

### VIII. REVIEWS

ARMITAGE, F.B. & J. BURLEY (compilers), Pinus kesiya Royle ex Gordon (syn. P. khasya Royle; P. insularis Endlicher), xiv + 199 p., 4 maps, many fig. (1980; Commonwealth Forestry Institute, Oxford OX1 3RB, England). Tropical Forestry Papers 9. Paperback. £ 10.00, plus postage.

This pine of SE. Asia and Luzon gives a light multi-purpose wood and a resin; during this century, plantations have been set up in many tropical, seasonally dry, montane regions. The present book discusses occurrence, silviculture, properties, and breeding; foresters, for whom it is clearly intended, now have a handsome manual, with many references.

A botanist reads with interest about its occurrence beside P. merkusii in S. Vietnam, its wide variation, and learns that elsewhere sometimes second generation plants have different, better properties (p. 53). Yet he'd wish that B. T. Styles, who contributed ch. 2, Taxonomy and Nomenclature had laid a stronger foundation in his discipline. The case for the name P. kesiya vs. P. insularis is less than convincing. It was made by Styles & Burley in Commonw. For. Rev. 51 (1972) 241-245; this text is virtually reprinted on p. 8-11. The original 'description' of P. kesiya is so slight that it hardly deserves that name, the provenance seems obscure, a type specimen has never been found. On p. 10 it is said that the 'description' adequately characterises the species, yet on p. 11 admits a possibility of confusion with 4 other species, in a group that may be the least-known of the genus.

Entitling a book with the preferred name does not necessarily enhance its correctness and introduces an element of prestige, without making good taxonomic weaknesses. On p. 8 all orthographic variants of P. kesiya are listed as synonyms, along with P. insularis and P. yunnanensis. The latter has, however, been kept separate on p. 13, 41 and map 1, for reasons of convenience. There is no documentation through cited herbarium specimens; the natural distribution has apparently been compiled from secondary sources. The considerable intraspecific diversity is expounded all over the book but has not been discussed systematically. It's highly desirable that on the forestry side more means are made available for un-hurried application of taxonomic craftsmanship. — M.J.

AYENSU, E.S. (ed.), Jungles, 200 p., many illus. (1980, Jonathan Cape, 30 Bedford Sq., London WC1), 31 by 25 cm, cloth, in U.K. £ 16.00 (in Holland Dfl. 98).

Essentially, this is a collection of marvels. The number of subjects is 87, each covering two opposite pages. The lay-out is masterful, with several types of illustrations harmoniously combined, an average of 8 per chapter. Many are in bright colour, and superb photographs are among them. The tendency towards profuse illustration results in a general over-reduction in size, and in amount of text which is less than 1/4, sometimes less than 1/6, of the space. The captions are very good, and in fact complement the story, which is high quality.

Emphasis is on the Neotropics, although Malesia and Africa are also covered. Animals receive more attention (37 chapters cover animal groups)

than plants; the latter are treated less keenly, like the rattan on p. 86, depicted with insipid adpressed spines and strange small leaflets instead of fruits. The treatment of the orchids (p. 144-145) could have been less superficial, and the big soil herbs have almost been neglected. *Shorea curtisii* (p. 37) lacks one fruit wing.

The map on p. 11 shows far more rain forest than there is: broad strips in Brazil along the Atlantic coast, in Madagascar, India, Burma, Vietnam, NE. Australia — wish it were true. That "forests are a renewable resource" (p. 167, top) is in its simplicity an extremely dubious statement.

About 1/4 of the book deals with Man and the Jungle, concentrating on tribes. Also in this part, ample attention is paid to products of the forests, with separate chapters on rubber (H.N. Ridley unmentioned, however) and cocoa. A section on greenish paper discusses 15 African timbers, 10 South American timbers, 16 Indo-Malesian timbers, 8 Spices, 8 Fibres and Canes (most of them, however, light-loving plants and not belonging to the rain forest proper), 11 Essential Oils, 11 Gums and Resins, 15 Chemical substances, 9 Ornamentals (no orchids among them).

It is a pity that in places the book has been kept unnecessarily superficial. Absent is any reference to further reading. Portraits of explorers abound, but we look in vain for those of Schimper, Richards, or Corner, who synthesized their work. There are remarkably few diagrams and quantitative data; found no way to estimate the height of the forest on p. 30-31, from which the standard picture on p. 35-131 has been derived to indicate the stratum a chapter refers to. The record trees on p. 35 have not even been drawn to the same scale. The 7 *Cercopithecus* species on p. 52-53, the 7 toucans on p. 82-83, the 7 parrots on p. 91 could have easily been provided with details about their different areas or niches.

These are minor shortcomings of a splendid book which, moreover, easily can be improved in a second edition. The reader certainly gets his money's worth. Yet, for all its sumptuousness, it has not succeeded in surpassing P.W. Richards's *The Life of the Jungle* (1970), as an illustrated introduction. — M.J.

DASSANAYAKE, M.D. (ed.), A revised handbook to the flora of Ceylon, vol. 1, viii + 508 p. (1980, Amerind; New Delhi). Cloth. Available from the U.S. Dept. of Commerce, National Technical Information Service, Springfield, Va. 22161, U.S.A., also from Balkema, Box 1675, Rotterdam, The Netherlands, Dfl. 48, DM 45, £ 12.00, \$ 24.00.

Two different editions exist under this title, which may generate enormous confusion, particularly since in the later edition no reference has been made to the earlier. They overlap in the Dipterocarpaceae. Both are sponsored jointly by the University of Sri Lanka, Dept. of Agriculture, Peradeniya, and the Smithsonian Institution, Washington. The earlier edition set out with B. A. A b e y w i c k r a m a as General Editor in part 1 (p. 1-107, 1973, reviewed on *pages 2376-2377*) and was continued under Dassanayake. Cowan (in *Taxon* 29: 744, 1980) mentions that "frustration with the original printing arrangements in Ceylon led to moving the printing to India. The publishers there preferred a different format and to issue a complete volume at a time. So it was decided to start over,

reissuing the families treated in the original two fascicles, revised by their authors, in a uniform format. In effect the 1973 and 1977 fascicles may be treated as edition 1, discontinued, and the 1980 volume 1 and subsequent volumes as edition 2." The prefaces in the two editions are almost the same, hence it is easy to overlook the sentence on p. vii in the later edition: "Those families previously published in fascicles 1 and 2, are to be republished, in revised form, in the new format as manuscripts are received from the authors." It is most unfortunate that in the actual text no references to the earlier edition were inserted if the same family was republished. In case of double treatment, the later edition largely amounts to a re-setting of the earlier ... in much more space: the same Dipterocarpaceae need 30 pages in the first, 59 in the later. Some minute alterations were made from the one edition to the other: Ashton, author of the Dipterocarpaceae, moved from Aberdeen to Harvard; the sections of Shorea are called Shoreae and Doonae first, Shorea and Doona later, while Anthoshoreae is in the plural in both. The last specimen cited, Worthington 4690, was located in PDA first, then inexplicably moved to K. However, no taxonomic alterations were detected.

The title too is unfortunate, since it duplicates the one by A.H.G. Alston. As the words Flora of Ceylon stand out clearly on the title page of both recent editions, and was not used before, it seems best to cite it as Fl. Ceylon, ed. Perad. for the earlier, and Fl. Ceylon, ed. New D. for the later. Objection against numbering editions 1 and 2 is in the absence of such indications on the books themselves. An editor's name should not be cited, because Dassanayake is the editor of the Peradeniya edition part 2 as well as of the New Delhi edition volume 1, and each author is responsible for his own contribution.

The following survey lists what has been produced in both editions. There is no intention to continue the Peradeniya one but taxonomists will have to use it.

