diversity of the subjects presented, however—the interaction between ribosomes and chloramphenicol, quinoloxaline antibiotics and DNA, the Na\(^+\)/K\(^+\) pump and ouabain, sulphonamides and carbonic anhydrase, the conformation of hormonal peptides in solution, and many others—leaves the reader with a feeling of skimming the surface rather than identifying common themes. This is a problem common to most symposium volumes—the contributors have often merely provided summaries of their own research work and it is difficult to identify any group of readers at whom this book might have been aimed. Thus the standard is much too advanced for final year students whereas research workers will find only one or two chapters relevant to their primary interests. To those active in any of these areas the work may already be familiar yet many of the articles require too detailed a prior knowledge of the subject(s) to be of value to those hoping to acquire insight into unfamiliar ground. Having said that, the articles themselves are well written (the style varies from the elegant to the professional) and the illustrations are clearly presented. Perhaps the greater value of this book lies not in its contribution to the literature but in the refreshing and obvious enthusiasm of the authors for their subjects. I would suggest, though, that the book is over-priced at £12.95 for less than 300 pages.

E. Cundliffe and J. R. Thompson

The Synthesis of Prostaglandins

by Abhijit Mitra
xiii + 444 pages. £16.90; $28.60

The prostaglandins are perhaps the world’s most synthesised molecules at the present time, and over the past ten years or so a formidable literature has accumulated. The present work is an attempt to organise and condense the synthetic methods used, mainly in terms of reaction flow-sheets. It is this Reviewer’s opinion, that the approach has been successful in stripping away much irrelevance and in focussing on the real essence of the synthetic approaches.

Biosynthesis is first discussed, and there follows an organised treatment of synthetic approaches. The latter are classified in some 14 groups—synthesis via symmetric intermediates, synthesis from acyclic precursors, hydrindenone approach, bicyclo-[2,2,1]heptane approach, and so on. Within each group the specific synthetic schemes are considered. First the strategy is analysed in terms of disconnections from the target molecule and then the synthetic plans are elaborated. This exceedingly clear analysis should be most valuable to students of modern synthesis since the subject is perhaps at its most advanced stage of development in the prostaglandins field.

Separate sections are devoted to the synthesis of thromboxanes, PGA\(_2\) and PGC\(_2\), and some 87 pages are devoted to the syntheses of PG analogues. This last section will be of special significance to those interested in attempts to isolate specific pharmacological properties from the mixture of many-sided activities which the natural PG’s show.

It was said of Suetonius’ ‘The Twelve Caesars’ that all mankind’s types are there: perhaps this is true of synthetic methods and the prostaglandins. Some methods are serious attempts to produce economically these rare and expensive compounds, eschewing ‘elegance’ as necessary. Some use the molecules as a ‘test-bed’ to provide improved synthetic methodology, whilst others employ them to display a bright idea—on paper which may turn out to be a poor synthetic approach. After reading this book one is left with the impression that despite the richness and beauty of the work, the natural prostaglandins themselves have per-
haps been 'over-synthesised'; the costs must have been very substantial. On the other hand there is still much useful work to do in the PG analogue and pharmacological areas. The high promise of the prostaglandins as a group of drugs has still to be turned into a reality, and the book will assist all those engaged in this important endeavour by giving rapid access to existing synthetic ideas.

L. Crombie

Cyclic 3',5'-Nucleotides: mechanisms of action

by H. Cramer and J. Schultz
John Wiley; Chichester, 1977
xiv + 554 pages. £17.50; $34.50

The consistently high standard set by this Series is maintained in this latest volume. The Editors are to be congratulated for persuading acknowledged leaders in the field to contribute lengthy reviews. Some of the papers cover the same ground as previous articles in the series. However, progress has been so rapid as to warrant these latest reviews. The problems associated with the unavoidable gap between completion of the review and publication are even more apparent in such a fast-moving field. Thus it is a pity that the recent fascinating studies performed by Gilman and colleagues in Virginia on the reconstitution of hormone-sensitive adenylate cyclase activity from components of cells with complementary lesions could not be included in their excellent review.

Investigators concerned primarily with the general problems of cyclic nucleotide metabolism should find most of the reviews in this volume of considerable interest. This is particularly true of the first five articles which are concerned with the β-adrenergic receptor, the mechanism of action of cholera toxin, cyclic nucleotide phosphodiesterases, the hormonal control of protein phosphorylation, and cyclic nucleotide action in the nucleus. These articles each review the subjects in considerable depth, but are also forward looking with the first article in particular including some intriguing speculations. The article on the control of protein phosphorylation may be considered over-long (a book within a book), but is undoubtedly comprehensive. Three of the remaining four articles are directed more to the involvement of cyclic nucleotides in water transport, in cardiac contractility, and in the nervous system. These reviews will be of special interest to investigators intimately involved in the specific subjects. However, all three are sufficiently comprehensible for those working outside the particular areas, who may wish to search for parallels in other systems. The final paper, which updates an earlier article in the Series, is concerned with the clinical aspects of cyclic nucleotide research.

This volume also contains an excellent subject index, and an author index which, apart from some omissions, is also very useful.

In general, this volume (and indeed the whole series) is to be recommended to all serious students of cyclic nucleotide metabolism, and of cellular regulatory mechanisms.

Barry Brown
Prostaglandin synthesis is the manufacture of lipid compounds within the cells of some animals, including humans. These substances are chemical messengers that mediate biological processes, such as inflammation, and are important in the normal function of many different tissues. Certain enzymes initiate prostaglandin synthesis by catalyzing a series of metabolic reactions that convert a fatty acid into the final biologically active product. Drugs such as aspirin prevent the synthesis of prostaglandin and thus reduce pain and inflammation. Aspirin prevents the synthesis of prostaglandin. Chemical Synthesis of Prostaglandins witnessed phenomenal activity during the 1960’s and 70’s. During this period, organic chemistry saw intensive development in “disconnection” and “Logic” as primary tools for synthesis. This period also saw development of several new reagents for stereoselective synthesis. The complexity of the structure of PG skeleton posed a great challenge for synthesis. The first problem was the synthesis of a cyclopentadiene with the alkyl group at the methylene carbon. Anion routes for alkylation of cyclopentadiene mostly led to a mixture of cyclopentadienes, due to easy isomerisation of the olefin. The problem was solved by alkylation with thallium anion (Fig 10.11).
The prostaglandins (PG) are a group of physiologically active lipid compounds called eicosanoids having diverse hormone-like effects in animals. Prostaglandins have been found in almost every tissue in humans and other animals. They are derived enzymatically from the fatty acid arachidonic acid. Every prostaglandin contains 20 carbon atoms, including a 5-carbon ring. They are a subclass of eicosanoids and of the prostanoid class of fatty acid derivatives. Publication year. 1969. Synthesis type. Total. Number of steps. 17 (linear).

References. Synthesis of prostaglandins. After two reaction steps, the prostaglandin 204 was isolated in a yield greater than 50% as a single diastereoisomer. Furthermore, the alkylation reaction on the Merrifield resin gave only poor results. The synthesis of prostaglandin EI in the naturally occurring leva form was achieved by a modification of the sequence described above in which the racemic amine A was resolved with (-)-oc-bromocamphor-Tl-sulfonic acid. The enantiomer of the natural PGEi ([a]57g+57° (cO.5, THE)) was also synthesized (Ref. 3). [Pg.254]. In the early work on the synthesis of prostaglandins, zinc borohydride was used for the reduction of the 15-ketone function and a 1:1 mixture of epimeric 15(S)- and 15(1)-alcohols was generally obtained.