

Academic Press) to the Cold Spring Harbor Symposia, large in 1972, gigantic 'Cell Motility' in 1975 (Goldman, R., Pollard, T. and Rosenbaum, J. eds (1976) 1373 pages, Cold Spring Harbor. This last three-volume work is unquestionably the most comprehensive and definitive yet to be produced. Against this background 'Contractile Systems in Non-Muscle Tissues', the proceedings of a symposium held in Bressanone, Italy in September 1976, offers the most recent collection: 28 lucid, well-illustrated papers and 19 abstracts,

photoreproduced from the diverse typewriters of over 100 authors. (A few months previously most of these authors had been involved, perhaps more painstakingly, in another project, 'Cell Motility'.) Continuity is negligible and previously-unavailable information is understandably sparse, but the centres of attention are clear: the molecular engines which slither along rails of actin or tubulin.

David Gilbert

Microbial Transformations of Non-Steroid Cyclic Compounds

Edited by Klaus Kieslich

John Wiley and Sons/Georg Thieme; Stuttgart, 1976
xxii + 1262 pages. £ 42.50, \$ 85.00

Compilations of the Microbial Transformation of Steroids exist, e.g., the handbook of Charney and Herzog, from Schering Corporation, NJ, USA ((1967) Academic Press, NY); their use in this field has been outstandingly successful in the Pharmaceutical Industry. Now comes a mammoth compendium from the head of the Microbial Chemistry Research Laboratories of Schering AG Berlin, dealing with microbial attack on representatives of the remaining cyclic natural products known to organic chemistry.

This book is designed primarily for synthetic chemists in the hope that it will increase their weaponry — provided they can be persuaded to use microbial cultures and enzymes derived from them — to perform specific chemical reactions, difficult or impossible to achieve by their traditional reagents.

Biochemists appreciate the fundamental role of micro-organisms in the dissimilation of biosynthesized organic molecules in nature; elucidation of their metabolic pathways is basic to our understanding of cell metabolism. Empirically, through the ages, man has harnessed this knowledge for his solace or health; present civilizations crave for organic chemicals with the most diverse properties — and hence the sophistication in structure grows — and industry is geared to supply them.

The author classifies the cyclic natural products into nine large groups: alicyclic, terpenoid, aromatic, *O*-heterocyclic, *N*-heterocyclic, alkaloids, di- and tri-*N*-heterocyclic, *S*-, *O,S*- and *S,N*-heterocyclic and carbohydrates. Within a span of 300 pages what is known about the chemistry of their microbial transformations (using bacteria, yeasts and fungi) is expertly summarized. This is profusely illustrated with structural formulae and reaction sequences — which should appeal to the chemist. The approach is to consider microbes as tools for chemical change. The plethora of patents mentioned, indicates the enormous efforts made by the Research Corporations to exploit the degradative and biosynthetic capabilities of micro-organisms for the production of pharmaceuticals and fine chemicals of all kinds: antibiotics and anti-viral agents; anti-inflammatory, anti-neoplastic, anti-leukaemic and hypertensive drugs; prostaglandins; schistosomacidal and trichomonocidal agents; biochemical and nutritional products, e.g., nucleotides, nucleosides, vitamins and amino-acids. The treatment is, however, fundamental and not slavishly geared to the production of 'useful' chemicals. Some remarkable and even exotic enzymic reactions are mentioned — the mind boggles at the antics of cyclophenase which opens a heterocyclic ring in the alkaloid cyclophenine

(from a *Penicillium* sp.) to give another quinoline alkaloid viridicatine. Microbial transformations of carbohydrates, occupying a 20 page Appendix, in a concentrated and largely tabular form, seems to have been included for completeness. Many are in industrial use already and have commanded detailed treatment elsewhere; the latter is true for some of the other classes of cyclic structures dealt with, e.g., aromatics, alkaloids and antibiotics. Nevertheless, it is useful to have them collected together in one book.

