

parisons that the great value of investigation of the H-2 locus will be seen to lie. It affords an opportunity for the study in detail of a mammalian genetic locus which has a wealth of pleiotropic effects and which should surely in the future give us many clues to the nature of some differentiative processes. This book on the H-2 locus should be looked into by all who aspire, however vainly, to a broad understanding of immunology. But don't expect it to be easy.

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## The Umbelliferae

*The Biology and Chemistry of the Umbelliferae.* Edited by V. H. Heywood. (Supplement to the *Botanical Journal of the Linnean Society*. Vol. 64.) Pp. x+438. (Academic Press: New York and London, December 1971.) £8.50; \$26.

FROM time to time, when faced with one of the apparently ever increasing number of symposium volumes, reviewers are wont rhetorically to question the value of such publications. Even the best symposia owe much to the sense of communal presence at lectures and discussions, not to mention the relaxed exchange of ideas with old and new colleagues outside the lecture halls. All of this is lacking from the bare publication of a series of papers the actual information content of which is usually already available in print elsewhere. The not so successful conferences, where successive lectures fail to gel into any sort of accumulative theme, are even more cruelly exposed when published months later as a symposium volume.

Happily, most of these strictures certainly do not apply to the present volume which records the proceedings of a symposium on the biology and chemistry of the Umbelliferae held at the University of Reading in 1970. The key to its success lies in the taxonomic unity and broad sweep of its subject matter. The contents include a historical review of the classification of the Umbelliferae, analyses of the family as it is represented in the New World, Old World and New Zealand, and two accounts of the presumed evolutionary relationships of the family, one based largely on morphological, anatomical and embryological evidence, and the other on chemical affinities; other contributions are surveys of data on pollen grains, inflorescence structure, comparative anatomy, stomata, fruit structure, cytology, floral biology, and the results of phytochemical studies on acetylenic, flavonoid, coumarin compounds and protein-serological work.

Clearly, the scope is most impressive, and the content is in general equal to the coverage since more than a third of

the contributors are leading specialists in umbellifer taxonomy, for example, Cerceau Larrival, Constance, Dawson, Mathias, Rodríguez, together with many other scarcely less eminent systematists and phytochemists. The organizers of this symposium are to be congratulated on mustering such a team and this new volume will represent an important source book for information on the Umbelliferae.

It would be nice to be able to report that this gathering of umbellifer specialists were able to pool their talents and draft at the end of the symposium an up-to-date consensus view of the classification of the Umbelliferae and their allies. Unfortunately, it seems that only politicians are called on to issue "agreed communiqués" after their international meetings, and this volume simply concludes with a scholarly account of the ethnobotany of the family. To be fair, this is perhaps too much to expect of a symposium which was necessarily more of a stocktaking operation and, as Professor Heywood points out in his editorial preface, the volume is intended to be a source of information and is in no sense a systematic account. Certainly there is information here in quantity, but the reader will have to do his own work to extract or correlate much of it. Thus, at the family level chemical data seem to be broadly in agreement with the Saxifragaceae - Pittosporaceae - Sapindales - Rubiaceae - Compositae mesh of affinity which has been suggested by anatomical and embryological studies. As some ideas begin to become clear, however, other possibilities begin to emerge. Particularly with the chemical data one is faced with the general systematic problem that as more information becomes available the network of possible evolutionary affinities spreads. Part of the problem, as Rodríguez in his masterly survey of family relationships in this volume suggests, is that certain established or widely suspected affinities are "tested" by phytochemists while other less advertised possibilities are not. Another aspect is that in the comparison of biosynthetic pathways or molecular structures we are dealing with a level of chemical evolution for which our critical judgments, in terms of assessing significant relationships, are barely mature.

The real value of this excellent volume is that by juxtaposing information available and drawing attention to where information is lacking, it should facilitate further progress in our knowledge of the Umbelliferae. Although the idea of holding a systematic conference devoted to a single family is not novel (the meetings held on the Gesneriaceae and Commelinaceae at the Royal Botanic Garden, Edinburgh, during the tenth international botanical congress

are notable precedents), such single family symposia have been fairly uncommon. The success of this Umbelliferae venture suggests that the format could well be repeated to advantage.

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## Semiconductors

*Electronic Processes in Non-crystalline Materials.* By N. F. Mott and E. A. Davis. Pp. xiii+437. (Clarendon: Oxford; Oxford University: London, December 1971.) £7.50.

THIS important work is the first treatise on the electrical and optical properties of liquid and glassy materials such as liquid metals and semiconductors, amorphous germanium, silicon, selenium and tellurium, and the chalcogenide glasses. The properties reviewed include d.c. and a.c. conductivity, thermoelectric power, Hall effect, and optical phenomena such as absorption and photoconduction. There are also chapters on impurity band conduction, phonons and polarons, and the metal-non-metal transition, which play a significant part in many of the systems being studied.

It is impossible to summarize the extraordinary variety of observation here reported in detail. On almost every page, experimental data of great complexity are recorded—data which are not always consistent with those on the previous page, for this is a notoriously treacherous field for the incautious experimenter. It is quite obvious that much of the ground will have to be gone over again, much more carefully, to establish firm results independent of the accidents of impure or imperfectly defined samples.

To have attempted a survey of this mass of data without a theoretical framework would have produced a mere catalogue, without rhyme or reason. The authors' decision to organize their book about a specific theory was clearly correct, for it sharpens the reader's perception of the problem of interpretation at every stage. A graph of, say, conductivity against temperature is meaningless in itself: our scientific interest is only aroused when we are told that this exemplifies a theoretical formula.

The basis of their theory is explained by the authors in the preface. "The keys to our present understanding have been the principle of Ioffe and Regel that the mean free path cannot be less than the distance between the atoms, and the concept of localization introduced by Anderson. . . ." As they go on to say: "In a sense, our book is written around these two theories. We have built a theoretical edifice on them, and since mathematical rigour is anything but easy in this subject we have not