Fl. Ceylon, ed. Perad. 1 (1973) :

Apocynaceae  
Asclepiadaceae  
Bignoniaceae  
Gesneriaceae

Loranthaceae  
Martyniaceae  
Pedaliaceae  
Periplocaceae  
Viscaceae

Fl. Ceylon, ed. Perad. 1 (1977) :

Dipterocarpaceae

Moraceae

Fl. Ceylon, ed. New D. (1980) :

Amaranthaceae  
Bombacaceae  
Clusiaceae  
Compositae  
Connaraceae

Convolvulaceae  
Dipterocarpaceae  
Elatinaceae  
Fabaceae  
Mimosaceae

The production is good. The scientific quality of the work will vary with each author's qualifications, facilities, and tenacity. Ashton's Dipterocarpaceae drew criticism from Kostermans, Landbouwhog. Wageningen Misc. Pap. 19 (1980) 207-219, who in the same material distinguished and described 5 new species of Stemonoporus.

The present Volume 1 contains about 361 wild species. A quick count in Trimen-Hooker volume 4 reveals that therein some 565 species are written up. There are 5 volumes like that, not counting Alston's supplement. This puts the Ceylon flora in the magnitude of between 2500 and 3000 species, and it will require 7 or 8 volumes like this to deal with them. — (abridged by the Director of the Rijksherbarium.)

Draft Index of Author Abbreviations compiled at The Herbarium, Royal Botanic Gardens, Kew, iii + 249 p. (1980, Her Majesty's Stationery Office, Atlantic House Holborn Viaduct, London EC1P 1BN). small 8°. f 5.50 net.

This booklet is again one of those very useful indexes prepared at Kew. It contains an alphabetic list of almost 10,000 names of authors of plant names (with years of birth and death) and indications how they are or could be cited in abbreviated form in literature. It was started long ago, by Daydon Jackson, the compiler of *Index Kewensis*; his MS was the basis of the present draft, which has of course considerably been extended and improved. It served originally for internal use of the Kew staff, but has now become available to all of us. About 1974 a stencilled draft was circulated among the main herbaria soliciting additions and improvements.

The present index is restricted to authors of flowering plant taxa; there is a perspective to add the names of cryptogamists in a future draft.

From the foreword by R.D. Meikle, who headed the compilation committee, we derive that in general author names have not been abbreviated unless more than two letters are saved thereby, but some well-known abbreviations are allowed in defiance of this ruling, and no rigid principles have been adopted. It is explained how difficulties have been solved with names beginning with 'Mac' or 'Mc'; names preceded by 'De', 'van' etc. have been entered twice, to satisfy easy consultation. Telescoped abbreviations are partially admitted. The committee solicits additions and corrections, for which there are blank pages at the end of the book. The index offers a measure of consistency in abbreviations. — Van Steenis.

DRANSFIELD, J., A manual of the rattans of the Malay Peninsula, v + 270 p., many line drawings (1979, Forest Department, Malaysia). Malay. For. Rec. 29. Cloth. Order from Forest Dept., Jl. Swettenham, Kuala Lumpur, Malaysia. Mal. \$ 25.

In 1974 Dr. Dransfield published A short guide to rattans in mimeo (BIOTROP, Bogor); the checklist there gives 479 sp. for the whole of Malasia. The 104 sp. of Malaya, in 8 genera, in the present book, make up 22% of this total. Of at least 21 species the cane is traded in the market, i.e. 1/5. Many more are useful; my somewhat arbitrary count revealed that use in 12 sp. is 'great', in 15 sp. is 'medium', and in 27 sp. is 'small', a total of 54 sp., all for the cane. In addition, 4 sp. are sought for their edible fruits, 5 for their leaves, as thatch and cigarette paper, 4 for their 'dragon's blood' (jernang, for varnish, red dye, and medicine); 4 have minor uses. Useless are 11 sp., use is unknown of 29. Although about half the Malayan species are endemics — 5 are shared with Thailand, 14 with Sumatra, 10 with Borneo, 17 with Sumatra and Bor-

neo, 5 are wider-spread (p. 23) — this book is far more than half-interesting outside Malaya, for the fine introduction to the whole subject it offers. It contains all the Malesian genera to date (with notes on their seedling leaves on p. 16); *Calamus* (incl. *Cornera* and *Schizospatha*) here with 62 sp., *Calospatha* with 1, *Ceratolobus* with 2, *Daemonorops* with 23, *Korthalsia* with 9, *Myrialepis* with 1, *Plectocomia* with 3, *Plectocomiopsis* with 3. Later, *Daemonorops ursina* was accommodated into a new genus *Pogonotium* (Kew Bull. 34: 763. 1980), and *Retispatha* has been described new, from Borneo (Kew Bull. 34: 529. 1979).

Descriptions amount to c. 15 (long) lines in which the diagnostic characters are italicized; also distribution, ecology, uses and notes are given, in which taxonomic reductions (made in Mal. Forester 41: 325-345. 1978) are explained. Under the bigger genera there is a 'list of distinctive features', which amounts to a multiple key. Dichotomous keys are also given. The (unillustrated) General Part covers a net 22 pages, discussing stem, sheath, cirrus and flagellum, inflorescence\*, fruits, germination (drought kills the seeds of these everwet-forest plants), growth rates, fertility behaviour, associations with ants and scale insects, harvesting, processing, trade, and silvicultural notes on the few species (*Calamus caesius* and *C. trachycoleus*) that are grown in plantations in Kalimantan — not in Malaya. Vernacular names are given at all occasions. Most of these points are also discussed in the Short Guide of 1974 which, however, carries a chapter on Altitudinal distribution (p. 20-21) in Java which would be nice to have for Malaya.

The text is well-written and clear. Much less happy I am with the illustrations. No reference has been made to any figure. Outside the book, the 4 series of well-documented photographs given by Beccari in Ann. Gard. Calcutta have been ignored even in the 'Selected Bibliography', to 1908: 238 plates, to 1911: 109 plates, to 1913: a Supplement of 83 plates (1914) and to 1918: 120 plates (1921). To Furtado's many drawn plates in the Gardens' Bulletin no reference has been made, either; part of them have just been reprinted, acknowledged on p. 3 but without indication of the original publication. A risk of confusion is introduced in the case of *C. diepenhorstii*. The plate on 249 is taken from Furtado, Gard. Bull. 15 (1956) 257, where it is identified as var. *kemamanensis*. On p. 248, Dransfield includes this variety in the species (although not formally citing it as a synonym); such things should be told in the text.

Inside the book, reference to the plates (at least one for each species but unnumbered, what a nuisance) is made only in the index by unexplained bold type, but no special reference therein is made to the page which carries the actual entry. A number of plates were newly drawn: look for the signature CMLaw. All other plates must be traced back to Furtado. The specimen on which a drawing was based, carefully cited by Furtado, has been left out here, also from the new plates which therefore are undocumented. This book, no doubt practical to the forester and utilizer,

\* On p. 8, it is noted that Dr. B.W. Teoh "has been able to distinguish some species anatomically and also to correlate anatomical features with the physical properties of the canes". We hope her thesis will in some form be printed.

is somewhat less than that to the botanist.

On page v, Director General of Forestry Muhammad Jabil correctly observes that "in Peninsular Malaysia, rattan is still produced entirely from natural forest." What I fail to understand is how Dransfield here can turn a blind eye on conservation, on which the future of this vital forest product depends. All he has to say about it is on p. 30: "At the rate of exploitation presently carried out, and with the increased destruction of primary forest, it is suggested that increased cultivation of rattan will be necessary if the trade is to be maintained." I think, this statement should be amplified with an explanation of the necessity to protect the various forest types containing the wild stock of the about  $54 + 17 = 71$  species,  $2/3$  of the total, which are at present known to be useful to the people of Malaya. Any materials for future cultivation must come from that wild stock in the primary forests. If these are not conserved, before long, maybe half this fine book can be thrown away, after the forests. — (abridged by the Director of the Rijksherbarium.)

