

BOOK REVIEWS

Techniques in Bioproductivity and Photosynthesis: edited by J. COOMBS and D. O. HALL. Pergamon International Library, 1982, 171 pp. £15 hardback, £7.50 flexicover.

This multiauthor volume is an attempt to draw together the diverse techniques of field measurement and laboratory investigation of plant productivity. Sponsored by the United Nations Environment Programme, the manual covers the substance of established training courses and workshops for students from developing countries; I suspect many students in the developed countries would wish to have a similarly well constructed course offered them.

The first section of Part I is a 'how to do it' guide to measuring solar radiation, temperature and humidity; this information is given clearly with pertinent discussion of special problems. In a similar vein the next section on biomass measurement is good on detail, not just on 'how to do it' but why we do it that way. Where to buy the equipment is useful, and most important, what the results actually mean. This sort of discussion is of particular value to students of developing countries, where a reference to a good bibliography for explanation is of little value when libraries do not carry the journals or stock the texts. On the whole these early sections are well presented and clear. The remainder of Part I is not as functional or as well presented with unclear anatomical drawings and some confusing use of outdated units. The overall coverage of Part I on 'Field Photosynthesis' is, however, very successful and could be of great use to both the student and the lecturer preparing a similar course.

Part II covers the 'Biochemical Aspects of Photosynthesis' and is a bit of a ragbag with pieces of varying quality and interest. The section (why sections and not chapters?) on carbon metabolism is a fair enough account if the course has access to $^{14}\text{CO}_2$ and

counting facilities. The next section on 'an experiment to test quantitative techniques' is all very well, but like cold baths in the morning most students will ignore it completely even if they understand it. Protoplast and chloroplast preparation recipes are clear and should prove useful, as should the suggested experiments. The Appendices on use of, and care for, oxygen electrodes and pH probes are highly necessary and put across well. Nitrogen metabolism finds a place in this part of the book and the various sections read well, if a little short on excitement, and the student should be able to carry out most of the suggested experiments.

The penultimate chapter on the isolation of enzymes is clearly written but with some surprising omissions, such as including three methods of protein determination but no mention of the easy-to-use Coomassie Blue method which is currently favoured by plant biochemists with its avoidance of many possible sources of error. On the other hand, it is surely superfluous to include the Enzyme Commission Classification System. At the end of the manual we find a 'book of lists', very popular these days and in this case very useful for the botanist; here is a selection of data on fuel reserves, productivity and land use that would serve well to disguise many an esoteric lecture as pertaining to the real world.

All physiology lecturers should read this book and use it as a yardstick for their own courses. Do students need to buy it? I wish I could say "No", but in truth they would do well to have a copy, and it seems to be a fair price. Despite a few criticisms I can only agree with the final statement of the Introduction. "Please enjoy the work and derive maximum benefit from it"; if all botany students attended such a course, I'm sure they would.

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Metabolism and Molecular Activities of Cytokinins: edited by J. GUERN and C. PÉAUD-LENOËL. Springer, Berlin, 1981, 352 pp. DM 98 (\$44.60).

In effect this is the proceedings of an international colloquium, organized by the Centre National de la Recherche Scientifique, and held at Gif-sur-Yvette (France) in September 1980. Anticipating the critical reviewer, the editors of the book write, "One may ask if a new colloquium devoted to the metabolism and the activities of cytokinins, considered at the molecular level, was really necessary and will add anything important to the previous contributions". Their answer is, of course, in the affirmative and they point to important new findings and conclusions presented during the colloquium. The editors single out for mention in this context, biosynthetic mechanisms; pathways through which plasmid-bearing bacteria, symbionts or parasites, provide the host with cytokinins and other growth facilities; chloroplast differentiation and

maturation of photosynthetic membranes. As a biochemist, I was pleased to see the inclusion by the editors of related information from animal systems. Thirty pages are given over to an interesting discussion of the response of animal tissues to cytokinin and its analogues.

The problem with published proceedings of meetings is that if they are too highly specialized they appeal only to the specialist researcher in the field concerned. Furthermore, in preaching mainly to the converted, such 'proceedings' run the risk of being considered by the expert as either out of date by the time they are published, or as a thin new veneer over the information published at the previous conference. Editors should therefore bear in mind that the main readership is not necessarily the research specialist but, more often than not, workers in a related field, wishing to keep up to date. Belonging, myself, to the latter category, my main criticism of this book is the mass of indigestible technical detail in some of the chapters. Not only do I

not need to know that "plants were extracted with 50% and 95% ethanol (20 ml ethanol/g fresh tissue) and then with ethyl acetate-water (5:1 v/v; 15 ml/g tissue)" but this kind of detail quenches my interest in seeking out the new findings which are, after all, the main interest of the non-expert in reading the book. It is not clear if authors were acting upon editorial instructions to write their contributions in the format of a scientific paper, complete with Materials and Methods section, Results,

and Discussion. However, the result is in effect, a hardback journal. For these reasons, I consider that this is essentially a book for the library in departments where there is special research interest in plant growth substances.

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Biology of Inorganic Nitrogen and Sulphur: edited by H. BOTHE and A. TREBST. Springer, Berlin 1981. 384 + viii pp. \$46.80.

This book contains the papers, both invited and contributed, presented at a Conference held in Bochum, Germany, in May 1980, to discuss and compare all aspects of both the nitrogen and sulphur cycles. The 16 invited papers make up 221 pages of the book and open with an introduction to the N and S cycles (Schlegel). The stage is then set for a more detailed consideration of nitrogen metabolism by a critical overview of nitrogen metabolism in plants (Beevers). This is followed by a review on assimilatory (Losada *et al.*) and dissimilatory (Whatley) nitrate reduction, genetics (Brill; Heumann), physiology (Postgate *et al.*; Bothe) and biochemistry (Zumft) of dinitrogen fixation, and the pathways and regulatory aspects of dinitrogen and ammonia assimilation in dinitrogen-fixing bacteria (Lleiner *et al.*). The six invited papers on sulphur metabolism cover the biochemistry of assimilatory sulphate reduction (Schiff and Fankhauser) and the biochemistry (Akagi; Thauer and Badziong) and ecology and physiology of dissimilatory sulphate reduction (Pfennig and Widdel) as well as photolithotrophic (Trüper) and chemolithotrophic (Suzuki *et al.*) sulphur oxidation. The

remainder of the book consists of 16 contributed papers on various aspects of nitrogen and sulphur metabolism and, with one exception, are exclusively by German workers. There is, perhaps inevitably, a small amount of overlap with the invited papers, but they provide some interesting data on nitrate assimilation in algae and plants, symbiotic dinitrogen fixation, and sulphur assimilation in higher plants (albeit now 2-years-old). The wide ranging objectives of the Bochum Conference suggest that there should be something in the book for everyone interested in the biochemistry and physiology of nitrogen and sulphur metabolism in plants and micro-organisms. However, at least one area, higher plant nitrate assimilation, has recently been reviewed elsewhere (although the treatment here does include an elegant section on light control of nitrate assimilation). Although the book has been carefully edited and produced, its rather high cost suggests that few research workers will buy their own copies. It will, however, be a useful addition to an Institute or University Library.

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