of the subject are treated very cursorily or omitted altogether.

'The Biosynthesis of Monoterpenes', reviewed by B. V. Charlwood and D. V. Banthorpe, covers all the enzymology, metabolic pathways and chemical rearrangements involved in the biosynthesis of this very large group of compounds and concludes with a review of the use of cell-free systems, tissue culture, the biological significance of the compounds, together with a short section on genetic studies and the chemotaxonomic importance of monoterpenes.

The next article by E. Harel on 'Chlorophyll Biosynthesis and its Control' is an excellent review of a very complicated subject from which he has made a readable and comprehensive story from 440 references. The article is extremely valuable because the author critically reviews each part of the biosynthetic pathway, paying particular attention to possible control points. The article emphasizes our lack of knowledge about the metabolic pathways involved in several of the stages in chlorophyll biosynthesis and their enzymatic control, and in particular, those concerned with ALA synthesis. The author indicates, at several points in the review, possible new approaches to research on the different stages of the biosynthetic pathway.

As K. R. Markham and L. J. Porter point out in their review 'Chemical Constitution of Bryophytes', there has been a very large increase in published work on this plant group recently. For this reason the review is most timely. It covers the chemistry of lipids, terpenoids, flavonoids, lignins and dihydrostilbenes of the bryophytes and then has a relatively large section on chemosystematics, paying particular attention to flavonoids and terpenoids as chemosystematic markers in the group. This is not, like many articles on the chemistry of plant groups, merely a collection of formulae and tables but includes a great deal of discussion on the validity of the procedures used for characterization and structural determination of many of the compounds isolated from bryophytes.

In the final chapter, 'Anticancer Agents from Plants', G. A. Cordell describes compounds isolated from plants according to their chemical classification. The majority of the compounds investigated to date are either terpenoids or alkaloids. Cordell explains the type of biological activity demonstrated by the compounds, their possible clinical use, as well as the methods used for investigating their structure and biosynthesis.

The general quality of the articles in the book is high. The editors must be congratulated on their choice of authors and subjects. Although many phytochemists would wish to be able to purchase their own copies of this volume, they will probably be unable to afford it at such a high published price. Furthermore, research workers may wish to have access to individual chapters. Would the publishers consider producing these separately at a price which postgraduate students could afford?

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Phytochemistry, 1979, Vol. 18, pp. 1422–1423. Pergamon Press Ltd. Printed in England.

Handbook of Phycological Methods: Physiological and Biochemical Methods: edited by J. A. HELLEBUST and J. S. CRAIGIE. Cambridge University Press, 1978. xiv + 512 pp. £18.00.

This volume was sponsored by the Phycological Society of America as a companion volume to 'Handbook of Phycological Methods: Culture Methods and Growth Measurements', edited by J. R. Stein. The present book, according to the Introduction, has as its remit 'the presentation of as many useful methods as possible for physiological and biochemical investigations with algae'. The editors attempted to use the limited space available to the best effect by the inclusion, as far as possible, of methods which are applicable to as broad a range of experimental procedures and algal types as possible. The extent to which these objectives have been achieved can be seen by reference to list of contents and to the taxonomic index.

The range of techniques covered are, according to the groupings of chapter headings in the contents list: Isolation of organelles and membranes; Analysis of chemical constituents; Enzymes; Physiological and biochemical processes; Nutrients; Ion content and transport; and Inhibitors. It is perhaps unfortunate that the distinction between 'nutrients' and 'ions' should be perpetuated so early in the book when the general trend of research and hypothesis is to break down this distinction. The taxonomic index does not do justice to the range of organisms covered: for example, the Prasinophyceae do not feature in the index yet are mentioned in the text (e.g. p. 230).

Focussing more finely on the contents, the individual chapters differ considerably in the experimental details supplied and in the range of applicability of the methods. There are some annoying omissions: thus the chapter on chloroplasts concentrates on the isolation of *Euglena* chloroplasts, which are ultrastructurally and enzymically good, but cannot (as yet) carry out photosynthetic CO_2 fixation at significant rates. It would have been useful had there been at least a reference to the ability of isolated chloroplasts from such giant-celled marine algae as *Acetabularia*, *Bryopsis*, *Caulerpa* and *Codium* to carry out photosynthetic CO_2 fixation at near the *in vivo* rate, even if the criteria of purity set in the *Euglena* work are difficult to meet for these marine algae. The reviewer finds it difficult to justify the separation of Chapter 9 (Protein determination by dye binding) and Chapter 10 (Carbohydrate determination by the phenol–sulfonic acid method) from Chapter 18 (Quantitation of macromolecular components of microalgae). All three chapters are by the same author, and at least the first two lack

specifically algal content. An amalgamation of these three chapters would have saved four pages which could, perhaps, have been devoted to one of the chapters mentioned in the Editors' Preface as having been volunteered by 'excellent phycologists', but for which space could not be found.

Overall, however, the choice of contributors and topics is sound, as one would expect of two such respected editors. The book is attractively produced, and generally free from errors. Finally, one can ask who will use the book and, particularly, what is its appeal to readers of Phytochemistry? One can divide potential users into two broad groups, i.e. phycologists who wish to use some particular biochemical or physiological technique, and those versed in biochemical or physiological techniques who wish to apply them to algae. Readers of this journal probably fall largely in the second category. They would find the biochemical techniques readily assimilable and could use their background knowledge to fill in any gaps in this part of the book; however, they might need recourse to the earlier volume edited by Professor Stein in order to grow the organisms on which to practice their phytochemistry! The biochemically inexperienced phycologist should be warned not just to read the chapter which appears relevant to his immediate needs, but to read more widely in the book. The reason for this advice is that while such essential biochemical procedures as rapid enzyme inactivation in the assay of metabolic intermediates, and the use of internal and external standards in the measurement of both chemical concentrations and enzyme activities are mentioned in the book (e.g. Chapter 19), they are not mentioned in each chapter. With these strictures in mind, the book can be recommended both to experimental phycologists and to phytochemists who are about to make their first descent (or ascent?) into the algae.

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