FAO-UNESCO, Soil map of the world / 1 : 5 000 000, Volume IX / Southeast Asia, xiv + 149 p. + 7 sketch maps (1979, UNESCO, 7 Place de Fontenoy; 75700 Paris, France), For. 74 + Map Sheet IX (1976; ibidem), Fr Fr. 50.

The old easy days of laterite, limestone, sandstone, schist and shale seem past: none of them is to be found in the Index in the general volume. The entire map shows 106 colours in 26 main groups. There are 3 Textural classes of soil, 3 Slope classes, 12 Phases, 3 Climatic variants; there are 7 types of Master horizons, with differentiations denoted by 17 letter suffixes, 13 Diagnostic horizons, 22 Diagnostic properties. Nearly all are indicated by esoteric words; the map gives the main terms in English, French, Spanish, and Russian. It must have been an enormous work to devise a system to include all soils of the world; this map with its accompanying texts is the result of a creative effort to establish such a system. Coordination of the project, which was begun in 1961, was in the hands of R. D u d a l, who previously worked in Indonesia and was one author of articles on the soils of the region in *J. Trop. Geogr.* 18 (1957) 54-80, and UNESCO, *Natural Resources of Humid Tropical Asia* (1974) 159-178.

Of the entire map, which consists of 18 sheets (all 76 by 110 cm frame) in 10 volumes, of which volume 1 is entitled Legend. Malesia is covered by Volume 9 (from Hong Kong to N. Australia, and from the NW. tip of Sumatra to the border between W. and E. New Guinea), and Volume 10 (Australia, E. New Guinea to New Zealand).

Compiled mainly from previous soil maps (c. 19% of the area is now in reliability 'good', 34% 'mediocre', and 47% 'poor'; for sources, see p. 7-8), the present map gives 60 colours in 22 groups. The colour patches are inscribed by its corresponding letters of group and subgroup, e.g. Pg standing for Gleyic Podzol, mainly in Borneo, carrying kerangas forest. Additional letters denote 'associated soils' (more than 20% in the map unit) and 'inclusions' (less than 20%).

The text volume (with summaries in English, French, Spanish and Russian) devotes brief chapters to Climate, Vegetation (potential, not ac-

tual), Geology and Lithology, Physiography, illustrated by 7 sketch maps; together they make a nice overview of Thailand, Laos, Cambodia, Vietnam, Malaysia, Indonesia, and the Philippines. Next, for 344 soil occurrences, areas are listed in units of 1000 ha, and the main types concisely described. Land use and soil stability is discussed in very general terms. Seventy pages are then filled with site data.

For understanding the vegetation or for other botanical purposes, I am afraid the map has not much value. While a maximum of detail has perhaps been reached in view of what is possible at a 5 million scale, for instance, in Sarawak I miss all the limestone outcrops, and the kerangas-supporting soils except for a small piece in the very West.

Execution is fine and tasteful; documentation extensive. — M.J.

Volume I of the series, Legend, v + 59 p. (1974) costs Ffr. 25, the accompanying chart (1972) costs Ffr. 50; both from UNESCO, 7 Place de Fontenoy, 75700 Paris, France. The text explains all the soil types hinted at above, with a synopsis which perhaps could have been presented as a dichotomous key. — M.J.

Flora Indonesia. Marah Maradjo (General Editor), in parts, size 15 cm (high) by 23 cm, each part c. 32 p. (1976-1977, publ. by P.T.Kary Nusantara, Cabang, Jakarta III, Jl. Patrice Lumumba 20). In Bahasa Indonesia. R. 500.

This series, of which I have seen 10 parts, intends to popularize botany for the general public, carrying excellent information and instruction. It is lavishly illustrated in colour. Each booklet is dedicated to a certain group of plants which are mostly familiar to the general public. Mostly they concern useful plants. Some of the subjects are too large for one booklet and then are represented by two different ones. Subjects are e.g. medicinal plants (2 parts), ornamental plants, spices & condiments, pulses (Leguminosae), vegetables, fodder-plants, stimulants, and bamboos. Some parts were obviously rather popular and were issued in a second printing. An excellent medium to raise interest of people in plants and propaganda for botanical research.

A similar series was published on the fauna. Whether the series is continued after 1977 is unknown to me.

The parts are not numbered and no single author is mentioned; the inside cover carries the names of persons involved of a small redaction committee. — Van Steenis.

FOSBERG, F.R. & S.A. RENVOICE, The Flora of Aldabra and neighbouring Islands, 358 p., 2 maps, 53 page-size fig. (29 April 1980, H.M. Stationery Office, London). Kew Bull. Add. Ser. VII. 8°. Paper bound f 15. net.

This is an excellent work, in all aspects a conventional Flora, with descriptions, keys, etc., of a group of four islands of the Comores (c. 9-10° S, 46-47° E). The islands are all limestone atolls, up to 8 m altitude (dunes to 30 m), covering together c. 100 sq.km, with a strongly seasonal climate. Besides the 2 ferns, there is a brief account of 6 mosses (by C.C. Townsend), the major part of the work being on the 274 Angiosperm species and varieties, of which 185 are indigenous, with not

less than 43 endemics, a most remarkable record for atolls. The usefulness of the work is greatly enhanced for the layman by excellent habit drawings of almost all taxa by Miss M. Grierson and A. Davies. The work was prepared for the Royal Society and many careful precursors preceded its publication. In all aspects an enjoyable florula for which our congratulation to the authors. — Van Steenis.

HAMILTON, W., Tectonics of the Indonesian Region, ix + 345 p., 154 fig. + col. map (1979, Geological Survey Professional Paper 1078, U.S. Government Printing Office, Washington, D.C. 20402). Paper, US\$ 11.25.

One of the foundations for historical plant geography is an understanding of the earth's history. This is especially important in a geologically complex area like Malesia. Since the last compilations by Van Bemmelen (1949) and Visser & Hermes (1962) no general synthesis of the geology of this area has been available. In that period the theory of plate tectonics was developed and Hamilton bases his interpretations entirely within its framework. The contrast with previous studies could not be greater. With a few notable exceptions, principally Smit Sibinga (Tijd. K.N.A.G. 44. 1927), most earlier geologists admitted only local and restricted horizontal movements. In plate tectonic theory, longlasting and large-scale horizontal movements of pieces of the earth crust, both oceanic and continental are postulated. Obviously the difference for plant geography is considerable, as already pointed out by H.J. Lam (Tijd. K.N.A.G. 47. 1930, English summary on p. 577) in a remarkably prescient attempt to explain the phytogeography of Malesia within the framework of Wegener's theory. Recently, Raven & Axelrod (Science 176. 1972), Van Steenis (Bot. J. Linn. Soc. 79: 97-178. 1979), and Whitmore (Wallace's Line and plate tectonics, forthcoming) have made attempts to relate plant geography to plate tectonics.

The value of Hamilton's study lies in the consideration of Indonesia as well as of surrounding areas, of the detailed evaluation and, where needed, re-interpretation of evidence accumulated by earlier geologists, and in the clear distinction between more and less probable explanation for events in certain complicated areas. Hamilton had also available new evidence from deep sea drilling, geomagnetic and seismic and bathymetric surveys, which enabled him to synthesize all in a very convincing plate tectonic picture.

