X. REVIEWS

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BALGOOY, M.M.J. VAN. 1997. **Malesian Seed Plants. Volume 1. Spot-characters. An aid for identification of families and genera.** 154 pp., numerous text figures. Published by Rijksherbarium/Hortus Botanicus, Leiden. ISBN 90-71236-31-5. Paperback. Price: NLG 50.

'Malesian Seed Plants, Volume 1, Spot-characters' is the first of three planned volumes. Volume 2 'Portraits of tree families' and Volume 3 'Portraits of non-tree families' that will contain brief characterizations of families, will be published separately in the near future.

Distilled within the covers of Van Balgooy's slim 154-page book is part of a lifetime's experience in the naming of Malesian plants. Spot characters are those useful features that stand out, and, being distinctive, add to the very special 'Gestalt' of a plant. They are essential for the naming of sterile or incomplete material, allowing one to circumvent tedious technical keys that require the boiling up of flowers, to discover whether the ovule placentation is axile or parietal, or whether the flower has other arcane details, difficult to see and understand. Those in large herbaria who sort incoming material build up with experience their own set of spot characters. At Kew, I have been responsible, with M. Coode for the sorting of material from the Malesian region. When stumped by a particularly teasing collection, we would first consult with our retired colleague, L. Forman, but if we still had no success, the specimen would then go into a box of mysteries in my room, waiting for the next visit of Van Balgooy. He seems to love to look at such mysteries, horrible though they often are, and he regularly makes uncannily appropriate suggestions as to what they may be.

This skill, built up over his career in Leiden, and including a significant heritage of teaching from the legendary trio of rapid determiners, C.G.G.J. van Steenis, R.C. Bakhuizen van den Brink Jr., and F.H. Hildebrand, is a rare gift indeed, shared by few botanists. Van Balgooy has now released part of the basis of his skill in Malesian Seed Plants, spot-characters. Here you will find lists of taxa (families, genera – and sometimes, even, species) with their family assignment, that share unusual characters. Thus all Malesian plants with winged seeds, or with glaucous leaves, or with opposite compound leaves, or with gland dots, or with scalariform venation, or with blue fruits (to give a mere sample of the 105 different characters included) are listed under the character. The characters are arranged logically and are easy to find. Most characters are illustrated with a botanical drawing, so that the characters are easily appreciated.

Van Balgooy is the first to admit that the lists of taxa under each character are incomplete (see his Introduction) (I have additions for monocarpy and ant plants, for example) and there is a nice challenge to the user to add characters and correct mistakes, and forward these to the Rijksherbarium. Based on herbarium experience, the characters are very much herbarium characters, and few distinctive field characters are included. All this is explicit in the introduction. The author's caveat aside, this is a wonderfully useful compendium of distinctive features and we should all feel privileged and grateful to Van Balgooy that he has shared his experience with us. As a reviewer all I can do is marvel at the richness of the data. Of course, I can find a few additions to taxa lists from my own special family, the palms. There are also some inconsistencies – for ex-

ample, *Heritiera* is illustrated as having a ridged fruit but is not in the list of taxa under this character. *Corypha elata* on page 12 is correctly *Corypha utan*. Under the same spot character (monocarpic plants) *Metroxylon* is cited; however, as *M. sagu* is caespitose it can scarcely be regarded as monocarpic, even though the growth of individual stems is terminated by the reproductive process, and single-stemmed *M. amicarum* is definitely polycarpic, producing a series of inflorescences throughout a long adult life (other single-stemmed species in the genus are indeed monocarpic). The user may also find that p.p. after some taxa, though absolutely correct, gives the wrong impression when the character is present in virtually all members of the taxon. Of course, all this will be clarified in Volumes 2 and 3, when they are published.

