Phytochemistry, 1976, Vol. 15, p. 357. Pergamon Press. Printed in England.

BOOK REVIEWS

The Flavonoids: Edited by J. B. HARBORNE, T. J. MABRY and HELGA MABRY. Chapman & Hall, London 1975. XVI + 1204 pp. £27.50.

Rupe, Schaerer, Karrer, Hadders and Wehmer needed 137 pages to discuss isolation procedures, identification, chemistry and distribution of flavonoid compounds in Klein's Handbuch der Pflanzenanalyse (Part 2, 1937). Twenty years later Ch. Sannié and H. Sauvin (*Les couleurs des fleurs et de fruits. Anthocyannes et flavones*, Mém. Nat. Hist. Nat., N.S., Série B, **2**, 1–257 [1952]) comprehensively treated the flavonoids occurring in higher plants, especially in their flowers and fruits, in 257 pages. The introduction of paper chromatography was an important milestone in flavonoid research too, because it provided a means of easy detection, separation and identification of most members of this class of plant constituent. Flavonoid research became possible in biological departments. The many and varied biological properties of flavonoids stimulated chemists to reinvestigate these constituents. The result was an explosive growth of knowledge of flavonoid biology and chemistry which called for a comprehensive treatment of the whole field. This was accomplished by Geissman in 1962 by editing his *Chemistry of Flavonoid Compounds*. In this book, twenty authors discussed in 666 pages all new developments in the flavonoid field, including new classes of compounds (leucoanthocyanins, chalcones, aurones) and economic, chemogenetic and biosynthetic aspects. The present volume may be considered as a totally new version of Geissman's treatment of flavonoids. Here, 25 authors contribute to a volume of 20 chapters and over 1200 pages and the introduction is provided by T. A. Geissman.

Fortunately J. B. Harborne, one of the main contributors to present knowledge of flavonoid compounds, acts as one of the editors of this volume which is a real handbook of flavonoid chemistry and biology. By comparing the chapter headings of this new book with those of its predecessor, new developments are immediately apparent. *C-glycosylflavonoids* (chapter 12), *Biflavonoids* (chapter 13) and *Neoflavanoids* (chapter 15) are new and already large classes of constituents. Chapter 10 devoted to *Proanthocyanidins* (leucoanthocyanidins, catechins, proanthocyanidins and condensed tannins) illustrates clearly the recent breakthrough in the chemistry of these complex constituents. The last five chapters are devoted to *Biosynthesis* (K. Hahlbrock and H. Grisebach), *Metabolism in microorganisms and higher plants* (W. Barz and W. Hösel), *Physiology and function* (J. W. McClure), *Biochemical systematics* (J. B. Harborne) and *Evolution* (T. Swain).

This handbook will be essential to all biology and chemistry departments. It is not only an indispensable source of information and references, but provides at the same time stimulating reading on many aspects of flavonoids including their function, their systematic significance and their relationship to plant evolution. The book is carefully produced and provided with three excellent indexes; author, plant taxa (not only species, as suggested by the Index title), subject. It is impossible, of course, to produce such a book without some factual errors and printing errors. On p. 276, e.g. a line must have been lost and *form* should be *fern* on line 26. It is needless, however, to mention more examples; most errors are minor ones and do not cause confusion. The present reviewer fully agrees with the statement with which T. A. Geissman concludes his introduction. "This book will, by providing an up-to-date summary of the state of knowledge in the field, serve as a new starting point for the investigations of the coming decade, after which, no doubt, another will have to be written."

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Controlled Environments for Plant Research: by ROBERT JACK DOWNS. Columbia University Press, 1975. 164 pp. £12.00.

The author is director of the phytotron at the North Carolina Agricultural Station, North Carolina State University at Raleigh and has first hand experience of the problems of designing and maintaining a complex controlled environment facility for plants. This short book is the result of his experiences and, expensive though it is, it would repay reading by biologists who are planning to buy or construct a plant growth chamber and would help them to avoid making expensive mistakes. Today a very wide range of biologists are users of controlled environment facilities and few of them have much idea about the design and performance of the facilities they use; nor indeed do many of the engineers who are faced with the task of building plant growth chambers. The purpose of this book is to describe the mechanical and biological systems that are encountered in controlled environment facilities and to relate these systems to the problems of operation. It attempts to introduce biologists to a consideration of the mechanical problems and to show engineers how to achieve better growth chamber design.

The contents include a general description of various types of controlled environment facilities for plants and a chapter on conditioning systems and their applications and performance. This is followed by a useful discussion of how to make environment measurements in growth rooms. Making useful and accurate measurements poses many problems and the biologist can fall into many traps; careful reading of this chapter would enable many biologists to improve their environmental measurements. The discussion of biological aspects is short and, in consequence, does not give much detail; nevertheless, several problems are raised that are often not considered. One chapter shows how to write a specification for a plant growth chamber in order to achieve the desired result including (a point often ignored by designers) easy access to parts and maintenance. There is a final chapter on testing and maintenance in growth rooms.

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