The bulk of this volume (over 800 pages) consists of a valiant attempt at systematizing microbial transformations of non-steroid cyclic compounds according to reaction type, beloved by organic chemists, in tabular form. Headings include: Empirical and Structural Formula of the Substrate, Organism used, Reaction Product, Yield, Isolation Method, Reaction Type and Reference. Chemical transformations are classified as: oxidative, reductive, hydrolytic, dehydration and condensation reactions, degradations, formation of C—C or hetero—atom bonds, isomerizations and rearrangements. Although this comprehensive information could be obtained through the use of computerized search facilities, it is valuable to have the data collected in one volume, in spite of it appearing somewhat like 'Beilstein in the Microbe'!

Penultimately, there is a list of micro-organisms used and where to get cultures of them. The address of the British National Collection of Industrial Bacteria (NCIB) is incorrect - it was moved from Teddington to the Torry Research Station, Aberdeen, Scotland some eighteen years ago!

Finally, the 2000 references pertain to a number in the text; hence the authors' names are not in alphabetical order. The Subject Index consists of names of organic compounds and micro-organisms only.

Translation from the German original into English has been well done by T. L. Jansen and J. A. L. Jansen — just the occasional absence of 'articles and prepositions' and a few typographical errors. Considering that the most complicated organic compounds in existence — apart from polymers — are dealt with here, structural formulae on the whole are clean, clear

and correct. On p. 90, the '*ortho*' cleavage product of hydroxyquinol is shown as an aldehydo-acid instead of a dicarboxylic acid; on p. 199, the N atom is missing from 6-hydroxynicotinate; these are not serious in such a lengthy and worthwhile compendium.

The work will be welcomed as a book of reference by organic and biochemists employed in the research laboratories of large pharmaceutical and fine chemical industries. Some of the microbial fermentations dealt with are in daily use by them. Details of other transformations not yet exploited will also attract attention; who knows when the products will become commercially important?

Academic biochemists and natural-product organic chemists, especially if their interests lie in microbiological chemistry will also be glad of a copy in their libraries.

What about the dream of Dr Kieslich, that these microbial transformations should find a place in the repertoire of the 'pure' organic chemist? I am afraid that this, at present, is a pipe-dream — for the following reasons: the prerequisites for a good chemical reaction, I would say, are: generality, specificity, yield, simplicity and a superiority over available methods (if any). Some of these criteria are often satisfied, but not all simultaneously, e.g., stereospecificity, but unless one is dealing with a purified enzyme system, the yield is often not quoted or unknown. Another serious obstacle is the fact that the techniques of the microbial biochemist are unfamiliar to the rank-and-file organic chemist. Their brief description (pp. 4–8) is hopelessly inadequate; yet, help is at hand for the adventurous from such tomes as 'Methods in Microbiology' (Norris and Ribbons eds (1968–1973) Vols. 1–8, Academic Press).

Because of these considerations the audience for this book is more limited than hoped for. Nevertheless, Dr Klaus Kieslich and his efficient secretariat are to be congratulated for their painstaking achievement in bringing together these available microbiological reactions; it is a fitting memorial to his brother, the late Professor Dr Günter Kieslich.

W. Charles Evans

Kieslich, K. Format: Book. Published: (Chichester) : Wiley (etc.), 1976. Subjects: Cyclic compounds. Organic syntheses by oxidation with metal compounds / edited by W.J. Mijs and C.R.H.I. de Jonge. Published: (1986). Inorganic rings and cages / D.A. Armitage. by: Armitage, D. A. Published: (1972). Search Options. Search History. Start by marking "Microbial Transformations of Non-Steroid Cyclic Compounds" as Want to Read: Want to Read saving! Want to Read. Let us know what's wrong with this preview of Microbial Transformations of Non-Steroid Cyclic Compounds by Klaus Kieslich. Problem: It's the wrong book It's the wrong edition Other. Unknown Binding, 1262 pages. Published January 1st 1976 by John Wiley & Sons. More Details Original Title. Microbial Transformations of Non-steroid Cyclic Compounds. ISBN. 0471018120 (ISBN13: 9780471018124).