However, none of this nit-picking undermines the usefulness of the list. If I have any real reservations about the publication, they are to do with presentation, not content. It's a pity that there is not always much room to write notes on the page – after all, this is a volume destined to be annotated. I think the format is a little unimaginative (might it not have been printed at a size to slip in the pocket?) and the cover may end up being a trifle flimsy, and finally, I suppose, the price, at NLG 50.00, will seem quite a lot of money to potential users in the Malesian region for such a slim book. I hope it can be given away in quantity in Malesia. What next? Van Balgooy mentions the next two volumes, but also alludes to the possibility of using the spot characters to generate a computerized key. This is an obvious development that would allow the searching for combinations of spot characters and the successive elimination of families or genera. I hope that such a computerized version will be considered a priority, and perhaps then, via the Internet, the contents of the book may reach an even wider audience. The reviewer's advice is to order your copy immediately – this is a special book. — J. DRANSFIELD

DASSANAYAKE, M.D. & W.D. CLAYTON (Eds.). 1997. **A revised handbook to the Flora of Ceylon. XI.** 420 pp., 1 illus. A.A. Balkema, Rotterdam, The Netherlands. ISBN 90-5410-269-1. Hardcover. Price: NLG 150, c. US$ 85.00.

In this ninth volume a number of families have been treated quite straightforward. As there is only an opportunistic and no taxonomic relation among them, there is no general introduction or family key. It might have been noted that, apparently due to privatization, from this volume on copies are not so freely distributed any more (for which the reviewer hereby greatly thanks the former policy makers) but have to be bought at current market prices. Also it might have been pointed out for bibliographers that Amerind in New Delhi is co-publisher for Sri Lanka and India and that its issues are available a few months earlier than the Balkema copies. In this case this is of no importance, as there are apparently no novelties in this volume.

All families have a description sometimes followed by general notes or none at all. Where required keys to genera and species are given. Nomenclatural synonyms and literature references are given, the extent varying with the author. Typification is often very succinct: 'from India', sometimes specific collections are cited and where they are, and sometimes also where the holotype is. The taxa are provided with descriptions, distribution, ecology, some notes before or after the citation of specimens. The latter is only of use to future revisors, not to collection managers. It's a continuing mystery to

me why some flora managers require this. A name index is lacking, which makes itvery difficult to discover renamed taxa. I understand an index is to be published as a separate, final volume, which in such time-extended flora projects as these is a dangerous promise. With modern computerized manuscripts it would have taken a day or two for a typist to have provided one, which in regard to the fees and production costs would have been a negligible expense but which would have made the treatments so much more accessible. An interim index to the published volumes would be a boon!

There is only a single drawing, surely the archives of Kew and Peradeniya could have provided more than that.

This volume is another step to a better knowledge of the South Asian flora, and in view of the floristic connection of Sri Lanka to Malesia, an important step forwards. Just see which families have been treated here, of which the *Euphorbiaceae, Cucurbitaceae*, and *Malvaceae* are the most important ones: *Aizoaceae (Ficoideae*: 2 gen, 4 spp; F.R. Fosberg), *Cucurbitaceae* (19, 36 + several cultivated; D. Philcox), *Eriocaulaceae* (1, 21; S.M. Phillips), *Euphorbiaceae* (43, 135 + several cultivated; *Antidesma* included without comment; *Aporusa* accepted for *Aporosa*; D. Philcox), *Goodeniaceae* (1, 2; F.R. Fosberg), *Malvaceae* (15, 47 + several cultivated; D. Philcox), *Myristicaceae* (2, 5; D. Philcox), *Orobanchaceae* (4, 10; D. Philcox), *Plumbaginaceae* (1, 3 + 1 cultivated, not keyed out; K. Abeynayake), *Polygonaceae* (4, 20 + 1 formerly cultivated, not keyed out; D. Philcox), *Simaroubaceae* (3, 3; B.M. Wadhwa & A. Weerasooriya), *Stylidiaceae* (1, 1; B.M. Wadhwa), *Surianaceae* (1, 1; B.M. Wadhwa). — J.F. VELDKAMP

GRUBBEN, G.J.H. & S. PARTOHARDJONO (Eds.). 1996. **Cereals.** PROSEA 10. 199 pp., illus. Hardbound edition: Backhuys Publishers, Leiden. ISBN 90-73348-56-0. Price: NLG c. 125, US$ c. 80. — Low price paperback edition: PROSEA Network Office, Bogor. ISBN 979-8316-31-2. Price: c. US$ 10.

