

of metabolic energy. I think I can accept that a course in microbial physiology does not have to include the *lac* operon of *E. coli* as an example; but I deplore the absence from a textbook of the subject, of any description of the control system of a well studied inducible operon, such as *lac*, *ara*, *gal* or *hut*. I was also surprised to find only occasional mention of catabolite repression, with in one instance, a hint that this might be a cyclic-AMP mediated phenomenon; indeed the unqualified and unsupported statement that "the enzymes of the glyoxylate bypass are repressed . . . by a process known as catabolite repression" infers a broader definition of this phenomenon than I have encountered elsewhere. Another area of confusion concerns the assimilation of carbon dioxide by phototrophic microorganisms. First, the text states "Photoautotrophs . . . fix carbon dioxide via either the reductive pentose phosphate (Calvin-Benson) pathway or the reductive C₄-dicarboxylic acid (Hatch-Slack) pathway. These systems were first discovered in green plants". I would infer that the unicellular green alga *Chlorella* (with which Calvin's group worked) is regarded by the author as a green plant and not a microorganism, were *Chlorella* not specifically mentioned as a group of organisms included in the eukaryotic protists (page 12). Second, Fig. 3-21 entitled "The reductive C₄-carboxylic acid (Hatch-Slack) cycle" is actually the reductive (or reverse) tricarboxylic acid cycle proposed by Evans, Buchanan and Arnon, which is dependent on two ferredoxin-catalysed carboxylation reactions characteristic of anaerobic metabolic systems and which are not present in the higher plants which show the C₄ pattern of assimilation investigated by Hatch and Slack. Indeed the role of phosphopyruvate as a product of CO₂ fixation in the reverse TCA cycle contrasts strongly with CO₂ fixation by C₄ plants where phosphopyruvate is generally considered to be the co-substrate for the key carboxylation reaction.

The reader will by now conclude rightly that I would not recommend A.G. Moat's book, and there are several general microbiology texts I would prefer.

Returning briefly to the other two volumes discussed I am pleased to have read them, I shall return to them again and I think they both represent good monetary value. *The Biology of Nitrogen-fixing Organisms* has an engaging scholarly style and I am sure will be widely read by biology students and others. Gottschalk's *Bacterial Metabolism* is excellent and I will be surprised if it is not extremely popular amongst students and teachers of microbiology and biochemistry for a very long time. □

C.F. Thurston is a Lecturer in the Department of Microbiology at Queen Elizabeth College, London, UK.

Microorganisms in their environment

J.P. Armitage

Microorganisms: Form, Function and Environment. Edited by L.E. Hawker and A.H. Linton. Second edition. Pp.391. (Edward Arnold: London, 1979.) Paperback £8.95.

THE second edition of this undergraduate textbook has changed format. It is now a fashionable large size book with large, bold print and diagrams. Its sixteen chapters, with twenty-two authors (all, except one, from the University of Bristol), have been divided into three sections: biochemistry and physiology, form, size and life cycles of microorganisms, and the activities of microorganisms in their environment.

The strength of the first edition lay in the good mix of prokaryotic and eukaryotic microbiology and the emphasis on their behaviour in the environment. To this end

this edition has added an excellent new chapter on symbiotic interactions.

However, the new format has resulted in many fewer words than the first edition and, rather than keeping or expanding the better areas of the first edition, all sections have been reduced. This results in much weaker coverage of many areas, in particular biochemistry.

The editing has also been hit and miss: for example, *Klebsiella pneumoniae* is referred to as *K. aerogenes* in the first section, but by its correct name in the second; *Rhodospirillum* has been misspelt and page references to other parts of the book have been left incomplete.

The difficulty with all multi-author textbooks is keeping the level and theme consistent. Unfortunately, by reducing the size of this book but attempting to retain all the subject matter of the first edition the result is a weaker textbook with little to recommend it over the other general textbooks on the market. □

J.P. Armitage is a Postdoctoral Research Scientist in Microbiology in the Department of Botany and Microbiology, University College London, UK.

Soil properties

Stephen Nortcliff

Geography and Soil Properties. By A.F. Pitty. Pp.287. (Methuen & Co Ltd: Andover, 1979.) Hardback £10; paperback £5.50. *Soil Erosion.* By R.P.C. Morgan. Pp.113. (Longman: Harlow, UK, 1979.) Paperback £3.95.

NOTWITHSTANDING the title of this text, the major shortfall of the first book is a failure to place the wealth of information on soil properties into a geographical context. The opening chapter presents a wide ranging review of soils and geography, both physical and human, together with a brief comment on soils and geographical method. In subsequent chapters little attention is paid to geography; rather, the emphasis is placed on detailed descriptions of numerous soil properties.

Although the detailed information presented together with an extensive bibliography of over 40 pages is evidence of considerable effort in compilation, frequently much of the information is presented without a context; also it is not shown why so much detail is important to the geographer. At times less information coupled with more elaboration and discussion would have produced a more complete and easily readable text more

suitable for undergraduate use.

The second book is one of a series of short texts in applied geography suitable for undergraduates studying in the fields of environmental sciences, geography or geology. In a little over one hundred pages the author has set himself the task of making the reader aware of the importance of soil erosion as a problem throughout the world, the mechanics and processes of soil erosion, the factors which influence soil erosion, soil conservation practices and the scope for modelling soil erosion studies, as well as giving some examples of soil erosion studies.

Remarkably the author achieves this, but only by presenting the reader with just a brief outline of each topic. Any additional information must be added by the reader, and to this end there is a bibliography chiefly of erosion studies. As an undergraduate text this approach may be acceptable, but at times a little elaboration or development of the topic would have greatly improved the text. In the introduction the author stresses that although soil erosion has long been acknowledged as a problem in tropical and semi-arid areas, it is increasingly recognised as a hazard in temperate countries. It is a pity that few of the examples used refer to erosion in these temperate countries. □

Stephen Nortcliff is Lecturer in Soil Science at the University of Reading, with teaching responsibilities in pedology and soil management.