent as, for example, between electrophilic additions to olefines and substitutions of arenes or between the chemistry of carbonium ions—just, indeed, as its authors intended. This success, though tempered by some minor penalties necessarily incurred (such as an over-emphasis on the distinction between  $S_N1$  and  $S_N2$  processes), is one of the book's strong points.

It is for the most part clearly written, uniformly reliable, and very accurate (save in its sole comment on electronic state correlation). It contains a wealth of illustrative examples copious documentation, and some searching problems as an appendix to each chapter. Its presentation approximately continues where Sykes's account quits the field and it provides an invaluable aid to an advanced study of reaction mechanisms. I recommend it for close

scrutiny, primarily by research students and teachers, though selected sections can be used with advantage for third-year undergraduate coursework.

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## Chromatography

*Modern Practice of Chromatography.* Edited by J. J. Kirkland. Pp. xix+454. (Wiley: New York and London, June 1971.) £7.

*Gas Liquid Chromatography.* By G. W. Grant. Pp. x+225. (Van Nostrand Reinhold: London and New York, July 1971.) £5.

THE first of these books is designed as an introductory text suitable for undergraduates and, presumably, anyone using the gas liquid chromatographic technique for the first time. The choice of material is defined by this aim and so the volume contains little that would be new even five years ago. But it is comprehensive, extremely well written and produced and, since there are few books at this level, is a definite acquisition in the field. Indeed, it is probably the best book now available as a lead-in to the subject and one can foresee that it will be a substantial success.

The second volume is essentially the first modern volume on liquid chromatography. The past five years, or so, have seen quite remarkable advances in this field, largely as a result of the adaptation of ideas and practices developed in gas chromatography. Columns can now be operated to give extremely fast analyses and quite remarkable theoretical plate efficiencies can be obtained. The field is so diverse at this time that it is, perhaps, not surprising that this volume is the combined effort of eleven authors working under a general editor. This leads to some overlap and a small amount of contradiction, but the editor has done an excellent job on the whole. The book is split into three sections entitled, "Fundamentals"; "Practice"; "Applications". "Fundamentals" comprises articles on theory, apparatus, detectors, and the mobile phase; "Practice" contains accounts of liquid-liquid, liquid-solid, gel-permeation and ion-exchange techniques, as well as a general review article; while "Applications" discusses detailed approaches to individual analyses and a separate section on nucleic acid separations. The book is undoubtedly well put together and is full of exciting prospects. There can be little doubt that high performance liquid chromatography, as it is now coming to be known, will become a major technique and those who wish to move in early are very strongly recommended to buy this book.

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