VI. MISCELLANEOUS INFORMATION

a) Research and Publications *(continued from page 2341)*

The South Asia Institute (see note on page 2342) has changed its address in Heidelberg, Germany: now P.O. Box 10 30 66. Work is in progress on the geography - with a botanical inclination - on Nepal, Ceylon, Java, Sumba, Timor, Papua New Guinea, and Stewart Island, New Zealand.

New policy of NUFFIC. The two projects executed by the Rijksherbarium for the Netherlands University Foundation For International Cooperation: seedlings in Bogor and Flora of Thailand, have been completed and discontinued respectively. Both were conceived in the early days of NUFFIC, when initiatives of interested parties were welcomed. Election of a socialist government in Holland in 1973 brought a gradual change in policy, towards larger, multidisciplinary projects for the benefit of the poorest, and we were informed that small projects like the above would not be accepted. We will see what the next elections bring, in 1977.

France-Russia-Vietnam. At the Leningrad Congress, Prof. J.F. Leroy and Dr. J.E. Vidal of Paris discussed with their Vietnamese colleagues Prof. Duong Huu Thoi and Thai Van Trung a project on the Flore du Viêt-Nam in which Soviet botanists are to assist. It was decided to exchange material and personnel in relation to the subject.

At Calicut University, Department of Botany, Kerala, S. India, Dr. B.K. Nayar has initiated a project to redescribe and identify the plants of the Hortus Malabaricus of R h e e d e.

Hermann's Ceylon herbarium on microfiche. Paul Hermann (1646-1695), afterwards Professor of Botany at the University of Leiden, resided in Ceylon as an 'Ordinary and First Physician' of the Dutch East Indian Company during the years 1672-1679. During his residence in Ceylon Hermann collected the herbarium, which is now in the possession of the British Museum of Natural History, London. This was not the only collection he made. In Trimen's paper 'Hermann's Ceylon Herbarium and Linnaeus's Flora Zeylanica' we find that "Besides the herbarium under consideration, Hermann formed another whilst in Ceylon, which he sent to J. Commelin at Amsterdam. It was from this collection (combined with that made by J. Hartog, which was sent from Ceylon to Voss, Curator of the Amsterdam Gardens) that J. Burman, Commelin's successor, compiled his 'Thesaurus Zeylanicus'." On page 132 Trimen mentions still other collections: "Hermann also sent specimens to other botanists of the time." These 'other botanists' may

have been Breyne and Plukenet. It is possible that one of the 'sets' came in some way into the possession of the Leiden University.

The herbarium, which is in a very good condition, appears to contain common species, wild in Ceylon or cultivated in that island. A number of the species described by Linnaeus in Flora Zeylanica and afterwards in the first edition of his Species Plantarum are, however, not represented in the London collection. When preparing his Flora Zeylanica, Linnaeus must have known these species only from the description given by Hermann or from a drawing made by him.

The herbarium contains 157 folios, among which are many types. A list of the species, and an 'Index of Latin names' appear in the article by Dr. S.J.van Ooststroom, 'Hermann's Collection of Ceylon Plants in the Rijksherbarium (National Herbarium) at Leyden', in Blumea, Suppl. 1, 1937. Some quotations from the article are used in this announcement. Price SFr. 120. IDC Order Department, Poststrasse 14, Zug, Switzerland.

Flora of Thailand volume 2 part 3 was published late in 1975, pages 197-280. It contains Podocarpaceae by C. Phengklai, 6 spp., Gnetaceae by C. Phengklai, 8 spp., Smilacaceae by T. Koyama, 27 spp., Magnoliaceae by H. Keng, 17 spp., Portulacaceae by R. Geesink, 5 spp., Stylidiaceae by K. Larsen, 3 spp., Goodeniaceae by K. Larsen, 2 spp., Sphenocleaceae by K. Larsen, 1 sp. Order from Thai Documentation Centre, 196 Phahonyothin Road, Bangkok 9, Thailand; price US$ 7.00 post paid.

The same address has been mentioned in connection with a clever idea. A scientist who is eager to do field work in Thailand is required to publish his results. Once the agreement is made, the scientist deposits an amount of money which he will receive back when the manuscript is received. This is a condition for cooperation in the field. Too many visiting scientists made off with their results without any benefit to their hosts.

A Flora of Thailand conference was held in Aarhus in June 1975 with participation of representatives from Bangkok, Paris, Leiden, Kew, Copenhagen, and Aarhus herbaria. Several larger manuscripts are nearly ready for printing. First priority to be printed is Dr. K. Iwatsuki's manuscript on the Ferns of Thailand. This will occupy the whole of volume 3 of Flora of Thailand. Volume 2 will be completed with a number of smaller families.

Indonesian Weeds. A NUFFIC-BIOTROP project was started early 1976 on a 3-5 years inventory and eco-physiological study of the main weeds of important crops, in order to pro-

duce a collection of 'weed species identification sheets' and a concise handbook. Coordinator is Prof. Dr. R. v a n d e r V e e n, Huizen, Netherlands, assisted by Ir. P.J.van Rijn. As Netherlands botanists are assigned Mr. Dekker for taxonomy and Mr. Pons for eco-physiology, as Indonesian botanist Mr. Soemantri Wirdjahardja. In an early stage they will familiarize themselves with the plants at the Rijksherbarium. Field work will be done around Bogor, Pasuruan, Medan, and in S. Sumatra, mainly in rice fields.

Flora of Australia. Preparations for this project of the Australian Academy of Science are making headway. Dr. Nancy B u r b i d g e, the pivotal botanist, has been working full time on it after Dr. H. Eichler took over her administrative duties as Head of the Herbarium Australiense at Canberra. She has undergone major surgery in mid-1975, but is recuperating well. After a visit to Australia by Dr. W. T. S t e a r n of the British Museum, some big businessmen who heard him lecturing decided to put up some money, and this actually made the start possible. A card index to all names of Australian plants is now being made by Mr. Arthur Chapman, which will be of much help to botanists working in isolation. Miss Burbidge who now has secretarial help, is also far advanced with a list of selected taxonomic literature available in Australia, for which the various Herbaria in the country are making additions. The cooperating Herbaria are: Brisbane, Canberra, Sydney, Melbourne, Adelaide, Perth, Alice Springs. Provincialism (each of these 'national' Herbaria is financed by its State and under obligation to observe its boundaries which, unfortunately, the plants don't) is gradually being overcome; heads of the major herbaria now meet once a year to discuss general policies. There is a trend to set free the senior staff members of institutes to work towards Australia-wide revisions, and to reduce the tedious and scientifically unproductive routine naming for the public by charging money for their man-hours.

