VI. MISCELLANEOUS INFORMATION

a) Research and Publications *(continued from page 3012)*

Fascicles of Flora of India. The first fascicle of this new Flora of India was issued by the Botanical Survey of India in 1978. It contains the treatment of Coriariaceae (2 sp.) and Paeoniaceae (1 sp.), both by Dr. M.A. Rau, in all 8 printed pages, each family illustrated by one full-page plate.

The treatment is the usual one in a Flora, with descriptions and keys, synonymy etc., in a concise form, the descriptions occupying 6-9 lines of print. Headings under each species are: citation of the type, flowering and fruiting months, distribution, uses, chromosome numbers, and notes. There is a lamentable lack of any entry on ecology (except altitude and flowering & fruiting time).

For future issues manuscripts on Annonaceae, Dilleniaceae, Magnoliaceae and Ranunculaceae are said to be in the final stage of completion.

In the introduction it is explained by the director, Dr. S.K. Jain, that the Flora of India will be brought out in four series:

1) Flora of India of which the above is the first issue. It is estimated that it will ultimately deal with 15,000 species of vascular plants. The minimum contents of each fascicle are either a family, or an account of one or more genera, having about 25 species.
2) State Flora analysis. These are catalogues or check lists.
3) District Floras. Local Floras with descriptions and keys. The Flora of Jowai District, Meghalaya, is in print.
4) Special Publications. Monographs, accounts of non-vascular cryptogams, or any floristic accounts not covered by other series.

We wish to endeavour success with its progress; a very large task looms ahead. — Van Steenis.

A Synoptic Flora of Mysore District by R. R. R a o, c. 400 p., is being published by Today & Tomorrow, 24 B/5 Original Road, Karol Bagh, New Delhi, 11 00 05 India; tentative price US$ 25.00.

Dr. K. H a u s h e r r, a geographer of the Südasieninstitut, Box 10 30 66, Heidelberg, B.R.D., made a study on the management of dipterocarp forest in the Philippines. An English version of the German text is scheduled to appear as Geoecol. Research vol. 4.

Mr. P. F. C o c k b u r n reports that the Forest Flora of Sabah volume 2 is in the press.

Dr. J. M e t z n e r of the Südasieninstitut at Heidelberg took his Ph.D. at Heidelberg on a thesis 'Agriculture and population pressure in Sikka / Flores'. A short paper in German was printed in Geogr. Zeitschr. 65 H4 (1977) 264-282.

Subhash C h a n d r a, Botany, Lucknow, 22 60 01 India, took a Ph.D. with Professor P. M. Z a m o r a, University of the Philippines, Diliman, on morphology of drynarioid ferns. Many characters of 15 sp. in 7 genera led to the proposition of two new tribes: Drynarieae with Drynaria and Photinopteris, and Aglaomorpheae, with Aglaomorpha, Drynariopsis, Merinthosorus, Pseudodrynaria and Thayeria, with Latin diagnosis.

At the Institute of Southeast Asian Studies, Cluny Road, Singapore 10, Mr. R. O. W h y t e is studying the evolving biogeography of innermost Asia and the eastern parts of the People's Republic of China. Particular attention will be given to the evidence for the prehistoric and recent evolution of the biological ecosystems in the relict areas in Tibet (especially Ching-hai plateau) and in those parts of southern China which ecologically compose the northern limits of southeast Asia.

An attempt will be made to calibrate the progressive palaeoclimatic, biogeographical and anthropological effects of Himalayan orogeny in innermost Asia to the north, and also in the now populated regions of eastern China. Related to this has been the publication of a short article, 'Asian droughts: past, present and future' in China Trade Report (published by the Far Eastern Economic Review) for March, 1978 (embracing southeast Asia as well as China); also the acceptance of a paper entitled 'The initial causation and subsequent periodicity of droughts in China', for the First International Conference on Climate and History, Norwich, England, July 1979; also the presentation of an invited paper on the biomes of the Himalaya at a conference on mountains convened by the Institute of Ecotechnics (USA) in Kathmandu, Nepal, December 1978.

A continuing study of the archaeology, evolution and present status of Gramineae, wild and cultivated, has led to (a) the completion of a manuscript for Asian Perspectives (Hawaii) on the Gramineae of western monsoon Asia; (b) presentation of invited paper on the annual crops of south and southeast Asia at the Xth ICAES post-congress symposium on Indo-Pacific Prehistory at Deccan College, Poona, December 1978; and (c) collaboration with the Smithsonian/Kew/CSIRO team producing a new flora of the Gramineae of Sri Lanka, by providing a historical/ecological analysis of the recorded genera and species in relation to geobotanical factors, including the rafting of the South Asian Plate and its biological cargo of primitive plants and animals from the southern to the northern hemisphere.

Frost in the tropics was the title of a paper by C.G.G.J. van Steenis of 1968, which touched off new enquiry. Now Dr. H. J. v o n L e n g e r k e of the Südasieninstitut, Box 10 30 66, Heidelberg, B.R.D. has studied the phenomenon in Ceylon, where the tea suffers badly from it. His many observations were published (in German) in Erdkunde 32 (1978) 10-28 and (in English) in Agricultural Meteorology 19 (1978) 1-10.

Flora of Thailand vol. 2 part 4 containing treatments of Ebenaceae, Elaeocarpaceae, Simaroubaceae, Symplocaceae and some minor families are sent to press. Expected to be published in 1979. Volume 3 part 1 containing the first part of the ferns is nearly ready from the printer; part 2 was expected to be sent to press ultimo 1978. This volume is planned to comprise all fern and fern-allies treated by K. Iwatsuki. Several other large manuscripts are finished as e.g. Caesalpiniaceae, Cyperaceae, and Mimosaceae. Printing of these are to start in 1979.

The Brisbane Herbarium reports:

S. B. A n d r e w s, Handbook to the Ferns and Fern Allies of Queensland is expected to be published in 1979. This will be a comprehensive account with detailed line drawings of all 375 species (120 plates) as well as descriptions and keys.

T. D. S t a n l e y, E.M. Ross, S.T. Reynolds & L. Pedley, Handbook to the Flora of South-eastern Queensland. Volume 1 (Dicots - Casuarinales to Sapindales, Melchior 1964) will be completed in 1979. Work has started on volume 2 (Dicots - Celastrales to Campanulales) with contributions by N.B. Byrnes (Myrtales) and L. Pedley (Asteraceae), and on volume 3 (Monocots) by P.R. Sharpe (Cyperaceae) and B.K. Simon (Poaceae). The remainder of the accounts of families of volumes 2 and 3 are being prepared by Mr. Stanley and Mrs. Ross.

S. T. R e y n o l d s & L. P e d l e y, A revision of Atylosia (Fabaceae) in Australia. Taxonomic work has been completed but problems in generic limits have still to be resolved.

H. E. K l e i n s c h m i d t & R. W. J o h n s o n, Weeds of Queensland is presently with the printers and will be published in 1979.

B. K. S i m o n, A preliminary Check-list of Australian Grasses was as Botany Branch Technical Bulletin no. 3 in September 1978. A manuscript of A Key to the Grasses of Queensland is well advanced and will be issued as a Technical Bulletin early in 1979. Work has started on an Australia-wide revision of Aristida but not much progress has been made. A chapter entitled 'The Biogeography of Australian Grasses' in conjunction with Dr. H.T. Clifford, University of Queensland, has been submitted to the editor of the forthcoming Biogeography and Ecology of Australia to be published by Dr. W. Junk late in 1979.

Professor Daniel H. J a n z e n, Leidy Lab 67, University of Pennsylvania, Philadelphia 19104, U.S.A., has submitted a manuscript on food abundance for small tropical birds to a Symposium on Migrant Birds in the Tropics, edited by E.S. Morton & A. Keast, Zoological Park, Smithsonian Institution, Washington, D.C. 20560, U.S.A.

Outbreak of flush provides food for caterpillars which, however, left the birds rather indifferent; several hypotheses are examined. Observations in Malayan rain forest already mentioned in Janzen 1977 (see Bibliography) are now quoted for further interpretation of bird biology.

Tree Flora of Malaya volume 3, edited by Dr. Francis S. P. N g (KEP), was expected from the press in December 1978, a slimmer volume than its predecessors, and slightly more expensive; publisher is Longman Malaysia. It contains the families Aquifoliaceae, Araliaceae, Bignoniaceae, Casua-

rinaceae, Connaraceae, Cornaceae, Ebenaceae, Ericaceae, Icacinaceae, Moraceae, Myrtaceae, Ochnaceae, Styracaceae, Symplocaceae, Theaceae, Verbenaceae, and Violaceae. Work on volume 4 is in progress.

At Kepong, Mr. K. M. K o c h u m m e n is revising the Pocket Check list of Timber Trees in Malaya, expected to appear in the course of 1979.

At the Missouri Botanical Garden, Mr. H. A. R o d r i g u e z - C a r r a s q u e r o is working on the generic delimitation in Sapotaceae, on leaf and pollen characters. A concise treatment of the Neotropical genera is in the press.

At Harvard Forest, Petersham, Mass. 01366, U.S.A., Dr. P. B. T o m l i n s o n is finishing another volume in the series Anatomy of Monocotyledons.

His paper on floral biology in mangrove Rhizophoraceae is expected in Biotropica, and with the aid of collaborators he hopes to develop a chemotaxonomic understanding of Rhizophora.

He also has started a survey of stem vasculature in Araceae.

A subdivision of the Indo-Chinese peninsula, a peaceful one, that is, has been prepared by Dr. J. E. V i d a l, Phanérogamie, 16 Rue Buffon, Paris, France. It consists of a sketch map which outlines 17 numbered provinces in Cambodia, 16 in Laos, 38 in Vietnam, followed by a 4-page index to the various synonyms and pro parte's. It was received in December 1978; Dr. Vidal may be willing to send copies on request.

Dr. T. C. W h i t m o r e kindly sent a Project Register of the Commonwealth Forestry Institute, Oxford, Unit of Tropical Silviculture. For Malesia. it is important that work on Agathis is continued: seed physiology, resin, field trials, scanning electron microscopy, and vegetative propagation. Also rain forest ecology is studied: recovery after exploitation, biology of fast-growing species, rain forest conservation and management.

A forestry paper on Gmelina asiatica is in revision.

Dr. B. V e r d c o u r t of Kew is in the process of correcting proofs of his Manual of Leguminosae of New Guinea. It is expected to appear as a Lae Botanical Bulletin.

An 8-page, loose-insert supplement applicable to both the original 1973 printing and the 1977 reprint of Aquatic Plants of Australia by Helen I. A s t o n, reviewed on *page 2208*, has been prepared. It contains updated information on Australian aquatic plant taxa, together with a bibliography, and is automatically included with each copy of the reprint. Holders of the 1973 printing may obtain a copy of the supplement free of charge from Melbourne University Press, Box 278, Carlton South, Victoria, Australia 3053.

Self-addressed envelope (10 x 7 inches) must accompany application.

Gardens' Bulletin, Singapore. The Indexes to vols. 27, 28 and 30 are in the press. They are available to all who have obtained these volumes. Botanical Gardens, Cluny Road, Singapore 10.

At the Botany School, South Parks Road, Oxford OX1 3RA, England, Ms. Camilla H u x l e y has embarked on doctoral studies of evolution and taxonomy of the ant-associated epiphytes Hydnophytum, Myrmecodia, Myrmedoma, Myrmephytum and Squamellaria, all Rubiaceae.

b) Herbaria, Gardens, Organizations *(continued from page 3017)*

The Role and Goals of Tropical Botanic Gardens, proceedings of a symposium held at the opening of the Rimba Ilmu Garden in Kuala Lumpur in 1974, edited by B.C. Stone, was published in mid-1978, by the University of Malaya, Kuala Lumpur 22-11 (price unknown). It is well-produced, viii + 249 pages, and contains a motley of 27 papers which together entertainingly cover the subject. Authors received a few reprints from cut-up copies, so presumably interested people must purchase the whole book; we can therefore as well review it in its entirety.

The Ilmu Rimba garden is located in a valley near the University campus, and 40 ha in area; the site was formerly a rubber plantation. Its soil types are described in the Closing address, where also a map is given.

