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BOOK REVIEWS

Physiology and Biochemistry of Auxins in Plants: edited by M. KUTACEK, R. S. BANDURSKI and J. KREKULE, SPB Academic Publishing, The Hague, 1988, 428 pp. $105.00.

This volume contains the proceedings from a symposium held September 28 through October 2, 1987 at the lovely baroque Liblice chateau (now the Mansion of the Research Workers of the Czechoslovak Academy of Science). These relatively small, highly specialized symposia have attracted praise from attendees both for the beauty of the location as well as the excellent planning of the symposia. The volume resulting from these proceedings offers few surprises, but does serve as an interesting window on auxin research. Here, in one volume, students and professionals can easily discern the high and the points in the broad areas of research linked to the phytohormone auxin. Areas of rapid progress are described side-by-side with areas either still dormant or areas for which the excitement has recently passed.

The volume is divided into five sections beginning with the conference *Plenary Lectures*. The first chapter is an interesting historical look, by Professor Thimann, at the accumulated knowledge on auxins. Biohistorians will find this account to be more enlightening than some longer and more complete accounts primarily because of what it says about Professor Thimann and his interactions with others working during the first half of the century. The rest of the volume is taken up by longer papers that summarize the work from several major laboratories, and smaller papers describing more directed investigations of individual problems. Most of the longer chapters are similar to those published elsewhere by the authors, but it is useful to have them collected in one volume.

One of the difficulties of organizing such a volume is the problems of collecting the manuscripts. Participants are often required to arrive with their chapter in hand. This in some ways defeats the purpose of using the conference to expand the published perspectives of the guest speakers. For example, major chapters by R. E. Cleland and by A. Theologis point out significant differences in points of view that could have been sorted out during such a conference. Their respective chapters serve as an interesting contrast, but with few issues resolvable from the data discussed. That is not to say the chapters are not good, they are both quite excellent, but I am left with the feeling that more interaction between these two points of view would be good. It is disappointing that they could not enlighten us with a consensus view or at least suggest how to resolve the apparent conflict between the biophysical and molecular biological views of auxin action.

This volume is taken from camera-ready typescripts, and the quality of the originals is highly variable. For a volume as expensive as this, one could rightly expect a higher quality original and publication on a higher quality paper stock. The photographic work is of particularly poor quality. This work is of limited scope and as such will be used primarily as a reference source or as a supplement to a graduate course on plant hormones. I find it useful as an introduction to the breadth of the auxin field and will give it to students and post-doctorals to read when they first begin to work in my laboratory.

Plant Hormone Laboratory JERRY D. COHEN
USDA-ARS Beltsville Agricultural Research Center
Beltsville, Maryland 20705 *U.S.A.*

Biochemistry of Photosynthesis: R. P. F. GREGORY, John Wiley & Sons, Chichester 1989. 257 + xxi pp. £21.95.

This book arrived at a most opportune time for me, about a week before I had planned to embark on an update of my lecture course on photosynthesis. As a biochemist whose research fringes into, rather than centres on, photosynthesis but who nevertheless is responsible for lecturing on that topic, I regard as a godsend, a good, up-to-date, account of the process in its entirety.

In the past I have used the first and second editions, so I did not expect to be disappointed in this book. Nor was I. I was, however, immediately struck by the reorganization that has taken place in the third edition. This, of course, reflects the great changes that have occurred in our understanding of photosynthesis during the last twelve years. For example, the molecular organization of photosynthesis within membranes is emphasized and we also see, as in so many other areas, the impact being made by recombinant DNA technology. As the author himself states, it is regrettable that the inclusion of new material should have occurred at the expense of the deletion of the earlier work in the subject, but this is unavoidable and does not adversely affect the balance of the book.

The book opens with three chapters on structure and function, the pigments and an overview of the photosynthetic light reactions, the latter particularly useful as it points out various unifying features of photosynthesis in different organisms. Then follow four chapters covering details of the photochemical reactions in photosynthetic bacteria and green plants, after which the book moves on to photosynthetic carbon metabolism (four chapters). The chapter on the Calvin cyle, its regulation and its integration with the light reactions of photosynthesis is

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 prevent 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 imformative. 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