Sample treatments have been compiled, one on the Loranthaceae after Barlow, by Miss Burbidge, and three on the Rhizophoraceae after Ding Hou, by Dr. R.D. Hoogland, in various degrees of elaboration. Also Dr. Helen Hewson is now writing up the Cruciferae after existing revisions by Dr. Elizabeth A. Shaw on some genera and completed by herself. The MSS are studied by the Executive Committee, whose members are Dr. Burbidge, Mr. S.L. Everist of Brisbane, Dr. H. Eichler, and Prof. D.G. Catcheside (representing the Academy). The larger Flora Committee, which meets annually, has about 18 members, representing each State and most Universities.

A liaison Officer will be at Kew all the time, as has been the case for many years; every year a different botanist is

to be sent. The present one is Dr. A. K a n i s, from September 1975 to September 1976.

George Bentham completed the 7 handsome volumes of the Flora Australiensis in 15 years time, nearly a century ago, besides preparing the Genera Plantarum. He was 62 when he started. It will not be easy to find a botanist with the intellectual gifts of a Bentham, who was schooled in law and philosophy and was up in ten languages. But the challenge is there. It may now take a team of botanists thirty years of work, but the field has been prepared, and a splendid thing may eventually be accomplished if soon the right person comes forward.

Evolution of Gramineae in tropical Asia. Dr. R. O W h y t e, P.O. Box 167, Kota Baru, Kelantan, Malaysia, will continue his study on the antiquity and evolution of wild and cultivated members of the Gramineae in 1976. Seminars and discussions with leading Indian cytologists on the geography of abnormal meiosis (so important in the evolution of the grasses in borderline environments - see preliminary review in The Nucleus (Calcutta) 18 (3), 1975) will be held from early January to mid-February 1976. In early May he will visit the International Rice Research Institute, Los Banos, Philippines, to continue his discussions with the geneticist Dr. T.T. Chang, on a new interpretation of the origin of rice (see paper by Chang in Euphytica, probably 1976).

In September 1976, Dr. Whyte will visit Dr. Tetsuo Satake and his colleagues at the Hokkaido National Agricultural Experiment Station, Hitsujigaoka, Sapporo, where important cytological work is in progress in a phytotron on male sterility caused by low temperatures at the limits of rice cultivation.

Forests and Land Use, legal and illegal, in Luzon and eastern Mindanao, are subject of a thesis by Mr. K. H a u s h e r r of the South Asia Institute, Heidelberg, to be completed in 1976.

Flora of India Project. A Flora of India Cell has been constituted in the Botanical Survey of India to expedite the progress of revisionary work on plant families. The meetings are held every month to review the progress of work. The revisionary work on Caryophyllaceae, Dilleniaceae, Polygalaceae, Sapindaceae, etc., is nearing completion.

Germination of seeds eaten by birds. Dr. M. M. J. v a n B a l g o o y, during his year at Kuala Lumpur, made observations on this subject and has sent a paper on it to the Malayan Nature Journal.

Hildebrand's Identification Books. The late Mr. F. H. Hildebrand, during his long career of pre-identification described on pages 2517-2521, prepared 4929 sketches in pencil with notes on characters, all documented with collector's name and number, determinavit, country; types are mentioned; language Dutch. They form a treasure of knowledge for the vegetative recognition of Malesian woody plants. They have been numbered, bound in 19 folio volumes, indexed and placed in the Rijksherbarium library.

Beginners in the pre-identification business who know some Dutch can take advantage of 80 diagnoses of large Malesian families, with exceptions and some genera mentioned, prepared by Drs. R. C. Bakhuizen van den Brink and C. G. G. J. van Steenis for internal use at the Rijksherbarium.

Legumes of East New Guinea. Dr. B. Verdcourt of the Kew Herbarium has agreed to apply his experience in African Leguminosae to the Papua New Guinea members of that family. He is visiting the country for the first 3 months of 1976, then in two years' time hopes to have written up the Legumes for the Handbook Flora of Papua New Guinea.

Agathis forests in the SW. Pacific have been travelled and studied by Dr. T. C. Whitmore of the British Museum; he hopes to complete his Report during 1976.

Goa Flora. On page 2320 there is a mention about field work in Goa. Perhaps by oversight the work was shown therein to have been carried out by the Botanical Survey of India. Actually Dehra Dun Herbarium is a part of the Forest Research Institute, Dehra Dun, separate from the Botanical Survey of India. The latter of course also has a regional herbarium at Dehra Dun - hence the confusion.

Writing of the Forest Flora of Goa (c. 450 ligneous spp., 100 illustrations) is nearing completion and is expected to go to the press sometime in 1976. Authors: K.C. Sahni, K.N. Bahadur and S.S.R. Bennet; assistance: R.C. Gaur; illustrations: P.N. Sharma.

Dipterocarp Seedlings. Mrs. Géma Maury, Laboratoire du Ecologie Générale, 4 Av. du Petit Chateau, 91800 Brunoy, Toulouse, France, worked in Malaya for two years and prepared a Ph.D. thesis on c. 200 spp. of fruits and c. 100 spp. of mature embryos and seedlings of Dipterocarpaceae. Seeds of 80 spp. were collected and sown in soil from the forest. Studied were Anisoptera, Balanocarpus, Cotylelobium, Dryobalanops, Dipterocarpus, Hopea, Marquesia, Monotes, Parashorea, Pentacme, Shorea (10 sections), Stemonurus, Upuna, Vateria, and

Vatica. Characters have been described, tabulated, summarized and discussed. This study confirms suspicions of Heim (1892) and I.H. Burkill (1920) that embryo characters have great value at generic level. Correlations were found of the sepals being valvate or imbricate with dehiscence of the fruit on germination, shape and place of the embryo and cotyledons, mode of germination, and ecology; all these correlations are indicated and reasoned, and phylogenetic trends sought. The work was done in connection with P.S. Ashton's revision of the family. A 180-page manuscript in English was sent to Mr. E.F. de Vogel at Leiden for reading. We hope to see it in print in some or other form.

Prize of the Professor Lam Rijksherbarium Fund. The biennial award (see page 1898, 2172), consisting of a lam(b) in bronze, was in a ceremony on 22 August 1975 given to Mr. J.M. B o n g e r s. Under supervision of Dr. P. Baas, he had prepared a paper 'Epidermal Leaf Characters of the Winteraceae' (Blumea 21, 1973, 381-411, 7 fig., 42 phot.), wherein he found a correlation with habitat in Drimys piperita. Professor H.J. Lam himself, 83, attended the ceremony, making a speech about doubt and certainty in evolution, which keeps intriguing him.

