

## BOOK REVIEWS

### **Chemotaxonomy of Plants:** By PHILIP M. SMITH

Contemporary Biology Series, 1976, Edward Arnold, London. 313 pp. £13.00 (hardback); £6.50 (paperback).

Considering that chemical plant taxonomy only really got off the ground as a distinct discipline about 1963, it has made spectacular progress and the subject has had considerable impact among plant systematists. Indeed its importance as a new approach in examining and assessing plant interrelationships is widely accepted, so much so that every student in plant science at University today needs to be aware of developments in this field. Although many books have been published on chemotaxonomy, the only textbook specifically written at the student level was produced as long ago as 1963. The book in question, Alston and Turner's *Biochemical Systematics* while a pioneering study and highly influential in its time, has unfortunately become rapidly out-dated. The need for a modern treatment has become more and more acute, so that the appearance of Philip Smith's study is very welcome and one can only be grateful to see the publication of this long awaited volume.

The plan of the book follows to some extent the layout used by Alston & Turner, there being three sections entitled: possibilities and problems; the sources of evidence; and applications. The first section begins with a general introduction defining terms, a brief history and a useful chapter listing the various stages of a chemotaxonomic investigation. Section 2, the main body of the book, consists of nine chapters which provide in turn phytochemical summaries of the major classes of plant constituent utilized, together with critical appraisals of their taxonomic worthiness. The final section on applications consists of three chapters, one covering developments in bacterial chemotaxonomy, another on chemical evidence at various taxonomic levels and finally, an account of macromolecules and

phylogeny. The book concludes with an alphabetical list of 514 references and a handy subject index.

Even in a work of this length, it has obviously not been possible for the author to include more than a few illustrative examples for each class of chemical compound and while one might argue that certain important papers have been overlooked, nevertheless the general coverage is good and the balance achieved between say micro- and macromolecular data very fair. I found this book a very useful one and I am sure it will be widely appreciated by all those directly involved in the subject.

Whether it will make an ideal student text is, of course, another matter and I have some hesitation in giving it an unqualified recommendation. The problem of deciding how much or how little phytochemistry to include in a work of this sort is difficult to decide, but since there are some excellent introductory texts in phytochemistry (e.g. T. Robinson's *Chemical Constituents of Higher Plants*) I believe the author could have saved some space here, with advantage, and concentrated more on chemotaxonomy proper. As it is, each chapter of the middle section contains a considerable amount of phytochemical information, some of which is repetitive or inaccurate. It is unfortunate too to find in a student text that a number of minor errors have crept into the chemical formulae, e.g. pisatin on p. 57 is lacking an oxygen and amentoflavone on p. 53 lacks two double bonds. The style is also rather forbidding for a student audience, and it lacks the clarity, enthusiasm and fire of Alston & Turner's book. Very commendably, however, the author has rightly stressed the implications on chemotaxonomy of recent advances in the field of biochemical ecology.

In summary then, this is a valuable source book for all chemotaxonomists, if not the ideal introduction for students of the subject.

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**Chemistry and Biochemistry of Plant Pigments**, Second Edition edited by T. W. GOODWIN, Academic Press, London 1976, two volumes, vol. 1, 870 pp., £26.50; vol. 2, 373 pp., £12.00.

Those who already know and value this book in the form of the first edition need only to be told that the second edition is a necessary purchase. It remains the same in intent and format but has been brought up-to-date (many of the references are to work published in 1975) and increased in scope by new chapters on betalains, flash kinetic spectrophotometry, and analytical methods for quinones and for phytochrome. Some of the chapters have been virtually re-written and the book now occupies two volumes, the shorter, second one being devoted to analytical methods.

Newcomers will find that the pigments mainly discussed are chlorophyll, the carotenoids, the bilins and phytochrome, the flavonoids, quinones, and betalains.

Their structures, chemical and physical properties, distribution, biosynthesis and biological functions are all given detailed treatment while a separate chapter deals with their metabolism in senescent and stored tissues. The choice of subjects could have been somewhat different, perhaps, but certainly not better and the amount and range of material presented is most impressive. The publishers blurb is overoptimistic, however, in suggesting that the book is suitable for undergraduates—these contributors are all experts describing the current state of knowledge in their respective fields, and the concessions they make are often those suited to experts in adjacent fields, rather than those suited to students.

Most of the chapters are written with admirable clarity, and are excellently organised even in difficult areas where results are confused and interpretations differ widely. Occasionally, contributors do seem too anxious to leave nothing out and fall into the trap of mentioning a number of papers so briefly that rational discourse vanishes

leaving nothing more than a reading list. Also occasionally, old invalidated work is given as much or more attention than the more recent work that supersedes it. The chapter on chlorophyll biosynthesis is rather slackly written with needless repetitions of simple statements—around p. 87, for example the author seems to be caught in an eddy.

Of the new chapters, that on betalains offers a most elegant summary, and that on the analysis of quinones contains much useful data not readily accessible pre-

viously. The chapter on flash kinetic spectrophotometry is particularly welcome, dealing as it does with one of the most powerful of new techniques. The theory is simplified without being vitiated, and the discussion frequently touches on points that should have wider currency amongst those that use spectrophotometric devices of more conventional kinds.

A very fine book.

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