

XI. REVIEWS  
(contd from p. 1162)

\* Ashton, P.S.: Ecological studies in the mixed dipterocarp forests of Brunei State. Oxford Forestry Memoirs no 25, Clarendon Press, Oxford, 1964, 75 pp., 37 phot., 20 tab., 70 fig., gazetteer.

This book is the first extensive field study in Brunei and besides of great value as a source of general information on that country. There is, for instance, a diagrammatic map on rainfall distribution, a geological and litho-pedological sketchmap, a map of contour lines, and detail maps of the areas of closer study.

A summary was presented by the author at the Edinburgh Congress; it was printed in the *Malayan Forester* 27 (Oct. 1964) 304-317, with graphs and two profile diagrams. The dipterocarps having been taxonomically written up by the same author (*A manual of the dipterocarp trees in Brunei State*, Oxford Univ. Press, 1964, xii + 242 pp., 58 phot., 20 plates with drawings, Sh. 63/-; favourably reviewed in *Blumea* 13, 1965, 171-172), here the ecological side of the picture is presented.

Three kinds of forest prevail in Brunei: 1) Peat Swamps, studied by Anderson, 2) Heath forest, studied by Brunig, 3) Mixed (because species dominance is very rare) Dipterocarp (because this family mostly comprises 80% of the emergent canopy) Forests, which term includes Lowland, Hill, and Submontane forest, as these distinctions are harder to appreciate in Borneo than in Malaya. Dipterocarps dominate on well, but not excessively drained soils, particularly on ridges, below about 1450 m; above that elevation, heath forest species prevail up to 1900 m, the highest altitude in Brunei. Like in other places in Malaya, we see that on unusually poor soils, montane species may descend to unusually low altitudes. Due to abrupt lithological and other physiographical changes, and clearly defined maximum flood levels, the limits between the forest types in Brunei are pretty sharp. In order to find ecological correlations, the author sought for a method that would be useful for future use in Borneo, without requiring much computation.

The method he came to adopt was devised by Bray & Curtis (1957) in Wisconsin. Points are related representing three stands in Euclidian space in such a way that the distance between one stand and the others in the system reflect its relative similarity in terms of a community coefficient derived from whatever properties have been chosen for comparison. The coefficient varies from 0 where no species are in common, to unity and complete similarity. By plotting the results of comparison of a number of sample areas on two axis of a graph,

\* Marks a book.

cluster diagrams are obtained which reflect the similarity for certain ecological factors.

This study concentrates on edaphic factors; the data were obtained chiefly in 50 plots at Belalong on shale and at Andulau Forest Reserve on interbedded soft sandstone and clay. Owing to the ease of identification (Ashton and his men can recognize a dipterocarp species from a dead leaf) and well-defined ecological range of the species, and the size of the trees, it was possible to take advantage of Braun-Blanquet's concepts of fidelity and constancy, without adopting his sampling and arrangement of plots. The latter point, of course, is a necessary weakness, because even in a plot size of 2 hectares = 5 acres the species/area curve shows no sign of flattening, which means that due to conditions of physiography a minimum area can never be covered. The number of tree species of over 10 cm  $\emptyset$  is in Brunei up to 220, exceeded only by 227 in Malaya, vs. up to 173 in South America. It is confirmed that in mixed lowland rain forest, drainage conditions are more influential than nutrition in determining the distribution of tree species.

The author himself admits (p.58) that species of one soil type in Brunei may occur on quite different soils elsewhere, due to biotic factors. It is supposed, that when a great area of sedimentary rock came above the sea at the end of the Tertiary, many old Sundaland species of igneous rock stepped on the rapidly eroding clayey and sandy latosols of the Brunei hills. The species adapted to deep soils of the lowlands spread unto the deep sandy latosols of the interlaminated sedimentary rocks. While an evolutionary explosion was taking place in the sandier soils, another occurred on the clays and shales, resulting in the highly endemic hillside flora.