Grasses form one of the largest and economically the most important family of the flowering plants as several species provide the most important staple foods of the world. Civilization without cereals would be very, very different, if any. The concept is here broadened to include also some pseudo-cereals as *Amaranthus, Chenopodium*, and *Fagopyrum*, while *Cyanotis* is briefly mentioned.

The introduction describes the history of domestication, the social, cultural, economic, agronomical, and genetic aspects, and the various uses and applications. A brief morphological description of grasses is useful for a basic knowledge of the terminology of the family.

Then 20 important cereal and 3 pseudo-cereal crops are extensively described with the for PROSEA usual paragraphs on synonyms, vernacular names, origin, production, properties, botanical description, growth and development, notes, ecology, propagation and husbandry, diseases and pests, harvesting, yield, genetic resources, breeding, prospects, and a literature list. An analytic drawing of good quality is provided for each. Another 9 less important cereals are briefly discussed.Especially the notes on the origin, uses, and botany make fascinating reading.

There were no less than 29 specialist contributing to the good quality of this book. — J.F. VELDKAMP

HANUM, I.F. & L.J.G. VAN DER MAESEN (Eds.). 1997. **Auxiliary plants.** PROSEA 11. 389 pp., illus. Backhuys Publishers, Leiden. Hardcover. ISBN 90-73348-66-8. Price: NLG 215, c. US$ 110. Paperback (in 1999): Price: NLG 140. — For developing countries by end 1997 available from the PROSEA Network Office, Bogor. ISBN 979-8316-00-2. Price: c. US$ 20.

The format of the treatments of the 'plants' ('species' is a better term) in this part of the PROSEA series will be familiar by now. From the introduction: Auxiliary species are defined as those that form part of a land-use system and provide a service and/or a product that is secondary to the main outputs of a system. Those included in this volume are an odd array; what they have in common is their role in agriculture and forestry. They do not deliver primary products, but assist the farmer or forester to better produce such products. They provide a service role: mulch, shade, shelter, cover, manures, fallow crops, live fences and wind-breaks, nitrogen fixation, erosion control, water-clearing agents. Fuel woods are included here as well. Of course species with other primary uses may often function as an auxiliary crop, such dual roles make it difficult to assign them to a particular commodity group, e.g. timber also used as fuel or fodder, and so some species treated here have been included in the volume on forages, too. The economic value of auxiliary species is difficult to estimate, use is local and so quantitative monetary figures usually cannot be entered in national statistics; take for instance the use of fuel wood (c. 1 cubic m/person/year) and many species are multi-purpose in traditional agriculture, anyway.

So, what we have here is a kind of tombola and I have the impression that some species are optimistically included, e.g. the grass *Desmostachya bipinnata* is a very rare species in SE Asia and known from a single collection in Malesia, only (Bali!, would there be a connection with Hindu rituals for its occurrence there? Any data and additional collections would be very much welcomed!). Curiously I've never seen a ripe fruit of it, so propagation must be vegetative only. *Vetiveria zizanioides*, treated under essential-oil plants is much more important as a soil-binder and an anti-erosion species. *Digitaria fuscescens* may be suitable as a soil binder, but it develops into a noxious weed, so it is hardly to be recommended. *Phragmites australis*, the common reed, does not occur in the tropics, what we have is *P. vallatoria* (*P. karka*). One would hardly recommend the tough and spiny *Spinifex littoreus* for cultivation, except in the stabilization of dunes. The legume *Centrosema pubescens* is extensively treated (p. 92), but no mention is made of the suggestion by G.F. van der Meulen in a Dutch Newspaper (NRC/AH, 22 April 1972, front page!; 26 August 1997) that it would put moisture back into the soil by catching dew, while also binding atmospheric nitrogen. A thing to be looked into! — J.F. VELDKAMP

KEAST, A & S.E. MILLER (Eds.). 1996. **The origin and evolution of Pacific Island biotas, New Guinea to Eastern Polynesia: Patterns and processes.** vi + 531 pp., 75 tables, 143 fig., 51 col. plates. SPB Academic Publishing bv, Amsterdam. ISBN 90-5103-136-X. Price: NLG 365, US$ 228.50.