A handful of notes from the Kuching Herbarium:

Manual of the non-Dipterocarp Trees of Sarawak. Corrected proofs of the first volume were received at Kuching from Dr. P. S. A s h t o n. A few minor corrections are still to be made, after which they will be sent to the printers. Work on the second volume continues.

Vernacular Check-List of the Forest Trees of Sarawak, was compiled by Dr. J. A. R. A n d e r s o n who is making a final correction of the MS. It is hoped that the check-list will be ready for printing in 1976, at Kuching.

Ornamental & Roadside Trees of Sarawak. This project aims at compiling a comprehensive and illustrated account of the common ornamental and roadside trees and shrubs in Sarawak. It is hoped that a manuscript will be ready for the printer in mid-1976 at Kuching.

Ecology of the Mangrove Forest of Sarawak. Analyses of soil samples was completed at the beginning of 1975. Annual measurements of trees in systematic transects and yield plots due for this year have been completed. A MS by Paul C h a i was sent to The Malaysian Forester.

Phenology of Forest Trees in Sarawak. In the Arboretum in the Semengoh For. Res. 246 trees were marked early in 1975 for monthly observation of flowering and fruiting. Steps are

being taken to include more species for observation by the addition of more than 100 trees.

Iridescence of plants in Malaya is studied by Dr. David W. L e e at the School of Biological Sciences, Kuala Lumpur. He is concentrating on Pteridophytes, but also Begonia pavonina, of the forest floor, with red underside of the leaves as many shade herbs have. Together with Dr. J.B. Lowry he is investigating the leaf flush, in Pometia pinnata and others. See Nature 254 (1975) 50-51.

Lectins in Malesian Leguminosae. These seed proteins especially common in rain forest species, are now also studied by Dr. Lee, in c. 130 species. See Malaysian J. Sc. 3 (A) (1975) 89-93.

Leptospermum recurvum on Mt Kinabalu, its genetic and morphological variation is also under study by Dr. L e e, using isozyme and seedling analysis.

Copeland's Fern Flora of the Philippines. Mr. M. G. P r i c e, Department of Botany, UPCA, College, Laguna 3720, Philippines, reports: "The dates on the three volumes are 1958, 1960 and 1960, respectively, being the years in which they were actually printed. According to the N.I.S.T. Annual Report for 1958-1959, volume 1 was received from the printer on 23 July 1958. No such precise dates were recorded for volumes 2 and 3, but delivery was effected only after payment was received by the printer (The Bureau of Printing). For volume 2, payment was made on 31 August 1960 and for volume 3 18 January 1961. These are therefore the earliest possible dates of distribution, and there is some evidence of further delay. Thus, volume 3 should be cited as 1961, not 1960. In the three volumes there are 41 new combinations.

One thousand copies of each volume were printed, and some complete sets are still available for U.S.$ 4.75, postpaid. Orders may be sent to: The Editor, Philippine Journal of Science, National Institute of Science and Technology, P.O. Box 774, Manila, Philippines. Checks should be payable to the N.I.S.T. Manila.

I am indebted to Mr. Romeo Cordero of the N.I.S.T. for help in searching through the records of the institution."

More Copeland papers, reprinted in one volume, DM 185.-, by Otto Koeltz, P.O. Box 1380, D-624 Koenigstein/Taunus, West Germany: Trichomanes, Philip. J. Sc. 51 (1933) 119-280, Hymenophyllum, ibid. 64 (1937) 1-188, Genera Hymenophyllacearum, ibid. 67 (1938) 1-110, all with plates.

Aberdeen-Malaya project on the reproductive biology of rain forest trees, announced on page 2333, has taken further shape. Dr. P. S. A s h t o n was in Malaya from 11 July to

28 November 1975."While there he taught an honours course in forest botany and assisted in another in economic botany and in a field course, besides collaborating with and supervising the research scholars participating in our collaborative investigation into the genecology of some rain forest trees. The full six students are now appointed; our most recent recruit, Mr. S. Appanah, got off to a very useful start aided by a moderate flowering of Xerospermum intermedium - though not as heavy as last year - and sporadic flowering among several dipterocarps and other species. S.K. Yap was thus also able to perform a second, more elaborate and hopefully more successful, crossing experiment in Xerospermum while C.O. Ha now has complete material for his cytological and embryological studies which are beginning to make significant progress; on the dipterocarp forest H.T. Chan has made studies of flowers and fruit phenology, mortality and pollination biology and performed some simple crossing experiments to perfect techniques in anticipation of a good flowering in 1976; Ms. A. Kaur has meanwhile continued her cytological and embryological work in this family and made further collections when the trees were in flower. Ms. Y.Y. Yap now has enough material, it is hoped, to provide convincing evidence of the pattern of gene flow and hence the breeding systems of Xerospermum intermedium and Shorea leprosula. The summer and autumn months saw some exciting moments at Pasoh. All three climbing booms were at one time erected way above 100 ft on giant chengal trees; Appanah and Chan were able to work within sight of one another on different flowering trees, and spent a whole night 'at the summit' observing flowers and insect behaviour. On another occasion the research forest rang with shots as we picked off leaves from the canopy of emergent dipterocarps for isoenzyme analysis. Leaves were sampled from all emergent individuals of Shorea leprosula and some from each of its six relations in the Shorea section, along a 1700 x 40 m strip, to investigate the variation in gene frequency within and between tree clumps. Our consultant sharp shooter, a Temuan, bagged 64 leaves with 66 shots - worthy of the Guinness Book of Records? Cartridges are only obtainable in Malaya through the district police chiefs, and P.S.A. received a distinctly ambivalent look when he asked for 75 SG12's from the OCPD, Kuala Kelawang, one of the game-shooting fraternity, 'in order to shoot leaves off trees'. As unexpected and not altogether welcome visitor to Pasoh in September was an itinerant tiger, whose periodic roars encouraged S.K. Yap to shin up a remarkable number of trees in the course of his pollination experiments.

Our project constitutes the only ongoing research at present in the now celebrated Pasoh forest, and until the UNESCO Man and the Biosphere programme gets started then Pasoh's

future will remain precarious, though our work presently ensures its safety. P.S.A. was able to establish a nature trail in the buffer zone during his free time, and to produce a first draft of an instructional guide for secondary schools, in collaboration with the state forest departments; this will provide essential local interest and support for its conservation.

Alastair Wallace, botany honours student at Aberdeen, joined the team during August and September to pursue a study of the branching habit and leaf distribution of some primary and secondary forest trees for his honours thesis."

