

## BOOK REVIEWS

**Chemotaxonomie der Pflanzen, Volume 7:** by ROBERT HEGNAUER. Birkhauser, Basle, 1986. 804 pp. Swiss Fr. 460.

Robert Hegnauer's magnificent six volume set, entitled "The Chemotaxonomy of Plants" and produced during the years 1962–1973, remains today the most important single key to the phytochemical literature. It provides a detailed listing of plant constituents set out on a comparative basis, family by family, throughout the plant kingdom. It also provides a chemical profile of each plant family and indicates existing correlations between chemistry and plant taxonomy. It has been a formidable, nay Herculean, task to accomplish and the whole occupies some 3700 closed packed pages.

The only difficulty with this series is that some of the earlier volumes, particularly those written during the 1960s, are becoming out-of-date. However, Professor Hegnauer has already recognized this problem and is in the process of preparing a complete updating. What we have in volume 7, which has now appeared, is an updating of the first two volumes with literature coverage up to mid-1985. However, it is much more than this in that the first 200 pages provide a bibliography of the phytochemical and systematic literature of the last two decades, especially drawing attention to books, review articles and key research papers. The literature on medicinal plants is fully documented and the recent growth of chemical ecology is also recognized. Additionally, there are several general reviews, written by the author, covering the role of tannins, alkaloids, iridoids and cyanogens as chemical

markers in green plants. The remainder of the book then progressively reviews the more recent literature on the chemistry of the algae, fungi, mosses, ferns, gymnosperms and monocotyledons. Recent advances in our chemical knowledge of this last group of plants takes up some 250 pages.

Volume 7 is much more than a simple listing of chemical constituents on a taxonomic basis. The whole is enlivened by insights into the systematics and general biology of these plant groups. The chemical data are encapsulated in places in useful summary tables and there are a profusion of chemical structures; wherever appropriate, biosynthetic pathways or relationships are indicated. The whole is highly accurate and an extremely exhaustive coverage of the burgeoning literature of phytochemistry. I doubt that the most sophisticated computer search of 'Chemical Abstracts' would provide such a thorough recall of the relevant information. It is also bang up-to-date with many additional references being added at the various proof stages.

Once more, therefore, we owe an enormous debt to author and publisher for this magnificent thesaurus. It should be widely available wherever phytochemistry and plant science are practiced. If you cannot afford your personal copy, make sure that your library invests in one; it is an ideal starting off point for all new phytochemical research.

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**Molecular Luminescence Spectroscopy. Methods and Applications: Part 1:** edited by S. G. SCHULMAN. John Wiley and Sons, 1985. £98.25.

This is volume 77 in "Chemical Analysis—A Series of Monographs on Analytical Chemistry and its Applications". Ten authors have contributed to the book which comprises eight chapters dealing with an overview, pharmaceuticals, natural products, inorganics, bioinorganics, excited state optical activity, fluorescence detection in chromatography and luminescence immunoassay.

The opening chapter gives a good overview of the subject and is briefly referenced. However for many busy analysts, I suspect that the main value of the book lies in the applications and these are well covered in subsequent

chapters. In a comprehensive chapter on pharmaceuticals, 748 references are quoted and the applications of fluorometry and phosphorimetry to the analysis of a wide range of pharmaceuticals is reviewed. Of particular interest to phytochemists is the chapter on the fluorescence of organic products covering 1417 references. Amino acids, proteins, coenzymes and vitamins, nucleic acids, alkaloids, oxygen heterocyclics, dyes and pigments together with a group of miscellaneous natural products are dealt with in the space of some 212 pages of text. Two chapters cover inorganic and biorganic substances and their determination by luminescence methods; again the texts are well referenced. The techniques of optical rotatory dispersion (ORD) and circular dichroism (CD) are valuable chiroptical methods but newer developments including fluores-

cence detected circular dichroism (FDCD) and circularly polarized luminescence (CPL) are now available and although there is a lack of commercial instrumentation the potential of these newer techniques is considered.

In considering fluorescence detection in chromatography, there is an introduction to liquid chromatography which is not necessarily relevant to the main theme of the book. Nevertheless, the application of fluorescence detection to thin-layer and high performance liquid chromatography is dealt with in some detail and the application to a wide range of organic molecules, including pharmaceuticals and natural products is given in tabular form. The final chapter on luminescence immunoassay focuses on the analysis of complex biological mixtures containing

subnanogram quantities of the substance requiring analysis. The use of fluorescence labels instead of radioactive labels has obvious advantages and the present levels of detection are in the  $10^{-12}$  M range. Applications tend to have clinical connections but this powerful technique has implications for the analysis of natural products.

The book is well presented, and indeed, it is of considerable benefit to scientists involved in sensitive assay techniques for the determination of a wide range of compounds including a fine selection of natural products.

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**Membranes and Compartmentation in the Regulation of Plant Function:** edited by A. M. BOUDET, G. ALIBERT, G. MARIGO and P. J. LEA. Proceedings of the Phytochemical Society of Europe, Vol. 24. Clarendon Press, Oxford, 1984. 334 pp. £30.

This symposium volume, which contains 18 reviews and a summary chapter by D. J. Morré, has a pronounced gallic flavour and stems from a meeting held in Toulouse University during the summer of 1983. The rather vague title masks a great variety of contributions which centre around one common theme—the plant cell membrane. The chapters range from a consideration of the cellular compartmentation of the two secondary compounds, dhurrin and coumarin, by Eric Conn to the various actions of different herbicides on cell membranes by R. Scallia and C. Gauvrit. One new area of plant research centres around calcium ions, the protein calmodulin and membrane-bound protein kinases and three chapters are

variously devoted to those subjects. P. J. C. Kuiper's review of membranes, salinity and low temperature brings out a number of new findings, for example that increases in membrane sterol levels may be correlated with salt resistance in some crop plants. Pierre Benveniste and his colleagues from Strasbourg also discuss here sterol biosynthesis in relationship to plasmalemma structure and function. More familiar themes also receive review treatment, such as auxin binding and membrane receptors, phytochrome action at the membrane, pH regulation and membranes and so on.

Once again, therefore, this review series has led to a successful volume. The book is produced to a high standard and there is a very adequate index. But it is a pity that the cover is so drab! And surely, the title of the symposium should appear on it somewhere?

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**The Genetic Manipulation of Plants and its Application to Agriculture:** edited by P. J. LEA and G. R. STEWART. Annual Proceedings of the Phytochemical Society of Europe, Vol. 23. Clarendon Press, Oxford, 1984. 318 pp. £24.

I well remember this symposium, since it was one of the most popular ever held by the Phytochemical Society and seats in the auditorium for the lectures were at a premium. The excitement and topicality of the subject were conveyed to an enthusiastic audience by a line up of distinguished scientists. Such events do not always transfer successfully to the printed page. Furthermore in such a

rapidly expanding field, some contributions can become outdated even before they have been edited and prepared for publication. In this case, however, little seems to have been lost and the written version bears up well to later inspection. Indeed, in what is for the non-expert a relatively complicated field, there is much advantage in having time and leisure to comprehend the fascinating intricacies of molecular cloning, the dideoxy method of DNA sequencing, the restriction map of the legumin gene and so on, which make up the illustrations in these proceedings.

This meeting took place at the crucial moment in the history of plant science when the possibilities of geneti-