Food chemistry **41** (1991) 361–365

Book Reviews

Protein Purification Principles, High Resolution Methods and Applications. By J. C. Janson & L. Ryden. VCH, New York, 1989. ISBN 0-89573-122-3. xi + 502 pp. Price: £44·45.

During the last few years there has been an explosion of interest and activity within the whole area of biosciences, and particularly in those parts with either short- or long-term applied objectives, i.e. biotechnology. The most important single factor in this has been the development of recombinant DNA techniques, but there is now increasing interest in using biological processes in previously unfamiliar situations, such as enzymes in organic solvents, for example, for a variety of purposes. Bioseparations work is crucial to both of these areas, and many others, for purifying proteins and enzymes for use as starting materials or catalysts and for purifying products. The extraction and retention of activity of biomolecules from micro-organisms and the regain of activity of materials expressed in the form of inclusion bodies in genetically engineered microorganisms are obvious growth areas for the future.

In contrast to protein engineering and organic solvent enzymology, which are both glamorous new areas of activity, the bioseparations field is something of a Cinderella with many current methods being essentially developments of long established techniques. Nevertheless while lacking glamour it is an area of vital importance to the whole of biochemistry and with a very large number of workers in the field there have been many important advances in recent years. Not only are there many people using protein purification techniques but there are also many methods and

variations of methods. For this reason the book is made up of chapters contributed by established experts in the particular methods concerned. This was undoubtedly the correct approach and has enabled each topic to be covered comprehensively and with authority. Many of the authors are from the research staff of Pharmacia-LKB Biotechnology but it is stated clearly in the Preface that the editors intended to avoid any selective description of methods and materials from that source and sought to give an unbiased account. They have succeeded admirably in this and have given an excellent and objective description of virtually all the important bioseparations methods used in both analytical and preparative applications.

An introductory chapter covers extraction and preliminary fractionation strategies, including raw material handling, precipitation methods, centrifugation, ultrafiltration, etc. as well as activity measurements, protein content, concentration, drying and useful comments on equipment needed. This chapter also gives a general overview of fractionation techniques discussed in more detail later and provides the background philosophy for typical protein purification regimes.

The rest of the book is divided into two parts, one headed Chromatography and the other Electrophoresis. Very roughly these equate to preparative and analytical methods, although of course there are many exceptions which depend to some extent upon the scale of the experiment. Thus both electrophoretic and HPLC techniques are very often used purely analytically but can be preparative on the milligramme or even gramme scale under certain circumstances.

Chromatography covers an introductory chapter discussing basic concepts, theory and general characteristics of procedures followed by more specialist chapters on gel filtration, ion-exchange chromatography, chromatofocusing, high resolution reversed phase chromatography, metal ion affinity chromatography, other affinity chromatography methods, covalent chromatography and affinity partitioning in two-phase systems. Electrophoresis includes chapters on gel electrophoresis, isoelectric focusing, immunoelectrophoresis, protein mapping on two-dimensional gels, capillary electrophoresis and protein blotting and recovery methods.

Each chapter follows the pattern of beginning with the relevant theory and background and then going on to describe typical procedures and to discuss the choice of materials and conditions as well as variations of the basic approach and ending with a final section on applications. The book is a long one, so, while there are seventeen chapters in all, there is adequate space for each subject to be given a good and reasonably comprehensive coverage. The quality of the chapters is extremely good with the information presented clearly and logically so the book is a very readable one. The scientific content is right up to date, so it will provide both good and useful background

knowledge and be a valuable source of methodology for those working in the area for a good time to come. The individual authors are to be commended for a job well done while the editors are to be congratulated warmly for putting together a really excellent book which I have no hesitation in recommending very strongly to students, research workers and all those interested in the separation of proteins and enzymes.

A. T. Andrews

Principles of Food Sanitation. By Norman G. Marriott. Second Edition. Chapman and Hall, London, 1990. ISBN 0-442-31807-3. xi + 387 pp. Price: £35.00.

This second edition of *Principles of Food Sanitation* is rather disappointing in that it has not convincingly developed or expanded the subject much beyond that achieved in the first adition. This book is, in fact, very similar to its predecessor differing largely through the addition of a limited amount of new material and use of new or modified headings.

There are 17 chapters in the book which range widely over the subject area from basic microbiology, personal hygiene, detergents and sanitizers; through sanitation equipment and systems, waste-product handling and pest control; to plant sanitation in various industries and quality assurance and sanitation programme development.

A new short chapter on 'Beverage Plant Sanitation' occurs in this edition, but its title is misleading since it covers only beer and wine industry sanitation without reference to the soft drinks and fruit juice industries.

There is both new and updated information in some important areas, including descriptions of pathogenic bacteria of more recent interest such as *Listeria monocytogenes* and *Yersinia enterocolitica*, and presentation of the HACCP system of microbiological control.

The early chapters are a source of some useful information on the principles or core material, and provide a framework on which a student reader might build. The later chapters on plant sanitation practices in various industries however, do not always measure up to this expectation. By their very nature these chapters tend to be descriptive and repetitive, but while repetition is to some extent acceptable there are instances in these chapters where it is quite unnecessary. For example, in the case of cleaning systems, and sanitizing agents, the information which is well-presented in the relevant earlier chapters is restated. Conversely, it is only in Chapter 13 (Fruit and Vegetable Processing and Product Sanitation) that reference is made to the principles of hygienic design of processing equipment and