All from Bulletin of the Institute of SE. Asian Biology, Aberdeen, no. 21. Editor Dr. Adrian G. Marshall, Department of Zoology, University, Aberdeen AB9 2TN, U.K.

Tree Flora of Malaya. Volume 3, edited by Dr. F. S. P. N g, is near completion. Families: Actinidiaceae, Aquifoliaceae, Bignoniaceae, Connaraceae, Ebenaceae, Ericaceae, Icacinaceae, Moraceae, Myrtaceae, Ochnaceae, Styracaceae, Theaceae, Verbenaceae, Violaceae.

Work on a Manual of Malayan fruits, seeds and seedlings, covering morphology, anatomy and germination is continuing in Kepong. A precursory illustrated paper dealing with 10 families (Alangiaceae, Araucariaceae, Burseraceae, Dilleniaceae, Erythroxylaceae, Lythraceae, Polygalaceae, Sarcospermataceae, Trigoniaceae and Violaceae) has been published in the Malaysian Forester 38 (1975) 33-99.

Contribution of the Malayan Nature Journal to the Natural History of Malaysia (late 1973) - Mal. Nat. J. 25 (3 & 4), 183 pp. Contents: Annotated bibliography of articles published in Malayan Naturalist, Singapore Naturalist, Malayan Nature Journal vols. 1-25, and other relevant publications. Obtainable from: the Secretary Malayan Nature Society, P.O. Box 750, Kuala Lumpur, Malaysia. Mal$ 10.00 (postage extra).

Ecology of Ceylon Trees, endemic species in relation to their conservation, was the subject of a thesis upheld in September '75 by Miss C. V. S. P e e r i s, supervised by Dr. P.S. Ashton, who is himself working on the Myrtaceae of that island, which he studied there in the field late in 1973.

Ochse Vegetables reprinted, the English edition of 1931, nomenclaturally updated by R.C. Bakhuizen van den Brink Jr and provided by him with a new introduction, was announced as forthcoming and offered at Dfl. 160.- by R. Meesters, bookseller, Molsteeg 9, Amsterdam.

Ant plants. Miss Camilla H u x l e y of Cambridge, U.K., who went out to work in Port Moresby for an M.Sc. degree, has taken up the study of ant plants which in New Guinea abound.

Flora Port Moresby area. An inventory project has been set up by Dr. D. G. F r o d i n of the UPNG-Herbarium, assisted by Miss Camilla H u x l e y, who is out there from Cambridge U.K. since mid-1974 on a 2-year contract. Involved are 1-3 students at a time. Aim is to contribute to a semi-popular booklet, the second of a projected series each on a special type of vegetation, following 'Mangroves of the Port Moresby region' by D.G. Frodin c.a. (UPNG Occasional Paper no. 3, price Au.$ 1.00). The next in the series will deal with the sandy and rocky coastal plants, a number of which are peculiar, e.g. Cochlospermum gillivrayi. General collecting of the UPNG is focussing on this whole region, to c. 50 km inland, in fact the area covered by the CSIRO land research series issue.

Ferns. Mr. E. H e n n i p m a n 's Bolbitis (incl. Egenolfia and Edanyoa) world monograph, based on extensive dried and living material of 44 spp. and 13 hybrids, is in the press with the Leiden Botanical Series, and scheduled for publication late in 1976.

Polypodiaceae sens.str.: generic limits. At the Rijksherbarium Mr. E. H e n n i p m a n has planned to sort out the contents of this taxonomically complex group. A start has been made by systematically examining in detail the rhizome scales in the type species of all the genera. Other characters will come up for examination later. The work is time consuming and it may last several years before the data can be taxonomically evaluated.

b) Herbaria, Gardens, Organizations *(continued from page 2348)*

The collection of Ceylon plants made by E. B. W o r t h i n g t o n has now been incorporated into the BM-collections.

In the Calcutta Herbarium, old collections of Aug. Henry, A.D.E. Elmer, George King, S. Kurz, were sorted out and incorporated in the Central National Herbarium. Several type materials detected were sorted out. Besides, about 2000 herbarium specimens received from foreign herbaria on exchange basis are also incorporated.

The Botanical Survey of India laid out an experimental Garden at Pauri, Uttar Pradesh under the Northern Circle, Dehra Dun.

University of Malaya. The administrative structure of the biological sciences was changed in 1975, the old unified School of Biological Sciences being subdivided into three autonomous Departments (of Botany, Genetics, and Zoology)

each with a Professor and a Head of Department (not necessarily combined). The result is a strengthening of the Department of Botany as its staff membership has increased and now includes plant ecologists and plant physiologists.

The Botanic Gardens of the University of Malaya experienced a difficult year with extremely meagre financing, but the situation improved late in the year and 1976 looks like a better supported episode. Staffing is still largely incomplete. The first garden building is now completed, comprising the stores, superintendent's administrative office, and a meeting room. The building is in semi-Minankabau style and is most attractive, harmonizing well with the garden. Plans to proceed with the second phase (the herbarium/library/staff room/laboratory complex) are now being given attention.

Kebangsaan University, Malaya. See Personal News: M.M.J. van Balgooy.

At Kuching, Sarawak, a proposal has been made to further extend the Research building in 1976; this will include one more store-room for herbarium specimens.

Plans are also being made to develop the area around the Sarawak Arboretum in the Semengoh Forest Reserve into a botanic garden. Survey and planting work will commence in 1976.

Sandakan, North Borneo. The SAN Herbarium was moved in August 1974 and is now completely sorted out and rearranged. The spacious arrangement includes work benches on nearly all external walls and drawers for carpological and spirit collections close to the families. The arrangement is still alphabetical.

The indices, reprint collection, maps, and assistants' working space is all included in the Herbarium. The Artist and Botanist have separate offices leading off the Herbarium. A renumbering of the collections has been completed and there are now 70,187 different specimens at SAN, 49,360 collected by Department Staff and 20,827 acquired by exchange. This is a very considerable achievement since the fire of 1961.

Palms at Bogor. "Worth noting", Dr. J. D r a n s f i e l d of Kew wrote, "that the plants of Pigafetta filaris planted by me in 1973 and 1974 are growing incredibly rapidly and are universally admired resulting in many demands to the Gardens for more seedlings. This palm has an enormous potential as an ornamental."

Bamboos in Flores. Inspired by the book of McClure (pages 1581-1583), Father E. S c h m u t z at Ruteng decided to collect bamboos for a garden that he is laying out.

Garden at Leyte, Philippines. Plans are being made for a botanical garden to the Visayas State College of Agriculture, Baobay, Leyte, with Mr. M. G. P r i c e of Los Baños as a consultant.