Section 1 contains 4 papers which together give quite a few historical notes on gardens in Thailand, India, and the Philippines. In Thailand, the Phu Khae B. G. 130 km N of Bangkok, was begun in 1941. It is 288 ha in area, at 50 m altitude, in a remnant of dry evergreen forest of Dipterocarpus alatus; it harbours 650 species. The second, Khao Chong B. G. is 20 km N of Trang in the Peninsula, was founded in 1968. It is 160 ha in area, at 100 m altitude, and in a rain forest region. As for the Philippines, the Makiling Gardens are near Los Baños, was established in stages. It is delineated in a forest reserve, 615 ha in area, at 100-600 m, in a seasonal rain forest climate. About 270 ha is said to be natural forest, 318 ha is arboretum. It is a multi-purpose garden, near the Agricultural College. The Philippine National Botanic Garden, at the U. P. Land Grant, c. 100 km E of Manila, is c. 1000 ha in area, at 450-600 m altitude in a hilly area once under rain forest (which during a visit in 1973 was found badly depleted). It has lodging facilities for researchers.

Section 2, on Research Opportunities, contains 6 papers. One reports on leaf structure, giving a list of species which have a 'Kranz' type of anatomy, and a list of those which don't.

Section 3 contains 8, mostly phytochemical, papers, giving much fact and many formulas; especially that on Rutaceae of Malaya is interesting, since it reports on a systematic examination of species taxonomically studied by B.C. Stone; in a few, anti-tumour activity was established. Another paper is devoted to Zanthoxylum wherein, of course, the taxonomists' ideas were again confirmed; 87 references are given. A 15-page paper reports on investigation of various minor plant products at the Lucknow Gardens, India. A paper on phenolics in Manihot gives many original data in tabulated form.

Section 4 contains 8 papers, one of which approaches the complex problem of Orchid conservation in an articulate and intelligent manner, to be continued at the 8th World Orchid Conference at Frankfurt in 1975. Two

papers deal with the role of gardens in the introduction of commercial crops. A list of durations from flower to fruit in 93 species of Malayan trees brings welcome data on this almost unknown subject. Hopes expressed in some papers that gardens will have a role in the conservation of species are dashed in another where it is concluded that gardens are unfit for conservation. They are, however, very fit for education, alluded to in several papers, and discussed in a special paper at the end. An addendum gives phytochemical notes on some species in the garden, with their location. Altogether, a nice volume to realize limits and possibilities of a garden, the latter in the majority.

Flora Malesiana and Malesia. In September 1978 Prof. Dr. C. K a l k m a n, Director of the Rijksherbarium, and Dr. W. V i n k, head of the Rijksherbarium group for Tropical Phanerogams, visited several countries in South East Asia. Apart from making acquaintance with persons interested in the Flora Malesiana, the purpose of this visit was to explore the possibilities of the involvement of more researchers from Malesia in the production of the Flora. At that time only four researchers (in Malaysia and Singapore) were active in this field.

The following is a summary of the full report.

in SINGAPORE, where Prof. H. K e n g is engaged in the revision of the Theaceae for the Flora, the discussions centered around the position of the Herbarium. This valuable asset to Malesian botany lost its hinterland when Singapore became an independent republic and accordingly the scientific staff decreased to the absolute minimum of one scientist. However, Commissioner Wong Yew Kwan stated that the Republic of Singapore will continue its contribution to international research by garding this national heritage, keeping it available for researchers, and by considering active contributions in the future.

In MALAYSIA Kuala Lumpur, Serdang, and Kepong were visited. Dr. Ruth K i e w (Universiti Pertanian) is revising the Oleaceae for the Flora, Prof. Dr. E. S o e p a d m o and Dr. B. C. S t o n e (Universiti Malaya) are working on the Bombacaceae and Pandanaceae, respectively.

Teaching is the primary duty of taxonomists in the universities, but taxonomic research is certainly not neglected. The Forest Research Institute is involved in the Tree Flora of Malaya project for the years to come.

From the discussions emerged a general interest in broadening the participation by Malaysia in the Flora Malesiana project. The Faculty of Science and Environmental Studies of the Universiti Pertanian sees taxonomy as one of its main areas of biological research and will in the near future increase its efforts in Malesian botanical taxonomy.

It was agreed that the botanists involved or interested in Flora Malesiana research will be brought together (by Prof. S o e p a d m o and Dr. S t o n e) into a working committee to promote research for Flora Malesiana within Malaysia, to prepare a proposal for additional manpower through extra financing by the Malaysian Government, and to support proposals of the Rijksherbarium to the government of the Netherlands.

In the PHILIPPINES many institutes as well as persons involved in research management were visited in Manila, Quezon City, and Los Baños. The

taxonomists are spread over quite a number of institutes, which means that there is no major institutional centre for Philippine taxonomy; this function is taken up by the young and enthusiastic Philippine Association of Plant Taxonomists (P.A.P.T.) uniting 17 members.

From many discussions it was learned that at all levels the interest in Flora Malesiana is high and participation in this international project is considered as very desirable. In the Philippines financing of research is on short-term basis, but it appeared that within this framework there are certainly possibilities for revisionary work on smaller families or on (groups of) genera.

During a symposium organized by the National Herbarium, the National Research Council, and the P.A.P.T., the interest in and enthusiasm for the participation of Philippine botanists in the Flora Malesiana project resulted in the decision that the P.A.P.T. will co-ordinate the efforts to materialize such a participation.

It was agreed that the Rijksherbarium will formulate a number of proposals from which Philippine botanists can make a choice.

The situation is certainly very promising and it is hoped that in the Philippines gradually a nucleus of taxonomic research for Malesia will take shape.

In INDONESIA were visited the Lembaga Biologi Nasional (L.B.N., including the Herbarium Bogoriense and the Botanic Gardens), the Forest Research Institute, and Biotrop.

The research activities of the L.B.N. are programmed by the Government Five Year Development Plan with emphasis on support of agriculture, health, and industry. On the botanical side this resulted in the research themes 1) applied microbiology, 2) plant genetic resources, and 3) the preparation of a publication on economic plants of Indonesia.

The main function of the Herbarium is seen in undertaking a floristic inventory of Malesian plants and in understanding their ecology as well as their economic potentials. As a result a large part of the young scientific staff (c. 15 botanists) is engaged in ecological and ethnobotanical projects.

However, the research programme leaves some room for basic science such as taxonomy. As the Flora Malesiana is published under the auspices of the L.B.N. and the Rijksherbarium, it was agreed that active participation by members of the Herbarium Bogoriense is desirable and within the possibilities. It was also agreed to explore possibilities to finance the necessary training.

The Forest Research Institute has only one forest botanist. There is no project comparable to the Tree Flora of Malaya.

GENERAL. From the many discussions we had in these weeks with numerous persons on widely varying levels it can be concluded that the Flora Malesiana project is on the brink of a new era: the increase of the number of Malesian botanists contributing to the production of their own Flora. This increase will, by necessity, be gradual but the enthusiasm shown by so many people must be a safeguard for its steady continuation.—W.Vink.

Rijksherbarium, Leiden, 1829-1979. The fever has been raging for months, and very few staff members have been spared. The 1½ centenary, after the foundation on 31 March 1829, was celebrated after a broad spectrum of preparations by six committees who operated in the democratic fashion of modern times. The outcome was:
— A session on 29 March in the aula of the University, where authorities and guests of honour will deliver speeches, with drinks after.
— A symposium, national, on priorities in plant taxonomy, on 30 March. Speakers: T.W.J.Gadella, C.Kalkman, F.A.Stafleu. Panel discussion led by P.Baas; then a very informal supper.
— The 'Open House', an exhibit in the building, to last from 30 March till mid-April, displaying the various activities of the institute.
— An issue especially intended for the University technical and administrative personnel (TCHAF); it is to carry many photographs illustrating Rijksherbarium activities. Perhaps an English co-edition will be produced later.
— A series of 13 public lectures and demonstrations by staff members, from November to May.
— An exhibition of botanical illustration, mainly 18th and 19th century, in the city museum De Lakenhal, 5 April to 20 May.
— A smaller exhibit of modern botanical and zoological illustration, 'Natuurgetrouw', in the Zoological Laboratory, in February.
— A summer exhibition on interactions between plants and animals, in the Botanic Garden, 19 June to 26 September.
— An instalment of Blumea dealing with the history and collections, and the only item which can be actually reviewed before the Bulletin's deadline. This is now in order.

Rijksherbarium 1829-1979 / A jubilee volume, edited by C. Kalkman and P. Smit. Blumea 25, no 1 (1979) 1-140, phot.

The first and only history of the Rijksherbarium to date is an essay by W.A. Goddijn in 1931, in Dutch, with a long summary in French. The present one consists of 11 articles by staff members (except Smit, who is a biohistorian, Verdoorn's successor at Utrecht, and Mrs. Van Steenis). Being usually concerned with the present rather than with the past, they placed their emphasis accordingly, and there is a general neglect in the documentation of their sources.

Almost no effort is made to reflect on the position of the institute. The interactions between Leiden and Utrecht go largely undiscussed. A comparison between Kew and Leiden would reveal the strong points of either in a highly instructive way. Readers could also benefit from a discussion of the role of these and other Great Old Herbaria in Europe as compared with that of the smaller local Herbaria in the tropics.

However, the Rijksherbarium as such is covered quite well. A key figure like Blume, about whom little was known, emerges in clear profile. On Goethart, who in a very different sense was a director of uneven merits, also much more light is cast. Lotsy is left too much in the shade to be fully understood.

Strangely enough, we are left with the hard-working, friendly Miquel (1862-1871) as the most controversial figure. Goddijn in 1931 blamed him

for exchanging away the whole stock of duplicates without replenishment, a serious threat to the continuity in the policy. Kalkman views his directorship as a kind of intermezzo. Van Steenis credits him with restoring the name and fame of the Rijksherbarium. All this is to show that the field for research is still wide open. And what a fascinating study could be made of the ideas which have originated from the institute, from the portable mycological drying oven to the pre-identification lamp with a hole to see pellucid dots!

As the Jubilee volume is published as the first instalment of Blumea volume 25 and will be distributed on a large scale as a separate issue while, besides, authors will disperse reprints of their contributions, I must suffice with recording here the contents:

C.KALKMAN. Introduction, p. 3.
P.SMIT. The Rijksherbarium and the scientific and social conditions which influenced its foundation, p. 5.
C.KALKMAN. The Rijksherbarium, in past and present, p. 13.
M.J.van STEENIS-KRUSEMAN. The collections of the Rijksherbarium, p. 29. (The bryophyte collections are dealt with by A.Touw.)
C.G.G.J.van STEENIS. The Rijksherbarium and its contribution to the knowledge of the tropical Asiatic flora, p. 57.
M.M.J.van BALGOOY. Contributions of the Rijksherbarium towards the plant-geography of Malesia and the Pacific, p. 79.
J.van BRUMMELEN. Mycology and lichenology at the Rijksherbarium, p. 83.
W.F.PRUD'HOMME VAN REINE & G.M.LOKHORST. The Rijksherbarium and its contribution to phycology, p. 89.
A.TOUW. Bryology and Bryophytes at the Rijksherbarium, p. 93. (A 3-page account of the bryophyte collections is included.)
E.HENNIPMAN. The collections of Pteridophytes at the Rijksherbarium, p. 103.
W.A.van HEEL. Morphology at the Rijksherbarium, p. 107.
J.MENNEMA. The Rijksherbarium and its contribution to the research on the Netherlands and European flora, p. 115.

There are two Appendices. The first one contains a complete alphabetical list of the scientific personnel which has been attached to the Rijksherbarium. Appendix 2 deals with the Publications, divided into four sections: a) Books and papers which were available as separate publications; b) Serials, published and/or edited by the Rijksherbarium; c) Dissertations; d) Publications on the institute.

The volume is finished by an Index to personal names.

This Jubilee volume is available at the Library of the Rijksherbarium, Schelpenkade 6, P.O. Box 9514, 2300 RA Leiden, The Netherlands. The price is Dfl. 50.

Green LBN books form a series, issued by Lembaga Biologi Nasional, Botanic Gardens, Bogor, which began in 1976, of hitherto 11 issues of 100-140 pages, with generally one page of illustration of the left, one page of text on the right. Each pair deals with one item of the category which is covered by the booklet.

The first issue deals with orchids, the 2nd with animals as sources of protein, the 3rd with timbers, the 4th with bamboos, the 5th with orna-

mentals, the 6th with vegetables, the 7th with tubers, the 8th with fruits, the 9th with natural resources, the 10th with industrial plants, the 11th with medicinal plants. The text is in Indonesian. They can probably be ordered from LBN, Box 110, Bogor, Indonesia.

It seemed an excellent initiative of the LBN management to popularize knowledge about these subjects in this simple but attractive form.

