*Copper Proteins*

Edited by G. Spiro
Wiley; Brisbane, Chichester, New York, Singapore, Toronto, 1981
x + 364 pages. £40.50

This book is the third volume of the series *'Metal ions in Biology'* devoted to current research into the structural chemistry of protein–metal ion sites. Both copper and iron-containing proteins play a dominant biological role in the utilization of dioxygen and are to be found as the primary oxygen carriers, oxidases and oxygenases of aerobic cells. Apart from the oxygen-carrying protein haemocyanin, found in arthropods and molluscs, the copper-containing proteins essentially participate in redox electron-transfer reactions. The intensely blue-coloured multicopper oxidases have, since their discovery, fascinated physiologists, biochemists and physical chemists. It is this latter group of scientists who have contributed to the 8 chapters and possibly to most of our definitive knowledge about these proteins. There is a lucid and concise up-to-date review of the blue multicopper oxidases, describing the three different copper sites and their involvement in the four-electron reduction of dioxygen to water. The multicopper oxidases are referred to in several chapters but overlap is minimal and on the whole complementary.

In one of the two chapters devoted to galactose oxidase it is proposed that the active form of the enzyme exists in a copper(III) state and the author goes on to speculate that since the copper(III) state can so readily be attained we might yet expect to find it in other copper complexes. The copper-containing glycoprotein dopamine-β-hydroxylase is introduced by a useful section on dioxygen and its reduction intermediates before describing mechanisms of substrate hydroxylation. In the final chapter, chemical and structural aspects of the copper–zinc containing superoxide dismutase are reviewed in depth.

Detailed accounts of current research into the structural chemistry of proteins with copper ions at their active sites are given with descriptions of new and powerful techniques used to probe these ligation and electron transfer mechanisms. Although the book is intended for a broad audience in the life sciences, it may have limited appeal to those essentially interested in the biological functions of these proteins. Indeed, many may be surprised to read that the ferroxidase activity of caeruloplasmin and the superoxide dismutase activity of the cuprozinc protein are not important biological functions of these proteins.

John M. C. Gutteridge

*Sequencing of Proteins and Peptides*

Laboratory Techniques in Biochemistry and Molecular Biology, volume 9

by G. Allen
Elsevier Biomedical; Amsterdam, New York, 1981
xviii + 328 pages. $29.75; Dfl 61.00 (paperback); $79.50, Dfl 163.00 (clothbound)

This is an excellent book that I can recommend to anyone concerned with amino acid sequence determination. The author is obviously personally familiar with a high proportion of the techniques that he describes, and is impressive in the way that he introduces comment and criticism to published methodol-

ogy. It is also pleasing the way he tries to give rational explanations for many of the minor points of procedure that have entered the mythology of protein chemistry.

While the book gives good coverage of automatic sequenator methods and applications, the author has sensible reservations about their use. He clearly does not subscribe to Walsh's pernicious concept (Annu. Rev. Biochem. 50 (1981) 261–284) of efficiency in protein chemistry being definable as the ratio of the number of residues placed in sequence to the number of fragments isolated to prove the sequence. As Allen points out (p. 258) redundant information is the safeguard against errors in interpretation or methodology.

While the author certainly recognizes the problem of accuracy in sequence analysis [e.g., p. 231: 'the quality of the data towards the C-terminus of a (30-residue) peptide is often poor'], I do not think that he appreciates the abundance of inaccurate published sequences. Of course (p. 260) 'the methods for amino acid sequence analysis should leave no room for error', but any investigation is a compromise between premature publication and excessive pedantry, and, alas, pedantry generally loses. Amide assignation, whether by direct identification of phenylthiohydantoins or from electrophoretic considerations (p. 219) is a particularly common source of error.

The author may be doing the subject a slight disservice by putting too much emphasis on the use of methods using small quantities of peptides and proteins. For many present day investigations, micromole quantities of protein are readily available, and to use nanomole or picomole methodology unnecessarily is to court problems from external contamination.

A few minor points are worth mentioning. The hydrolysis of some peptide bonds involving proline by trypsin (p. 53) can be rapid, as susceptibility is sequence-dependent. Probably most –Gly–Arg–Pro– bonds will be split at 'normal' rates. The separation of peptides by gel filtration in dilute acid (p. 88) usefully enhances the aromatic retardation effect as compared to using $NH_4HCO_3$, and is probably kinder to labile –Asn–Gly– sequences. The only disadvantage is the far-UV absorbance of the solvent. α-Nitroso-β-naphthol (p. 158) also detects tryptophan-containing peptides, which show as grey bands on the yellow background, although the sensitivity is less than for tyrosine.

The book is well produced, with abundant figures, good references and useful appendices. It is the only handbook on the subject that I have yet met that I am able to recommend wholeheartedly.

R. P. Ambler

*Affinity Chromatography and Related Techniques*

Analytical Chemistry Symposia Series, volume 9

Edited by T. C. J. Gribnau, J. Visser and R. J. F. Nivard
Elsevier Scientific; Amsterdam, New York, 1982
xviii + 584 pages. $83.00, Dfl 170.15

This volume is number 9 in the series on Analytical Chemistry Symposia. It adequately reflects the plenary proceedings of the fourth (biennial) International Symposium on Affinity Techniques. The book consists of seven sections: (I) Theoretical aspects; (II) Polymeric matrices and ligand immobilisation; (III) Applications, isolation and purification; (IV) Applications – diagnostic – biomedical; (V) Applications – organic dyes – dye ligands; (VI) Applications – high performance liquid chromatography – affinity partition – peptide synthesis; (VII) Posters.

The book contains only a listing of the titles and authors of the poster sessions, which is a shame because the many interesting and varied presentations at the meeting covered a far wider range of topics than the lectures. Unlike the latter, many poster presentations contained original unpublished results and as with many conferences provided the focus for some of the most important informal exchange of views and information.