Old collections. BS 24557 from the Philippines, isotype of Villaresia latifolia (Icacin.) and not known to have survived was located at Agricultural Faculty, Kagoshima University of Japan, where S. Hatusima was working.

NGF 236 was collected as early as 27 June 1944, by Aust. For. Svy. Co., according to a label in the Brisbane Herbarium. The plant is Artocarpus vrieseanus (Morac.).

Lae Herbarium. "The Division of Botany of the Department of Forests has developed from a small botanical group associated with an Australian Army Forestry Company which was located at Lae. The late Lindsay Smith, botanist from the State Herbarium, Queensland was attached to the Forestry Unit which was under the command of J.B. McAdam. McAdam subsequently became the first Director of Forests for Papua New Guinea. Through McAdam the importance of having a local herbarium was emphasized. In 1946 when the present Chief of Division was appointed as Forest Botanist, the collections consisted of fewer than 2,000 botanical specimens housed in open shelving in a building the sides of which were wire mesh." Thus reads an excursion pamphlet of 1973.

Now the Lae Herbarium has about 200,000 specimens; see pages 2344-45 for the present status and publication program. It is the best-kept Herbarium in Malesia, where a constant effort is made to keep the collection up to date by inserting identifications from literature and specialists.

Following independence of Papua New Guinea, Mr. J.S. Womersley left after 29½ years of service (see Personal News); Mr. Michael G a l o r e, from Wedau in the Milne Bay District, who joined the Herbarium in 1954 and rose to the position of Curator, has now taken over the executive position, as Co-ordinator of the Division of Botany. He will be supported by a team of professional botanists, under the direction of Mr. E. E. H e n t y.

We hope that, after the departure of the 'founding father', the splendid institute left by him will continue to realize its potential for identification, research, and training, although "Due to budget cuts the previous assistance to visiting overseas botanists and horticulturists will be severely curtailed" (Austral. Syst. Bot. Soc. Newsletter 6). To our congratulations to Messrs. Galore and Henty we add the wish, that the records of explorations made, which from the note books are being written up for publication, will indeed be published in due course, so that we know where collections have been made, and how many.

Wau Ecology Institute, Papua New Guinea. To the note on page 2013, here comes an additional one:

"We can add to the enclosed report that in 1974 much more progress has been made at Wau Ecology Institute. Mr. Paul Kores came from U. of Hawaii to take up the rhododendron project in April. Mr. Alan Hart, Lin's artist/technician from Bishop Museum, came to help in research & curating the growing insect collection. From February to August we greatly enjoyed the presence of Dr & Mrs Joe Szent-Ivany, continuing their studies of biologies of moths & butterflies. Some sizeable manuscripts were achieved. Thane Pratt & Allen Allison have made great progress on their thesis projects. Michael & Barbara Robinson continued research till departure at end of August.

We may realize $24,000 (US $ 36,000) from this first large coffee crop we've had since acquiring the plantation; with visitor rentals, this will cover a large part of operating costs. But funds are needed to bring a minimum of one grad student early in 1975 to partly replace those departing (Pratt, Allison, Hart, Safford), besides for completion of a lab, & for other salaries. Remember: gifts are tax-deductible both in the U.S. & in Papua New Guinea. For the U.S., send to Bishop Museum Ecology Fund, Box 6037, Honolulu, Hi. 96818.

We do need further help to pay off debts and to buy another 30 acres of coffee adjacent, which should make WEI self-supporting for minimum operation. We hope for a government subsidy for salaries of instructor for classes, as well as for manager and secretary. Next project will be for fellowships.

We have an outstanding location picked out for a marine branch when financing can be found.

We hope that you or your friends can visit Wau before long."

Port Moresby Herbarium (UPNG). In 1974, the Herbarium moved into a more spacious temporary building nearby; capacity 10,000 sheets for 4,000 now.

Flecker Botanical Gardens, Cairns, a place more fortunate than most provincial cities in that past administration had the foresight to set aside large tracts of land for use as parks. Also, that climatic conditions are highly conducive to active plant growth. Mr. K. V. W h e b e l l, Acting Town Clerk, P.O. Box 359, Cairns, North Qld. 4870, Australia, kindly reported:

"The present area set aside for botanical reserve and gardens is about 300 hectares, at Edge Hill reached via Sheridan Street, turning into Collins Avenue - about three and a half miles from the G.P.O. This goes from tidal creek to over 400 metres altitude (Mt. Whitfield being the highest point), em-

bracing mangroves, Melaleuca forest, coastal vine scrub, vine scrub and Eucalyptus open forest. This then gives us a fair representation of our indigenous flora common to Cairns, to preserve for the education, admiration and health of future generations.

Mr. E. Stephens of the Cairns Historical Society has told me that their records show an area known as the Botanical Gardens on our present location as early as 1880. Cairns was founded in 1876. Mr. H. MacDonnell who came to Cairns as a young man in 1897 remembers the gardens well as "Fitzalans". Mr. Collinson, in his book "Tropic Coasts and Tablelands", states when he arrived in Cairns in 1887 that one road led south past Ah Kee's, the other north to "Fitzalan's Botanical Gardens" where he attended a lecture after an enjoyable walk from town. The late Mr. G. Bates had a photograph of a landscape and a clump of bamboo, marked "Botanical Gardens 1909", taken by his father who was editor for many years of one of Cairns' early newspapers.

Eugene Fitzalan was the botanical collector on board the Government schooner "Spitfire" on the expedition to the lower Burdekin in 1860, then settled in Bowen, moved to Cairns about 1888. Council records for the year 1897 have him as Curator, salary £5 i.e. $10.00 per year; however, there is evidence in the Government Archives that he collected and sold native plants and orchids for over thirty years including the State's floral emblem to help supplement this low income. He left Cairns in 1898, opening a florist shop at West End, Brisbane, where he lived to an old age. Two plants in the gardens bear his name, the lovely small tree Randia fitzalana and the orchid Eria fitzalani.

Nothing is known then till the Council appointed Mr. L. Wright of Townsville as Nurseryman in 1923, his duties being to establish and control a nursery at the present site at Edge Hill, and to maintain the City's parks. This is at the far end of the reserve from Fitzalan's gardens. Mr. Wright remained until 1947. He was well known for his knowledge of palms and butterflies. During his term, a small zoo was established, which proved very popular.

Mr. Mitchell was then appointed Curator. He had been Head Gardener before this. Mr. Mitchell came to a sad end of heart attack or exposure while plant collecting in the Gulf of Carpentaria in 1954. The zoo was closed during his term for economic reasons and a new brick dwelling was built for the Curator.