A botany branch office of the BRI-Herbarium for North Queensland based at Mareeba is being opened in early 1979 and J. R. C l a r k s o n will be operating from this office for an initial period of 5 years. The main activities planned for this duration are intensive collecting on North Queensland prior to the preparation of a handbook to the flora of this area and mapping the vegetation of Cape York Peninsula north of 16°S on a scale of 1:1,000,000.

From Honiara, Solomon Islands, Mr. K. D. M a r t e n reports: For some years the Forestry Herbarium has been largely under care and maintenance. The only collecting carried out has been by visiting scientists of various disciplines. Recently Dr. Jocelyn Powell working out of Papua New Guinea and Doug Yon (?) working with various anthropologists and archaeologists of the Bishop Museum in Hawaii. Doug Yon has recently reported collecting a range of Canarium spp. of economic importance showing very much wider variation than he had anticipated.

In the night of 6/7 July 1978 the UPNG-Herbarium, Port Moresby, in its wooden building, was largely destroyed by fire, caused by deteriorated electrical wire. Two weeks before, Dr. David G. F r o d i n still had issued another warning to the authorities. A great deal of partly damaged books, papers and specimens were salvaged, so were most notes on Schefflera and all colour slides were intact, but PNG-collections fared worse. At the time, the 10,000 mark had been passed.

Meanwhile, a location has been found in a new building, where a new start will be made. Dr. Frodin will be grateful for donations of books and reprints, especially on Malesia and adjoining regions. We regret this great loss of precious materials and effort; Manila was destroyed in 1945, Sandakan in 1961 (also a case of negligence by the authorities); a Herbarium in the region burnt down every 16-17 years is perhaps a bit frightening.

In the Parks & Wildlife Service, Fairfield Road, Yeerongpilly, Queensland 4105, Australia, four botanists are working: Dr. P. S. L a v a r a c k, head, orchid taxonomy, ecology and conservation; flora of Cape York Peninsula. Mr. J. P. S t a n t o n, ecology of Queensland, criteria for selection of reserves. Mr. C. J. E. B e l l, palaeohistory and geobotany. Ms. C. S. S a n d e r c o e, benchmark reserves.

At the CAL-Herbarium specimens of Wallichian collections were sorted out from the general herbarium and a separate herbarium called 'Wallichian herbarium' is being maintained.

The Botanical Survey of India has started building up a collection of photographs of Type specimens. The Regional Botanist at Kew has sent over 5000 negatives of types and authentic specimens of Indian plants available in 'Red Covers' in Kew Herbarium. Copies of these photographs are made available to bonafide research workers at a nominal price of Rs. 10 per copy (21½ by 16½ cm); contact Director, Central National Herbarium, P.O. Botanic Gardens, Howrah, India.

Official Orchid Gardens in Papua New Guinea. Apart from the well-known large living Orchid collection assembled by Mrs. A. Millar in Port Moresby and the Orchid collection at the National Botanic Garden at Lae, both concentrating on the lowland orchids, there is also one for the mountain orchids, known as the 'Highland Orchid Collection'. This has been assembled by Mr. T. M. R e e v e, officer of the Department of Primary Industry, who is in official charge. It is situated at Laiagam, Enga Prov., at c. 2200 m altitude. It consisted (March 1979) of about 500 different species, to which are added also some other ornamental plants (Begonia, Rhododendron). The collection is open for the public, and the display is mainly intended as a tourist attraction. Mr. Reeve himself is devoted to the taxonomic study of sect. Oxyglossum of the genus Dendrobium.

See for a review on the state of orchidology in New Guinea the account given by J.S. Womersley in The Orchadian 6 (1978) 10.

Bulolo Herbarium (proposed abbreviation: BFC), Box 92, Bulolo, Papua New Guinea, kindly sent the following communication, in correction to our sketchy note on *page 3015*. The Forestry College commenced training in 1962 when six Europeans, including J. J. H a v e l and H. S t r e i m a n n, offered a six month course in field training. This was held in temporary buildings at the Bulolo Forest Station. The College classes from 1963, until the new college buildings were completed, were held in the old single men's quarters at the Forestry Station. It was located where the present Forest Office is now. The initial stage of the new College complex was officially opened by the Minister of Territories, C.E. Barnes in 1965.

There was a small herbarium held at the Forest Station, Bulolo, which had been collected by J. J. H a v e l (in NGF series), and often with A. K a i r o. This herbarium was transferred to the College in 1965. These collections were of the major tree species in the Bulolo area and were haused in cardboard boxes. Havel and Kairo continued collecting on the various field trips with the students. This herbarium was used as a teaching set for the students and was stored in herbarium boxes which had become redundant after LAE set up their present cabinet system. Havel resigned at the end of 1964 or early 1965 after some problems with the reclassification of his position to a lower level.

In 1964, H. S t r e i m a n n joined the college and took over the collecting and maintenance of the herbarium. He also established a reference herbarium. His collections (in the NGF series) were from various field trips throughout Papua New Guinea. A large proportion of his collections were made in the Morobe Province. Streimann, often with Kairo, collected from many areas where no botanical collections had taken place

previously. He lectured in Taxonomy and Timber identification, together with the associated field work. Streimann transferred to the Division of Botany, Lae, in May 1971.

A. N. G i l l i s o n joined the college, from Lae, in 1967 and took over the lecturing of Ecology. In 1971, he commenced the construction of a separate botany building to house this expanding herbarium. It was completed in 1972, and now houses the reference herbarium. Gillison's research was mainly concerned with the collection of data towards his M.Sc. on Forest grassland transition. Much of his collections were ecological and many of these have not been distributed.

R. J. J o h n s transferred from Lae in 1971. He lectures in Ecology and Dendrology (which includes important tree species and special courses on Monocots and ferns). He has collected throughout Papua New Guinea (except for the following provinces: East Sepik, Manus, Milne Bay and Bougainville), often with W. Moi and/or K. Rau. He collected in both the NGF series (c. 500 numbers) and his private series (c. 2500 numbers). Approximately 1000 of the Johns series are ecological collections and these have not been distributed.

B. J. C o n n transferred from Lae, in 1976, to lecture in Botany and Plantation Botany. Much of his research time has been spent on a revision of the genus Geniostoma (Loganiaceae). He has collected from the following provinces: Southern Highlands, Western Highlands, Eastern Highlands, Gulf, Central and Morobe. About 800 numbers in the LAE series and c. 700 in his private series, often with Kairo. He has supervised the establishment of an arboretum and from 1976-1977 he acted as honorary curator of the herbarium. Since 1978, K. R a u has held this position. Other collectors include A. B e l l a m y (c. 100 in private series) from Madang and Morobe, K. Rau (c. 450 in private series) from Madang, Morobe, Central, New Britain and New Ireland, W. M o i (c. 200 in NGF and private series) from Madang, Morobe, Northern and Highlands.

A. K a i r o transferred from the Bulolo Forest Station to the college in 1962 (with Havel). He has collected extensively throughout Papua New Guinea. A large proportion of Havel's and Streimann's collections were made with his assistance. Frequently, he also collected by himself. However, these were recorded with the previous two collectors. Recently, he has collected with Conn in several localities. He has given valuable assistance in the field and in the laboratory. His knowledge of the forest flora and his memory of particular plants and their locality has led to many valuable and rare collections. Also, his meticulous care in drying the plants has given the College herbarium an excellent reputation.

The herbarium now contains approximately 20,000 collections from all over Papua New Guinea, including duplicates from B, AK, LAE, MAU, REUN and SUVA. Since 1976, duplicates are distributed from Bulolo to LAE, L, K, A and CANB. A separate wood collection is maintained. There are c. 200 collections for teaching purposes and c. 500 numbers in the NGF series for reference purposes.

On the staff are A. Bellamy (assistant lecturer in Botany, illustrator); B.J. Conn, now in Adelaide (aquatic flora, Aristolochia, Asclepiadaceae, Coriariaceae, Droseraceae, Ebenaceae, Erythroxylaceae, Logania-

ceae); R.J. Johns (Forest Ecology - vegetation classification, regeneration, autecology of Anisoptera, ferns, monocots, field keys); A. Kairo (field collector and technical assistant); K. Rau (curator of herbarium and Heliconia); and J. S i m a g a (curator of wood collections).

c) Symposia, Congresses, Societies, Meetings

(continued from page 3020)

Dipterocarp Round Table Conference at Paris, 1977. The Proceedings are now in the press with the Mémoires du Muséum d'Histoire Naturelle, Paris. Contact Dr. Géma Maury, Écologie, 4 Av. du Petit Chateau, 91800 Brunoy, France.

International Legume Conference, Kew, 1978. The Proceedings are now in preparation. Contact Mr. R.M. Polhill, Herbarium, Royal Botanic Gardens, Kew TW9 3AB, England.

The 14th Pacific Science Congress is to be held at Khabarowsk, USSR, 20 August-5 September 1979. Secretary General: Dr. M.A. Drobyshev, Academy of Sciences, 12 Zhdanov St., Rm. 90, Moscow 10 30 45, USSR.

The 13th International Botanical Congress is to be held in Sydney, 21 to 28 August 1981. Executive Secretary: Dr. W.J. Cram, Biology (A 12), University, Sydney, NSW 2006, Australia.

The 2nd International Congress of Systematic and Evolutionary Biology will be held at Vancouver, 17-24 July 1980. Contact Dr. G.G.E. Scudder, Zoology, University, 2075 Wesbrook Mall, Vancouver, B.C. V6T 1W5, Canada.

Impressions of the Eight World Forestry Congress, Jakarta. An invitation and Rijksherbarium support gave me the opportunity. But first I wanted to see something of Borneo again, and was able to pay a brief visit to the splendid forest in the East Kutai Reserve, which Mr. Mark Leighton was studying.

From Balikpapan, a Pertamina helicopter kindly took me northwards over the lowlands, more or less following the coast, to Sangatta, a distance of 200 km; Samarinda lies about halfway. This flight, at a few hundred metres altitude, enabled me to get an impression of the deforestations. The landscape is a mosaic of splendid forests and destruction in all stages. Photographs of it can be arranged in a near-complete series, from untouched to nothing left.

The soil is mostly sand, in places it is so poor that it does not even support the rain forest; there in more or less round spots several hundred metres across, the canopy becomes lower and thinner towards a centre where the white sand can be seen through the vegetation; kerangas is its name. Dr. E.F. Brünig, who had studied it in Sarawak, and examined similar places near Samarinda, told me that their plant species and ecology are exactly the same as there.

Destruction of the rain forest begins with the logging roads: narrow meandering strips of earth. Next, along their sides, through holes in the canopy, also soil shows up. There is no way of judging from the air the

damage inside the forest. Loading stations and, on rivers, rafts of logs are easily spotted. On the giant river Mahakam by Samarinda, ships lie surrounded by such rafts; since no local industry works the wood, the logs are shipped whole to their overseas destination, mostly Japan. This country carefully preserves its own forest cover. Indonesia receives a mere quarter of the free on board value of the wood in revenues. Later, I saw an array of Japanese radios and recorders in even the smallest villages in SE. Celebes. They may last ten years; a dipterocarp needs sixty to grow up.

After the loggers, the people take over. They cut down plots of forest, one acre here, two acres there. The whole biomass, built up during millennia, is quickly burnt. When at a distance one sees a small isolated cloud in the air, there is such a fire on the ground below. Columns of smoke are everywhere.

The very largest trees, the emergents of 60-65 m, which may be three centuries of age, are left standing, being unattractive to loggers and the forest cutters are unable to bring them down. To get rid of their shade, fires are made around the trunk. The tree then gradually dies; a grey skeleton is left for some time which will disintegrate in rain and wind. On the hills around the Balikpapan airfield, many such eerie, incredibly tall trees still stand.

No plan or system whatever in the landuse can be detected from the air. Larger and larger bites are taken out of the forest; one sees whole hillsides where all the trees have just been cut, remote from population centres. There is much transmigration from Java in this region; I visited such an area at Lempake, near Samarinda. The villages are planted with an impressive variety of tree and vegetable species. Around them, the primary forest had recently been cut, but it was not evident that any forest was saved for water catchment or any other purpose. I heard that the transmigrated people were never instructed in such things as land use planning or conservation.

It is often said that the transmigration serves to alleviate the population pressure in Java. Since every day 5500 people would have to be removed just to cope with the population increase, this is hard to believe; more weight carries the idea that the central government through transmigration strives for 'ethnic unity'.

