

rather cursory, but it was nice to see that photorespiration and the C4 pathway now each rate an individual chapter. The concluding two chapters of the book cover chloroplast development, the interrelations between chloroplasts and the rest of the plant cell and the impact of molecular genetics on photosynthesis. A brief, but adequate, introduction to the terminology and techniques of modern genetics is included in the last chapter, very necessary if the book is to stand on its own.

Inevitably, when an extensive revision is undertaken, errors can creep in. The one that concerned me most was the omission of the glutamine synthetase/GOGAT route for reassimilation of ammonia produced during photorespiration (Chapter 10). However, this would not pre-

vent me from recommending this book to senior undergraduates or to research workers interested in photosynthesis itself or related topics. Similarly, for those of us who teach photosynthesis, the book is a good buy and, for the next few years at least, should save us much painstaking searching of the literature for the latest review of each particular aspect of photosynthesis. However, anyone who has an earlier edition of this book should not be tempted to throw it away. There is still useful background information therein that complements the new findings contained in this third edition.

*School of Biological Science,
University College, Swansea*

J. R. GALLON

Plant Molecular Biology: a Practical Approach: edited by C. H. SHAW. IRL Press, Oxford, 1988. 313 pp. £29 (hard back).

Methods in Plant Molecular Biology: by MARY A. SCHULER and RAYMOND E. ZIELINSKI. Academic Press, San Diego, 1989. 171 pp. \$29.95.

Firstly there was the generation of molecular biology recipe style books, the methodologies contained within of use to all workers in life sciences. The last few years has seen apparently more specialised texts purporting to address problems encountered by those working with plants. Early volumes seemed to deal almost exclusively with plant chloroplast and mitochondrial gene expression and were of limited use to those working with other cellular components. As there are now quite a number of such volumes available, perhaps it is worth considering what might be exclusive to plant molecular biology to merit purchase of any of these publications, especially with the availability of excellent general methodology books. Clearly, when working in the nucleic acid area, transformation methodologies unique to plants obviously justifies separate treatment but very little else that could not be found in general treatises. Indeed the red herring that plants demand special considerations when employing extraction techniques is dismissed in the introduction to the Shaw book as a myth perhaps perpetrated by those who desire exclusive status. Possibly, what is needed in such cases are chapters describing case studies or pointing out which technologies and sources of material have been used successfully in well-founded laboratories with regard to the difficulties encountered with particular types of biological material. The novice in the field is always confronted with the same problem when, for example, attempting to clone as to which vector to use and the best screening strategy. Then finally, a plea, are not molecular studies with proteins not classified as molecular biology? If so, there is often precious little protein work dealt with in many of these types of volumes.

With these considerations in mind the books under review present very different pictures, although they purport to accomplish the same end according to some of the press blurb. In this way the Schuler and Zielinski book leaves itself open to criticism although to some extent it is unfair to review the two books together.

The Shaw book is part of IRL's magnificent Practical Approach Series and is available in the new hardbound fold-flat format which greatly helps use at the bench and enhances the lifetime of the volume. Dr Shaw is to be congratulated on assembling a distinguished group of authors whose contributions to plant molecular biology have been so formative. The result is not just another cloning book. The first two chapters deal with manipulation of RNA and DNA and some of the contents have been useful in solving problems in the reviewer's laboratory. I found the chapters on chloroplasts and mitochondria rather a duplication of existing volumes. There is some treatment of protein work in the localisation of macromolecules chapter, although some partial purification protocols for antibodies might usefully have been presented. This is followed by three excellent chapters that deal with transformation and the highly topical transposon tagging. The volume ends with three rather specialised texts, written by considerable experts in their fields, on molecular plant virology, *Chlamydomonas* and cyanobacteria. These are probably of little general application, although very informative. Some colleagues have expressed some disappointment with the volume as a whole, but the reviewer considers this volume a very worthwhile addition to the series and to the bench.

In contrast, the Schuler and Zielinski book does not achieve all that it claims to set out to do. It certainly achieves its first goal which is a course for senior undergraduates and is simply a very well presented series of protocols which would at best give hands-on experience to a limited number of tried and tested older techniques in molecular biology. Although it purports to, it would be of little use to researchers or molecular biologists starting to work on plants. The most disappointing aspect of the book is that it is just a number of techniques and gives no

indication of the range of alternatives nor any idea of the application of methodologies to particular problems. In this way it fails the student and gives a very false impression of how molecular biological techniques are used in research. The examples of this are too numerous to quote. Quite frankly I do not see why Academic Press brought out this book, considering their existing volume

on plant molecular biology. This is simply a very well written teacher's source book to a course which would probably need rapid overhaul to keep it up-to-date.