The author arrives at the distinction of five formations (comparable to Braun-Blanquet's Associations): 1) of *Cotylelobium malayanum* on shale lithosols; then in the 'Alliance' of *Dryobalanops aromatica* on sandy soils; 2) of *Shorea flemmichii* on yellow podsolic soil; 3) of *Anisoptera grossivenia* on sandy latosol; and in the 'Alliance' of *Shorea parvifolia* on clayey soils; 4) of *Dipterocarpus verrucosus* on clay latosols; 5) of *Dryobalanops lanceolata* on clay lithosols.

The book is made up for about two-fifths of text; the rest consists of an impressive amount of documentation. Photographs give instructive pictures of vegetations. To the taxonomist who here speaks, the study seems to have been composed with great intelligence, thoroughness, and drive. Worth of a warm recommendation; also as general reading to botanists of all descriptions. -- M.J.

Carte internationale du tapis végétal, et des conditions écologiques à 1/1.000.000. Prepared and distributed by the Institut français, P.O.Box 33, Pondichéry, India.

In this Bulletin no 17, on page 916-917, we have written very appreciatingly on the map of Cape Comorin, and of Bioclimates of India and Ceylon. Meanwhile, the series has been continued in the same way, with 4 sheets, each accompanied by a + 50-page booklet, of Madras (1963), Godavari (1964), Jagannath (1964), Ceylon (1965); the authors are again H. Gaussen, P.Legris & M.Viart. Except for Ceylon, these lands are on the eastern coast of the Deccan, between 12 and 20° N. The maps are bilingual in English and French, but it is to be regretted that the booklets, dealing with and intended for an English-speaking country, should be in French only.

An instructive explanation to these maps is found in Trav. Sect.Sc.& Techn.Pondichéry I, 4 (1959): "The vegetation maps" by H.Gaussen, and "Documentation and method proposed for vegetation mapping at one millionth scale" by P.Legris & M. Viart. It is accompanied by a 1:10.000.000 map of the bioclimates from Afghanistan to SE.China and Hainan, from Kashmir to Ceylon.

\*C.S.I.R.O. Land research series. "The objectives of these surveys are to describe, classify, and map the inherent land characteristics of the country - including its surface geology, topography, soils, and vegetation, and broadly assess the land-use potentialities by consideration of these characteristics in relation to the climate, the present land use, and the edaphic requirements of various crops."

The series consist of quarto books of + 100-200 pages of text, with vegetation photographs, accompanied by one or more maps in colours on which the land systems, soils, geology, geomorphic units, vegetation and potential are depicted. Although essentially economical in scope, they are of great value to the ecologically interested botanist, too.

Publication began in 1953. The titles of the issues, all published at Melbourne as a periodical, are the following: Survey of the Katherine-Darwin region, 1946 (number 1, 1953). Survey of the townsville-Bowen region, 1950 (number 2, 1953). Survey of the Barkly region, 1947-48 (number 3, 1954). Lands and pastoral resources of the North Kimberley area, W.A. (number 4, 1960). Pasture lands of the Northern Territory, Australia (number 5, 1960). Lands of the Alice Springs area, Northern Territory, 1956-57 (number 6, 1962). Lands of the Wiluna-Meekatharra Area, Western Australia, 1958 (number 7, 1963). General report on the lands of the Hunter Valley (number 8, 1963). General report on lands of the West Kimberley area, W.A. (number 9, 1964). General report on lands of the Buna-Kokoda area, Territory of Papua and New Guinea (number 10, 1964, 113 pp., 8 pl.). General report on lands of the

Leichhardt-Gilbert area, Queensland, 1953-54 (number 11, 1964). Lands of the Wanigela-Cape Vogel area, Papua-New Guinea (number 12, 1964, 99 pp., 8 pl.). General Report on lands of the Tipperary area, Northern Territory, 1961 (number 13, 1965). Lands of the Port Moresby-Kairuku area, Papua-New Guinea (number 14, 1965, 182 pp., 12 pl.).

The portions of New Guinea here described are all in the eastern tail of the island. R.D. Hoogland and other botanists took an important part in all the surveys. The results are detailed, and have been clearly and concisely presented. We hope that more of such reports will follow. -- M.J.