Mr. J. Gould was then appointed. He further extended the gardens before he resigned in 1966.

Mr. V. Winkel was then appointed in November 1966. During March 1967 the Council adopted a five year plan to develop the eight acres above Collins Avenue into a small Botanical

Gardens. Good progress has been made with this, it being designed in a figure-eight walk, with the focal point being the Munro-Martin Fernery in the centre.

The gardens are disected into three areas by Collins Avenue and MacDonnell Street. South of Collin Avenue 40 hectares, east of MacDonnell 312 hectares, and west of MacDonnell 4 hectares.

We were fortunate in the mature indigenous trees which were left by past Curators, and the flowering size exotics which they planted.

The latter area is well suited to landscaping, being cut diagonally by two pleasant little streams, which flow for nine months of the year. These have been left as natural as possible, except for the addition of exotics.

The eastern side of the creek is lawn, with speciment plantings of trees, some genera being Cassia, Parkia, Caesalpinia, Tabebuia, etc. These are seen to their best advantage during October, November and December, when most are in flower. Some natives have been left, others planted. There is a large specimen of the notorious tar tree, Semecarpus australiensis, with a warning label. It is not generally known that this tree is a close relative of the Mango and Cashew Nut, whose sap can also burn. Another of interest is Barringtonia calyptrata, pendulous white blossoms, golden autumn tonings, and the leaves were used by the indigenies to stun fish, so they could be caught and eaten without harm.

Across the bridge and up a lawn terrace brings you to two of our dominant trees, a large Peltophorum pterocarpum - a cassia-like tree covered with bright yellow flowers, and a Tectona grandis - the world famous teak of Burma, Thailand, etc. used for boats and very fine furniture. It is also a fine flowering subject, being covered with large panicles of white flowers; the seeds, when they fall, are enclosed in a sheath, as if wrapped and have a fascination for children; the leaves are often over eighteen inches long and twelve inches wide.

A short walk and you enter the Fernery. This was planted in September 1968, and is already our chief attraction in conjunction with the orchid collection which has enlarged from two hundred to over ten thousand, which can be viewed from the Fernery.

Between the Curator's office and cottage, we have a fine hedge of Vanda orchids and a collection of over one hundred different species of native orchids growing on a line of palms. From here to McCormack Street, facing Collins Avenue, are some of our palm collection. We now have well over two hundred and fifty different species; the Royals and Oil palms are getting very tall.

Already our collection of different eatable plants is over

one hundred. Although the fruit of some are not in favour here, all are held in high esteem in their country of origin.

Trees are landscaped with bromels, ferns, orchids, philodendrons, presenting them in a natural manner.

The 40 hectares on the south of Collins Avenue is lowlands, bisected by Saltwater Creek, which for the extent of the gardens is tidal. Maximum being 2.3 metres. This gives us saline wetlands embracing a few species of mangroves. The rest of the area is sand ridges covered by sclerophyll forests and an extensive area of Melaleuca wetlands. There is a small area left of lowland rain forest and palm swamp. About ten hectares are mown, the rest remaining in its natural state. Some genera to be observed in this area are: Trees - Melaleuca, Deplanchea, Nauclea, Alstonia, Alphitonia, Eleocarpus; Creepers - Faradaya, Longicarpus, Calamus, Hardenbergia, Lygodium.

The above are indigeneous to the area. As well as Calamus, the other palm is Archontophoenix. There are large collections of ferns including Ceratopteris, large plants of Cycas media.

Many exotics are being planted. Picnic facilities and a shelter shed are available. A ten hectare freshwater and a two and a half hectare saltwater lake are planned for the area and for completion by 1976.

Area east of MacDonnell Street is entered by a well graded walking track. The "Red Arrow" walk takes about one hour, going to an elevation of 240 metres. The track passes through a large clump of bamboo which was planted at the turn of the century, now comprising approximately 1 hectare. On reaching the top of the escarpment, the northern slopes are open sclerophyll forest and grasslands. A view may be had of the north side of the city, Trinity Bay, Murray Prior Range, and the coral cay Green Island and Upollo sandbank and Michalmas cay.

The track returns through dense rain forest. The following are a few of the genera which can be seen: Palms - Calamus, Linospadix, Archontophoenix, Licuala, Ptychosperma; Cycadales - Lipidozamia, Bowenia and Cycad. To the best of our knowledge, this is the only place in the world where three genera of cycadales can be seen growing side by side. Actually, the area is rich in ferns including terrestrial and epiphytic. Trees - Sclerophyll - Bombax, Eucalyptus, Albizzia, Plancho-nella, Acacias, etc. In the adjoining forest - Euroschinus, Toona, Melia, Pavetta, Flindersia, Aleurites, Alstonia. The walking track has been extended to the summit of Mt. Whitfield (400 metres) and Mt. Lumley - the former a dense rain forest, and the latter sclerophyll. On the former is a Lepidozamia of ten metres in height, and on the latter good specimens of Xanthorea.

The gardens are open from sunrise to sunset, the Fernery

on weekdays only from 8 a.m. to 4.30 p.m. A kiosk is not yet constructed. Guided tours can be arranged with application to the Town Clerk of the Cairns City Council.

Canberra Forestry Herbarium, formerly of the Forest Research Institute, has now been brought under the Division of Forest Research CSIRO. Keeper is Mr. George C h i p p e n d a l e. The way seems now open to closer cooperation or perhaps physical integration with the CANB-Herbarium.

The Melbourne Herbarium now charges the public $1.75 to name a specimen or $7.00 for an hour of work, according to the ASBS Newsletter of November 1974. Any competitors in sight?

By 1 January 1976 the Adelaide Herbarium, hitherto in the Botanic Garden Department, has been placed under the much bigger Department for the Environment.

c) Symposia, Congresses, Societies, Meetings

(continued from page 2353)

The Papua New Guinea Botanical Society. At an informal meeting in Lae on 19 June 1975, 8 botanists decided to set up a new society under this name, primarily to hold discussion weekends every now and then, with a possibility to expand activities. The first weekend was held at Lae on 20-21 September 1975, with a variety of subjects dealt with by 11 speakers, combined with meals together. Convener was Mr. Bill Barker, National Herbarium, P.O. Box 314, Lae, Papua New Guinea; contact him for further enquiry.

Orchids on TV. On December 17, 1974, Dr. D i d i n Sastrapradja gave a talk on TV concerning the Orchid resources of Indonesia. Of about 24.000 species (in 700 genera) about 5.000 (in c. 150 genera) occur in Indonesia. Orchids could be an important export item of the country but much remains to be done in the fields of stock taking, cultivation, etc.