If in the non-volcanic areas the soils are soon exhausted, and new land is opened up, the pressure on the forest lands will further increase high-speed destruction of the vegetation, owing to shifting cultivation systems which are officially so strongly condemned. In terms of ecological damage, the cost of transmigration may be enormous, the practice ridiculously wasteful. In East Kalimantan an environmental disaster is in the making which dwarfs the much publicized defoliation in Vietnam.

There are still quite some orang-utans in the East Kutai Reserve, or what has been left of it. In its southern part, the Silva Duta company had obtained permission to make a road through the reserve to reach its concessions further West. The permission included logging within a certain distance from the road; thus the company would be refunded for its trouble to construct it. The company thereupon constructed a zig-zagging

road, and thus within the letter of the law depleted a disproportionate area in the reserve. Thus I was told in Bogor, where the office of the PPA (conservation service) is bristling with activity.

But we were on our way to the World Forestry Congress.

World Forestry Congresses are organized by FAO, every six years. The 8th was held in Jakarta, from 16 to 28 October 1978 in the large Convention Hall. The title: Forests for People. Eleven hundred foreigners, many Latino's among them, probably because the previous congress was held in Buenos Aires in 1972. Eight hundred Indonesians. Organization smooth and in excellent taste. Five sections were held, namely Forestry for: 1) Rural Communities, FRC, 2) Food, FFF, 3) Employment Promotion, FEP, 4) Industrial Development, FID, subdivided in Resource base and Industries, 5) Quality of Life, FQL. In these five categories, there were altogether 30 sessions; conservation of forest animal and plant genetic resources being FQL 26. A session lasted half a morning or afternoon. First a keynote address, delivered in full, then discussion from the floor, by arrangement, then an oral summary by a recorder, then refreshments; this went very well. Simultaneous translation into English, French, Spanish and Indonesian. The Brownian movement of participants was quickened by Satellite Meetings, where parts of a subject were discussed fuller, or where people gathered to discuss the Man And Biosphere project about human influence on the tropical forest ecosystem.

On registration, every member received some nice keepsakes, besides a box with several kilograms of papers. As the congress proceeded, cartfuls of papers were delivered at a central distribution point, where the delegates collected as many as they could, every day again. We ended up with a pile of about 80 cm. This will be compressed into the Proceedings of the Congress, which is to be published in the course of 1980. A biased selection of papers is already summarized and reviewed here. Reference is to section.

ANDEL,S. *The impact of harvesting systems on tropical forest management in South East Asia (with particular reference to the operations in the mixed dipterocarp hillforests of Peninsular Malaysia)*. Papers 8th World Forestry Congress (Jakarta 1978) FID-I/18-1; 15 p.

Now that the lowland forests are gone, the hill forests come up for logging. Author has worked out a system to harvest their modest average of 38 cu.m/ha/year. But while detailed on past mistakes, cutting sizes, equipment, damage percentages and cost/benefit, he is silent about the actual effects on run-off and erosion, even if the logging is done carefully.

Economic profits look marginal all the same. Might the unmentioned adverse effects tip the scale? Without these questions properly dealt with, it seems irresponsible, as author does, to call for government support of such operations. Conservationists, beware and watch!

P.S.: This text was sent to author for comment, but no reply came.

ASHTON,P.S. *The biological and ecological basis for the utilisation of dipterocarps*. Papers 8th World Forestry Congress (Jakarta 1978) FQL/26-16; 14 p., 1 phot.

When 10-20 years from now the dipterocarp resource will be exhausted,

a hardwood famine will ensue, with no knowledge available to redeem it, owing to a criminal lack of investment into research, one aspect of short term-thinking. Wasteful logging by foreigners may destroy the base for more efficient home industries. Road building and logging in steep terrain reduce regeneration by 50%.

It is held that a sound ecological basis for a selection system to manage Mixed Dipterocarp Forests is lacking, and since too little is known about mortality at various ages, the uniform system is considered safer. Regeneration estimates are in danger of being distorted by inclusion of species that will never grow large. If dipterocarps fail to regenerate sufficiently, will other families come forward? Transplantation of the tender mycorrhizal seedlings is bound to fail without basic research on root ecophysiology.

The potential of fatty illipe nuts (produced by 11 species which together cover the full range of soil types common in inland Borneo) is underlined.

A table gives mean densities per ha, for size and soil, of 35 genera or groups of species, non-dipterocarps as well.

One of the outstanding papers.

ATMOSOEDARYO,S. *The importance of forests for rural communities*. Papers 8th World Forestry Congress (Jakarta 1978) FRC/0-3; 15 p.

A balanced outline of the problems due to overpopulation and land misuse, for Indonesia in comparison with some other countries. Solutions: training of peasant forest workers, tumpangsari or taungya, firewood planting, fodder and medicinal plants in forest, are discussed, but facts and figures are hardly given.

BOOTH,H.E. *Integrated utilization of tropical forests*. Papers 8th World Forestry Congress (Jakarta 1978) FID-II/20-0; 22 p.

Ecologists to whom the word 'integrated' has a positive ring: be quick to learn that 'integrated utilization' simply stands for consuming all parts of a whole forest. If for a moment we leave aside the question how this can be morally justified, let's see what happens. Man as an animal economicum reigns supreme. Stable shifting cultivation supports 1-2 persons per sq.km, at no cost; through a modern Kraft pulpmill, 7 can be supported on the same area, at an investment of US$ 35,000 per head. "This represents a notable increase over the traditional system for the actual area involved". But wait.

The range of intensity of utilization stretches from sawnwood to plywood to hardboard to charcoal to pulp. All these 'forest products' must be marketed, which subjects them to price fluctuations. The market demands a uniform produce, hard to come by in a truly mixed tropical forest. Yet something can be done, perhaps.

Growing populations call for land. Clear a forest, and "the huge quantities of wood which became available suddenly and for a limited period of time" thwart your good intentions. Pulp it for export? Remember the big investment and its proportional risks. It seems better to log the forest first but this, too, is expensive, especially in rugged terrain, and it must be done in competition with softwood. Moreover, settlers may

move in and upsettle the utilization planning. A highly selective way of logging or 'creaming' of top species may be feasible, but even if regeneration proceeds fast, the period of the latter will last about as long as a sawmill.

Logs have an unwelcome inclination to rot when the market slumps, and their protection costs money. The log market is a buyer's market, and the buyers, who are rich and well-organized, like to keep it that way. Railway sleepers and veneer are notoriously vulnerable to the whims of the market. Saw them on the spot, then? "In fact, the whole problem of integrated use of the tropical forests has revealed new problems in sawmilling", owing again to diversity in wood properties, including the frequent occurrence of silica which blunts the saws, and stresses in the log from unbalanced wood, which causes planks to bulge. This puts tropical sawmilling at a disadvantage in relation to softwoods. Plywood production is essentially dependent on the supply of light dipterocarps, of which the end is drawing near. Particle board and fibre board, once hailed as a key to fuller utilization, require binding chemicals, expensive to import.

Why not use the rain forests for fuel? A comparison with coal is revealing. Its calorific value is 1½ times that of dry wood, but it is far cheaper to mine from thick seams; in fact, a stocking of 200 cu.m of wood per ha is equivalent to a coal seam thickness of 1 cm. One could decide to extract the logs and to collect the waste - roughly 50% of the log input volume - for burning, but thus the supply will not last long. Charcoal-making is inefficient, energy-wise, since only about 25% of the thermal energy of the wood is retained. The technology to convert wood into methanol exists, but it, too, faces competition with coal.

In pulp and paper production nearly all the above constraints seem to recur and culminate: permanence of supply, costly technology, distance to the market. It is nice to replace the rain forest by wood plantations, but don't expect too much of soil fertility.

So will the tropical rain forest be useless after all? "The ultimate use pattern of most of the tropical forest will probably be a conservative one. The resource will be preserved as far as possible producing a timber crop commensurate with this long term permanent capability." Back over to Ashton!

CASSELLS,D.S. & D.A.GILMOUR, *The changing role of the North Queensland rainforest*. Papers 8th World Forestry Congress (Jakarta 1978) FQL/25-18; 8 p., 1 map.

Main occurrence is in a strip 8-65 km wide from the Pacific coast, between 16° and 19°S. Soon after discovery in 1873, exploitation began (for Toona australis), which has destroyed half the area, 6000 sq.km now remaining in the less accessible pockets; 23% is now protected.

Blunt commercial attitudes changed in the 1960's, when values other than timber began to be recognized, although cost awareness lingers on. Quota of supposedly sustained yield were probably set too high, and have to be reduced.

CHRISTENSEN,B. & M.N.DELMENDO, *Mangroves and food*. Papers 8th World Forestry Congress (Jakarta 1978) FFF/9-1; 27 p., 2 maps.

There may well be 4-6 million ha in Asia alone. Sustained long-term

exploitation is possible but rare. Overcutting of Rhizophoraceae leaves Avicennia scrub. The mangrove supplies little food directly to man. Bioproduction is high, however; crabs fragmenting the leaves start the decomposition which supplies the basic materials for the food chain. In Indonesia, nearly all commercial shrimp species depend on the mangrove and adjoining sea grass vegetation for food and shelter. Also crabs, molluscs, and fish species are cited as commercial, living free in the mangrove or in brackish aquaculture.

Establishment of aquaculture is described, with figures and cost/benefit. Fish production may well outstrip timber production in value. Fields on reclaimed mangrove usually develop into acid sulphate soils, of which improvement is expensive. And there are social constraints of alienation or conversion to consider.

Nice review paper; 60 references.

HANS,A.S. e.a. *Potentialities of Zambian forest fruit trees*. Papers 8th World Forestry Congress (Jakarta 1978) FFF/9-8.

Twelve species are listed in Anacardiaceae: Sclerocarya; Annonaceae: Hexalobus; Bombacaceae: Adansonia; Caesalpiniaceae: Cordyla, Dialium, Tamarindus; Ebenaceae: Diospyros; Euphorbiaceae: Ricinodendron, Uapaca; Loganiaceae: Strychnos; Malvaceae: Azanza; Mimosaceae: Parkia; Olacaceae: Ximenia; Palmae: Borassus; Rhizophoraceae: Anisophyllea; Rosaceae: Parinari. Their fruits are harvested from the forest; more should be done about them.

HARDJOSOEDIRO,S. *Resettlement to circumscribe shifting cultivation: an approach and resulting experience*. Papers 8th World Forestry Congress (Jakarta 1978) FFF/6-0; 11 p.

Arguments to move categories of shifting cultivators in Borneo away from the forest concessions. Author knows what is best for them, and takes issue with R.F. Watters's study on the problem in Latin America.

JACKSON,J.K. & J.P.BOULANGER, *The forests of the Mae Sa Valley, northern Thailand, as a source of food*. Papers 8th World Forestry Congress (Jakarta 1978) FFF/9-9; 4 p.

Many plant species, most of Malesian genera, are listed, contributing greatly to variety in diet.

JACOBS,M. *Significance of the tropical rain forests on 12 points*. Papers 8th World Forestry Congress (Jakarta 1978) FQL/26-12; 19 p., 3 fig.

The Declaration of the Rights of Animal and Plant Life (see *page 3048*) is presented. Position of the taxonomist is defined as different from the forester who deals with a few species only. Numbers of species on a hectare are quoted, which foresters want to reduce. Scores of plant species may be needed, however, to support a pollinator all the year round. Gardens are unfit for conservation purposes. The autonomy of the primary forest seems to irritate man. The forest plantations in Holland are nowadays criticized.

The 12 points are: 1) supply of timber, exemplified by dipterocarps on which some data are given, 2) retention of soil, 3) regulation of run-off, 4) stabilization of climate, 5) source of minor products, 6) source of new economic plants, 7) gene pool, 8) food and shelter for animals, 9)

matrix of evolution, 10) source of knowledge, 11) respect for the creation, 12) education, instruction, recreation.

The long-term identity of economic and ecological interests is asserted. The task for forestry is to revegetate the world's large tracts of deforested land.

JOHNSON,N.E. & G.F.DYKSTRA, *Maintaining forest production in East Kalimantan, Indonesia*. Papers 8th World Forestry Congress (Jakarta 1978) FID-I/18-4; 11 p.

Effects of logging in dipterocarps are not altogether fortunate. Poor soils may not support transmigration in the long run. Target for plantation on forested land is 208,000 ha, with another 633,000 on bare lands. "We think that private industry can help governments to achieve their forest plantation goals." At present, Weyerhaeuser has 2500 ha of experimental plantation forest, Eucalyptus deglupta and Pinus caribaea. Prospects look good, although "we do not yet know what yields to expect at what ages". But on p. 8, authors know that "plantations on 25 percent of the present forest land would more than double the total production."