\*Darlington, C.D.: Chromosome Botany and the Origin of Cultivated Plants. George Allen & Unwin Ltd., London, 1963, 2nd ed., 80, 231 pp., 21 tab., 44 fig.

The tools which Darwin and De Candolle had a century ago to attack the problem of the origin of domesticated plants, viz history, archaeology, and geographical distribution, appear antiquated by the overwhelming importance of the essential approach during the past forty years through observation of the genome contained in the chromosomes, the study of breeding systems, and genetical experimentation. Besides, radiocarbon dating has greatly elevated the importance of modern archaeology. A survey of chromosome knowledge and its immense diversity occupies the first half of the present work. This concise digestion is a masterly survey with a wealth of correlations, fitting examples, and suggestions, urging the reader to great attention and convincing him of the staggering achievement of chromosome botany in elucidating descent and affinity. This first half of the work covers four chapters: (i) the chromosome 'morphology', (ii) chromosomes correlated with systematics including reproduction modes, breeding systems and discontinuity, (iii) correlation with ecology, geographical distribution and migration, and (iv) plants in time, i.e. basic numbers of larger groups, adaptation, descent, and evolution. The second half of the book is dedicated to the application of chromosome botany to domesticated plants, centres of origin, centres of agriculture, evolution by cultivation, and migration of cultigens, including also ornamentals. Almost all domesticated plants are polyploids in some way; more details are given on wheat, hyacinths, iris, garden roses, chrysanthemum, and dahlia. Conclusions are drawn on the mechanisms of improvement and this is of utmost importance for the understanding of evolutionary processes or principles generally, as these cannot be different from those occurring in nature, admitting that selection of man is of course mostly directed otherwise than selection in nature.

As a plant systematist I have enjoyed reading this work which contains such a wealth of suggestions and thought next

to a wealth of facts that it needs many times rereading; it forms a most important contribution to the theoretical background of taxonomy.

My sole criticism is that Darlington depreciates the colossal work done by the systematists in commenting (p.35) that "systematics remains a theory of creation ... unable to take account of evolutionary processes and relationships". Is not chromosome change and mutation also a theory of "creation"? Is there any virtual or logic necessity that chromosomes should change or a polyploid plant should emerge? The only thing to be said is that it happens and can be observed. On p.67 he also depreciates the work of the systematist in saying that the latter "relies on morphology alone and may thus sometimes reach the right and sometimes the wrong conclusion. Which result he achieves will be a matter of luck, not of judgment. But any geneticist will judge progeny by morphology. Indeed, morphology is the materialized reflection of the genome qualities."

Indeed, the taxonomic system has been gradually built up by trial and error, but this is a feature common to all natural sciences. But I fail to see that its results are attained by sheer luck; instead they were accumulated by hard labour, astute observation, and endless checking. Also Darlington himself recognizes the taxonomic species, genera, and families as defined by the morphological taxonomist and should realize that, hitherto, chromosome botany has not shaken this major structure. Doubtless chromosome botany has added essentially to our insight of microphylogeny and will do so in future. It may be a superior tool for fathoming macro-phylogeny, difficult to obtain by other methodologies, which have all their limitations; the author endeavoured to frame a chromosome dendrogram of the woody families of spermatophytes. Though a truism that "experimental taxonomy", blended with "cytogenetics" into chromosome botany, is a most promising field of research, it can neither be divorced from, nor replace systematics *sensu lato*, but is one of its disciplines, alongside systematic anatomy, embryology, chemotaxonomy, blastogeny, palynology, palaeontology, etc. This criticism is of course a mere matter of accent in appreciation of the various branches of taxonomy and does not affect my admiration for the work before us on "chromosome taxonomy", as Darlington's book should have been titled more precisely. — v.St.

\*Fosberg, F.R. & M.-H. Sachet: Manual for tropical herbaria. Regnum Vegetabile 39, Utrecht, 1965, 132 pp., 16 fig. Non-members of the I.A.P.T. US\$ 7.00, Dfl. 25,00.