Summary of the resolutions 12th Botanical Congress, Leningrad, as far as related to Malesia.

Prudent land use must be based on ecological studies; local plant knowledge is to be stimulated. Taxonomic work is therefore to be promoted. The impact of man on ecosystems be studied, as well as methods of protection and rehabilitation. Wild plants are to be conserved in every way possible; exploration is encouraged. New plant uses are to be discovered. An International Threatened Plants Committee is welcomed. Ecology and Conservation be incorporated into curricula in schools and universities. Soils are to be protected from erosion. Wild species are to be tapped as gene pools and to be

protected and studied accordingly. Phenological research is encouraged, and so is work on remote sensing of vegetations by satellites, for the latter a working group is recommended under the IUBS.

If such resolutions have any real effect, it is a pity that birth control was not advocated, and that no emphasis was placed on the need of monographic taxonomic study.

Montane Vegetation in SE. Asia. Dr. B. Rollet, UNESCO, P.O. Box 273/JKT, Jakarta, Indonesia, is considering the possibilities for a symposium on this subject.

A National Seed Symposium was held at the University Pertanian Malaysia from 2-5 February 1976. The symposium dealt with seed problems of rubber, timber, rice, oil palm, pasture, cocoa, horticultural plants, groundnut and other field crops. The organiser was Dr. H.F. Chin of the Fakulti Pertanian, Universiti Pertanian Malaysia, Serdang, Selangor, Malaysia.

A Symposium on Planning and Management of National Parks in Malaysia is being planned by the Malayan Nature Society to take place in 1976, probably in Penang. Those interested should get in touch with the Secretary of the Society, P.O. Box 750, Kuala Lumpur, Malaysia.

A Symposium on South East Asian Plant Genetic Resources was held on 20-22 March 1975, organized by the National Biological Institute (LBN), FAO and BIOTROP at Cisarua, Bogor. The symposium was attended by 104 participants from the Philippines, Indonesia, Laos, Malaysia, Singapore, Thailand, South Vietnam, Burma, India, Japan, Fiji, Netherlands, United Kingdom, and U.S.A. A total of 29 working papers were presented at this symposium. The proceedings of the symposium are still in press and can be ordered from the National Biological Institute, Bogor. Review in the next Bulletin.

BIOTROP and the Faculty of Forestry, Bogor Agricultural University, jointly organized a Symposium on the long-term effects of logging in South East Asia on 24-27 June 1975 at Bogor. See Conservation.

UNESCO Training Course. The National Biological Institute, BIOTROP and FAO had jointly organized a six-week training course in 'Techniques in Conservation of Plant Genetic Resources' from 10 February to 22 March 1975 at Bogor, under the leadership of Dr. S e t i j a t i Sastrapradja (director of LBN). The course was attended by participants from Indonesia, Laos, Malaysia, Philippines, Singapore and Thailand. During this training course a field survey of plant genetic resources was made in West, Central and East Java and Bali.

The LBN, UNESCO and the Indonesian National Committee for the Man and Biosphere (MAB) program jointly organized a Regional Post-graduate Training Course on Methods in Tropical Vegetation analysis on 1-30 September 1975 at Bogor and Cibodas. The course was attended by 19 participants from Indonesia, Malaysia, Philippines, Thailand and Papua New Guinea. Dr. B. R o l l e t (UNESCO), Dr. Ross Cunningham (CSIRO, Australia), Mr. K. Paijmans (CSIRO, Australia), Dr. C. Heyde (CSIRO, Australia) and Dr. Kuswata Kartawinata (LBN-LIPI, Bogor) were participating in this course as lecturers. The training course was aimed at introducing a broad view on up-to-date techniques used in the study of tropical vegetation, ranging from remote sensing to the latest development of classification and ordination. A ten-day field work was conducted at the Cibodas Nature Reserve.

An International Conference on Legumes devoted to classification problems will be held at Kew, in the summer of 1978. The theme will be the generic classification of the family, taken in the broad sense. Participation and the presentation of papers will be by invitation (dealing with wood anatomy, cytology, seed morphology, geography, and many aspects of the chemistry), but those interested are to contact the organizing committee, listed below.

For making the chemical, cytological and anatomical survey as broad as possible, samples of seed associated with herbarium vouchers are sollicited. Small samples are welcome, but those of up to 300 g are preferred. Such samples may be sent either to Dr. B.A. Krukoff, c/o The New York Botanical Garden Bronx, New York 10458, or to Dr. P.H. Raven, see below. Samples from the Southern Hemisphere and the tropics are especially welcome and either Dr. Krukoff or Dr. Raven may be consulted for further details concerning the collection of samples.

A draft synopsis of the Fabaceae at the generic level will be prepared by Dr. R.M. Polhill and circulated during 1976 on application. Revisions and comments on this draft are welcome for further discussions at the conference. It is hoped that classification of the family can be improved.

Organizing Committee: Mr. J.P.M. Brenan and Dr. R.M. Polhill, Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AE, Great Britain, and Dr. P.H. Raven, Missouri Botanical Garden, 2315 Tower Grove Avenue, St. Louis, Mo 63110, U.S.A.

Aberdeen-Hull Symposia on Malesian Ecology. Only the 4th in the series came to the knowledge of your editor. It was held at the Department of Geography, University of Hull, HU6 7RX, England, in May 1975, organized by Dr. J. R. F l e n l e y. Dr. P. Legris spoke on the work of the Insti-

tute for Vegetation Mapping in Asia; Dr. P. Stott on Recent trends in the classification and mapping of dry deciduous dipterocarp forest in Thailand; Dr. E.F. Brunig on Classification and mapping of forest in the NW. Borneo neogeosyncline; Dr. P.S. Ashton on Numerical vegetation classification in conjunction with photogrammetry to map Mixed Dipterocarp forest.

The transactions of Symposia 2 and 3 were received and are here reviewed; see under Ashton and Flenley respectively. Those of Symposia 1 and 2 are still available at the cheap original price, at Hull. Presumably the 4th one will be similarly published; contact Dr. Flenley.

The next one in the series will be held at Aberdeen, probably in September 1977, and deal with Cytogenetics and Ecology. Contact Dr. Kwiton Jong, Department of Botany, University, St. Machar Drive, Aberdeen AB9 2UD, United Kingdom.