This beautifully produced book is a bit expensive (about half a US dollar per page), but it is worth every cent of investment. It comprises the proceedings of two symposia with additionally invited authors to fill up the last gaps in a series of topics varying be-

tween the geological history of the region to the present-day changes induced by man. The geographic area covered by the book has not been discussed anymore since 1963 (J.L. Gressitt, ed., Pacific Basin Biogeography), while our knowledge of the region has increased greatly in especially the last few decades. Recent comparable works have been published for adjacent regions (New Guinea, Australia, New Caledonia, Indonesia, etc.). Therefore, the book fills up an important gap in our present-day knowledge.

The topics are arranged in three themes, which start after an introduction by Keast and Miller, and a tribute to Ernst Mayr as one of the modern pioneers of Pacific biogeography.

The first theme, "Origins and development of islands and their biotas," covers the geological history of the region and several examples of flora and fauna development on some of the island groups. The quality of all 9 chapters is high, but especially the geological reconstructions produced by Kroenke stand out. They cover the tectonic changes of the last 150 Ma years and they can easily be converted into a short movie showing all plate movements. Other chapters show the development of the Hawaiian islands, several island arcs and the changes during the Quaternary. Flora and fauna development are discussed in general in two chapters and examples are given for Krakatau, the Galapagos islands, and Norfolk island near Australia.

The second theme, "the Pacific islands floras and faunas: New Guinea to Eastern Pacific and Wallacea," comprises 15 chapters. They mainly show distributions of plants and animals, which are often explained in cladistic terms of vicariance and dispersal. The first six chapters concentrate on plants, showing general patterns, but also patterns of selected plant families which are difficult to explain (*Proteaceae, Myrtaceae, Nothofagus, Coniferales*, and *Cycadales*). The next 7 chapters do the same for animal taxa (*Lepidoptera*, Cicadas, snails, birds, mammals, amphibians, and reptiles). The last two chapters concentrate on the influence of man and special attention has been paid to conserve the Pacific biota against that same influence.

The last theme, "patterns and processes: ecological and evolutionary basis," comprises a summary of the book in two chapters. In both chapters the editors provide, next to general summaries, summaries per geographical region in the Pacific. Miller mainly concentrates on terrestrial invertebrates, while Keast covers all topics discussed in the book.

The publisher has spared no costs in producing this beautiful book. The hard cover shows an attractive 'satellite view' of the Pacific Basin with four continents, the ocean floor relief, sea floor spreading and the 'ring of fire' surrounding it. The printing is of superb quality, not only the text, but also all plates, whether they are diagrams, black-and-white photographs, or colour plates. It will take a while to digest the content of all chapters, but the book has amassed an enormous amount of data, reading of which is a must for at least everybody somehow involved with aspects of the Pacific region. Even the lay-man will find most chapters easy to read and interesting. — P.C. VAN WELZEN

LEMMENS, R.H.M.J., I. SOERIANEGARA & W.C. WONG (Eds.). 1995. **Timber trees: minor commercial timbers.** PROSEA 5 (2). 655 pp., illus. Backhuys Publishers, Leiden. Hardcover. ISBN 90-73348-44-7. Price: NLG c. 225, US$ c. 135. — Low price paperback edition: PROSEA Network Office, Bogor. ISBN 979-8316-18-5. Price: c. US$ 20.