The preface speaks of so many suggestions from so many people, which were carefully considered before inclusion in this book, that a critic may feel a bit shy when he starts to continue. The greater is the surprise to see the first para-

graph: "Plant taxonomy is the branch of this science that deals with plants", and one begins to wonder what these authors think of their readers. We read that a herbarium building must have washrooms and toilets in convenient places, that collecting expeditions to distant areas should be planned carefully and well in advance, and that it is a serious error to regard even the laborers as menials and to treat them as such. But this may just mean that all things of importance could have been said in half the space, and no one will doubt the weight of the subject: how to run a tropical Herbarium, or, for that matter, the principal usefulness of a Manual where nothing of the kind existed.

The difference between temperate and tropical Herbaria is a historically determined one. Since botany began in the temperate regions of the northern hemisphere, all the old books and plants are there preserved. This gives a double meaning to the word "tropical Herbarium": it can be a Herbarium in a temperate region where mainly tropical plants are studied; it can also be a Herbarium in a tropical region which means that in practice there exclusively tropical plants are studied. Both kinds of "tropical" Herbaria have a different task. The elaboration of the information, that is: the making of great revisions, monographs, and Floras, must be done in the large old Herbaria, because for this purpose the old materials and a large library must be handy. The tasks allotted to a Herbarium in the tropics are primarily 1) the gathering of fresh material and field data in the widest sense, and 2) the study of taxonomic literature and the handling out of the information it contains adapted to the needs of the country, which requires the maintenance of a reference collection. There are many variations, some of them successful, but here lies the essential difference, of great weight in any policy-making, but from this book its importance cannot be appreciated.

That the book is more general than tropical, needs not be a disadvantage. Since 90% of the plant species are tropical, any such a book would naturally be "tropical" in scope. The "tropical" aspect, then, consists of reference to special techniques and ideas for collecting and maintenance in tropical countries, and of techniques of general bearing which have been developed in the tropics by whatever causes. However, the "tropical" features of this book are not very prominent. This does not need to matter much, provided that full weight has been given to "tropical" aspects. A full explanation and discussion of the Schweinfurth method is the then least one can expect. And from the scanty remarks in the present book the method can never be properly understood, let alone its advantages and disadvantages compared, as has been so neatly done in Fl.Mal. I, 1 (1950) lix. A "tropical" technique un-

discussed is the system of institutional number series (Singapore Field, "bossen-buitengewesten", etc.), which has proved so efficient where frequently non-taxonomists are employed as collectors and many duplicates have regularly to be made.

The planning of collecting, pre-identification, the immediate distribution of duplicates, and identification by mail, have in this book not received consideration of such profundity as is in proportion to their importance for good herbarium management. Therefore a few remarks on each point. The manual recommends a kind of relentless collecting that is in accordance with its spirit of hasty expansion of science and institutions. There are objections to this way of thinking. First, most institutes hold stock of material enough for decades of taxonomic study. Second, collecting entails great expenses in time and money: for the field work, for mounting, filing, and maintenance, for dispatch and identification. For these reasons, science is in need of selected material; the collecting of this requires careful planning and great ability. A logical step towards a solution of the problem is to promote specialized collecting in selected areas and in selected groups, for or by monographers. This remains undiscussed.

The stray sentence on page 96: "then the lot is turned over to the botanist to be sorted into families" would not suggest that here lies one of the most important and most difficult acts of the whole herbarium keeping. This pre-identification (the provision of the material with family, and if possible, generic names) is the only way to make a tropical collection available to science, because only then materials can be directed to specialists. This is a job which requires great memory, experience, and regular practice. It is one of the key jobs in the routine of tropical botany; if an institute has no man available for it, and duplicates have been distributed, other institutes may be able to assist in this vital task.

As for immediate distribution of duplicates, it should have been expounded with more vigour that a collection is safeguarded for science only by distributing duplicates to other institutes. A comparison of the destroyed Herbaria at Berlin, where all is gone and lost, and at Manila, where all is gone but very little was lost, has taught a few people that any delay in distribution means risk. The practice of keeping material undistributed unless provided with a specific name is therefore a risky one, and will only work there where monographers are faster than collectors. Otherwise, the undistributed, incompletely named material must be kept apart, and will suffocate the institution. Identifications of properly distributed material can always be communicated by mail.

