

BOOK REVIEWS

C. R. METCALFE and L. CHALK: *Anatomy of the Dicotyledons*. Vol. I. Second Edition, 1980 (1979). Oxford, Clarendon Press. ISBN 0.19.854383–2. VII + 276 pp., numerous text figs., 18 Plates. Price £ 20.00 (cloth).

Firmly rooted in Solereder's 'Systematische Anatomie der Dikotyledonen' from the turn of the century, the first edition in 1950 of Metcalfe and Chalk's 'Anatomy of the Dicotyledons' was to become the most frequently cited work of reference in botanical literature. This edition together with the series on the anatomy of the Monocotyledons edited by Dr. Metcalfe at Kew, have profoundly stimulated comparative and systematic anatomy, so that an updated second edition of the 'Dicots' has to incorporate a tremendous amount of recent literature. This has induced the authors to choose an entirely different approach for the new edition. The present, first, together with the forthcoming second volume contain general chapters only and thus will constitute a 2-volume textbook of systematic plant anatomy. The individual family treatments are to follow at a later stage, although their completion seems somewhat uncertain, also in view of the widely mourned death of Dr. Chalk in 1979.

In volume I several chapters have been contributed by guest authors, and the main authors therefore share the credit with Richard A. Howard, who contributed on nodal and petiole anatomy; Leo J. Hickey (on leaf architecture), Katherine Esau (on phloem); David F. Cutler (on scanning electron microscopy); William L. Theobald, Joseph L. Krahulik and Reed C. Collins (on trichomes); and last but not least Hazel P. Wilkinson on the plant surface (with 70 pages the most important chapter). Other chapters are on the history of systematic anatomy, external morphology, different cell types, and general histology of leaf and stem by Dr. Metcalfe. Dr. Chalk's contribution will constitute a major part of volume II, which will deal with wood anatomy and ecological anatomy, amongst other subjects.

All chapters contain much useful information, presented in a way which makes the book attractive for students and specialists alike. There are numerous literature references at the end of each chapter, and also special suggestions for further reading. Sometimes the latter are rather demanding: for instance not all our colleagues across the Dutch border will be able to obtain a copy of Thorenaar's thesis on bark anatomy (published by Veenman, Wageningen, in 1926) and subsequently digest the Dutch text as Dr. Esau recommends. Perhaps this has stimulated Dr. Metcalfe in crediting the Netherlands with 'a specially long tradition for anatomical investigation'. This statement is made in a most readable historical survey of the development of plant anatomy, which otherwise shows a slight, but most understandable, anglo-saxon bias.

The chapter on the plant surface, covering subjects as stomata, hydathodes, extrafloral nectaries, domatia, cuticular sculpturing, epicuticular wax, and hydropoten, merits special praise for offering a most comprehensive, yet concise and balanced picture of a complicated and strongly developing field. We are much indebted to Dr. Wilkinson for bringing together such an amount of hitherto scattered information in such an ordered way.

The chapter on trichome classification must be singled out for a critical note. One can wholeheartedly agree with the statements by the authors about the present lack of a satisfactory classification of all hair types and about the problem in making one, caused by the occurrence of intermediates or highly complex forms. However, I can only equally wholeheartedly disagree with the alternative classification presented here: superficial resemblance based on appearances like 'simple unbranched', 'stellate', 'dendritic' or 'scale-like' is given precedence over fundamental similarity based on whether the trichomes are variations on a unicellular, uniseriate multicellular, or multiseriate ground plan. Accepting this classification might perhaps be a step forward for alpha-taxonomists using low power magnifications, but definitely implies a few steps backwards for unambiguous anatomical nomenclature. The reader is almost tempted to cut out the attractive drawings of the different hair types and re-arrange them into a more natural classification.

The book is concluded by lists of families showing particular diagnostic features. These may serve as synoptical keys to help in identification of vegetative plant parts, and as such their value can be tremendous, as demonstrated by the experience with the versions from the first edition. It is a pity that now these lists will be spread over two volumes (wood characters, secretory cavities, crystals etc. will be in volume II). This, together with several notable, but quite forgivable, omissions from the present lists will reduce the efficiency of the lists. An additional, stencilled version, with room for additions would be a blessing in this respect.

This first volume is handsomely produced, although the reader is too often referred to page '000'. Its publication constitutes another landmark in the history of plant anatomy. May subsequent volumes follow soon!

P. BAAS

A. J. HEALY and E. EDGAR: *Flora of New Zealand*. Volume III. *Adventive Cyperaceous, Petalous and Spathaceous Monocotyledons*. Government Printer, Wellington, New Zealand, 1980. xiii + 220 pp., 27 figs., 4 col. pl. Price: \$18.50.

Since Hooker and Cheeseman wrote a *Flora of New Zealand* it has become a tradition not to incorporate introduced plants in the *Flora*, but list them separately. Their number is steadily increasing: of the families treated here 335 species occur native in New Zealand and 168 are introduced. Thus the aliens gain an important floristic position, which is important for a largely agricultural country as New Zealand is. Not all introductions are of equal value, some are rare, some others may become naturalized dominants and a threat to pasture land. An accurate knowledge of them is therefore of importance.

The present, excellently printed volume is an attempt to cover the introduced monocots, except for the grasses, and the presentation is in the form of a *Flora*, with descriptions of families, genera and species and full keys. There are two general keys, one for flowering material and one based on vegetative characters. The original countries for the aliens or garden escapes are mostly Tasmania, Australia, southern Africa and South America. The large latitudinal stretch between 34 and 47 degrees south offers opportunity for plants of diverse ecology.

The book covers 22 families, 66 genera and 168 species, *Juncus* and *Carex* being the largest genera. In order to avoid confusion also the native species of the treated genera are incorporated and the authors suggest that in a future comprehensive *Flora of New Zealand* introduced species should be entered. A full commented bibliography on New Zealand plants 1969–1977 is appended. The authors, both on the staff of DSIR, Christchurch, have attempted to provide the work with a laudable critical standard.

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