Most trees in SE Asia are of minor importance, together they have a large impact on the communities that use them. The major commercial trees may enter the statistics of the national economy, the minor ones are used locally and don't. In day-to-day use they have a great significance, but usually too little is known about them, and it may well be that because of the fixation of the lumber companies on the 'major' species, the value of the 'minor' ones is much overlooked. 'Red Meranti' (*Shorea spp.*) used to be considered as inferior timber species, now they are logged out of extinction because of their prized value as 'tropical hardwoods'. The present volume in this series aims to bring the 'minor species' into the limelight: c. 62 genera are treated by 60 specialists, followed by a selection of the 'major' species, about 800. An extensive literature list (747 items) guides the interested reader to further information. To facilitate identification descriptions of the wood anatomy with 3 anatomical photographs have been provided as well as the usual drawings of habit, leaves and inflorescences and infructescences for representative species. A chapter ('table', p. 516–535) lists their wood properties, from which it becomes evident that data are often based on very few observations, so a lot of further research is required. — J.F. VELDKAMP

MACKINNON, K., G. HATTA, H. HALIM & A. MANGALIK. 1996. **The ecology of Kalimantan.** The Ecology of Indonesia Series 3: xxiv + 802 pp., illus. Periplus Editions (HK) Ltd. ISBN 0-945971-73-7. Price: UK £ 50.

Most of what Van Balgooy has said in his review of volume 2 (Whitten et al., Ecology of Java and Bali; see below) applies here as well. The format is somewhat different. The first chapter sketches the general abiotic and biotic background of this third largest island of the world. Chapters 2–7 discuss the various vegetation types from the shores to the summit of Kinabalu, the highest peak (4100 m and rising) between the Himalayas and the mountain ranges of New Guinea. Chapters 8, 12, and 13 are dedicated to the human impact, while Chapters 9–11 enumerate the various resources from the forest, wetlands, and coastal areas. The relation between development and the environment is discussed in Chapter 13, while the tricky problem of conservation is laid out in Chapter 14. There is an extensive bibliography and index (The part after 'Vines' is absent in the L copies).

It is hard to review works like these. They are more like encyclopedias and not books to read, but rather to browse through, starting with one subject and reading on. The style is clear and addictive. Wherever opened at random interesting tidbits are met and the authors are to be praised for their grasp on the many subjects and their wide-ranging reading. As the books are written for a lay public as well as a more specialistic one, the various chapters can be used for teaching purposes in tropical botany and all its facets.

Some completely irrelevant subjects pop up that make an interesting read, e.g., on page 637 it is mentioned that the formerly common tree *Calvaria major* (= now *Sideroxylon sessiliflorum, Sapotaceae*) has not produced seedlings since the dodo became extinct some 300 years ago. Mabberley (1987) tells us that "turkeys (have been) force-fed & germination enhanced (but introd. monkeys also eat unripe fr.)."

It must be noted that the title of the present volume is somewhat misleading as many discussions and examples are based on observations and experiments made in Sabah

and Sarawak, but this makes the book even more valuable on a general scale. It's too bad that this is not reflected in the maps.

The presence/absence of elephants is an interesting subject: presently they occur only in a small area of Sabah and NE Kalimantan. Fossil teeth have been found, on the other hand it is suggested that they have escaped from a menagerie of the Sultan of Sulu. I was once told (by whom?) that they had escaped from a circus that had burned down. The original prime dipterocarp forest is not much to their liking (p. 230), as they prefer foraging on disturbed and secondary forests, edges and open clearings, of which there used to be very little, browsing on palms, grasses (incl. bamboos), and bananas. Still, they are known to travel great distances. With all the present-day destruction of the primary forest going on, why don't they now spread rapidly? Too dense a human population, perhaps?

The absence of tigers is also puzzling, as with the elephant fossil teeth have been found, but of these it is stated here that they may have been imported (p. 306). Why not tusks as well? On the other hand when the Sunda shelf was dry, its interior was much drier than it is now (e.g. p. 18–21) and would have provided the necessary niches for elephant and tiger. Several distribution patterns of plants support the idea that a savanna connection was present at some time between SE Asia and Borneo, e.g. the grasses *Apocopis collinus* which occurs in Thailand and Vietnam, and then Aceh, Sabah, and Kalimantan (Kuala Kurun, Banjarmasin), *Eriachne triseta* of SE Asia, Malay Peninsula, Sumatra, N Borneo, Palawan, Culion, Luzon, Aru Islands, Merauke and West Province of Papua New Guinea, and Australia, *Leptochloa malayana* of Thailand, Kedah, and Banjarmasin.

