

## BOOK REVIEWS

**The Flavonoids—Advances in Research:** edited by J. B. HARBORNE and T. J. MABRY. Chapman & Hall, London and New York, 1982. x + 744 pp. £49.50.

This is an updating of the handbook *The Flavonoids* [for review see *Phytochemistry* **15**, 357 (1976)] covering the period 1975–1980. The present 'advances' has 12 chapters written by 20 authors. Besides contributions treating individual flavonoid groups, the book contains chapters devoted to recent advances in isolation techniques,  $^{13}\text{C}$  NMR spectroscopy, biosynthesis and mammalian metabolism of flavonoids. The flavonoid groups treated are: anthocyanins, flavones and flavonols, flavone and flavonol glycosides, minor flavonoids (including chalcones, aurones, dihydrochalcones, flavanones and dihydroflavonols), proanthocyanidins, C-glycosylflavonoids, biflavonoids, isoflavonoids [including isoflavones, isoflavanones, rotenoids, pterocarpanes, isoflavans, quinone derivatives like the abruquinones, 3-aryl-4-hydroxycoumarins, 3-arylcoumarins, isoflav-3-enes, coumestans,  $\alpha$ -methyldeoxybenzoins, 2-arylbenzofurans, isoflavan-4-ols and coumaranochromones (= benzofuranochromones)]. The book is well indexed; it has a plant species index and a subject index. Highly valuable novel-

ties are the checklists to individual flavonoids which are included in each chapter on flavonoid types. These comprehensive checklists not only include new compounds, but also those treated in the 1975 standard work. The biflavonoid checklist on pp. 505–516 well illustrates how a wealth of information can be offered in condensed form: the 12 presently known types of interflavonoid-linkages are indicated by the numerals 1–12 (e.g. 6 means an 8,8"-linkage) and the types of flavonoids linked together are indicated by the letters A (flavone–flavone), B (flavanone–flavone), C (flavanone–flavanone) and D (others). The formula of 2B on p. 506 should have a flavanone unit on the left side instead of a flavone unit, of course.

All that was said for the 1975 handbook [*Phytochemistry* **15**, 357 (1977)] is fully valid for this first supplement. It is an extremely valuable and well produced book which cannot be missed in departments of organic chemistry, biochemistry, botany and nutritional chemistry.

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**Secondary Plant Products:** edited by E. E. CONN. Vol. 7 in the series 'The Biochemistry of Plants—A Comprehensive Treatise', Academic Press, New York, 1981. pp. 798. £56.20 (\$85.00).

"What, yet another book on secondary metabolites?" the weary phytochemist might complain. Yet an eight volume text which sets out to cover the whole of plant biochemistry can hardly fail to devote at least one volume to this subject. With so many competing texts now available in this area, the problem for the contributors is to find something novel to say which has not been said before or to find new ways of presenting their topics. I believe that the editor, Professor Conn, has successfully elicited from his staunch band of authors a variety of new viewpoints which more than justify the publication of the present text.

Inevitably, there are a number of chapters written by well-known specialists, covering once again the biochemistry of lignins, quinones, tannins, betalains and so on. Nevertheless, to balance these basic treatments, there are a variety of more general chapters which consider the biochemistry of secondary metabolism overall. Thus, their physiological role is briefly outlined by E. A. Bell in the opening chapter, while their production in tissue culture and their turnover are described by D. K. Dougall and W. Barz, respectively. Excellent chapters follow on cellular

compartmentation (H. A. Stafford) and synthesis in relation to plant differentiation (R. Wiermann). Another important general chapter is that of H. G. Floss on stereochemical aspects of biosynthesis. This is a topic which has been rarely covered in such depth before and, hence, it is particularly valuable to have it included here.

The chemosystematics of secondary metabolites rates a separate chapter by D. S. Seigler, who provides a useful, if brief, outline of the different chemical patterns encountered among the some quarter of a million known plant species. This same subject creeps into several other chapters, notably that by L. Fowden on non-protein amino acids. Although these unusual amino acids have been much reviewed before, this author still finds fresh things to say about them and this contribution is a real pleasure to read. There has been much recent interest in the polyamines, such as spermine and spermidine, in relation to plant growth processes and in a companion chapter, T. A. Smith elegantly summarizes our present knowledge about plant amines.

The enzymology of biosynthesis is another general theme which is taken-up in many chapters. It is salutary to compare the considerable successes that have been achieved with the flavonoid-synthesizing enzymes (reviewed here by K. Hahlbrock) with the general lack of success in isolating the enzymes for alkaloid biosynthesis. It is clear from an extensive account of alkaloid metabolism by