

their relatives may be found in its pages.

Over 30 years effort have gone so far into its preparation, by a fairly large and able staff based at the Rijksherbarium in Leiden, Netherlands. Directing this effort, and the originator and promoter of the project, is one of the most able and energetic botanists of our time, Prof. C.G.G.J. van Steenis, until his recent retirement director of the Rijksherbarium. In addition to the Flora Malesiana staff, and that of the Rijksherbarium, treatments of various families of plants are being prepared for the flora by specialists enlisted from other countries and institutions.

The treatments are generally conservative. The format is very informative. The bibliographic foundation, especially the work of Mrs. M.J. van Steenis-Kruseman, is superb.

The publication is expensive, but no library with any concern with the Indo-Pacific tropics, or for that matter, with the tropics generally, can well afford to be without it. Not only are native genera and species treated in full with keys, correct names, synonymy, descriptions, statements of geography and ecology, but the widespread pantropical and other naturalized exotic species are included, in so far as they occur in the region. Cultivated species are mentioned.

All in all, it is a very satisfactory flora and we hope it will continue publication until all the families are covered. Then it will be time to start over to bring in the new knowledge and discoveries it has generated.

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SEEDLINGS OF DICOTYLEDONS; structure, development, types, descriptions of 150 woody Malesian taxa. By E. F. de Vogel. Centre for Agricultural Publishing and Documentation, Wageningen. 465 p. (available from Unipub, 345 Park Ave. South, New York, N.Y.) \$125.00—Most field botanists, ecologists, and foresters have often wished for a book that will enable them to identify seedlings in the field, or in the herbarium for that matter. Those who work in the tropics have an even greater need

for such a book or key. The volume under review is not such a book, though it gives a pretty good idea why such a book is not available, nor likely to be in the near future.

One with some experience with systematic botany has every reason to expect that seedling types will bear some relation to the families to which the seedlings belong. It may come as a shock to find that this is apparently not the case. The present volume examines, exhaustively, all the previously proposed systems of arrangement or classification of seedlings and finds neither any relation to taxonomic arrangement nor any other logical and consistent scheme, at least that can be applied to seedlings of tropical plants. The author, on the basis of the sample of seedlings of Malesian woody plants that he has studied, then constructs a scheme of his own, and, in over 100 pages of very difficult reading, attempts to demonstrate its rationale. From the outset he shows that there is no relation between his 16 types with 5 additional subtypes and any so-far proposed taxonomic system.

Through most of the discussion it was difficult for this reviewer to detect any convincing basis, whatever, for the proposed scheme. Only in the chapter on Classification of the Seedling Types, pages 93–117, where the author shows some possibility that the types can be derived from each other by likely morphological modifications, does the scheme begin to make any sense. The one thing that does come through clearly is that there is no possibility of anything like a simple arrangement of seedlings, especially any based on taxonomic relationships of the adult plants.

The book contains an enormous amount of information. To get at it requires more effort than most readers are likely to put into this task. The illustrations are good, but even the diagrams are not easy to follow or understand. The format of the book, with very long lines, makes use of the book even exhausting.

The descriptions and illustrations of the 150 Malesian taxa are clear and adequate. However, the ratio between these 150 species and the enormous woody flora of Malesia makes it clear that the book will provide little help in identification. This, plus the prohibitive price, \$125.00 U.S., makes it unlikely that any except dedicated seedling morphologists and the largest botanical libraries will be able to own the book. The fact that the author acknowledges financial support for a part of the costs of publication makes one wonder at the

necessity for such a high price.

Few typographical or other errors were noted. One might, perhaps, question the author's repeated insistence that the endosperm, not being a part of the seedling, can have no significance in seedling classification. This is especially puzzling since mention of the endosperm and its behavior recurs constantly in his descriptions and his discussion of the criteria for his system.

This book presents the results of a tremendous effort and the gathering of a vast amount of information, and, as such, is a valuable addition to botanical literature. It can scarcely, however, be recommended as essential botanical reading to more than a very few persons.

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HAWAIIAN MARINE SHELLS. By E. Alison Kay. REEF AND SHORE FAUNA OF HAWAII. Section 4: MOLLUSCA. Bernice P. Bishop Museum Special Publication 64(4). Bishop Museum Press, Honolulu, 1979. 653 p. \$30.00.—This excellent volume is the second to appear in the Bishop Museum's new series, Reef and Shore Fauna of Hawaii, and it bodes well for the continued success of this ambitious venture. There are about a thousand species of marine molluscs in Hawaii, and even long-time students of tropical Pacific molluscs (like myself) will marvel at the book's breadth of coverage.

A concise introductory section briefly describes Hawaiian marine environments, with natural history notes on the predominant molluscs of each. The introduction also treats introduced species, the economic importance of molluscs as food, tools, and ornaments, and the distribution and historical biogeography of Hawaiian molluscs. Although several of the main islands have extensive fossil deposits, the sketchy information available suggests opportunities for productive future research on Pleistocene history. Kay hypothesizes the origin of the Hawaiian shallow water molluscan fauna from the western North Pacific, via early Tertiary stepping-stone islands now represented by seamounts between Hawaii and Micronesia. The evidence presented is suggestive but modest, and data on other taxa in future volumes of the series could bear fruitfully on this interesting hypothesis.

The longest section of the introduction, titled Historical Resumé, begins with the first knowledge of Hawaiian molluscs in Europe from the study of

specimens returned by Captain Cook's voyage, extends to the contributions of the author of the original Reef and Shore Fauna of Hawaii, C. H. Edmondson, and includes some events of the last century that indirectly facilitated my own initial researches on Hawaiian molluscs.

Kay tells of collecting by early missionaries and their offspring in Hawaii, and their socializing with naturalists of expeditions that called there. Missionary ships also ventured between Hawaii and other Pacific islands. Several of the missionaries were Yale men, and some sent shells back to the natural history collections of *alma mater*, later incorporated into its Peabody Museum of Natural History. These collections were reorganized and curated in the 1940's by the late Percy A. Morris, who used them as the basis for the Hawaiian section of his FIELD GUIDE TO SHELLS OF THE PACIFIC COAST AND HAWAII (1952). His increasing knowledge led Morris to realize that many species labeled in the Museum as having been obtained by missionaries in Hawaii were not known to live there. He was able to translate his concern for accurate locality records into a small sum that helped finance my initial studies on *Conus* in Hawaii (in 1954), in return for my making a collection of *bona fide* hawaiian marine molluscs for the Museum.

Most Hawaiian marine molluscs are prosobranch gastropods, and most of the systematic section of the book (400 pages) is devoted to them. Each species entry includes a streamlined synonymy, description of shell characters, habitat and habits, and distribution. There are keys to the genera of 8 families and to species of 3 others. If a species was originally described as endemic to Hawaii but this has later been debated, the author tends to side with the splitters. This is probably a wise policy, because if Hawaiian and central Indo-West Pacific forms are later shown to be conspecific, it is easier to lump after splitting than to partition the earlier published records of lumpers.

An unexpected feature of the section on gastropods is the description of 43 new species of prosobranchs, from 34 genera in 18 families. The author's well-known fondness for microscopic molluscs has now been brought to fruition: some of the newly described species have shells scarcely a millimeter long!

While the book emphasizes shells, 100 pages are devoted to the opisthobranch gastropods, whose major evolutionary trends have been toward loss of the shell. Kay describes one new species of