MALIK,A. *Forests for people*, 10 p. Keynote address by the Vice-President of Indonesia.

We are still repeating history's costly errors. Population increase brings new pressure on the forest, mountain areas not excepted. But its impact and that of technology are overshadowed by the problems presented by the just demands of the rural poor, who unintentionally destroy their own livelihood. Developing nations have too little room for bargaining. What our world needs is "to move from our profligate use of forests to a careful husbanding of this resource."

A Declaration of Human Rights should be complemented by one on Human Responsibilities (these not further specified). The rural poor should be involved in development. Multiple use of the forests, integrated development, and 'social forestry' are in order.

The Congress is called upon to rethink approaches, review policies, reorder priorities, restructure human relations. Consultation, consensus, mutual help.

MEDWAY, Lord, *The tropical forests as a source of animal genetic resources*. Papers 8th World Forestry Congress (Jakarta 1978) FQL/26-22; 7 p.

Sundaland has 297 sp. of land mammals in 36 families, 732 sp. of non-sea birds in 68 families, 131 sp. of amphibians in 5 families. Of the 460 bird sp. breeding in Malaya, 60% are confined to forest. On 200 ha of forest in Pahang, 156 bird sp. were tallied, and on 20 ha of isolated LDF in Sarawak, 147 sp., the latter averaging 1.15 kg/ha of biomass. Distribution of reproductive populations may be very restricted, and recruitment rates among birds are a low 10-20% a year.

Resource value of the vertebrates is limited owing to the low densities per area, and so is domestication potential. Monkeys have been of vital significance in medical research (Macaca for polio vaccin) and may be badly needed in the future as well. The forests hold a stock of invertebrates which are natural enemies of herbivorous pests, and the health of plantation crops may depend on them. The soil fauna, virtually untapped, may serve a variety of agricultural purposes.

MILLER,K.R. *Forestry and custodianship of the human habitat.* Papers 8th World Forestry Congress (Jakarta 1978) FQL/0-4; 12 p.

Forestry should assume a larger and more articulate role. Forests contain many more values than wood. Environmental problems require balanced, comprehensive solutions. Forests are part of the human habitat, and are to be managed accordingly. The principles of Ecodevelopment and of the Cocoyoc Declaration are to be observed. Use or abuse of forests in one nation affects other nations. MAB of UNESCO brings social and natural scientists together; EARTHWATCH of UNEP monitors, investigates, evaluates.

A policy paper from the chairman of the IUCN Parks Commission, clad in general, diplomatic language.

MYERS,N. *Conservation of forest animal and plant genetic resources in tropical rainforests.* Papers 8th World Forestry Congress (Jakarta 1978) FQL/26-1; 13 p.

Examination of the extinction threat in relation to the pragmatic value of species. Discussed are the potential of forests as for minor products; genetic improvement of fruit trees; pest control (both biologically and through phytochemicals); new substances against cancer, hypertension (half the prescriptions in the U.S. contains at least one drug of natural origin) and for birth control; oils for lubrication; plantation wood (40,000 ha could produce an equivalent of 500,000 tons of coal a year).

Minimum-size of reserves depends on species richness (inversely proportionate to density per ha), and migration habits of animals; 1000-2500 sq.km is a bare working minimum. Disproportion of species richness, threat and conservation results in the Amazon is signalled. Many facts, 105 references.

PHENGKLAI,C. *Edible plants of Thailand.* Papers 8th World Forestry Congress (Jakarta 1978) FFF/9-15; 13 p.

Alphabetical list of 168 phanerogams and 12 fungi, with botanical name, Thai name, family, edible part, and how eaten.

SASTRAPRADJA,S. e.a. *The conservation of forest animal and plant genetic resources.* Papers 8th World Forestry Congress (Jakarta 1978) FQL/26-0; 47 p.

General sketch of the plant world of Indo-Malesia with vegetation types and many species named (6 p.). Overview of the fauna for the main groups and regions (11½ p.). Categories of useful plants are listed, with many species or groups named (3 p.).

Forest resources in rough figures are cited for Indonesia, Malaysia, Philippines, Thailand. Current management practices are critically reviewed against long-term effects of logging. Some data on shifting cultivation are given. Arguments for conservation are set forth, and a plea is made for a strong social discipline. In-situ conservation is recognized as most desirable, with ex-situ as second-best. Problems of environmental education are identified, and the basics of such education outlined.

Position paper from the Lembaga Biologi National of Indonesia; 74 references.

SIMATUPANG,M.H. *The processing of rotan, a minor forest product from the tropical rain forest*. Papers 8th World Forestry Congress (Jakarta 1978) FID-II/23-10; 20 p.

The 9 main rattan provinces of Indonesia, from together 78354 sq.km, yield a total of 59,600 tons annually, of which 7000 tons from plantations (1500 in Riau, 4000 in Central Kalimantan, 1500 in Central Sulawesi). Old secondary forest is suitable for cultivation. Seedlings are grown in nurseries, need 15 years to attain full productivity, when 5 stems of 26-30 m can be harvested every 2-3 years.

Harvesting is done by locals. The outer layer of silica is rubbed off, then the stems are washed, then dried for 14 days, although an undesirable 20% of the weight in water may remain. Preservation is attained by treatment with oil, bleaching by sulphor fume or other chemicals. Splitting is done mostly by hand.

Classification for the trade is rather irrespective of the botanical identity - although c. one sixth of the species only is regarded as commercial. It is diameter, absence of silica, softness, colour and shine that determine the categories in the German market which are summed up. Of the world export, which has remained constant for 30 years, of 60,000 tons, Indonesia produces three quarters; the Philippines runs second. There is much re-export from Singapore and Hong Kong. Importing countries are listed with percentages. There is a general lack of statistics.

SINGHAPANT,S. *National parks of Thailand*. Papers 8th World Forestry Congress (Jakarta 1978) FQL/26-3; 10 p.

A country report. Organized conservation, started in 1959, have led to establishment of 14 parks, totalling 8977 sq.km, with another 7, totalling 1483 sq.km, proposed (all listed). In 1972 the National Park Division was set up. Much is still to be done. Problems are shifting cultivation, wood cutting along borders, poaching. Work on a hydroelectric dam in Khao Jai National Park in 1971 could be stopped.

SOERIANEGARA,I. *Forest management and conservation of forest resources management*. Papers 8th World Forestry Congress (Jakarta 1978) FQL/25-27; 9 p.

Policy outline for Protection, Production, Conservation Forest and Forest Reserves. Conversion of some natural forest into plantations may be necessary (why not convert wasteland into plantations?). The statement that "A very limited felling in a conservation forest aims at improving the forest stands and developing and maintaining the proper habitat for wildlife" is unproven, and opens the door to degradation and loss of genetic capital. — Such arguments were also used to log Sekundur in northern Sumatra!

TRAN Van Nao, *Agrisilviculture: joint production of food and wood*. Papers 8th World Forestry Congress (Jakarta 1978) FFF/7-0; 16 p.

The concept outlined in 1968 by K.F.S. King (whose interesting paper on the subject to this Congress was unavailable to me) now comprises a) agriculture in regular rotation with forest tree species, b) forest tree plantations with agricultural crops in the first years, the taungya system, c) perennial crops combined with forest plants. In all cases it aims

at creating a vegetation more valuable than ordinary secondary forest allowed to grow up in fallow periods of shifting cultivation. Forest fallow can produce 30 kg/ha/year of nitrogen in the soil and 60 kg in the overhead vegetation, vs. 10 and 25 in savanna.

Systems have been developed in Burma, the Philippines, Kurdistan, Italy, Nigeria, Thailand, Indonesia ('tumpangsari'), China; they are described and compared, with facts and figures, and a few species named. Their share in agricultural production is 5-6% in China, a mere 1% elsewhere. Arduous labour, hard conditions, loss of profit to forestry services help account for the low percentage. If changed for the better, the system will have much to contribute to a badly needed food and (fuel)wood supply. The cultivators should be treated more fairly and protected by law, investment should be made for improvements, research is needed, and local ingenuity should be encouraged.

Interesting paper by FAO expert; 18 references.

WHITMORE,T.C. *Potentially economic species of South East Asian forests.* Papers 8th World Forestry Congress (Jakarta 1978) FQL/26-17; 9 p.

Some genera and species are summed up which yield fruits and seeds, primary and secondary metabolites; rattans and orchids are also mentioned. Several pioneers are named as promising for plantations; Melaleuca, Dodonaea, Kleinhovia, and bamboos are recommended for research.

While in Borneo and Sumatra the forests are being destroyed in the manner described above, the impressions about the Congress are more positive. At this late hour, the precariousness of the forest resource has dawned upon the minds and we found forces of exploitation in search for a sort of balance with conservation, difficult as they find it. A deep concern about shifting cultivation was prevalent, and much attention was paid to 'agroforestry' which may indeed be the answer to the problem — if any. The brutal inefficiency of big technology is also coming under scrutiny. We got the impression that for the first time, tropical forestry saw itself confronted with its limits, yet there was plenty of hope and optimism — I dare predict that there will be less at the next Congress.

An announcement which carried hopes for a longer period was the official announcement, made at the Congress by Mr. H. Prijono, Director of the Conservation Service (Dinas PPA), that Indonesia has set a first conservation target of 5% of the land area, eventually to be increased to 10%. Other observations, too, rule out any doubt that the highest authorities in Indonesia are perfectly aware of all the problems in their country, and that they are determined not to let it be ruined completely. The top of the forestry organization seems strong, the base seems weak. While sound ideas and power may slowly seep down, erosion of the forest resource goes on, until some equilibrium will be reached. Where this will be, no one can tell. All we can say is that where ten years ago only destructive forces were operating, now a front has been formed between destruction and conservation, in which the gaps are closing; the public gaps, that is, for always losses to corruption must be accounted for. But the front is there. It now depends on the keenness, drive, and perseverance of conservation-minded people, in what direction the front will move.

While on the Congress floor harmony — and tight organization — prevailed, mention must be made of a play entitled 'Rimba Tiwikrama': *The Great Anger of the Forest*, staged by a wayang group in Hotel Indonesia. An extensive, bilingual explanatory pamphlet made it clear what the play was about. In an allusive but unmistakable manner, the audience was reminded of the proximity of senseless destruction of rain forest, and that corruption was not far away, either. This was not the intention, and sale of tickets in the Convention Hall was soon prohibited. But, to the delight of many, the show itself went on, and a large number of participants came to taste the critical spirit of courageous Indonesians.

The Congress Declaration, in 26 points, is fine enough. It calls for government responsibility, water and soil conservation, firewood planting, land rehabilitation and food production through reforestation, attention to minor products, establishment of National Parks, research towards a wide scope of benefits, continued existence of the forests. Of course, such phrases are conventional, but in the hands of energetic, devoted, persistent people they may serve as instruments to pin down governments on declared good intentions, again and again and again.

In addition, we mention a few more publications. The Proceedings of the U.S. Strategy Conference on Tropical Deforestation, 12-14 June 1978, held at Washington, have become available, free of charge, from the Office of Environmental Affairs, Room 7820, Department of State, Washington, D.C. 20520, U.S.A. It is a 78-page booklet, which deals with Trends and Policy Implications; Response to date by Institutions; the Scientific and Technological Approach; Future Needs and Opportunities; Discussions and 41 Recommendations, some 20 papers in all in compact style, good and informative altogether. A 64-page well-written booklet by Erik ECKHOLM, Planting for the Future, Forestry for Human Needs (1979), available at $ 2.00 from the Worldwatch Institute, 1776 Massachusetts Ave., N.W. Washington, D.C. 20036, U.S.A., sums up the consequences of deforestation, then discusses the recent successful reforestations in China, South Korea, and India, with emphasis on the social aspects of the effort. The subject of 'Agroforestry' or 'Communal Forestry', very much talked about at the Congress, is discussed in two FAO booklets (available from FAO, Forestry, Via delle Terme di Caracalla, Rome, Italy), Forestry for Local Community Development, a 114-page mimeographed memoir with very wide scope, discussing many aspects one by one, followed by case-studies and a bibliography. Forestry for Rural Communities, 56 p., is printed and provided with many fine illustrations. Finally, the fine FAO quarterly Unasylva, devoted to world forestry, carries many a paper of value to the concerned botanist. It is obtained by subscription.

