The third group may generally be described as biological and clinical studies on protein–metal interactions, and the physiological role of some essential metal ions. In this group one finds articles on metal binding components in serum (Henkin) and intestine (Evans), on the biological consequences of zinc and nickel deficiency (Sanstead et al.) and on the basis of toxicity to lead and mercury. These articles are representative of the classical approach to metallobiology and owe nothing to the impact of physical techniques on this field.

I suspect that the very breath of the approach taken in this volume will ensure that it appeals to a very limited audience. Many workers in the field may wish to refer to one or two of the articles, but it is hard to imagine that any one individual will find sufficient pertinent material to justify inclusion in their library.

M. C. Scrutton

Chemical Microbiology: An introduction to microbial physiology (3rd edition)

by A. H. Rose
Butterworths; London Boston, Sydney, Wellington, Durban, Toronto, 1976
x + 469 pages. £7.75

'Chemical Microbiology' appears in a third edition after eight years and has increased in size by about half, in price by more than three-fold, and changed in form by becoming paper-backed and typewriter-set. However, the basic content is the same but updated and with only minor changes to the ten chapter headings.

The book presupposes some knowledge of microbiology and biochemistry and begins with a chapter on 'Molecular Architecture' which includes brief mention of methods of preparation as well as anatomy and chemistry. Walls, membranes and organelles such as cilia, flagella, mitochondria, photosynthetic apparatus, genomes and ribosomes are included and reference is made to algae and fungi as well as to bacteria. Over fifty classified references are given and they include titles which is helpful.

'The Environment' embraces chemical and physical factors and the responses to them – growth, inhibition, movement – and leads to a short chapter on transport. Then follow sixty pages on 'Energy-yielding Metabolism' and eighty on 'Energy Expenditure: Biosyntheses'. The former covers the standard pathways of catabolism including various fermentations, and electron transport and phosphorylation in both heterotrophs and lithotrophs. In the chapter on biosynthesis, assimilation of one- and two-carbon compounds and inorganic nitrogen leads to a consideration of amino acid and nucleotide synthesis and then their polymerisation to proteins and nucleic acids. Peptidoglycans, teichoic acids, and lipopolysaccharides are also dealt with in sections on carbohydrates and lipids. However, there are only six references at the end of this chapter to protein and nucleic acid synthesis – one each from 1969 and 1973 and two each from 1971 and 1972.

'Regulation of Metabolism' begins with the genetic code, mutation, and transfer of genetic material, and goes on to inhibition and repression of enzymes. The treatment of genetics in a textbook which now has the additional sub-title 'An Introduction to Microbial Physiology' is cursory to say the least and the only three references to the genetic code are to the out-of-date 1970 edition of Watson and to a book and a paper by Woese (1967 and 1970).

The penultimate chapter, entitled 'Growth and Survival' deals with replication of organelles, individuals and populations, while the last is called 'Differen-

tiation' and discusses cell shape in *Arthrobacter spp.*, yeast-mycelial dimorphism, spore formation, and the life cycle of the slime mould.

This has been (and is) a useful text which reads easily and covers a wide field. It is a pity that the figures are even less good and in some instances have diminished in size alarmingly, and that the treatment of topics is somewhat uneven. However, it is certain to be useful to undergraduates although not, perhaps, of such 'value to postgraduates embarking on research' as the publishers claim.

Kenneth McQuillen

Thiamine

Edited by C. J. Gubler, M. Fujiwara and P. M. Dreyfus
John Wiley & Sons; New York, Sydney, Toronto, London, 1976
x + 393 pages. £16.75; $ 30.00

This volume contains the proceedings of the 2nd US–Japan Thiamine Seminar held in Monterey, California in October, 1974. It consists of 26 articles contributed by workers with interests in the fields of thiamine biochemistry and nutrition and of pathological states associated with deficiency of, or disorders involving, this vitamin, together with the discussions (presumably edited) which followed the oral presentations.

As is often the case with published proceedings of symposia of this type, most of the articles in this volume fall between two stools. They are neither sufficiently lengthy or incisive to serve as authoritative reviews of given aspects of thiamine metabolism nor, in most cases, sufficiently detailed to be adequate as definitive reports of original data. Indeed, certain of the authors appear to have taken care to omit relevant supporting material. Furthermore, the initial section on the thiamine-dependent enzymes contains much material which has been very adequately reviewed elsewhere in greater detail. These articles, which in any case appear to add little to the subsequent discussions on thiamine deficiency and pathophysiology, seem therefore to be superfluous to the main theme.

The remaining sections of the book are devoted primarily to the description and characterisation of thiamine transport systems and to consideration of various aspects of the role of thiamine in brain metabolism and function. Although it is clear that much work is in progress, one does not gain the impression that rapid progress is being made, or that new concepts are in process of formulation. In particular, a satisfactory explanation of the neurological consequences of thiamine deficiency is still apparently not in prospect. Nonetheless, some studies of considerable interest are described. For example, several articles are devoted to the processes involved in formation and degradation of thiamine triphosphate, a thiamine derivative for which no biochemical role has yet been established.

I would expect this book to be of prime interest to those who wish to have a 1974 vintage view of studies in the field of thiamine metabolism. Its chief value lies in the assembly, between two covers, of accounts representing most of the current research trends in this area. However, it is questionable whether in this instance the sum is greater than the component parts.

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