The main events which have determined geologic history in Malesia have been a) the movement of India away from Australia in the early Jurassic with complete separation achieved in the upper Cretaceous and northward movement starting in the middle Cretaceous and b) the Tertiary movement northward of Australia + New Guinea. Starting from the situation in the Perm-Jura, Hamilton discusses evidence indicating the possibility that Sumatra + Malay peninsula + part of Indochina may have been situated originally North of New Guinea. In this reconstruction the Cathaysian flora of Djambi is situated in a tropical latitude, the mixed Cathaysia-Gondwana flora of New Guinea could be subtropical, while the Gondwana flora of Australia was temperate. This solves at least one plant geographical puzzle, but cannot have affected Angiosperm distribution, unless a

very early origin is assumed, unsupported as yet by any fossil evidence.

The northward movement of India caused rotation of Sumatra from an E-W to a SE-NW position and of course many other striking features such as the uplift of the Himalayas as already postulated by Argand in 1924.

The approach of the Australia plate in the middle Tertiary can be followed with more certainty. Hamilton shows successive stages and thinks that the Banggai-Sula and Buton minicontinents have been displaced from New Guinea westward to their present position near Celebes. He also supposes that parts of Flores and Sumbawa have moved southwards from Celebes. Macassar Strait is shown to be of relative recent origin, the connection between Borneo and Celebes being severed only in mid-Tertiary time. The complicated geology of Timor is extensively discussed and interpreted as a tectonic mixture resulting from plate collision. He even assumes that the fossil Anthracotherium of SE. Asian affinities has been tectonically displaced to the Southeast.

The main plant geographical problem is to find out what was present in the area between Australia-New Guinea and SE. Asia in the Cretaceous and lower Tertiary when they had not yet collided. However, in Hamilton's interpretation all strata have disappeared in the process of subduction, although he appears to favour the idea that this was oceanic crust. The only possibility here is a palaeobotanical record of immigration in those areas which are still available for inspection.

Hamilton briefly discusses the explanations for these vast movements, which still go on today, and honestly states that there are "many conjectures and no proofs". He himself favours the idea that torques generated by the earth's spin may have had an influence.

The study (poorly glued, alas) is lavishly illustrated with a map (1:5,000,000), very clear diagrams and local maps and all evidence is summarized on a large and very beautifully coloured geotectonic map. It will form the base for any interpretation of the geologic history of Malasia for a long time to come. It also entirely vindicates Professor Lam's revolutionary views of 1930. — J.Muller.

HANBURY-TENISON, R., Mulu / The rain forest, xi + 176 p., 2 maps + 45 phot. (1980, Weidenfeld & Nicolson, 91 Clapham High Street, London SW4 7TA). Cloth. £ 8.95 in U.K.

When working up the Rejang in 1958, I had the good fortune to read O. Beccari's *Wanderings in the Great Forests of Borneo* (Italian 1902, English 1904) and was captivated. He explored Sarawak as a naturalist from mid-1865 through 1867; I think he would have been delighted to read this book, which kindled so many memories of Borneo. It reflects similar keenness and ingenuity, it too evokes that sublime happiness the biologist experiences when he realizes: the richest rain forest on earth surrounds me.

Beccari, almost singlehandedly, collected very many plants and a considerable amount of animals. The Mulu crew totalled 115 scientists, who were supported by a special team to arrange things, a rather new concept in expedition organization. It lasted 15 months, the largest, longest, most productive Royal Geographical Society expedition. Some facts were

already given on pages 3409-3410; Dr. A. C. J e r m y \*, the scientific coordinator, is shown full-size on phot. 18.

The expedition, flown by the Royal Air Force, generated a wide array of contributions, conducted in a spirit of humour and no nonsense, stands out in what as a Dutchman I regard as the best of the British tradition, that funny mixture of war and peace.

The set-up is described in 54 pages, the findings in 78, in refined blends of facts and viewpoints. In a most instructive (and almost light-hearted) way the essentials of the methods through which a rain forest is studied are revealed; this alone makes the book an asset. The history of the project is described, the way up the rivers Baram and Tutoh, topography, the Caves, of course, the rain forest and its ecology, the mammals (their movements radio-tracked) and birds, the reptiles, amphibians, fishes and insects, and finally the concept of the Park. Author is chairman of Survival International, and his pages devoted to the Penans are outstanding. Their future as tribal people who live off the forest is in jeopardy; their problems, discussed in very careful, considerate, sensible reasoning, may not be insoluble.

Gunong Api, with 1625 m the highest limestone summit between Thailand and New Guinea - limestone in layers 2100 m thick with unbroken series of fossils - owes its name to surface fires in its top area, probably caused by lightning. No orang-utans, rhinos or big cats have been sighted, but 262 sp. of mammals have, 2/3 of the Bornean fauna. Good stories include a python meal for Christmas (p. 122), and Dr. B.H. Kiew seeing a £ 10 million market for frogs' legs (p. 123). However, the whole book, through cleverly interspersed ecological observations and pleas, splendidly conveys the cause of conservation.

It makes easy reading while packing rich stories in a few sentences: "Married couples were much teased during relatively dry periods when the deafening sound of torrential rain on the tin roof was not heard for nights on end" (p. 42).

"The Medalam, down which we now floated and poled our way, has a quite different character from the Melinau. Instead of curling along under a limestone wall, trees meeting overhead to form a tunnel and with sandy bars and muddy inlets, the Medalam is a big, clear, boisterous river full of rocks and gravel beds. Fine trees line the banks, many with a red peeling bark like eucalyptus, and the open reaches were wide and deep. Rafting is the best way to travel a river, even though the Medalam had a few daunting rapids where we were nearly swamped; silently we drifted for two hours beyond the last boundary of the park at Long Mentaway seeing things a motor would have disturbed; a five-foot monitor lizard draped asleep in the sun over a submerged log; a green heron standing motionless gazing into the water; striped squirrels playing on a branch" (p. 57).

When the expedition came to an end, all traces in situ were wiped out. Yet the marks have been made. After a RGS expedition had studied a forest

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\* He edits the Notulae et Novitates Muluenses, number 1 of which appeared in the Bot. J. Linn. Soc. 81 (1980) 1-46, with novelties in palms and in basidiomycetes (see Dransfield, Jülich).

in the Mato Grosso, Brazil, the whole site was destroyed for 'development' (p. 148); the Sarawak Government is more likely to keep the Mulu National Park as the treasure it is; the Management Plan for 5 years has indeed been accepted. The eyes of the world are on it. — M.J.

P.S. — Caves of Mulu, a 44-page printed booklet with splendid illustrations, sketch maps and text, was published in 1978 by the Royal Geographic Society, London SW7 2AR; price £ 2.00.

LESSARD, G. & A. CHOUINARD (ed.), Bamboo research in Asia / Proceedings of a workshop held in Singapore, 28-30 May 1980, 228 p. (1980, International Development Research Centre, Box 8500, Ottawa, Canada). Paper. Can. \$ 12.

The Canadian IDRC organized another workshop (see Rattan), the first conference on bamboo, of 22 people from 12 countries, and quickly produced this handsome book. It contains country reports and special papers. Some country reports are very informative. Species lists are given for India, the Philippines, Malaya; a list of uses, with species, for 6 countries is given; 20 genera are mentioned with notes.

The Special papers offer an overview by Sharma, a discussion of history and state of taxonomy by Dransfield\*, of propagation by Hassan and by Banik, on cultivation by Uchimura, on anatomy and preservation by Liese, on mechanical properties of *Bambusa blumeana* by Janssen, on utilization in the Philippines by Tamolang e.a., on bamboo musical instruments in west-Java by Widjaja. The references have been combined to a 471-item list.