Communication of names by mail is another weighty point on

which the manual is too brief. It is important because it saves the dispatch of so much material. It is already in use with some Herbaria, but the system should be considered for extension. 1) Lists can be made of the material present of a group which is elsewhere under revision; from the list the monographer selects what he wants on loan, supplying later the names for the material that stayed. 2) Published sources can be scanned by skilled clerks for identifications by monographers, and duplicates which the latter did not see can be labelled afterwards. 3) Lists of pre-identifications can be distributed to institutes where sets of a certain tropical collection have been sent.

Chapter 5, on Herbarium techniques and procedures, is one of the best, and will give many a director a good idea or two: for instance, the stress on voucher specimens, the net-bags for unmounted fruits, standardized sheet format of 29 by 42 cm. But many clever inventions are missing. If we did not know, we could here read that specimens must not be dropped, but not a word about the small piece of kneadable plastic for fixing a glume in a desired position under a binocular, nor on the petri-dish with engraved millimeter-net for easy measuring under water, nor on the lamp-case with one small bright hole for examining leaves for pellucid dots (Fl.Mal.Bull. no 11, 1955, 431).

How great keeping of specimens in boxes is "a deterrent to botanical activity" (page 60) anyone may inspect at the Rijksherbarium, at Utrecht, and Bogor. There is no danger of cracking the plants every time a strap is tightened (if no straps are used, the plants lie loose on piles, but it is true, the book recommends in earnest to avoid draft which could blow the specimens away). Not only do the specimens not suffer from internal transport, but the whole herbarium can be moved and stored anywhere in time of war, or of re-building. The further advantages named by the authors also stand in strange contradiction to their negative conclusion.

If some ideas of E.D.Merrill have been quoted, why is his name absent from the bibliography? His plea for field labels instead of notebooks (Bull.Torr.Bot.Club 61, 1934, 71-74) should have been discussed in connection with the institutional series. His idea of cheap corrugated carton herbarium cases (Torreya 26, 1926, 50-54) should have been mentioned, and the reason why they were eventually abandoned, as well as his idea to get unemployed people (he had once over 100) to work on the insertion of published data into the herbarium (J.Arn.Arb. 18, 1937, 173-182). Another practice not mentioned in this manual, although long in use at Bogor, Kew, and Leiden, is to keep lists of the numbers and names of all plants taken by one collector. Old duplicates can thus be named, the system may be useful for the study of local floras and vege-

tations, and many a problem has already been solved by tracking down these books.

There is no index. The "references" amount to 33 numbers; the "selected literature" in Fl.Mal. I, 1 (1950) lxvi to 121 numbers, where also is referred to the rather full list in the Bradley Bibliography - here unmentioned. Valuable is the Appendix with instructions for the collecting of aquatic plants, bananas, fungi, palms, cytological material, bamboos, Araceae, succulents, and wood samples - but why omitted tree ferns (Fl.Mal.Bull. p.567) and pandans (op.cit. p.1133) etc.?

Since so much has either remained unmentioned, or has got lost among a flood of dull words, one wonders why this book pays such loud tributes to modern progress. If one thing is sure, the herbarium worker (who "willy-nilly will be removed from his position of aloofness and from the position of unappreciated and unrespected servant where he is placed by some of his colleagues. He will be forced to become a full and active partner in the enterprise of biology") will need something more than this manual. -- M.J.

Manual of the forest trees of Papua and New Guinea. Issued by the Department of Forests, Port Moresby. Text by P.van Royen and others. Offset-print. Part 1. Combretaceae (June 1964) 45 pp., incl. 25 fig. Part 2. Sapindaceae (1964) 53 pp., incl. 22 fig. Part 3. Sterculiaceae (1964) 39 pp., incl. 16 fig.