MAB in East Kalimantan. Indonesia is a partner in the UNESCO Man And Biosphere program 1 (tropical rain forest), under the aegis of LIPI. A note on its 1976 workshop is on *page 3034*. A second workshop was held at Samarinda, East Kalimantan, where Professor R. S a m b a s Wirakusumah, Rector of Mulawarman University and a forester by education is enthusiastically promoting activities towards a sensible use of the land. The Proceedings of this workshop, 57 p. (October 1978) are available from LIPI,

Jl. Teuku Cik Ditiro 43, Jakarta, for I believe US$ 5. They contain quite a few data on East Kalimantan.

Experimental plots have been laid out at two locations near Samarinda, the transmigration area at Lempake, and the kerangas at Semboja. The idea is to study man's influence on the vegetation and its regeneration. In October 1978 I could pay a brief visit to the former, thanks to Dr. Sambas's excellent hospitality, and pleasant company of Mr. Soedarsono R i s w a n of the BO-Herbarium and Mr. M a n s u r Fatani, Faculty of Forestry in Samarinda. About the same time, Professor E. F. B r ü n i g of Hamburg visited Semboja, and found the kerangas there exactly the same in all features as in Sarawak.

During the Forestry Congress another workshop was held, where among others Dr. L. J. W e b b of MAB Australia was sitting in; plans were made to strengthen the fledgling Samarinda Herbarium. A next workshop is due at Kuala Lumpur, during the Ecodevelopment Symposium in April 1979.

Sago-76 is the title of the published Papers of the First International Sago Symposium, held in July 1976 at Kuching, Sarawak. It has 330 pages, many illustrations, printed at the University of Malaya Press (dated 1977, received 1978); contact the editor, Dr. K. Tan, Box 46, Kuala Lumpur.

One must go through the book with its 33 papers to get an idea how varied is the world of this insipid-tasting starch. It is an ethnical crop, part of ancient ways of life, growing in swampland, with botanical aspects, agronomic, industrial and economic dimensions, and last not least supplies lucky finders with weevil grubs to eat alive.

While in the Neotropics the genera Arecastrum, Copernicia, Manicaria, Mauritia and Roystonea have starch palms, the real sago area is from Ceylon, through Malesia, to Fiji. Dransfield notes that in this region, Arenga, Caryota, Corypha and Eugeissona are also starch palms, but Metroxylon is the main supplier. Ruth Kiew briefly discusses its 7 species; according to her estimate, one plant produces (after c. 10 years) 120,960 to 376,320 flowers. Chromosome counts of the common rumbia, M. sagu, yielded 26.

People have manufactured a surprising variety of basketry and other tools for handling sago, a delight to the ethnobotanist. It sustains many small village communities, and the Symposium very appropriately urged governments not to promote a takeover of the crop by growth-minded profiteers.

Perspectives in Tropical Botany is the title of a Symposium held in Michigan in August 1977, which at first sight is already outstanding by the slimness of the Proceedings, published in the Annals of the Missouri Botanical Garden 64 (1957) 657-748, a mere 91 pages!

And the subjects and authors have been well-chosen to cover the field evenly and with originality.

Prance, in his *Inventory of the tropics: where do we stand?* (l.c. 659-684) made an extensive effort to answer the long-standing inventory question.

The tropical flora consists of c. 155,000 species of flowering plants,

11,000 pteridophytes, 16,000 bryophytes, and at least 90,000 fungi. Africa is poorest with 20,000 (plus 10,000 in Madagascar), America is richest with 90,000. As 110,000 sq.km of rain forest are annually destroyed, there is a race of exploration against time. Author proceeds to inspect the state of collecting and of botanical knowledge for the three main rain forest regions. In view of the regional differences in organization of botanical knowledge and in width of taxonomic concepts, this is not an easy task. Africa seems to be the best-collected, Malesia is best-organized, America is behind in both. Out of 140 references, a variety of interesting facts and viewpoints has now been assembled; it will be worthwhile, after five years or so, to make a revised edition of this paper. We'd like to collaborate again.

Tomlinson, in his *Plant morphology and anatomy in the tropics — the need for integrated approaches* (l.c. 685-693) explained the need for integrated approaches, feasible now that "modern high-speed travel has made easy the traditional process of what may be called 'body snatching'". The monocarpic way of growing is an example of such an approach needed. Wet (= slimy or resinous) vs. dry buds is another. Nectaries attract birds who may linger to pick insects. Apical growth or its inhibition determines tree shape. The diversity of tropical plants provides ample of opportunities for simple methods if applied cleverly.

Ashton discussed in his *A contribution of rain-forest research to evolutionary theory* (l.c. 694-705) research problems in the most species-rich forests. The diversity at species level in Malesian forests exceeds all others. Distribution of dipterocarps in Sarawak. Account on speciation work on Shorea and Xerospermum in Pasoh forest, Malaya. If too many species have come to occur in an area unit, distances between individuals prohibit outcrossing, and an extent of apomixis may become an agent of secondary, essentially ephemeral and possibly sympatric speciation. The balance may shift in the course of time, depending on accretion/extinction. Choice of fruit trees for research has shown the right way; now others must collaborate towards practical application.

Janzen delivered one brilliant idea after another in his *Promising directions of study in tropical animal-plant interactions* (l.c. 706-736). This paper is "dedicated to our grandchildren, who will inherit a devastated tropics". By a trail in Malayan rain forest 1.3 understorey plants in flower per km. On poor soils, competition of dipterocarps for nutrients may have a herbivorous-like impact on the understorey, from time to time. This favours nomadism in animals; carnivorous birds seem to be scarce in these rain forests. Epiphytes in them may be starved off the trees, unless associated with ants. Higher up (1000-1600 m), where the nights are cooler, the days' photosynthats are broken down slower, and the balance of harvestable productivity is higher. Natural species-poor forest show great promise for study of monoculture ecology: where do the pollinators come from? how about genetic exchange and adaptation? why don't adapted parasites destroy them all? Secondary metabolites give rise to the question how animals arrange their diet. Why fruits rot and seeds mold can more easily be understood. But what is the meaning of variation in fresh ripe fruit weight within a tree's crop? Other questions come up about animal—plant interaction; Janzen fills pages with them, shaking up the

reader's mind, making him eager to return to the rain forest and look again.

A plea is made for "grants that will float with the investigator", better $ 4000 for ten years than 40,000 once. Eight points of good advice, and 110 references conclude this exciting paper.

Jordan & Medina talked about *Ecosystem research in the tropics* (l.c. 737-745), in which they gave an account of the San Carlos Project at the Upper Amazon in Venezuela, especially on nutrient movement in rain forest.

In addition, Tomlinson and Raven give some introductory and concluding words. Compare this with UNESCO's Tropical Forest Ecosystems, feel the difference in specific gravity, it's like going from labour to refreshment.

d) Conservation *(continued from page 3040)*

Indonesia: minister of environment appointed, about May 1978. He is Dr. Emil S a l i m, a Berkeley-educated economist, former Minister of Communications, who started his new job by calling government planners and others concerned with environmental matters together for a seminar in Jakarta to discuss the main problems and how they should be tackled.

In his opening address to the seminar Minister Salim drew attention to the emphasis placed on environmental conservation in President Soeharto's recent inaugural speech. Namely, that conservation of the environment reflected solidarity between present and future generations; that development and conservation were both designed to improve living standards; that there was a close interrelationship between the people and the environment, and that every member of the community had a moral obligation to conserve the environment.

The creation of this new ministerial post provides welcome confirmation of the Government's determination to tackle environmental problems, including those of air and water pollution and also conservation of the country's immensely valuable but increasingly threatened flora and fauna. — From WWF Indonesia Programme Newsletter.

Mr. S u t r i s n o Soewoko, Head of Section Jambi of the Dinas PPA, the Conservation Service of Indonesia, obtained a fellowship of the Dutch Ministry of Education to familiarize himself better with the botanical aspects of conservation, with Dr. M. Jacobs at the Rijksherbarium during the first half of 1979.

When looking for accommodation in Leiden, we visited a Polish lady who lives here for a long time, and on learning that he was a conservationist from Indonesia, she exclaimed: "Ah, to protect the tropical rain forest!"

Indonesia: tidbits. By count of October 1978, 198 reserves were in existence, 60 of them post-war. Half of them are cagar alam = strict reserves, the other half are suaka margasatwa, where the animals are protected but their habitat isn't.

The term of the FAO advisory group under Mr. John H. B l o w e r (Dinas PPA, Box 133, Bogor) has been extended for three years, with some increase of staff. For them, emphasis lies on the development of national parks where many people can enjoy themselves; especially East Java offers

parks where many people can enjoy themselves; especially East Java offers good possibilities for this.

More valuable for the plants and animals is the compilation, also by FAO staff (Jan W i n d, A. P. M. v a n d e r Z o n, assisted by counterparts of the PPA) of management plans for reserves, for which a few weeks surveys are made. Only on the basis of such a plan can negotiations be opened on destination of the land, boundary marking, and funds be budgetted. Often a management plan provides fresh information on little-known areas. A number of them are announced below.

There is also a WWF-involvement; this rather concerns biologically important reserves outside Java, where a conservationist in residence can be marvellously effective. Thus for instance, John M c K i n n o n has been working in Tangkoko-Batuangas, NE. Celebes, Nico v a n S t r i e n in G. Leuser, Conrad A v e l i n g at Bohorok, NE. of Medan; they are employed by WWF Morges, Switzerland, where Anton K. F e r n h o u t is the desk officer for this region, while Mr. Jeffrey A. M c N e e l y is providing assistance in Bogor. He is the author of an important book on the Mammals of Thailand, which is also eminently useful for West Malesia (the text of a review was misdirected and must wait for the next issue).

Large steps have been made in education. Posters, stickers, T-shirts, calendars, Suara Alam, lectures, films are emerging, often in excellent taste. The Green LBN Books (see Herbaria, &c.) supply some background. The Minister of Environment regularly goes on TV. The public responds well. What I never saw in Indonesia: groups of people who for recreation go out on marches, signals a trend towards outdoor life. Camping is becoming popular. Bohorok, the rehabilitation centre for orang-utans and education centre for humans, receives 5000 visitors from Medan annually. A centre at Cibodas (for which the Dutch Ministry of Culture had voted a modest sum) suffers delays because of feelings that it must be big and beautiful, which requires much larger amounts of planning.

Low standards of staff, whose meagre salaries make them subject to arm-twisting by loggers, are widespread problems, which also involve other branches of forestry. Higher up in the hierarchy, too, hard fights are sometimes waged, like for the Sekundur lowland forest in N. Sumatra (*page 3027-3029*), where high authorities had issued licences to log Agathis in an adjoining area which was to be included in the Reserve. The Agathis is still standing, some authorities have fallen - bravo!

A good idea of the struggle gives the following note supplied by Peter C o c k b u r n, who together with Mr. Effendy S u m a r d j a visited Tanjung Puting Game Reserve in S. Kalimantan west of Sampit, in November-December 1978. "The Reserve was found to have been recently demarcated on the ground (1976-77) and nominally covers 270,000 ha. Logging by companies within the reserve has now been eliminated, but stealing of timber, Jelutong, and other forest products continues in several places. The worst area is on the north east boundary where at Natai Keampat some 150 people are removing several cubic meters of Ulin (Eusideroxylon zwageri) per day and at the same time cultivating rice within the reserve boundary. The WWF party, assisted by R. B r i n d a m o u r, from the Tanjung Puting Orang utan research project of The Leaky Foundation, reported this

interference and reaffirmed the violation which has been known to the Forest Department for several months if not years. Ir. Prijono, retiring head of the Department of Nature Conservation, has promised to take up this important matter with the regional authorities.

A further area of some 30,000 ha. has recently been added to the reserve in the South East, but logging of the Ramin (Gonystylus) forests outside the reserve continues on both the East and West boundaries. A large population of Orang utan and Proboscis monkey continues to live there however, and botanically the reserve has a number of interesting habitats. Nowhere however is the forest very well developed, and the Dipterocarpaceae are poorly represented. A collection of plants made by Dr. Galdikas-Brindamour which has been kept at Camp Leaky was viewed and arrangements are being made to ship duplicate material to Bogor and the Leiden Herbaria where these interesting collections will become available to science.

Mr. Cockburn and Drs. Sumardja will be formulating a management plan for the reserve and their recommendations will be available by the beginning of February 1979."

The status of the Indonesian Wildlife Fund is not very clear, and more news may emerge in the future.