For all the 10 million tons of annual bamboo production and wildly fantastic uses (75 categories in Sharma's list; on p. 190 some others), the state of knowledge is very unsatisfactory. The cytology is poorly known (but see the list of chromosome numbers on p. 37-40), neither the seeding cycle (p. 133) nor regeneration is understood (p. 137), we don't properly know how to propagate bamboo (p. 150, 153), and the first results of chemical preservation are not yet in (p. 171). In taxonomy, much is to be desired, and there is a great lack of well-collected material (instructions on p. 207-208). And under the Research Needs and Priorities not even ecological properties, soil requirements and phenology of individual species have been mentioned.

In truth, bamboos are so difficult that only those who can apply excellent brains to this group for at least 25 years can hope to make the really big contributions needed. Such a contribution was F.A. McClure's book The bamboos / A fresh perspective (1966; see pages 1581-1583, and his obituary in *Taxon* 20: 777-784. 1971). That book, in depth and clarity, has set a standard which I miss here. Let me give examples.

"The much used and modern treatise of Javanese flora" (p. 64) turns out to be Backer's *Handboek* of 1924 (correctly 1928); the updated treatment in English, *Flora of Java* 3 (1968) 625-641 is nowhere mentioned, al-

\* Indonesian bambusologist Soejatmi Soenarko (reference 397 in the list), by marrying British rattanologist John Dransfield, became Soejatmi Dransfield (reference 83). Why can't the women collect and publish under their own names throughout, as all other botanists do?

though it was apparently used in the case of *Gigantochloa* aff. *atter* (p. 204). "Nine genera and 31 species have been reported from Indonesia. It is likely there are more" (p. 102), writes Sharma. In itself, this is not incorrect, except that the 31 species are obviously from Java only (whence by my count there are but 8 genera). Actually, an estimate of 65 species for Indonesia is given on p. 64. In the Philippines country report it is said there are c. 54 species, 36 of them erect (p. 69), in the special paper that of the 48 sp. in the Philippines, 29 are erect (p. 189). Actually, in the table on p. 71, there are 33 listed as erect, with 2 extra varieties, and 18 sp. as climbing, with 1 extra variety, a total of 51 species, 54 taxa.

What to think of Sharma's estimate of 1250 sp. in 75 genera (p. 99) vs. Soejatmi's of 750 sp. in 45 genera? What to think of all other (partial) differences between statements? What other inaccuracies may be lurking? It seems advisable first to examine and sift the facts, and carefully build forth on predecessors. For propagation purposes, McClure adopted De Rivière's distinction of 1879 between Group I, Caespitose, and Group II, Running, which he thinks fundamental; I did not see any comment on it.

One certain result of this workshop: the bamboo challenge is now greater than ever. — M.J.

MANILAL, K.S. (ed.), Botany and history of Hortus Malabaricus, x + 237 p., some illus. (1980, Oxford & IBH, 66 Janpath, New Delhi, 110 001 India, Rs. 85.00). Cloth. Distributed in Europe by Balkema, Box 1675, Rotterdam, The Netherlands; price Dfl. 48.00 net.

"Hortus Malabaricus is a classical, monumental book on the valuable plant wealth of Malabar, written by Hendrik Adriaan van Rheedee" — thus reads the opening sentence. Only, on p. 35 we learn that the 15-page Preface to vol. 3 is "the only publication entirely written by Van Reede himself" (translated into English on p. 41-56).

However that may be, this collection of 23 papers was issued to mark the 3rd centenary of the publication of Volume 1, in 1678; the last two papers bear no relevance to the subject.

Of a general or historical sort are papers 1-6 and 9. Paper 8 dates F. R o t t b o e l l 's *Beskrivelse* in the first half of 1783. The other papers interpret Rheedean plant names in certain families, notably Burserac. 17, Caesalp. 18, Dipteroc. 17, Euphorb. 17, 21, Gramin. 13, Guttif. 16, Laurac. 15, Myrtac. 14, Nymphaeac. 10, Rubiac. 11, Verben. 19, Vitac. 20, Zingib. 12. Ridsdale notes that most of Rheedee's plants seem to have come from secondary vegetation or cultivation.

Most important is paper 7, D. J. M a b b e r l e y, A re-examination of the Indian Catalogues, with particular reference to Hortus Malabaricus, p. 80-110. Following bibliographical spadework, it comes up with many additions or amendments to *Index Kewensis* or *Index Filicum*, which emerged from an anonymous catalogue of 1773, and works by G r a h a m, R a l p h, V o i g t, W a l l i c h, and W i g h t. Appended are unlisted or incorrectly listed Roxburgh names, names validly published in Wallich's Catalogue, and those published by R o y l e and not discussed by

Sprague or Stearn, names validly published in Wight's Catalogue and overlooked names of Asiatic plants published before 1855. Nota bene: most of all these names do not occur in the Index!

The editor himself apparently did not compare Váczy's name lists with his own: Canavali on p. 30 with V. is wanting on p. 72 with M., and so is Canti. Manilcara on p. 31 becomes Manilkara on p. 72, Pungam on p. 31 becomes Pongam on p. 73. Such items cast doubt on both the completeness and the accuracy of either. On p. 17 his name is commemorated only in Rheedia, on p. 33 also in Drakensteinia. On p. 7, historian Fournier is in error as to Herbarium Amboinense, 4 vol. 1751-1756. As for the botany, in Capparaceae I note that Capparis rheedii on p. 32 does not belong to C. zeylanica but to C. baducea (unless Nicolson's reinstatement in Bull. Bot. Surv. Ind. 17: 161. 1975 is accepted), and that Cratavea is the correct spelling for Crataeva (p. 74).

Novelties have not been marked out in the Index (where infraspecific taxa have been omitted too) and not even always in bold in the text (p. 184); look under Butea buteiformis, Caryopteris bicolor, Dioclea hexandra, Hewittia scandens, Leea asiatica, Moullava spicata, Nothapodites nimmoni-ana, Odontanthera 4 sp., Phlogacanthus thyrsoformis, Syzygium zeylanicum.

One point still puzzles me: in Fl. Males. i 4 (1949) lxxxiv, De Wit wrote "A new interpretation of Hortus Malabaricus, I am told, is now kept in provisional manuscript by Dr. A.H.G. Alston." In this book, I could not find reference to it. Who knows what more Mabberley will discover in the British Museum? — M.J.

PERRY, Lily M., Medicinal plants of East and Southeast Asia. Attributed properties and uses (with the assistance of Judith METZGER), 620 p.; 4<sup>o</sup> (1980, The MIT Press, Cambridge, Mass., U.S.A.). Price: c. DM 150.

This alphabetically arranged compilation on medicinal plants covers an area from China and S. Korea southwards to Java and eastwards to New Guinea and the Solomons; whatever was found about Burma and Thailand was included, but not India. Data are from the extensive literature, while some notes were taken from herbarium field notes (PNH, CCC, NGF). Under each species there is a clear factual evidence; sources are indicated. The Latin plant names are those in current use; where necessary, synonyms are cited. There is a valuable index to attributed therapeutic properties arranged by uses in about 100 categories. Literature has been digested up till 1961.

Though there are several excellent works on useful plants containing data on medicinal plants (Burkill, Heyne, Quisumbing, etc.) the compilation is extremely useful and Miss Perry must be warmly congratulated with this highly appreciated effort which took her 20 years to assemble and which she had the privilege to see in print at her 85th birthday. — Van Steenis.

Rattan: a report of a workshop held in Singapore, 4-6 June 1979, 76 p., phot. (1980, International Development Research Centre, Box 8500, Ottawa, Canada). Paper. \$ 3.50; sent to tropical countries free of charge.

