The book opens with a highly readable essay on the potential applications of biotechnology in the design and production of food ingredients. This is followed by an introductory chapter on bioreactor engineering by H. W. Blanch, which largely contains 'recycled material' from the author's earlier articles on the same subject. The role of plant tissue culture to produce flavour and pigment, in particular, to tailor a flavour in order to meet a stipulated objective in food formulation, is discussed in Chapter 3; while Chapter 4 is an exhaustive review on enzymic processes in membrane bioreactors. Chapter 5 is an authoritative exposition of freeze concentration by H. G. Schwartzberg; the detailed discussion in the influence of ice crystal size distribution on the process is particularly enlightening. The coverage of supercritical extraction (Chapter 6) and extrusion cooking (Chapter 10) is somewhat limited in scope, even though these chapters are well written: one would have hoped to see more discussions on the process engineering side of these subjects, especially in this book. Chapter 7 provides a useful approach to model and characterise drying of foods, while the engineering science of aseptic processing is covered in Chapter 8. An insight into encapsulation and controlled release of food components is given in Chapter 9. Recent process engineering developments in food freezing (Chapter 11) and microwave processing (Chapter 12) are exhaustively covered, and these chapters enhance the utility of this book. Chapters 13 and 14, dealing, respectively, with robotics and integration of computers in food processing, are important contributions made through this book; these areas have seen an upsurge in activity in recent years, and it is certain that, in future, computers will play an increasingly important role in food processing.

This book contains a useful compendium of articles concerning recent developments in food processing. The editors must be complemented on producing a very welcome addition to the literature.

K. Niranjan

Analytical Instrumentation Handbook. By Galen Wood Ewing. Marcel Dekker Inc., 1990. 1008 pp. ISBN 0-8247-8184-8. Price: $195·00 (US & Canada); $234·00 (all other countries).

The principles of instrumental techniques and their applications in analytical chemistry have been described in many books. However, the editor of this book has changed the emphasis from that of most other texts by concentrating on providing a description of the principles of the equipment used in a variety of analytical techniques with very little discussion of the applications or the interpretation of the data. The

strength of the book lies in the breadth of the coverage of instrumental techniques. The twenty-seven chapters are categorised into six categories, namely: computers, methods for measurement of mass, spectrochemical techniques, electro-chemical instrumentation, chromatographic and miscellaneous methods. Besides techniques that are commonly covered in other tests of this type, the inclusion of chapters covering chiroptical techniques, photoacoustic instrumentation, thermoanalytical techniques, automatic titration and continuous flow analysers broadens the appeal of the book.

Inevitably in a multi-author text, there are wide variations in style and content between different chapters. Tables of useful data are included in several chapters such as the limits of detection or different elements in the excellent chapter on atomic absorption and flame emission spectrometry. However, other chapters lack tables of this type. Suppliers of instruments are listed in many chapters, but this information is also not uniform. There are also variations in the depth of coverage with the discussion of HPLC detectors being much more detailed than the coverage of GC detectors.

There is much useful information in this book and many analytical chemists will find it worth consulting especially when they are considering using a technique that they are less familiar with. The high price may preclude many individuals from purchasing a copy but the purchase of this book for the libraries of companies or departments involved in analytical chemistry is recommended.

M. H. Gordon