to gene cloning per se. Alan Malcolm has contributed a useful account of the properties of restriction endonucleases and the ways in which they can be exploited, but later sections of this article might reasonably have been deferred for treatment in a separate article. For example, the subject of maximizing expression of a cloned gene is treated in a single paragraph, which cannot possibly do it justice. This is a suitable subject for a subsequent volume in the series. Jean Beggs has prepared a clear article on cloning in yeast, a host organism which is attracting great interest owing to its potential value in the commercial application of gene cloning. Whilst this volume is not intended as a lab-manual, these articles contain much that is of practical value to the committed gene cloner.

Both the development of gene manipulation techniques, and the expansion in our knowledge of gene structure and function that has resulted from application of recombinant DNA methods, continue at such a pace that even the most assiduous reader of the literature has difficulty in keeping abreast of developments. Specialist reviews of the kind found in this volume fulfill a clear need. It can only be hoped that the editor will continue to find contributors who will uphold the high standard now set for the series, and that rapid publication can be maintained.

R. W. Old

Genetic Engineering-Cloning DNA

Edited by D. M. Glover
Chapman and Hall; London, New York, 1980
78 pages. £2.45

This work forms part of well-established series entitled 'Outline studies in Biology'. These books are designed to give final year undergraduates and new graduates in the biological sciences an introduction to those topics which are not adequately dealt with by standard texts. As a novel, and rapidly changing, area of research genetic engineering falls into this category and this book will therefore undoubtedly fulfill a useful role.

The book is divided into 7 sections. There is a brief introduction and this is followed by a description of the enzymes used for in vitro DNA recombination. The various artificially constructed plasmid and phage-cloning vectors are next described, with particular emphasis being placed on the considerations of utility and safety which affected their design. One particularly useful feature of the chapter on plasmid vectors is a well-illustrated description of the labyrinthine series of steps involved in construction of, that workhorse of the genetic engineer, pBR 322. The chapter on phage vectors is also well presented and contains a brief, but highly lucid, description of those features of the biology of phage λ which affect its use in the cloning and expression of foreign DNA. There then follows a chapter entirely devoted to the expression of cloned DNA in *Escherichia coli* which uses as paradigms several of the elegant constructions used to synthesize commercially and pharmaceutically important proteins. The same emphasis on using selected published examples to illustrate specific techniques is also apparent in chapter 6 which describes methods of characterizing cloned segments of DNA. The final chapter deals with the expression of cloned genes in eukaryotic systems and, while significant advances have been made in this area since the book's publication, it provides a good background for further reading.

When it is realized that the text of the book is only some 70 pages in length, then it is clear that an enormous amount of information has been packed into a relatively few words. While this brevity of presentation is not generally a problem there are a few sections where a more verbose text would have aided understanding. There are also a few sections, particularly in the chapter on methods of characterizing cloned DNA, where relatively complicated biological systems are used to illustrate the use of relatively straightforward techniques. These are, how-

ever, minor criticisms because the standard of presentation in the book is generally very high. Moreover, while in such a short book it is not possible to give a totally comprehensive review of all of the subjects considered, great care has been taken to present an historically accurate view of developments in the field. In summary then, while this book performs some minor miracles of condensation which may deter the faint-hearted, it will be of great value to those seriously intent on understanding genetic engineering in it's full complexity.

J. G. Williams

Topics in Enzyme and Fermentation Biotechnology

Volume 5

Edited by Alan Wiseman
Wiley; Chichester, New York, 1981
360 pages. £26.50

This volume maintains the high standard of review article already well established for this series. The layout allows for easy reference, the artwork is clear and there are few typographical errors.

Looking forward to technological developments which may facilitate the use of immobilised enzymes of the type requiring a coenzyme for catalytic activity, over one-third of this book is devoted to the subject of immobilised coenzymes. It is made clear that this may best be achieved by devising appropriate analogues, possibly only of the functional part of the coenzyme molecule, which can readily be regenerated, and co-immobilising them in equimolar concentrations with their co-functional enzymes. Such a system would have considerable application, for example, in the industrial production of certain pharmaceuticals (notably steroids) and as detoxication agents for artificial kidneys. A specific example, alcohol dehydrogenases, is reviewed separately by the editor at the end of the volume.

A chapter on large-scale enzyme extraction and recovery has inevitably a strong emphasis on the biochemical engineering aspects and is followed by an article on the properties, biogenesis and fermentation process of the cyclic decapeptide antibiotic gramicidin S. Not only is this article an excellent general review of the subject but it specifically highlights the formation of gramicidin S synthetases, thereby fitting perfectly the prevailing theme of potential application, which must be overt, and indeed is, in these 'Topics in enzyme and fermentation biotechnology'. Since the gramicidin S synthetases are non-ribosomal and have been isolated in a functional form they clearly have potential value for preparative scale total enzymatic synthesis of appropriate natural products.

Finally, the diversity of interest generated by this volume is also significantly due to a review of the constituent enzymes of the latex of Carica papaya. The most notable is papain which is used quite extensively in the brewing, meat and baking industries. Prospective legislation against enzymes added to food and drink may stimulate the development of immobilised papain systems, thereby potentially bringing this natural product well within the prevailing theme of this book.

P. G. Mantle

â€˜Genetic engineeringâ€™ is the process to alter the structure and nature of genes in human beings, animals or foods using techniques like molecular cloning and transformation. In other words, it is the process of adding or modifying DNA in an organism to bring about a great deal of transformation. Genetic engineering was thought to be a real problem just a few short years ago. We feared that soon we would be interfering with nature, trying to play God and cheat him out of his chance to decide whether we were blonde or dark-haired, whether we had blue or bright green eyes or even how intelligent Deoxyribonucleic acid (DNA) synthesis is a process by which copies of nucleic acid strands are made. In nature, DNA synthesis takes place in cells by a mechanism known as DNA replication. Using genetic engineering and enzyme chemistry, scientists have developed man-made methods for synthesizing DNA. The most important of these is poly-merase chain reaction (PCR). First developed in the early 1980s, PCR has become a multi-billion dollar industry with the original patent being sold for $300 million dollars.