naturally occurring derivatives such as the ϵ-*N*-methyllysines or residues containing covalently-bound oligosaccharide moieties. Common methods of end-group analysis and sequential degradation are described, although problems may arise when these are applied to peptides containing some types of modified amino acid residues.

Criteria for useful group-specific reagents vary according to requirements. For example, selectivity is not important when reaction of nucleophilic groups with cyclic anhydrides is undertaken purely to alter the solubility or electrophoretic mobility of proteins or peptides, but selectivity is generally an advantage when these reagents are used in amino acid sequence analysis. Chemicals commonly used for modification of either native or denatured proteins are classified according to the group or side-chain for which they are generally found to be appropriate, and due note is made for any lack of specificity when, for example, it may be essential to protect the outstandingly reactive side-chain of cysteine before further modification of other groups.

The protein environment may often confer great selectivity on certain residues and reasons for the successful site-specific modification with reagents, such as diisopropyl fluorophosphate and pyridoxal-5-phosphate, which do not bear a strong structural homology to natural ligands, are explained. The authors prefer affinity labels for site-specific modification because the chances of success are higher and, even if the reagent is unsuccessful, results provide the basis for design of other labels. On the other hand, much labour is required to synthesise affinity labels, whereas group-specific reagents can usually be purchased. Synthetic schemes for attaching certain types of reactive or photoactivatable groupings to affinity labels are described and some suggestions for analysing the often complex products formed from target residues are put forward.

An appendix contains details of methods used in the authors' laboratories for peptide resolution, plus a list of suppliers of resins and specific exo- and endopeptidases. The book is available as a soft-cover pocket edition and many laboratories will soon possess a well-thumbed copy.

D. G. Smyth

Analysis and Control of Immobilized Enzyme Systems

Edited by D. Thomas and J.-P. Kernevez
North-Holland/American Elsevier; Amsterdam, New York, 1976
viii + 306 pages. Dfl. 70.00, $ 27.50

This book presents the 23 contributions of the international symposium held in Compiègne in May 1975. It is mostly oriented towards the biomathematical, biophysical and biochemical approaches in studying immobilized enzyme systems. From the papers presented one can conceive that knowledge in this field helps us to understand real biological systems.

Those interested in immobilization techniques and in the characterization of certain preparations, can find some good articles about these topics. Richardson and Chen describe a technique for coupling enzymes to erythrocytes, Manecke and Vogt write about the covalent attachment of enzymes to a new carrier, crosslinked polyvinyl alcohol, Pansolli et al. treat the kinetics of fibre-entrapped glucose isomerase, Coulet et al. present their azide method for coupling enzymes to collagen supports and Barbotin puts forward electronmicroscopic studies on enzyme-membranes. Particularly interesting is the paper of Suzuki et al., who discuss their new results with enzyme–collagen membranes, including the enzyme fuel cells and the photocontrol of enzyme–collagen membrane activity.

In the last years the theories of dissipative struc-

tures have greatly expanded. In immobilized enzyme systems, owing to the possibility of coupling chemical reactions to transport (diffusion) processes, highly organized spatio–temporal structures may occur. Hardt et al. present their theoretical analysis on a membrane-containing immobilized papain and they also show the possibility of signal propagation in the plane of the membrane. Kernevez develops a numerical analysis to solve the problems of optimal control or to identify unknown kinetic parameters in reaction–diffusion coupled processes. Lefever gives a stochastic model for the investigation of dissipative structures and proves that in the phosphofructokinase reaction dissipative structures may occur, which is a novel feature in the theory of glycolytic oscillations. Bunow and Colton claim, on the ground of a numerical analysis of a model system, that in the case of a pH sensitive, base or acid consuming or producing system, if mass transport limitations are imposed, multiple steady states may appear.

In addition, there are articles about various themes, e.g., Monsan et al. deal with the mechanism of action of glutaraldehyde, Engasser and Horvath discuss the 'buffer shuttle mechanism', Gelff and Henry treat the performance of immobilized enzyme columns, etc.

Last but not least there are very useful review articles in this book, e.g., the one written by Porath about bioaffinity and hydrophobic chromatography, or the survey by Broun about the current trends in the field covered by the meeting. Thomas presents an excellent review of the results obtained with artificial enzyme membranes, including fundamental kinetic modelling, the new properties due to the membrane shape (active transport, memory, oscillation, etc.) and a survey of the applications.

Veronika Jancsik

Laboratory Techniques in Biochemistry and Molecular Biology
Volume 4: Part 1. Chemical Modification of Proteins
Part II. Separation Methods for Nucleic Acids and Oligonucleotides

Edited by T. S. Work and E. Work
North-Holland Publishing Company; Amsterdam, Oxford/American Elsevier; New York, 1976
xiii + 492 pages. Dfl. 130.00, $ 51.95

A new methods-oriented book is always welcomed by scientists. Now, a new volume of the well-known series edited by Work and Work has become available. Volume 4 consists of two parts, both designated for day-to-day bench use.

The first part written by A. N. Glazer, R. J. Delange and D. S. Sigman is about the chemical modification of proteins. The authors give the reader a fairly broad view of the most valuable methods in protein chemistry and biochemistry. Protein and amino acid analysis is carefully reviewed on an up-to-date basis. Probably the most useful section is the detailed interpretation of the various methods concerning the modification of protein side-chains. The application range of the particular techniques is critically discussed and the descriptions are detailed enough to be used without reference to the original papers. A special merit of this part is the review on the practical use of affinity and photoaffinity labels in protein chemistry.

The second part is entitled 'Separation Methods for Nucleic Acids and Oligonucleotides' written by H. Gould and H. R. Matthews. Nucleic acid research is still one of the most rapidly developing fields in molecular biology and it is difficult therefore to keep up with new methods. In an earlier volume of this series G. G. Brownlee summarized RNA sequencing methods which, of course, involve many separation techniques. It is a pity that this volume does not deal with some of the problems listed there because some powerful methods have been developed since the former book was written.

This review concentrates on the separation problems