

## BOOK REVIEWS

**Photosynthesis Energy Transduction; a Practical Approach:** edited by M. F. Hipkins and N. R. Baker, IRL Press Inc., Oxford, Washington D.C. 200 pp. Hardbound £ 25.00, softbound £ 15.50.

This book provides a most welcome detailed account of procedures and techniques used to measure photosynthetic energy transduction, a process which the editors define as the reactions leading to the reduction of NADP and to phosphorylation of ADP to ATP. This adequately describes the scope of the topics although many of the techniques covered have broad applications. This is a well-illustrated practical text and contains some scientific background information on the individual processes of the photosynthetic light reactions but they are discussed largely in terms of laboratory measurement. A wide range of sound experimental methods are covered in a comprehensive complementary fashion. The authors of the individual chapters provide a high quality of expertise in addition to a wealth of sound detailed technical information and advice on instrumentation. The text is limited to relatively simple, commonly used methods and apparatus and does not attempt to discuss highly sophisticated technology or equipment which has narrowly defined uses.

Current experimental techniques are explained simply and methods are generally easy to follow, rendering them readily applicable. The text begins with a general introduction in Chapter 1 which attempts to lay a cohesive biochemical and structural foundation for the remainder of the book which is concerned with techniques; however, it is rather insubstantial and lacking in references. Chapter 2 describes the basic preparatory procedures and methods of isolation of leaf protoplasts, chloroplasts and thylakoid

complexes. This leads neatly into the following chapter on electrophoretic procedures for analysis of pigment-protein complexes.

Chapter 4 considers a wide range of spectroscopic measurements including absorption, kinetic and fluorescence techniques. In view of the widespread application, ease of measurement and upsurge in popularity of fluorescence spectroscopy it might have been profitable to extend this section to a full chapter by itself, particularly since data interpretation is difficult. However the subject is expertly dealt with in a most useful fashion. The concluding chapters on methods of measurement of electron transport, redox titration and photophosphorylation are complete and informative.

Overall this book achieves a more than adequate compromise between simple routine laboratory procedures and some advanced more specialized techniques. It is largely concerned with measurement of higher plant tissues although some mention is made of algae and photosynthetic bacteria and many of the techniques could be easily adapted to most photosynthetic organisms. Books of this type are rare and much needed. Here is a realistic approach to the study of the processes of energy transduction in photosynthesis. This book contains a comprehensive review of commonly used techniques in photosynthesis and some description of the more specialized techniques which will provide a most useful reference companion for the more expert research scientists and a laboratory manual for students.

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**Hormonal Regulation of Development III. Role of Environmental Factors:** edited by R. P. Pharis and D. M. Reid. Encyclopedia of Plant Physiology, New Series, Vol. 11. Springer, Berlin, 1985. 887 pp. DM 398.

Why do we agree to review books such as this? For myself, because I am interested, because I need an update, because a new idea might help my students and I can't afford to buy it. So why do I feel so despondent once I start reading? This is the third volume in the 'New Series' to fall under the umbrella of "Hormonal Regulation of Development" and is subtitled "Role of Environment Factors". The basic premise is that hormones are involved in everything. Supply of mineral nutrients, tropisms, magnetism, and insects; all are forced to fit within the coverage. Some of the chapters give a tightly argued and well documented case which fully justify their inclusion; others seem somewhat formless or historical. Of the nineteen chapters

there are perhaps four good solid heavyweight pieces with another six attaining high standards of reportage and style. The other half of the book does not grip the mind, excite, or inform at the depth expected by the assumed readership. However, the effort has been made to cover all conceivable topics; perhaps being encyclopaedic is sufficient.

The strengths lie in the treatment of responses to positional information and includes chapters on polarity, nastic responses and related topics. In particular the two chapters by Pickard on geotropism and phototropism are well worth the effort of once more looking at old evidence and comparing it with newer work. Here recent criticism is met head on with a severe piece of scholarship. Although obviously not the final word it does give the reader a sense of excitement and leaves one, somewhat breathlessly, looking forward to the next episode. The strength continues while covering phase changes, photoperiodism, and

water relations: although all tend to be, sometimes vainly, struggling to establish a concrete role for the hormones.

The final chapter was perhaps the most enjoyable to read and brought forward some obvious, and some not so obvious, points. Here Salisbury and Marinos discuss concepts of stress and strain giving necessary clarification. After pointing out that in real life all plants are stressed to some degree or other, and that ecology is governed by the rule that plants are found where they experience least stress. I'm not too sure about that, but it has started an idea off. These authors touch upon many of the points covered elsewhere in the volume and in doing so successfully show that ecology and physiology cannot be pursued in isolation.

Some statements throughout the volume are perhaps going to raise hackles: "... hormones promote assimilate transport ..."; "... since auxins control cell extension ..."; "... a hormonal role is implicit ...". And from the final chapter, "In such situations, reproductive effort might be thought of as a strain ...". Enough.

After ploughing through the entire volume the one distinctive flavour is that much of the work discussed is out of date. Perhaps this is due to difficulties in production, or fashions in research changing, or author problems. But, as other areas of plant biology are moving so rapidly this is disappointing. Of two chapters I selected for the pointless exercise of reference counting, one (with 190 references) had over 80% from 1975 or earlier, 15% from 1976–1980, and 3.5% post 1980. To be fair another larger chapter had, from 590 references, figures of 60, 30, 10%, respectively.

I respect the intention of this volume and admire the presentation of a good half of the contents. It is a pity that it is not more up to date, and that the views are sometimes very narrow. Perhaps the authors of the concluding chapter have deliberately chosen their final words—"keeping us largely mystified".

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