The Training school for middle échelon conservation personnel is about to start full speed in April 1979, financed by the Dutch International Technical Help, after a long delay to overcome bureaucratic obstacles in The Hague, while on the Indonesian side everything was ready. The well-known primatologist Dr. H. D. R ij k s e n (see *page 3080-3084*) is one of the teachers. Four consecutive courses, each of one year, have been projected.

Thus the progress made by the loggers is going to be matched by the conservationists. Strength to the latter!

Nature Conservation in Indonesia is the title of a 86-page booklet by Mrs. W. V e e v e r s - C a r t e r (c/o Dinas PPA, Box 133, Bogor, where copies can be ordered at US$ 5).

In a manner as simple as attractive it deals with the main reserves in the country. The illustrations, all page-size and in colour, consist of maps to locate all the larger reserves, elegantly drawn by the author, and photographs of animals and scenery. The text gives a concise but informative description of selected important reserves and their chief highlights. Thus described are for Sumatra the G. Leuser; for Kalimantan Tanjung Puting; for Java Ujung Kulon, Meru Betiri, Baluran, and the E. Java mountains; for the Lesser Sunda Islands the Komodo region, for Celebes Lore Kalamanta, for the Moluccas the marine environment; West New Guinea is briefly mentioned.

At the end there is a note for tourists; a table of ecosystems with their value to man, and one of the largest reserves with basic data; a list of geographical terms Indonesian-English, and a list of some mammals, birds and reptiles, with names in English, Indonesian, and Latin. A list of popular works and another of more technical ones completes it.

Many a tourist, domestic and foreign, will be immensely glad to have this well-executed, well-balanced guide. In paging through it, one would wish to be there.

The Nature Reserves Way Mual and Way Nua / Central Seram, Maluku, ii + 15 + 26 p., 5 col. illus. + 2 maps (1978, Dinas PPA, Box 133, Bogor, Indonesia). Field Report 8, FO/INS/73/013.

A bilingual report in Indonesian and English, based on a trip by Harry Amir and Jan Wind. The two reserves are on the N and S side of Ceram. They were established in 1972, mainly to protect the Shorea occurrences at the eastern limit of distribution of this genus. The island is steep and most of it unsuitable for agriculture. It is geologically diverse with much limestone, and has much good forest (some even down to sea level) on which the loggers have their eyes. In Way Mual large stretches of forest are swampy in the wet season. There is not much population; movements have occurred from the mountains to the coast. The fauna is poor in mammals (4 endemics), but has 167 species of birds (9 endemics); a considerable trade is conducted.

An irrigation scheme was proposed regardless of the Way Mual Reserve, and logging threatens the foothill area. Suitable recommendations are made. Way Mual, on rather level land in the North is to be extended from 175 to 425 sq.km, Way Nua, down from the summit of G. Binaya (3027 m), 200 sq.km, is to be better protected. In between, at about 1000 m, the Manusela valley is maintained as an enclave; the steep sides bordering it are to be strictly protected forest.

We hope that the planned joint Rijksherbarium/LBN expedition to Ceram, which was cancelled by the Indonesian authorities (it is now diverted to Celebes), will one day materialize.

Proposed Bromo-Tengger-Gunung Semeru Mountain National Park East Java, 26 p., 20 phot., 3 maps (1977, Dinas PPA, Box 133, Bogor, Indonesia). Field Report FO/INS/73/013; stencilled.

This park is meant primarily for recreation. Smeru, an active volcano of 3676 m, is Java's highest mountain. It totalled 16,912 visitors in one recent year. The area is also important for catchment. Within the projected park, there are 4 reserves of long standing: the Bromo Sand Sea, i.e. the inside of the caldeira; the other three are centered on small lakes in the uplands to the South; Ranu Pani Regulo (96 ha), practically denuded of its forest cover; Ranu Kumbolo (1340 ha), mainly Casuarina woodland; and Ranu Durungan (380 ha), originally rain forest, now heavily logged. The projected park will be about 600 sq.km in area, and have the status of Hutan Wisata or Forest Recreational Area. Accessibility and accommodation are described.

Nature Conservation in Irian Jaya / General information and proposals for establishment of new conservation areas, 49 p., 11 phot. + 8 maps (1978, Dinas PPA, Box 133, Bogor, Indonesia). FO/INS/73/013, Field Report no. 9, stencilled.

This is a first approach to conservation in an island that never needed it, although the cancellation of the 21500 sq.km Lorentz Reserve by the last Dutch Governor cannot be called a happy decision; the Indonesian

authorities have, however, reinstated it, together with the 225 sq.km Cyclops Mountains Reserve near Jayapura. An agreement has been reached on the 1420 sq.km Wasur-Danau Rawa Biru area near Merauke, and 6944 sq.km Pulau Dolok formerly known as Frederik Hendrik Island which beyond its rich birdlife has, however, no biological value.

A number of areas proposed in the past by the Forestry Department "with as their main justification the lack of exploitable forest or their unsuitability for logging" (p. 8) are briefly discussed, followed by a number for future survey; a map of both categories is given. Pending these suggestions, the report concentrates on two proposals for new reserves. The first is Waropen-Mamberamo, a roughly square area on the western side of the lowest part of the Mamberamo River, a very rich and varied area from sea level up to 1000 m, in the Van Rees Mountains with Danau Bira (formerly Lake Holmes). The total area, strict reserve, would be 7775 sq.km. Lake Rombetai, 112 sq.km, East of the Mamberamo, with its surrounding lands totalling 575 sq.km, is proposed as a game reserve, where hunting is allowed. The second is in the Tamrau Mountains North in the Vogelkop, halfway between Sorong and Manokwari, bordered in the South by the Kebar Valley. Mts. Kuoka (2453 m) and Bagimana (2584 m) are included; the reserve will reach 500 m out in the sea, its size is projected at 3130 sq.km.

A section is devoted to crocodiles and leatherback turtles. More useful to the botanist is a list of Indonesian-Dutch-English equivalents of 17 main geographical names (p. 46).

Report on a preliminary visit to Morowali / Central-Sulawesi, 25 p., 4 phot. + 4 maps (1978, Dinas PPA, Box 133, Bogor, Indonesia). FO/INS/73/013, Field Report no. 13, based on work by A.P.M. van der Zon and Yaya Mulyana. Bilingual in English and Indonesian, stencilled.

This area lies in the short, poorly known Eastern arm of Celebes, near the pit. The highest peak in the central range of the Banggai peninsula is reported to exceed 3000 m; Bukit Morowali, S of it, is 2280. Southeast of this, halfway the coast, are two small lakes, named Ranu. Limestone and ultrabasic rocks occur, with alluvium towards the coast. The area is sparsely inhabited by the nomadic Wana people. Most of it is under primary forest from which rattan is collected, with Agathis. On the seasonally wet plains there is mixed forest, with Alstonia scholaris, Calophyllum soulattri, Gonystylus macrophyllus, Sapotaceae, and Anisoptera. The lakes are connected by swamp forest, with much Casuarina.

The lowland forest was given out as a timber concession to a very large firm, but no logging has been started, and hopes exist that the concession can be cancelled. The reserve should run from the highest peak down to the coast, and cover 2000 sq.km.

Further surveys can hopefully be made by the English 'Operation Drake' expedition, early in 1980.

Draft Management Plan for the proposed Gunung Leuser National Park, by N.J. van Strien, 123 p. + 17 maps (1978, Dinas PPA, Box 133, Bogor, Indonesia). The final version is to follow before long.

Apart from the technical conservation matter like legal status, bound-

ary marking, management and tourism, this stencilled report is valuable for its descriptive matter on the area, although botanically it is almost too weak to mention. Much attention, however, is paid to historical aspects. The maps are 500,000 and sketchy; most give the rough distribution of animals.

The Leuser complex is now a more or less accidental conglomerate of reserved areas, for which a number of exclusions and inclusions are proposed, amounting to a small increase, and resulting in an area of 9814,50 sq.km (p. 61-67); this is to be given National Park Status. While this will make Leuser one of the most important reserves in the Indo-Malesian region, for its richness in both plant and animal life, and pristine state, there are three precarious factors. The first is distribution of altitude: above 2500 m is 6%, between 1500 and 2500 m is 35%, between 600 and 1500 m is 48%, below 600 m is a mere 12%. Second: much of the lowland area is in Sekundur, of which the northern part is currently being logged (*page 3029-3034*). This will rob the rich lowland fauna of its home, to so serious an extent, that the value of the park will diminish if the logging is allowed to go on; efforts are being made to retain the southern part of Sekundur: "It is estimated that only 25% of G. Leuser is below 1000 m altitude. In this one quarter of the park more than half of the [animal] species and most of the individuals are concentrated. When these low-lying parts of the park cannot be protected, G. Leuser will lose the largest part of its wildlife; what remains, although still a huge area, will only harbour a trifle of the original richness" (p. 40). The third danger is the population increase in the Alas valley which thrusts northwards into the reserve like a wedge. Bataks who come to enrich themselves cause a drain of forest products.

Geologically, the area is highly interesting. Much is still unknown but an extract of a 1973 mineral exploration report is given (p. 36-38); fortunately, there seem to be no minerals, although there may be oil near the eastern boundaries.

On pages 103-123 we find a checklist for vertebrates: a full list for Sumatra, in which the Leuser species are filled in (512 now known) and one line is left open for the other Sumatran species. Rough habitat and altitude indication are given. About the main species, a paragraph is devoted in the previous text.

Yayasan Indonesia Hijau means Foundation Green Indonesia. It was established on 12 January 1978, and produced its first Annual Report, of 24 pages in Indonesian and as many in English (the Yayasan Lestari, *page 2589*, has not been heard of much recently). Its aim is primarily environmental education, to stir public awareness, especially with the young, towards conservation of natural resources. The foundation has become a member of a high-level committee to advise the new Minister Emil Salim (see the first story). Much work towards these goals has been done by Mr. Julius T a h i j a, former President Director of Caltex Indonesia, and Ms. A. Regina F r e y, expert of the WWF Education Programme in Indonesia. She has set up a bi-monthly Suara Alam, a sprightly illustrated paper in Indonesian, to some extent comparable with Tiger Paper, carrying a larger amount of instructive matter for budding naturalists. One copy

is distributed free of charge to senior high schools, teachers, colleges, universities, boy scouts' clubs, youth centers, &c., all over Indonesia. The first issue (June 1978) of 16 pages was printed in 2500 copies, the second (October 1978) of 26 pages, in 5000 copies, the third (January 1979) is to be as large.

Under the aegis of YIH, artistic creativity is encouraged to prepare stickers, posters, and other presentations to express the value of wildlife. It is heart-warming to see the response. We wish YIH the best of success and all the perseverance needed for it!

Report on a Study-Tour on Nature Conservation in Iran, India, Thailand, Malaysia and Indonesia, viii + 299 p. (1978, Natuurbeheer, Ritzema Bosweg 32A, Wageningen, The Netherlands). Four students in conservation of the Agricultural School amassed extensive data, had many talks with experts, and presented the results in an informative manner.

There are 9 sections under which each country is dealt with on a number of points. A, Introduction gives background, itinerary, acknowledgements; B. General Outline, deals with: Land, People and land-use, History of the conservation movement, General policy and objectives, Results and present situation, Major problems, The future, Conclusion; C. Ecology and Conservation deals with: Main habitat types and changes, Present status of wildlife, Conservation actions, Suggestions for action, Natural vegetation, The multiple-use concept, Conclusion; D. Inventory of Wildlife and National Park Legislations, deals with licences, trade, protected animals, offences and penalties, authorities and powers; E. Organization and Finance, presents the outlines clearly by country, with charts, also mentions societies, local conditions and lacunae; F. Management of Nature Reserves and National Parks examines the position and tasks of wardens, the distribution of authority, training or the lack of it; G. Economic Aspects, deals with: traditional subsistence hunting, commercial hunting and capturing, controlled capturing and harvesting, trade, sports hunting, tourism; H. Conservation Education deals with: general information, languages, basic education, geographic distances, audiences, media, authorities, youth, urban population, rural population, education centres; I. University Education Including Research discusses the different aims, gives a summary of programs, lists workers and curricula. Appendixes give schedules of protected animals, a summary of the Draft Legislation for Indonesia, and 141 items of literature.