Department of Biological Sciences, G. PAUL BOLWELL
City of London Polytechnic

Flavours and Fragrances: Proceedings of the 10th International Congress of Essential Oils, Fragrances and Flavours, Washington D.C., U.S.A.: edited by B. M. LAWRENCE, B. D. MOOKHERJEE and B. J. WILLIS. Elsevier, Amsterdam, 1988. 1104 pp. \$302.85.

Many practising scientists pay lip-service to the value of conferences. Undoubtedly these can be useful forums for meetings, discussions, canvassings and posturings and they are invariably pleasant social occasions. Only a prig could object to those who can enjoy paid (or at least subsidised) trips to agreeable places under the aegis of furthering the progress of their science. However, the practical, let alone the intrinsic, value of many such happenings is surely disputable. And whether the proceedings need to be routinely recorded for posterity (especially in the form of very expensive volumes) seems to me to be debatable.

Three broad categories of scientific meeting may be distinguished. One follows the Solvay prototype and is essentially a seminar given by authorities to (usually small) invited audiences, e.g. the Ciba Foundation Symposia. The discussions following the lectures are an integral part of the events and the published records are documents of lasting worth. The second type are symposia arranged around a series of plenary lectures, e.g. some phytochemical Society Symposia. Again, publication in an edited form provides a valuable series of up-to-date reviews and previews. The third type are demotic gatherings comprising numerous presented papers, sometimes accompanied by poster sessions. At worst, the brief, un-refereed and sometimes trivial communications—often given to justify attendance or to claim priority—are not worth placing on permanent record. In any event, by the time any volume of the conference appears much of the work is likely to be in journals—if indeed it had not been published before the event. It is noteworthy that the proceedings of many periodic prestigious conferences and congresses are not published in book form (e.g. those of the Royal Society of Chemistry).

The volume under review is an expanded and edited version of scientific papers presented at a three-day congress held in 1986. The meeting is held triennially and is clearly a high-grade example of the third type listed above. In contrast to the previous meetings in the series, the number of presentations was restricted (to 85) and these were solicited from notable workers in the field. The divisions were Agricultural/Botanical (29 contributions) and Analysis/Composition (28) which overlapped exten-

sively in subject matter, and Chemistry/Technology (28). The first two groupings largely consisted of detailed listings of the aroma and taste components of numerous oils and extracts, including studies of minor components of known oils, the analysis of new oils, of oils from known plants grown in new locations, of headspace analysis, of the existence of chemotypes and so on. The edited versions are in 'journal' style, with adequate experimental detail usually accompanied by pages of GC-MS and phytochemical data largely pertaining to the lower terpenoids. The standard of work is high, but most studies can be of interest only to specialists within the already restricted field under survey. But there are some more generally digestible things in the pudding: in particular, papers on the extraction of oils with liquid carbon dioxide (D. A. Moyler and H. B. Heath), the catabolism of monoterpenes in essential oil plants (R. Croteau) and the role of tissue culture in micro-propagation (T. W. Stones); but even these largely tread some very well-worn paths. The third section as a whole is of more widespread interest and mainly gives details of selected general and specific synthetic routes to aroma and flavour compounds and their analogues. Noteworthy contributions concern the industrial synthesis of optically-active terpenoids based on asymmetric isomerization (S. Akutagawa, T. Sakaguchi and H. Kumabayashi), an excellent review on new developments in the analysis of essential oils by Fourier transform (IR, UV, NMR) spectroscopy (K. H. Kubeczka, W. Schultze, V. Formacek, and W. Herres), the mass spectrometry of sesquiterpene hydrocarbons (S. K. Ramaswame, P. Briscese, R. J. Gargiullo, and T. von Geldern) and recent developments in the synthesis of perfumery chemicals (J. H. P. Tyman).

In my view, most of the articles in this book are of limited interest—even for browsing purposes—and should be, in any event, lodged in the primary literature. I cannot see any scientific justification for a permanent record of such a conference although this volume is, of course, one of many of its kind. Nevertheless, the book does exist for those who want it and whose libraries can afford it; and publication is presumably a commercial proposition. The logic and economics of much scientific book production never fail to amaze me. The format is elegant using most expensive paper, and the editing is admirable: but the volume groans, and I can only regret the sacrifice of all those trees!

Department of Chemistry,
University College, London

D. V. BANTHORPE