Nineteen experts from 8 countries (why not Papua New Guinea?) convened,

with Canadian support to which we also owe a bamboo symposium; see Lesard & Chouinard. The discussion centers on rattan as a raw material, for which the Malesian rain forests are the chief source, although Thailand and India play significant roles. Harvesting, processing, cultivation, marketing, research, receive full attention, with a clear eye on socio-economic development of the Indo-Malesian countries. Investment per rattan worker is US\$ 1750, vs. 26,250 in the petro-chemical industry.

This booklet has been well-conceived, and makes indeed a fine overview. Rather than bundling another collection of short stories, the IRDC commissioned Mr. K. D. M e n o n to compile the background paper Rattan: A state-of-the-art review. As a result of the workshop, it was amplified and improved. Dr. John D r a n s f i e l d (see the review of his book) lent a hand, apparent in the good representation of taxonomy and distribution aspects, he supplied the photographs and may have contributed many of the 146 references which together make a valuable list (add two papers on seed storage, germination, and seedling growth of *Calamus manan*, Mal. Forester 43: 44-55, 187-192. 1980).

It was time to put the rattan house in order. Collection is irregular, trade names are confused, grading is subjective, the trade is scarcely organized, research has been sporadic. Yet the value of the trade is US\$ 50 million in the region, and the sales reaching the consumer may be worth \$ 1200 million. The Philippines and Thailand banned export of raw rattan; Indonesia now provides 90% of the world market, 1/6 of it coming from plantations. From processing and re-trading, Singapore in 1977 earned \$ 21 million. Many other interesting data are given in the country reports, with descriptions of procedures and conditions.

"Conservation of existing stocks" is named as one of the three broad areas requiring immediate attention; "serious consideration must be given to strict protection of rattans in nature reserves and the establishment of gene pools in arboreta and botanic gardens" (p. 7) .... then the issue fades out of sight. Had a good conservationist attended, he would have said that gardens are inadequate for the long-term maintenance of rain forest species; he would have stressed that, cultivation being in its infancy, the wild stock is to be conserved entirely along with the animals to pollinate and disperse them, and that this requires large, varied, and well-guarded reserves. He would also have pleaded for a regular paragraph on rattans in all considerations about rain forest management, exploitation, and conservation in Indo-Malesia; the future of rattan is inextricably connected with the future of the rain forests themselves.

The synopsis of research programs, by country (p. 58-61) is interesting. Taxonomy, silviculture and utilization are well-covered; there are some plans for inventories, but ecology and conservation are rather missing as subjects, as fact that will weaken the potential links between taxonomy and silviculture, and undermine the potential basis of silviculture and utilization. As ecological work takes time, a start be better made soon. The effects of harvesting on rattan habitat and population, which may be bad, should be studied as part of ecology. I also see fine opportunities for studying the utilization of rattans by the tribal peoples with their large body of experience.

Study should begin, however, with a critical examination of data. In an unpublished script of a Mr. Zainal, a target is set of 67,000 tons annual harvest, from 80,000 sq.km of Indonesian forests and plantations. From this, it follows that, since between 1950 and 1970 Indonesia produced an average of 40,000 tons a year, only 60% of the potential was harvested (p. 34). This amounts to building rattan castles in the air.

From things emphasized and things bypassed, I sense a familiar syndrome. Demand going up, cost of cultivation negligible, promote plantations, don't mind ecology, organize the business, great profit ahead. Timber forestry is still suffering from similar narrow-minded attitudes, concerned with few aspects of few species. This is the most important Malesian forest product after wood. Should we seek to repeat with rattan the timber boom of which the disasters are only just beginning to show? — M.J.

Postscript: the need for conservation affirmed. In 1979, Dr. J. Dransfield, on an FAO consultancy about rattans, visited Thailand, the Philippines, Indonesia and Malaysia. In Thailand, he reported, "though there is a government ban on the export of raw rattan, prices are so high that rattan collection has increased to destructive levels. If nothing can be done to control collection, the rattan trade will collapse in a few years' time. The factors which have influenced the depletion of rattan stocks are wide scale forest clearance, increase in accessibility of remaining forest areas, and the lack of control by the Forest Department" (p. 10).

As for the Philippines Dransfield points out that Merrill's interpretations of the rattan flora were more influential than fortunate, and that in fact the Philippine rattan flora is far from well-known; this is not evident from the above rattan booklet. "Finally, the importance of strict conservation of rattan stocks in Nature Reserves and National Parks throughout the Philippines, should be emphasized. It may become increasingly difficult to safeguard seed sources as cane prices and demand increase" (p. 19).

"The immense volume of rattan coming out of Celebes", Dransfield continues, "suggests that many economically important species may be destructively exploited before their taxonomic status and silvicultural potential can be evaluated" (p. 22). "As with Thailand, there is a strong impression that there is little if any control of the collection of wild rattan, even from strict nature reserves. In relation to this, rattans in Indonesia may be considered to be one of the most endangered plant groups from a conservation point of view" (p. 24).

ROYEN, P.VAN, The alpine flora of New Guinea (Cramer, FL-9490 Vaduz, Liechtenstein).

Volume 1: General Part, 317 p., 32 fig., 78 phot. + frontisp. (1980). Print, cloth. DM 100.

This volume, the first of maybe 4 (subscription DM 720, after publication DM 800), contains general chapters, on zonation, geomorphology, soils, climate, ecology, plant geography, plant communities and historical factors which influenced them, history of field work, languages, and

a list with map of 82 alpine areas. The lower limit is at 3000 m, with c. 700 sp. as genuine alpine plants. G. Jaya (Mt Carstensz) (4884 m) is the highest peak. Perhaps 400 sq.km of glacier may be left; the ice reaches down to 3200 m, occasionally to 2940 m. Forest on Carstensz reaches 4030 m, on Wilhelm 3870 m. As the afternoons are more cloudy than the mornings, eastern slopes are warmest.

Thus the book is full of interesting general facts. Van Royen himself wrote less than 1/3 of this volume; 5 other authors wrote 7 chapters together in it. There are 33 types of vegetation, in 6 categories (not reckoned the cryptogam communities. Under shrub-rich grasslands two types have been described which are admittedly poor in woody plants (p. 189, 198); this I find strange. On p. 15, the upper limit of lower montane forest is set at 3000 m; this seems an average between 3200-3400 m on Mt Carstensz and 2790-2900 m on Mts Dayman and Simpson. On the same page, we are left in confusion about an 'aeolian zone' which may be there or not. On p. 16 McVean & Wade are in fact Wade & McVean, and it is revealed that even the title Alpine Flora may lack a scientific basis. On p. 24, Alph. de Candolle is dated 1974, on p. 25, Gams and Kalkman are in the list, not in the text; on p. 26, Mani 1962 is in the text, not in the list. On p. 25, Love is listed with 2 references for 1970.

These are editorial shortcomings. As for contents, the chapters are uneven: those on Climate and Vegetation are rather technical, although the texts are of a summarizing character. Each one starts with its own introduction, which leads to overlap (ch. 7.2 duplicates ch. 2). Chapter 7, on plant geography, disappointed me: author J.M.B. Smith, who saw the taxonomic MS, on account of species numbers, distinguishes 6 "more or less discrete and comparable mountain regions", and another 5 areas of New Guinean affinity. He refers to his 1975 analysis based on records in the Lae Herbarium, i.e. from the eastern half. On floristic differences and resemblances of mountain plants between parts of New Guinea, he says something in his interesting paper in J. Biogeogr. 2 (1975) 87-101, but hardly does so here. Upon completion of the Flora (where localities are rather extensively indicated), a full analysis of distributions within the island can be made.