The book several times points out the fundamental differences in the soils of Borneo and Java. In general those of Borneo are poor, hence the low density of the original human population. This minor point has apparently escaped the proponents of transmigrations, as the transmigrants have found out to their cost. — J.F. VELDKAMP

SOEPADMO, E., K.M. WONG & L.G. SAW (Eds.). 1996. **Tree flora of Sabah and Sarawak 2:** x + 443 pp., illus. Forest Research Institute Malaysia, Kepong, 52109 Kuala Lumpur, Malaysia. ISBN 983-9592-56-4. Price unknown.

Soon after volume 1 we have now volume 2. Next to the *Anacardiaceae* with 95 spp. (by K.M. Kochummen), *Loganiaceae* (57; K.M. Wong & J.B. Sugau), and the *Sapindaceae* (62; F.A.C.B. Adema, P.W. Leenhouts & P.C. van Welzen, Eds.) it contains *Boraginaceae* (9, incl. *Pteleocarpa*; A.L.D. Awa), *Caprifoliaceae* (8; N.W. Haron), *Casuarinaceae* (4; R.S. Pungga), *Chloranthaceae* (4; J.B. Sugau), *Crypteroniaceae* (10; J.T. Pereira), *Ctenolophonaceae* (1; R.S. Pungga), *Daphniphyllaceae* (2; B. Perumal), *Epacridaceae* (4; S.P. Lim), *Erythroxylaceae* (4; R.C.K. Chung), *Ixonanthaceae* (2; R.S. Pungga), *Leeaceae* (7; A.M. Latiff), *Lythraceae* (7; P.C. Yii), *Malvaceae* (13; B. Perumal), *Myricaceae* (2; A. Noorsiha), *Nyctaginaceae* (9; A.M. Latiff), *Santalaceae* (6–9; L.S.L. Chua), *Scyphostegiaceae* (1; E.J.F. Campbell-Gasis), *Tetrameristaceae* (1; J.B. Sugau), *Ulmaceae* (10; E. Soepadmo & Z.E. Hamli), and the *Winteraceae* (1; K.M. Wong). Beautifully executed and another important step in this series. — J.F. VELDKAMP

SUHENDANG, E., C. KUSMANA, ISTOMO & L. SYAUFINA (Eds.). 1996. **Ekologi, ekologisme dan pengelolaan sumberdaya hutan (gagasan, pemikiran & karya Prof. Dr. Ishemat Soerianegara).** Jurusan Management Hutan Fakultas Kehutanan IPB. (In Indonesian).

A book to commemorate the late Dr. Soerianegara containing a compilation of his publications and his ideas on the management of the forestry in Indonesia.

Soerianegara was the proponent of ecologism, which he believed should become the basis of environmental management or even broader, the whole of human activities. Ecologism covers the ecological philosophy underlying the basic concept or ideas on ecology and the ecological ideology which transforms a philosophy into concrete and systematic activities which will become a general guidance for society to behave ecologically in every aspect of its activities.

It also contains the articles of his former students and friends on Tebang Pilih Indonesia (selected cutting), silviculture, ecology, and tree breeding. In addition a short biography and an article about him was written by his wife and children.

For an obituary see Fl. Males. Bull. 11 (1996) 496. — S.S. TJITROSOEDIRDJO

WHITTEN, T., R.E. SOERIAATMADJA & S.A. AFIFF. 1996. **The ecology of Java and Bali.** The Ecology of Indonesia Series 2: xxiv + 969 pp., illus. Periplus Editions (HK) Ltd. ISBN 962-593-072-8. Price: UK £ 50.

This is the second of a planned series of seven volumes on the ecology of Indonesia. The first two on Sumatra (vol. 1, 1985) and Sulawesi (vol. 4, 1987) were reviewed in Fl. Males. Bull. 10: 193 and 444.