This new useful series is inaugurated to provide information by keys, descriptions, figures and occasional distribution maps of forest trees with stress on the economically important ones. Of course, the treatments, essentially based on existing literature, reflect the state of knowledge. Thus, the Combretaceae-part has obviously been based on Exell's Flora Malesiana revision, providing full information to specific level; in the Sterculiaceae-part this is the case where monographs are available, which have been closely followed. In the Sapindaceae treatment is mainly on the generic level; in Pometia, the whole revision in Reinwardtia 6 (1962) 109-144 has been rejected along with its taxonomic concepts, with the result that two nomenclatural misconceptions have been retained (P.coriaceae and P.tomentosa).

Full-page illustrations elegantly depict habit; with a somewhat uneven hand data on ecology, vernaculars, distribution, wood qualities, wood anatomy, uses, and enumeration of species have been recorded. Unfortunately, the revisions and monographs have not been cited. Additional data and editing is by J.S.Womersley, K.J.White, S.J.Colwell, chiefs of the Divisions of Botany, Silviculture, and Utilization respectively. -- M.J.

Muller, J.: A palynological contribution to the history of the mangrove vegetation in Borneo. Ancient Pacific Floras, Univ. Hawaii Press (1964) 33-42, with pollen phot. and diagr.

In the NW. Bornean geosyncline, sedimentation has gone on for a long time under the same conditions. A succession of samples was obtained and dated. Described are the pollen types of *Nypa*, *Brownlowia*, *Rhizophora*, *Sonneratia caseolaris*, *S. alba*, *Avicennia*. In the Eocene, there was only *Nypa* and *Brownlowia*, mangrove being hardly developed. A *Rhizophora* type appeared in the Oligocene, *Sonneratia* and *Avicennia* did not before the Miocene, all initially in very low percentages, suggestive of gradual adaptation to a difficult environment. The area under study was, however, limited; other recent data are still too scanty; other palynologists are encouraged. Address author: Prinses Marijkelaan 16, Oegstgeest, Netherlands.

\* Neal, M.C.: In gardens of Hawaii. Bishop Museum Press, Honolulu 96819 (1965) xix + 924 pp., 317 fig. US \$ 15.00.

This is mainly an enumerative ethnobotanical book. The first edition, 'In Honolulu gardens' of 1928, had 2000 species; the present one has 3000 (vascular plants) in 1420 genera and 204 families, arranged in the Engler-Prantl order. As no key to the families has been given, the book requires knowledge of these, or of the vernacular names. The latter are the ones that have been printed with capitals, the botanical names coming in the second place, in italics. Under the families, keys to the genera have been given; these seem to be well-constructed. It is perhaps saying a bit too much (in the Introduction) that this is a "general floral guide to Hawaii" and that "many of these species are new records for Hawaii." No references have been made to botanical literature, and the descriptions are very macroscopical. The author must have a great knowledge of the history of gardening in Hawaii with its peculiar ethnological and sociological make-up, of gardens which there are and of their importance, who were the chief promoters of plant introduction and how and whence the main waves of introduction took place. It is a great pity that she has not elaborated such knowledge to an introductory synthesis. Now the book may be mainly (and fruitfully) consulted for the richness of ethnobotanical data concerning various uses and folkloristic legends. The illustrations do not entirely come up to the high standard of binding, paper, and print.

One feature of the book will attract the special interest of the taxonomist. This is the enumerative "Color Key" at the end, where under each character the pages have been listed where species having that character are to be found. In the present form its use will be limited because few readers will have the patience to look up some 50 different places. -- M.J.

\*Parham, J.W.: Plants of the Fiji Islands. Government Press, Suva, Fiji (1964) lv + 353 pp., incl. 104 phot.

This book was based on 'Fijian plant names' (1942) by B.E.V. Parham. A Flora taking too long to prepare for 449 genera (77 ending their eastward distribution in Fiji, 12 endemic), this most welcome enumeration has been brought out. Pains have been taken to make it complete for the vascular plants, the introduced ones included. The names with author are given, within the families alphabetically, with vernaculars and (all?) synonyms, and under each name reference is made to the 667-number chronological bibliography - a clever system.