There is no index; the map on p. 312 with the 82 peaks is poor. Execution is not bad (if we disregard the lack of running heads), binding is good. Printed on better paper, the photographs would have been splendid. In short: for another half year of editorial attention and DM 50 more, geographers and biologists would have had a magnificent book.

Volume 2, Taxonomic Part: Cupressaceae to Poaceae, lxviii + 1232 p., fig. 33-392, phot. 79-112 (1979). Offset from typescript, cloth. DM 300.

It is not explained what system has been followed. Eleven families are treated; we are under the impression that all the monocots are covered. Looking in the Key for family 12, we don't find it, but the long list of Errata reveals that it is the Winteraceae: impression correct.

No introduction to the taxonomic part is given, to explain the scope of the work and growth of knowledge; volume 1 ch. 10 gives only the history of exploration. For each species, name and references are given, description in some 20 lines, type specimen, distribution with often

localities and collections, ecology, and notes. There are keys, and the figures are very well done.

The number of novelties I counted is 174, of which c. 150 new species, the remainder in other ranks. As the Index gives only families and genera (expletive deleted), it is worth mentioning that novelties occur in Eriocaulon (Erioc.), Agrostis, Anthoxanthum, Danthonia, Deyeuxia, Festuca, Poa (all Gram.), Agrostophyllum, Bulbophyllum, Calanthe, Ceratostylis, Corybas, Dendrobium, Epiblastus, Glomera, Glossorhyncha, Liparis, Medio-calcarr, Microtatorchis, Octarrhena, Phreatia, Platanthera, Sarcanthus, Spathoglottis (all Orch.), Kolowratia, Riedelia (both Zingib.). In his elegant coining of new names, author's grammar school education shows.

The total number is 395 sp. in 69 genera. If the typing had been done more compactly, the book would have weighed less than the present 1950 grams. To get an impression, I went to the Juncaceae, because Backer wrote these up in *Flora Malesiana* 1 4 (1951) 210-215. Here he is not cited under *Juncus* at all. Under *Luzula*, a curious-looking reference to Jansen, *Blumea* 24 (1979) 52g, leads us to page 529, where however *Luzula* as a genus is not dealt with, only *L. papuana*. Jansen comments that two forms may be distinguished, but that more material is needed; Van Royen is silent about this matter.

Backer gave *L. effusa* from 2100-3300 m and *L. campestris* var. *australasica* from 2000-3700 m, both rather wide-spread. Van Royen writes: "In New Guinea 2 species of which one only in the high altitude regions" (p. 818). Jansen placed the latter in *L. papuana* .... what happened to *L. effusa*?

Should we wish that Dr. Van Steenis had succeeded in stopping Van Royen (vol. 1: 315) who is a fine field botanist? It is too early to know, not too early to be alert. — M.J.

SHAW, H.K. AIRY, The Euphorbiaceae of New Guinea, 243 p., 8 pl. Kew Bull. Add. Ser. 8 (1980, recd. June; Royal Botanic Gardens, Kew, Richmond, TW9 3AB, England). Paper. f 15.

———, A partial synopsis of the Euphorbiaceae-Platylobeae of Australia (excluding Phyllanthus, Euphorbia and Calycopeplus). Kew Bull. 35 (1980, publ. Nov.), 577-700, 7 fig. Reprints available from above address. f 7.

This euphorb series was started with the species of Thailand (Kew Bull. 26: 191-363. 1971); then came Borneo (Kew Bull. Add. Ser. 4, 245 p. 1975; see page 2637). Largely similar in design, they provide keys to all taxa. The latter are dealt with in alphabetical order, with synonyms and descriptive, taxonomic, and ecological notes. Distribution is given in detail within, sketchily outside the covered area. A synopsis of genera under tribes is given for Borneo and New Guinea; *Antidesma* and *Galearia* are separate but included. *Macaranga* was extensively written up by T. C. Whitmore for Borneo and New Guinea; *Euphorbia* was done by A. Radcliffe-Smith (olim A.R. Smith); the 3 Australian genera had to be left out for lack of assistance.

Certain differences in editorial scope can be detected by comparison. Descriptions are missing for Borneo; identical ones are given for the genera in New Guinea and Australia, but for the same species they differ.

Later references to names are listed for Borneo and Australia, hardly for New Guinea. A few specimens are cited for Australia, hardly for the others. Typification is only given for Australia, but since quite a few Malesian species occur there, the Australian treatment has a bearing on Malesia. In each of the three memoirs taxonomic notes are given with different emphasis, they complement one another anyway.

Novelties from Borneo have not been listed or indexed, from Australia they are partially named in the summary on p. 577, from New Guinea they are listed on p. 221 but incompletely: add Euphorbia plumerioides vars. macrocarpa and microphylla, and Phyllanthus aphanostylis var. tristis.

There is a minor painful point I am stuck with. In the New Guinea introduction, Mr. Shaw writes to have dealt with c. 340 sp. in 80 genera for Borneo and c. 500 sp. in 48 genera for New Guinea. However, I counted in the Borneo memoir 427 sp. in 71 genera\* and in the New Guinea one 443 sp. in 54 genera; this must shake the conclusions drawn by Mr. Shaw from his own figures.

The Australian account deals with 165 sp., if it were complete it would cover c. 263 sp. in 45 genera. Of the 165 sp. treated, 140 occur in Queensland; 57 extend into Malesia (not all from Queensland and not all in New Guinea).

The outcome of a lifetime of work on this family by a great expert is most valuable, and we are very happy to learn that he means to produce similar memoirs for Sumatra and Celebes-Moluccas-Lesser Sunda Islands. Mr. Shaw has already very nearly put to order this big family for Malesia. Had the manpower been available to provide him with editorial assistance, perhaps a Flora Malesiana revision could have been ready by now.  
— M.J.

STEENIS, C.G.G.J. van, Rheophytes of the world / An account of the flood-resistant flowering plants and ferns and the theory of autonomous evolution, xv + 407 p., 47 fig. + 23 phot. (1981, Sijthoff & Noordhoff, Box 4, Alphen a/d Rijn, The Netherlands). Cloth. Dfl. 150, US\$ 75.

After young Van Steenis got physically in touch with rheophytes during swimming (p. xi), he made his career in the world's richest rheophyte area, and enjoyed the years to write it all up. Of this book can be said (like W.T. Stearn did, in a quotation, of Botanical Latin, p. vii) that it "makes no claim to be the last word on its subject: it is much closer to being the first one".

Previous words are indeed on record. Beccari in Sarawak (1865-68) cast his sharp eyes on these plants with their narrow leaves and in Nelle Foreste di Borneo of 1902 devoted a passage to the 'stenophyllous plants' of streambeds. However, Ridley published observations on them in 1893 (quoted on p. 58) and since these are clear and correct, the priority of the discovery must be acknowledged as his. Brandis followed (1906, from

\* For Borneo, 129 sp. are listed as endemics, 9 as doubtfully so; this makes c. 31%. For New Guinea, 295 sp. are listed as endemics; this makes c. 67%. For Borneo, I counted concentrations of species: Sabah has 294, Sarawak 281, E. Kalimantan 197, West K. 57, SE. K. 53, and South K. 14.

India, p. 54), then came Merrill (1914, from the Philippines, p. 63 and 1921 from Hainan, p. 57), then Burkill (1924, from Assam, p. 55), and Beumée (1924, from W. Java, p. 55), then Holttum (1927, from Malaya, p. 58); shortly thereafter Van Steenis during a trip to the Anambas and Natuna Islands (his first in Malesia), took up their study, and in 1932 coined the term 'rheophyte' (p. xiii) for plants which are confined to streambeds, below the high-water mark.

