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## BOOK REVIEW

**Angiosperm classification and evolution.** It is perhaps appropriate that this symposium volume\* which is devoted to the evolution and classification of the higher categories of flowering plants should begin and end with contributions by two sceptics. Professor Heywood introduces the proceedings by spelling out with renewed force and clarity his well-known reservations to the whole concept of phylogenetic classification. Likewise, Professor Merxmüller, in his concluding lecture, holds "a truly evolutionary system or a generally acceptable classification to be an unattainable aim in our time", although from his admirably fair summary it is clear that he has in fact a more moderate stand in any phenetic *versus* phylogenetic polarisation. The problem is that although much cool logic lies with the pheneticists, for those who are imbued with the central role of evolutionary processes in biology it is well nigh impossible to resist giving an evolutionary interpretation to the existence of similarity and difference between organisms. I suspect that it is the evolutionary implications, however vague and shadowy these may be, which make the distribution patterns of betacyanins or sieve element plastids of great interest. But certainly the array of differing and often contradictory interpretations of evolutionary affinities presented at this symposium will do little to encourage the faithful. Some years ago, in a different context, Mr B. L. Burtt wrote: "We are seeking not merely to classify plants but to learn about them. The classification is both an end product and a tool. We need stable classifications against which the distribution of other characters (not used in their construction) can be studied. It is just from the tension between a classification and characters discordant with it that we learn about plants" (*Notes R.B.G. Edinb.* 30, p. 143, 1970). I have found this idea very helpful, particularly in discussions with students, and it is certainly a view which will do much to fortify the reader of the present volume.

The twenty-one papers which were delivered at the symposium reflect a wide array of opinion and content. As always, there are contributions where one or two ideas have been expanded to produce a conference paper, such as Dr Cronquist's speculative attempt to interpret overall distribution patterns of secondary metabolites as successive waves of adaptive responses against predators, and Dr Gottsberger's views on the catalytic role of cantharophily in the evolution of polystemony in diverse angiosperm lines, and Professor Ehrendorfer's concept of the Hamamelidales as the remnants of an anemophilous transition group between the originally entomophilous Magnoliidae and subsequent Dilleniidae-Rosidae evolution. Other largely theoretical contributions are provided by Professor Kubitzki, on the need to understand the function of characters, Dr Clifford, with a numerical taxonomy of the Monocotyledons, and Dr Sporne, with an up-to-date restatement of his character-correlation approach to the primitive angiosperms. Another group of papers is by specialists who have studied a character complex across a broad sweep of families. These include contributions by Dr Gottwald, on secondary xylem in the Magnoliales *s.l.*, Professor Philipson, with a reassessment of the taxonomic value of the unitegmatic ovule, Dr Krach, on seed characters in the Saxifragales *s.l.*, Professor Behnke, with a statement of the current position with regard to the occurrence of sieve element plastid types, and Professor

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Hegnauer, with a reappraisal of the taxonomic value of cyanogenic compounds, also Professor Meeuse, who continues his plea for a reinterpretation of classical floral morphology and a less blinkered approach to the alternative evolutionary possibilities, and an intriguing paper by Professor Gottlieb and collaborators who stress that chemotaxonomists should be more concerned with biosynthetic pathways rather than simply endproducts. In this central group of papers we can see the process of tension between data and classification in action. Another series of papers are by authors who have individually attempted to resolve such problems by reclassification. Professor Dahlgren and Dr Thorne each give commentaries for some of the judgements involved in parts of their classifications, and Professor Huber explains his view of the Monocotyledons. Rather than propose a reclassification, Professor Wagenitz is one of the few contributors at this symposium to examine the Asteridae and argue that this sympetalous group should be retained as a natural unit. Finally, there is a most instructive series of papers by systematists with a long experience of various families who give us the benefit of their knowledge. These include Mr Burt, who uses the Gesneriaceae to illustrate criteria which can be applied when making taxonomic decisions between generic and family levels, Professor Endress, with an outline of evolutionary trends in the Hamamelidales-Fagales, and Dr Berg, with an account of the systematics of the Urticales. Here too belongs an isolated paper on a gymnosperm group, a study of *Phyllocladus* by Professor Keng.

Overall it is evident that the Cronquist-Takhtajan subclasses are creaking under the strain of accumulated discordant data and as Merxmüller observes, formal use of these categories seems scarcely justified, if indeed it ever was. But agreement on alternative evolutionary or phenetic groupings of families seems a long way off. In such circumstances a degree of classificatory stability seems most important if only to provide a backcloth against which the debate can be carried on. The benefits of such conservatism can be illustrated in two ways. Some years ago, when the idea of dismembering the Sympetalae (which we were just getting used to calling the Asteridae) was more novel than it is today, Thorne published a bare outline synopsis of his new classification. I can recall being somewhat dismayed to see that in this system the Solanales were linked with the Malvales in the Malviflorae. The same treatment was reaffirmed at this symposium. But, exactly ten years after that initial synopsis, I note that Thorne has recently re-evaluated the affinities of the families concerned and now prefers to locate the Solanales in the Solaniflorae close to the Gentianiflorae and Corniflorae. To be sure, this is still a much modified view of the original Sympetalae, but there has been a certain circularity in the taxonomic wanderings of the potatoes and their allies. Again, recent classifications have been much influenced by phytochemical evidence. It is certainly of great interest that sufficient data has now accrued to permit a broad view of the patterns of plant chemistry, to discern families of compounds midst the angiosperm families as it were. But what do we understand by the *absence* of particular compounds in particular groups? The perverse absence of betacyanins in the Caryophyllaceae has been a classic case. A more recent one is the Asclepiadaceae which is apparently singularly lacking in the iridoid compounds characteristic of the Gentianales. In both of these examples the chemical parameter has usually been disregarded in favour of other evidence, but on Dahlgren's view the absence of iridoids in the Solanales is apparently critical. It may well be that the traditional sympetalous assemblage is an unnatural grouping but personally I would prefer to bide my time before driving a wedge between the Solanales and orders such as the Gentianales and Scrophulariales. However, the conservative approach implies that there is something to conserve and this series of papers makes more apparent than ever the current chaos of supra-family classification and nomenclature. We may not be able to produce phylogenetic classifications by consensus, as Thorne has observed, but surely it should be possible to agree on ordinal and other group names? It would have been a great service if this symposium could have identified the clusters of families on which there is relative agreement and attempted to draw attention to those which are more problematic, that is to distinguish the Malvales *versus* Celastrales types of orders.

One should not expect too much. This is a symposium volume with all the strengths and weaknesses of the *genre*. The post-lecture discussions and informal debates are missing so that the bare lectures inevitably seem encapsulated. But there is much to inform and stimulate as well as irritate and bemuse the taxonomist in this book. It is handsomely, but alas, expensively produced, typographical blemishes are minimal, and it is a pleasure to be able to read in English contributions by so many German authors. On this point those who assisted with the English text of some of the papers are to be congratulated on the felicitous results.

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