The quality of the first two volumes have led to great expectations about the ensuing ones and I have certainly not been disappointed about the present volume. The more so since, whereas Sumatra and Sulawesi may be larger in size, much more has been written about Java and Bali which pose much larger ecological problems owing to the much more serious population pressure.

The book consists of five main themes, each discussed in a series of chapters.

Part A deals with Ecological Concerns and Principles with extensive statistics on land use, population density, carrying capacity, climatic data, tourism, etc.

Part B discusses Ecological Components: geology, soil, hydrology, climate past and present, flora and vegetation, fauna, and human background.

Part C covers the various ecosystems, such as mangroves, lowland rain forest, estates, etc. as well as the influence people have upon them.

Part D is devoted to Conservation issues, with an interesting survey of existing and potential conservation areas and their problems.

Part E finally discusses Finding a path for the future, advocating a strong personal ethic to safeguard the environment for future generations.

A bibliography of nearly 3000 references and a subject index concludes the book.

The amount of information the authors have brought together in this volume is astounding, the more so since it is based for a great deal on references not easily available. Reading all the chapters is too tall an order and I have had to make a selection. The relative floristic paucity of Java is a generally recognized fact. The proportion of

endemism compared to the other Indonesian islands is low, certainly at genus level. One of the four remaining endemic genera has in the meantime been reduced: *Grisseea (Apocynaceae)* proved to be a synonym of *Parsonsia* (Middleton, Blumea 42, 1997, 200). The authors adhere to the generally accepted idea that the paucity of the biodiversity of Java is to be ascribed to volcanic activity and human pressure. Although these factors probably played a role I wonder if the real reason could be that Java at the far end of the Sunda flat just had not been reached by many taxa before it became isolated.

A list is given of the known endemic species of Java and their status. Not surprisingly many belong to the *Orchidaceae*, the best documented family of Java thanks to Backer & Bakhuizen van den Brink f.'s Flora of Java (1963–1968), and Comber's Orchids of Java (1990)

The treatment of the various animal groups is interesting and alarming at the same time. Not only larger animals (tigers, rhinos, and banteng) have become scarce or have disappeared altogether but various other groups have declined. From personal experience I know that many bird species have all but disappeared. Trapping of birds is said to have played a role (p. 233) which is certainly true for species such as the Java sparrow (*Padda oryzivora*), Bali starling (*Leucopsar rothschildi*) and the two species of jungle fowl (*Gallus gallus* and *G. varius*), but I wonder about the role of herbicides in the extermination of birds. On p. 216 it is stated that the Java pig (*Sus verrucosus*) is very common in the hills above Bandung, an area that I know like the back of my hand. The only species of pig occurring there is the common wild boar (*Sus scrofa*)

T he loss of plant ecosystems is equally alarming, but whereas replanting schemes of mangrove have been set up and teak forest have of old been maintained, nearly all of Java's lowland rain forest has completely disappeared. The discussion of the remaining patches is interesting reading. I missed mention of the forest patches near Lengkong (South of Sukabumi). Curiously the largest block of remaining lowland rain forest is not a gazetted conservation area: the island of Nusa Kambangan which falls under the jurisdiction of the Department of Justice.

T he ecological problems of Java and Bali are serious. Politicians, residents, and also tourists should read the final chapters of this book: "... something is intangibly wrong with Java and Bali ... the ultimate result could be irreversible loss or degradation. To deal with this effectively demands focussed attention and broad unified participation ..." In this connection I was interested to read the remark about golf courses on p. 43. Despite being an avid golfer myself I cannot help agreeing with the authors to regret the boom in golf courses on Java.

A few critical notes have to be made, although they in no way detract from the value and quality of the work.

The use of names is not always consistent: *Bombax* next to *Salmalia, Myrsine* and *Rapanea*. Spelling of names is often incorrect. In the figures scale bars are not consistently shown. In the bibliography several references, especially of Dutch literature, contain many spelling errors.

Despite these shortcomings this is a book that everyone interested in the ecology of the area should have. Dr. Whitten and his team are to be warmly congratulated on a job well done. — M.M.J. VAN BALGOOY