Rheophyte rivers are usually short, subject to sudden floods up to several metres which last a couple of hours to days (banjir, in Malay), the lower their altitude and the closer to the equator, the richer they may be. Except for the Podostemaceae, which have c. 250 sp. vs. 400 in all 67 other families together, they hate seasonal climates. They occupy a variety of niches (p. 22-28): cascades and rapids, gorges, riverbeds of rock boulders, gravel, pebbles, sandbars, banks and sand-submerged bottoms. One must have witnessed a flash-flood to appreciate its power (c. 30 times that of a hurricane) and the selection pressures it brings about; yet when it's over — leaving behind drift particles to as much as 7 m above the low water level — the plants emerge fully intact (p. 39). Nobody knows how the seedlings establish themselves (p. 59). When they have mysteriously succeeded, some clasp rocks with their roots so strongly that a block can be lifted along with the plant (p. 31). In addition, they often have a widely branched crown which may be flat-topped as if clipped, strong, tough branches, no indumentum, leaves conferted, (sub)sessile and narrow, firm, entire, with drawn-out apex, the inflorescence short (p. 31-42). Seeds vary, and are medium-sized.

While such plants are found in most parts of the world (not in the cold regions and not in truly oceanic islands), Indo-Malesia, as said, contains most: Borneo has 82 sp., Malaya 38, New Guinea 33, the Philippines 26, Sumatra 19, Java 7. Asia mainland is also rich; at a great distance follow Tropical America, Madagascar, and then the other parts (p. 74). New Caledonia is also rich. The best-represented families are Acanthaceae, Aponogetonaceae, Araceae, Euphorbiaceae (esp. *Antidesma*, *Phyllanthus*), Hydrostachyaceae, Lauraceae, Melastomataceae, Moraceae, Myrtaceae (esp. *Eugenia*), Podostemaceae, Rosaceae, Rubiaceae.

The 'Census' or annotated list of the c. 646 species, includes c. 250 'facultatIVES': plants which may be rheophytes but are suspected to occur outside the strict environment as well. Not included are the 250 Podostemaceae (named on p. 77-78) discussed on p. 80, 338-342, one wholly rheophytic family which by its large number of species would spoil all statistics. The Census covers 240 pages, giving species with literature, diagnosis, leaf index, distribution, ecology, selected specimens (alas, not indexed!), and notes (elaborated are those on *Homonoia* p. 241, *Hippophaë* p. 101, 227, *Nerium* p. 179 [probably the best-known rheophyte, through the ornamental *N. oleander*], and *Rotula* p. 209 ["a fervent rheophyte"]).

For all its comprehensive coverage and the great amounts of fact presented in it, the book is the first word on the subject in so far that it leaves most problems unsolved. Is there any relation between seasonality in rheophyte flowering and fruiting (if any) and seasonality of floods?

(p. 17). What is the effect of a flood on the rheophytes? (p. 39). How is the distribution in riverbeds to be understood in relation to seed size and dispersal patterns? (p. 39). Why are rheophytes so scarce in temperate regions? (p. 68). Lack of flash floods may be the reason, but how is this to be understood? Why are the rapids-loving Podostemaceae and Hydrostachyaceae so abundant in Africa and tropical South America but rare in Malesia? (p. 76). How to explain trans-Pacific areas of rheophytes? (p. 81). What is the crucial factor prohibiting cultivation? (p. 84). How about the restriction of rheophytes to the streambed? (p. 86).

Essential questions are answered, though: what taxa are actually rheophytes, where do they occur, and what do we know about them? Although Van Steenis made observations wherever he could, in Malesia and recently during journeys in South Africa and Australia and stimulated correspondents, the bulk of the data come from the archives of botany. Besides the 171 items of literature listed, Floras were scanned for narrow-leaved plants and ecological notes; clues were followed up in the herbarium, where field notes on labels often appeared to be pitifully meagre. From Malesia, with its long tradition of rheophytology, data are much more complete than from Amazonia.

As it is, plenty of interesting tidbits can be collected from the Census. All three rheophytic conifers are New Caledonian, and so is the only parasitic conifer. *Nerium* consists of 2 species. *Hippophaë* consists of one very variable species, with local rheophytic populations. *Homocia riparia* may be deciduous in a seasonal climate; it is planted against soil erosion. A few plants with compound leaves are rheophytic (p. 286). Like *Dipterocarpus oblongifolius*, *Ficus adenosperma* has narrower leaves on the lower branches. In Podostemaceae, the root-cap is oblique. *Myrmeconuclea strigosa* is associated with ants and has comparatively broad leaves. *Psychotria*, the largest genus of Rubiaceae in Malesia, has almost no rheophytes. *Planchonella rheophytopsis* is not a rheophyte, nor are 21 other narrow-leaved plants listed on p. 88. Thymelaeaceae by virtue of their silken bark fibre might make good rheophytes, but not one is found among them (p. 387).

Subspecific novelties from our region are: *Colysis acuminata* var. *fluvialis* (ferns), *Elaeocarpus glaber* var. *sphaeroblastus* (Elaeoc.), *Fagraea racemosa* var. *stenophylla* (Logan.), *Psychotria dubia* var. *affinis* (Rubiaceae).

Rheophytes are called 'a biological group', a haphazard assembly of taxa adapted to this very ancient, rough-going habitat which, however, gives them well-oxygenated water rich in minerals, plenty of light, and no biological competition. Their evolution is thought to have been 'autonomous', not always according to expectation (p. 100) but in their own headstrong manner, along the lines set forth on p. 98-142 and earlier in Gard. Bull. 29 (1976) 103-126 (see page 3163).

Now that the first words have been pronounced so well - production is good and firm, the photographs fine - much work can be done fruitfully. Especially for tropical America, the Census should be extended. Doubts are to be cleared up about the status of some rheophytes (some are accepted as true in bold type but not in the subsequent notes, e.g. *Couepia*,

*Ilex salicina*, *Maesa stenophylla*, *Microsorium pteropus*, *Podocarpus novae-caledoniae*). The basics of their behaviour are yet to be discovered.

A second Van Steenis the world may never see. But if a gifted botanist takes up the subject now and publishes his book 50 years hence (or earlier, we hope), it is bound to be an interesting one. — M.J.

Postscript: the book by S.M.HASLAM, River plants / The macrophytic vegetation of watercourses, xii + 396 p., fig. + 27 pl. (1978, Cambridge University Press, cloth £ 27.50 in U.K.) deals with the ecology of these plants in Britain, with notes on North America. It discusses various types of streams with their water regimes, resistance of plants to flow, and many other aspects, and may get researchers on rheophytes in tropical rivers many an idea on how to conduct such work.

#### BIOCHEMICAL MARKER IN CRUDE OIL

Chemists at the Chevron Oil Field Research Laboratories in California have found the saturated (hydrogenated) version of botryococcene, a hydrocarbon with the formula  $C_{34}H_{58}$ , up to 1% in crude from Sumatra's two main fields (1). This compound is only known to occur in a freshwater or brackwater green alga *Botryococcus braunii*, which leads to the assumption that this must have been one of the common sources of oil formation in the ancient coastal swamps (1). Prescott says (2) "that this highly buoyant, planktonic alga often occurs in blooms sufficient to give water an oily taste and a 'fishy' odour. In Scotland can be found an oil-rich *Botryococcus* coal that was formed by the accumulation of these plants in ancient seas." Fott (3) recorded it from sediments in lakes in the USSR, Germany, and South Australia. — (1) *New Scientist* 27 Nov. 1980: 576. — (2) C.W. Prescott, *The Algae: A review*. 1968: 61-62. — (3) B. Fott, *Algenkunde* ed. 2. 1971: 547. — C.G.G.J. van Steenis.