and ideas on an informal basis. The symposia have now grown to be truly international in character and offer a valuable insight into the wide range of food flavour research being undertaken throughout the world. This book contains the proceedings of the sixth Weurman symposium held in May 1990 in Geneva, Switzerland. The sixty-two papers are arranged under six chapter headings: general and analytical chemistry of flavours; reaction flavours, including Maillard reactions, oxidations and so on; biotechnology and flavours; instrumental analysis and extraction methods; computerization and statistics; physical chemistry and technology of flavours. Each chapter comprises a useful review of the subject and a number of shorter research papers.

It would perhaps be invidious to single out any of the numerous research papers presented, but those describing the chirospecific analysis of chiral flavour molecules in the chapter on the analysis and chemistry of flavours are particularly worthy of mention. The procedures involved are very elegant and, if generally applicable, must introduce a new dimension into the description 'nature-identical'.

The editors and publishers are to be congratulated on producing this volume in less than six months from the date of the symposium. However, the variations in type face and style resulting from the use of camera ready manuscripts have had an adverse effect on the overall clarity of the text. Nevertheless, this book presents an interesting collection of papers on a broad range of topics and will be of considerable value to newcomers to the flavour area as well as to established workers.

D. McHale

Biotechnology and Food Process Engineering. Edited by Henry G. Schwartzberg & M. Anandha Rao, Marcel Dekker Inc., New York, 1990. 544 pp. ISBN 0-8247-8363-8. Price: $69·75 (US & Canada); $83·50 (all other countries).

This book contains a selection of papers presented at the Advances in Bio- and Food Process Engineering symposium held in Chicago in June 1989. The editors have endeavoured to include food process engineering operations which have illustrated significant developmental advances in recent years. The book contains 14 chapters: Chapters 1 to 4 deal with some applications of biotechnology to food processing; Chapters 5 to 12, with the exception of Chapter 9, cover developments in food unit operations; and Chapters 13 and 14 explore the role of robotics and computers in food processing.

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