The bias of the report is clearly zoological, flaws and errors can easily be found in the botanical statements about Indonesia on p. 65 (New Guinea has a typically Australian flora; over 40,000 plant species have been recorded for Indonesia; in middle Sumatra forests with Pinus merkusii are found at higher elevations). This matters little if the report is consulted to learn about the conservation organization and situation, although G. Leuser and Ujung Kulon would be far more valuable to discuss than the three small reserves in Java on p. 101. Certainly, the keen visitor who comes to one of these countries for the first time, will not be able to do better than this enthusiastic, efficient team of four. Their labours will thus save others large amounts of time (once they have digested the densely typed text) and offer interesting comparisons.

Lessons from Australia. People who are really concerned with forest exploitation should study R. & V. ROUTLEY, *The Fight for the Forests / The takeover of Australian forests for pines, wood chips and intensive forestry*, 2nd ed., 407 p., 4 maps, 9 charts, 21 tables, 37 phot. (1974, Research School for Social Sciences, Australian National University, Canberra); offset print, price unknown.

From between the figures and quotations, what a story emerges! The half truths, bluff, and self-serving statements on the part of forest exploiters are investigated by two very sharp, tenacious minds. The viewpoint is economical rather than biological, which appears to lead to similar conclusions provided that all aspects of reality are taken into consideration.

The issue is that all sorts of clever pretexts are invented to convert the meagre area of Australian natural forest into wood plantations, a big money business, to which nature must give way. Photograph 29 shows a charred rest of a tree on a deforested tract of land, with the quotation, from an opening address to the 'Forwood Conference': "In this context, of course, the word 'devastate' or similar expression is quite unacceptable."

The chapter titles are: 1. The wood production ideology, 2. Pine planting for self-sufficiency, 3. The likely future population of Australia, 4. 'Predicting' consumption levels, 5. Overestimation instead of rational decision-making, 6. Likely future requirements and plantation areas, 7. The environmental costs of Australian pine planting, 8. Arguments from profitability and economic desirability, 9. Woodchipping for export, 10. The environmental costs of intensive pulpwood production, 11. Forestry economics of woodchipping, 12. Routes to commercial viability? 13. Wider economic considerations, 14. The Manijup scheme in Western Australia, 15. Parallel problems in USA and New Zealand, 16. Alternative forestry. Appendixes are: 1) The economic framework and underlying economic issues, 2) The pressures of growth and development on the environment, 3) The alternative of planting pines on cleared agricultural land, 4) Further details of the Eden woodchip project, 5) The 'objective' assessment of non wood-production values, 6) Unifying economic and environmental objectives through optimisation and decision modellings, 7) Forwood - a case study of the industrial lobby at work.

Apart from money, the fight for the forests is a conflict between values. "However the conflict between wood production and other values has received insufficient recognition in forestry literature, and indeed it is fashionable to deny that there is a conflict ... What is good for wood production is what is good for wildlife, soils, watershed protection, aesthetic values and everything else. The devotee of intensive forestry needs to deny that there is any serious conflict of values — because in this way, and only in this way, can he present himself as an expert in the relevant areas" (p. 12). "The forest, it is said, is a renewable resource and nothing can be lost by its use; hence its exploitation must be environmentally sound, even admirable since its products satisfy so many needs" (p. 13).

Authors quote the often-heard arguments for interference: in natural forest because there are so many old and dying trees, in ravaged forests

to replace it altogether. "But the forests can't both be run-down and improved by the same sorts of silvicultural activities (logging) and interference (fires, storms). In fact, neither argument amounts to much more than a roughly disguised way of imposing wood-production values as ultimate aesthetic values and as biologically-dictated. Neither argument will be very convincing to those who have admired the great shaft-like trunks of mature trees and magnificent ferngully and rainforest understoreys in the few tiny remnants of prime virgin forests, which forestry activities have left us, particularly if they have compared such 'unimproved' areas with adjoining cut-over forests" (p. 76).

The ideology is simple. All values are reduced to money value. Money value is expressed in wood production. Wood production must increase. Authors claim that foresters, to have their way, misled the public by imposing this ideology, and to make propaganda for adjusting public opinion to current forestry practices: to influence aesthetic values so that people come to prefer the young dense even-aged stands of trees.

Many of the tenets in this book are also found in E.F. SCHUMACHER's booklet *Small is Beautiful* (1973). In it, an experienced economist critically examines a broad spectrum of the ideology, in the light of clear and sensible observations. Many are relevant to our problem. Quotation: "Economics, moreover, deals with goods in accordance with their market value and not in accordance with what they really are. The same rules and criteria are applied to primary goods, which man has to win from nature, and secondary goods, which presuppose the existence of primary goods and are manufactured from them. All goods are treated the same, because the point of view is fundamentally that of private profit-making, and this means that it is inherent in the methodology of economics to ignore man's dependence of the natural world" (ch. 3). An economics-guided forestry is a misguided forestry — this is the inescapable conclusion.

The old forestry ideology: exploit nature and exploit it quickly, is failing. The many economic arguments true and false are deeply investigated by the Routleys, predictions tested, against a wealth of data; they fail to stand critical probing. The field is complex, so much so that misunderstandings come up easily even between those who are in agreement, let alone between those who differentiate between their values and those to whom only money counts. The life of the old ideology will be prolonged by civil servants who invested prestige in it, and see no other way to save their face than by stonewalling and cover-ups. But the arguments to cut up the lies, to correct the misunderstandings, and to save the values that must guide us, can be found and used to win, as these authors demonstrate. Much progress in the good direction was made at the Jakarta Forestry Congress. Yet it is hard to forget the lame pretexts to deplete Sekundur (*page 3029-3025*) in northern Sumatra, which has thoroughly shocked faith in Indonesian credibility. So the fight for the forests is likely to go on.

Dr. L.J. Webb, Rain Forest Ecology, CSIRO, P.M.B. 3, Indooroopilly, Qld. 4068, Australia, pointed my attention to the writings of JUDITH WRIGHT, a poet who from a literary background applied her talents to the cause of conservation. She is a Doctor of Letters honoris causa, also

co-founder of the Wildlife Preservation Society of Queensland, and she was a member of the Committee of Enquiry into the National Estate. Here is a poem from her anthology 'Five Senses' (Angus & Robertson 1963):

A d o c u m e n t

"Sign there." I signed, but still uneasily.
I sold the coachwood forest in my name.
Both had been given me, but all the same
remember that I signed uneasily.

Ceratopetalum,* Scented Satinwood:
a tree attaining seventy feet in height.
Those pale-red calyces like sunset light
burned in my mind. A flesh-pink giant wood

used in coach-building. Difficult of access
(those slopes were steep). But it was World War Two.
Their wood went into bomber planes. They grew
hundreds of years to meet those hurried axes.

Under our socio-legal dispensation
both name and woodland had been given me.
I was much younger then than any tree
matured for timber. But to help the nation

I signed the document. The stand was pure
(eight hundred trees perhaps). Uneasily
(the bark smells sweetly when you wound the tree)
I set upon this land my signature.

*A small genus of Cunoniaceae, in New Guinea and East Australia.—Ed.

To her writings on conservation she brought a wide erudition. In 'Science, Value and Meaning' (Australasian Annals of Medicine 18: 323-327. 1969) she explains how modern science and technology since the 17th century are based on a devaluation of certain specifically human qualities. The consequences made themselves felt in Australia: "In effect, we are carrying on a world-wide experiment on nature itself that amounts to vivisection. But we are making money out of it, for we are cashing in on age-old natural capital reserves of minerals, soils, plants and animals. So the danger-signals are going to be ignored as long as possible, and maybe longer (...) our spaceship has its limitations, and we are coming up against them", quotation from 'The Battle of the Biosphere' (Outlook p. 3-5, June 1969).

In 'The Individual in a New Environmental Age' (Austral. J. Social Issues 8: 3-9. 1973) she examines the role of the ecologist. "Organizations are powerless to change themselves. Only individuals can change themselves, and if enough of them do this, they in turn can change organizations." And a change is in order. "Our present world-view is materialist-utilitarian; it has been most successful in bringing us into our position of total control over the planet. Or what seemed like total con-

trol, until the problems began showing up. There is an old saw that says: 'Take what you want, said God, and pay for it.' We have taken what we wanted; the bill is now being presented, and even in purely economic terms, it is going to be enormous." After having examined the limits of the materialist-utilitarian outlook, she continues: "We are beginning to see that 'nature' and 'man' are not separate, that each needs the other; it is a small beginning, but a beginning. And it is a reassertion of the values of feeling against the economic and technical Gradgrinds of our time."

"This, then, is the possible power we are searching for, to provide the starter fuel for our new vision and ethic. The obvious alarm with which it is being viewed by our economic masters — the dismissal of these small movements as 'emotional' — is well justified. There is no stronger force than emotion, if it is well based and well directed. For it is feeling that establishes values, and if we are ever to move from economic values to a reassertion of ecological values our feelings and sympathies must be engaged first. I think there are many signs that this is happening."

"This is not to say that an ecological value-system by itself would be enough, or that we can do without an intellectual thought-out basis for it. Far from it; the scientific and intellectual revision of our priorities is urgently necessary and has indeed been the basis for the new movement of feeling. It is because we recognize that the technological explosion and the economic thinking that has supported it have been based on bad premises about the resources of the planet, and that these must be reversed and revised if man and his planet are to survive the next couple of centuries in good shape, that our attitude to nature is changing."

Recognition of it being feeling that sways public opinion far more than reason, is a great enrichment, and Dr. Webb told me that one of the most appealing arguments for conservation in Australia now is the wish of parents that their children and grandchildren shall know the land as they have known it. The next step is decision-making; this subject is examined in 'Conservation: Choice or Compulsion?' (Morris Lecture 1975, Adult Education Board, Box 84, North Hobart, Tasmania 7002).

"But it would be a great over-simplification to say that many people, even among those who recognise that our lack of planning and bad management faces us with serious effects that must be remedied, are willing to accept controls that may go against their own immediate interests. On the contrary, they are likely to fight against control and planning wherever and whenever they can. It is always someone else who ought to make sacrifices in the long-term interest; when people are faced with the need to do this themselves, they take a different view. This is the rock on which governments determined to act to change bad resource-use can founder. On the one hand, there is pressure to recognise the need for new priorities; on the other, there is even more determined resistance from those who will stand to profit privately from going on in the old accepted ways. (...) Very many farmers have bankrupted themselves by land use unsuitable for the land they held and worse, they have bankrupted the land itself in the process."

Judith Wright points to the philosophy of progress and optimism as a deep-rooted cause of the trouble; I think rightly so. "I don't, then, have much faith in programs of public education that depend on the old 'system of optimism' for their effect. Certainly we need such programs urgently — programs that inform people on the wise use of land in all its aspects, including the management of private forests, wildlife, the proper use of pesticides and fertilisers, the need for national parks, nature reserves and scientific areas for reference, tied in with national land use policy. But while this conflicts with private interests in the use of land, I think it is not likely that we will suddenly become a responsible breed. And meanwhile, all the problems continue at a rate of compound interest. (...) But the real crux, the problem so difficult that few reports and advisers dare to mention it, lies in the question whether we should continue the system of private choice in land-use decisions, or impose authority and compulsion?"

I think that here the lesson element comes in. What the foreign logging companies are doing to the environment in the humid tropics, under the system of free enterprise, is beyond description. But they are doing this only with permission of the government and to land that is owned by the government. It was a moving moment when Indonesian Vice-president Adam Malik put the question before the World Forestry Congress in Jakarta: Please give us advice. As far as conservation matters are concerned, Mr. Malik may be assured that advice will keep coming.

Queensland: new National Parks have recently been declared in Cape York Peninsula. The major acquisitions are:

— Jardine River National Park (2350 sq.km), includes most of the catchment of the Jardine River areas of heath, rainforest, open forest swamps and sand dunes.
— Iron Range National Park (305 sq.km), mostly semi-deciduous mesophyll vine forest on the Claudie River catchment. Of great interest for the New Guinea affinities of its flora and fauna.
— Archer Bend National Park (1660 sq.km), gallery forest near the junction of the Archer and Coen Rivers. Also extensive areas of open forest dominated by Eucalyptus tetrodonta and other species.
— Staaten River National Park (4670 sq.km), woodland mostly dominated by Melaleuca viridiflora.
— Lakefield (about 5000 sq.km), yet to be gazetted at time of writing. Mangroves, wetlands, open forest, Melaleuca woodland, noted for waterbirds, crocodiles and the rare golden-shouldered parrot.

The addition of these parks has increased the area reserved in Queensland by a factor of three to about 22,000 sq.km. The parks preserve samples of almost all the biogeographically important Cape York vegetation types.