The species themselves have been briefly annotated with an occasional sentence, but these are too heterogeneous to be very enlightening: under one there is a brief description, under another a remark on the type specimen, under a third merely "collected from the Nausori Highlands by A.C. Smith in 1947". The usefulness of the book would have been trebled if the same space had been used for identification keys, perhaps half-descriptive ones, not too hard a task for this limited flora, and worth the cost of a trip to America, where most of the materials are. The plates have not fortunately been reproduced and could have been omitted without much loss, and the binding for that money improved with much gain.

The volume is dedicated to the memory of Berthold Seemann, whose fine portrait has been reproduced well. There is a Brief history of botanical exploration and investigation (starting with 1840, the year of both the "Sulphur" under Belcher and the U.S. expedition under Wilkes), sketch maps, and notes on flora (predominantly Malesian in affinity) and vegetation (coastal, dry, intermediate, wet zone), and at the end a special bibliography covering the cryptogams. — M.J.

\*Wyatt-Smith, J., revised by K.M. Kochummen: Pocket check list of timber trees. Malayan Forest Records 17, Kuala Lumpur (1965), vi + 428 pp. text + 46 phot. and 126 pp. of drawings. Mal. \$ 6.00.

The aim of the book is important, and worth of a close look at the possible value, however hard it is for a taxonomist to estimate the measure in which it will meet the requirements of foresters. Symington had an excellent reputation, and his work on Dipterocarpaceae has been used for this book unaltered. This should be recalled when the balance of the book is questioned; that the data on dipterocarps are meagre as compared with the 6-12 line descriptions of non-dipterocarps, is perhaps chiefly a matter of necessity. Wyatt-Smith, who recently left Malaya, gave a brief introduction and a chapter on mangrove species; the other non-dipterocarps are by him and Kochummen. The book is as far as possible bilingual in English and Malay.

The emphasis lies on the characters provided by stem, bark, and slash, and it is these that mainly account for the botanical value and originality of the work. These characters are almost never found in revisions and monographs, because collecting botanists rarely put them on record. Any botanist should get acquainted with the terms and characteristics of stem, bark, and slash characters that can be found on page 90-96, for preparing his field notes, and with the data mentioned under the genera and species, for reference.

From the taxonomic and editorial point of view, the book is less satisfactory. In *Pometia*, the one character to tell at a glance *P. pinnata* from *P. ridleyi* has been omitted, namely that in *P. pinnata* every other nerve ends in a tooth. "Leaves toothed" in the generic key on page 176 does not apply to *P. ridleyi*. Under *P. pinnata* not only the *f. alnifolia*, but also the *f. glabra* should have been mentioned. The second genus looked at was *Canarium*. Leenhouts listed 13 species for Malaya, Kochummen 4. But it remains obscure what criteria for selection he has applied. Of *C. megalanthum*, for instance, a tree up to 40 m, the wood is said to be hard (*Fl. Mal. I*, 5, 1956, 274), but the species has not been discussed, nor has *C. pilosum*, used for house-building (*Fl. Mal. I*, 5, 1956, 281). *Canarium sumatranum* (like a few others) is rare in Malaya, but so easily confused with *C. pseudosumatranum* of the list, that the distinction should have been explained, supposing that there are differences in quality of the wood.

There are two indexes, both on the vernacular name as catchword and hence essentially the same, but the index on page 30 gives the author's name, vernacular synonyms, timber name, trade name, storey class, and occurrence; the index on page 368 gives family name and the page of the description. If one has only the Latin generic name and wants to learn author and family, one should start with a third index, on page 410, where the vernacular name is found, necessary to consult the other two indexes.

It is convenient that the genera are in alphabetical order, but since no family names have been added (except in that index on page 368), the reader must discover all by himself the relationships that may exist between the genera and what families are represented by what genera.

The leaf-drawings of the non-dipterocarps at the end - separately paged and only to be found by accident - would have been of far greater value if the lateral nerves and veins had been drawn, for what the figures now give can as well be described in words. -- M.J.