Forest Botany to Indonesian Universities. Dr. W. M e ij e r of Lexington, Kentucky, author of *Field Guide to Trees of West Malesia* (see Reviews) and of *Indonesian Forests and Land Use Planning* (page 2395) has made a plan to promote Indonesian involvement in the subject matter of these books. Mid-1976 he hopes to make a seminar tour along universities of Java, Borneo and Sumatra, linked up with botanical exploration in Bali and S. Celebes. Mid-1977 (when elections in Indonesia may prevent field work) he will do homework and study Dipterocarps in several Herbaria. Mid-1978 field work in Indonesia will be continued with further involvement of local staff and students. The aim is to make responsible local people aware of the vegetable resources in their areas and to instruct them in a more sensible use of them, ecologically = economically. Significance of botany and role of herbaria will be emphasized. The Dean of the Forestry School at Makassar, as well as authorities in other universities, have already expressed interest. It will be tried to establish nature reserves for forest research and conservation, in which these universities will participate. Emphasis will be on Dipterocarps. Wide use will be made of ERTS-images for exploration and conservation. Several American agencies have been approached for support; we hope they will comply, since a better long-term investment is hard to make.

Symposium on the Equatorial Swamp as a Resource is held at Kuching, Sarawak, on 3-5 May 1976. The focus is on sago, to discuss the present condition in Sarawak, the technical problems, and possibilities. Fee is $ 200, plus cost of perhaps an excursion. Contact Prof. W.R. Stanton, Department of Botany, Faculty of Science, University of Malaya, Pantai Valley, Kuala Lumpur.

Round table conference on Dipterocarpaceae. This will be a meeting of botanists who have studied this family, or whose research is directly connected with it. It will take place on 14-16 June, 1977, at the Museum National d'Histoire Naturelle Paris, and will be organized by the 'Museum' and the 'Centre National de Recherches Scientifiques', Paris. The purpose of the meeting will be a joint evaluation, starting from present results, of: a) taxonomic levels of genera sections and subsections, b) evolutionary trends, c) possibilities for a numerical analysis of all results.

Contact Mrs. Géma Maury, Laboratoire du Ecologie Générale, 4 Avenue du Petit Chateau, 91800 Brunoy (Essonne), France.

d) Conservation *(continued from page 2363)*

Ceylon. During his latest visit, Dr. A.J. Kostermans realized the conservation value of a tract of forest in the Hiniduma Kande region in the S. part of the island, with many rare species of trees. On his suggestion, Mr. W.R.H. Perera, Conservator of Forests, P.O. Box 509, Colombo 2, Sri Lanka, reported that action is being pursued to declare this forest a nature reserve.

Indonesia, miscellanea.

The Institute of Technology, Bandung has introduced a compulsory course in ecology for all its first year students, who in March 1975 staged a seminar on Environment, followed by an exhibition on the subject. In general, concern about it is growing in Indonesia, and the newspaper Kompas regularly takes up articles and letters on this topic.

Government interest, too, in conservation is definitely growing, and there is a tendency to increase the land area under protection. A workshop is held at Bogor by Man And Biosphere and the Conservation Department (PPA), on 5-7 February 1976, to draw up further guidelines towards this goal. Mr. Sudarsono Riswan has started to study the successions in Lowland Dipterocarp Forest of E. Borneo. BIOTROP starts a 6-week training course on management of nature reserves, in February 1976.

On his trip in April 1975 Prince Bernhard handed President Suharto a cheque for $ 100,000, from the 'Coin Project' for conservation in Indonesia. It is not yet known how the money is to be spent.

Philippines: 25% of the logs now for export. A few clippings tell the story. In Conservation Circular vol. 11 no. 5 the Board of Investments Governor Mr. Caesar Z. Lanuza is

quoted: "Basically, a log phaseout is desirable for many reasons, the basic consideration being the fact that we are cutting our forest faster than what is normally required to support our wood processing industry and similar industries to which we are exporting logs abroad. What is happening is that there has been a very serious denudation problem. According to reports, we are losing at the rate of more than 204,000 hectares of forest lands every year in illegal cutting, kaingin making and overcutting in the case of concessionaires. That is one evil that we are going to stop, and because of the log phaseout there will be no more market for logs outside the Philippines. And therefore, what would be necessary is to cut only the logs that would be processed locally. Instead of exporting logs, which are a low-value material, we will be exporting finished products like furniture, door jambs, plywood and other products and these carry more value than logs, and there will also be more employment because in addition to logging, there will be processing plants, and therefore, additional employment. These are the more specific advantages of the log phaseout as I see it."

Because of these considerations, "the Philippines will impose a total ban on its log exports effective January 1, 1976".

However, the Times Journal, Manila, of 31 December 1975 reads: "President Marcos authorized yesterday a limited and selective exportation of logs on a temporary basis to prevent any economic dislocation that a total ban might create," since "the full implementation of the policy may adversely affect the country's balance of payment, employment and the stability of the wood industry. Seeking to reconcile this policy with the realities obtaining in the wood industry, the President authorized the exportation of a portion of the log production which should not exceed 25% of the total allowable cut."

The same paper of 2 January 1976 quotes a top man of the wood industry as saying: "the emphasis on processing while at the same time allowing 25% of the allowable cut of logs to be exported, is a well-considered policy."

Again: the conflict between long-term prudence and short-term profit. Certainly a ban on log export means a great step towards restraint in forest destruction. On the other hand, the 25% quota demonstrates the lack of firmness in conservation matters - also apparent from the logging of Mt Apo National Park, see page 2359 - that will leave the grandchildren, literally, on the rocks to sit on.

Long-term effects of logging in SE. Asia. A symposium under this title, held at Bogor on 24-27 June 1975, was attended by 50 persons, mostly Indonesian. Sponsor was BIOTROP, P.O. Box 7, Bogor, where the texts, altogether ± 60 pages,

are available. Here follows the summary which I made of some of the papers.

Kuswata Kartawinata (Herbarium Bogor) on the biological damage: Trees damaged during the logging have little future because of deformation and increased danger of pests and diseases which now can easily enter. At an extraction rate of 25 trees per hectare, tractors ruin c. 30% of the soil area, thus enabling second growth to invade; this suppresses Dipterocarp regeneration, and Anthocephalus for instance will not disappear within at least 40-45 years. Tractors crossing streams often squeeze these partially off, thus creating semi-permanent ponds, which mosquitoes like. Besides malaria, also Rickettsia and other diseases to man and cattle may be promoted by the ecological havoc. Many references given.

Tinal & Palanewan (Manado, Celebes) on damage due to logging in E. Borneo: About half the trees over 14 cm Ø are wasted during the operations, especially the trees under 50 cm. Most of it is due to breakage, bark damage occurs much less but is very dangerous because of pest and disease. Planting of desirable species after logging is recommended.

Abdul M. Ahmad (Malaysia) about effects on mangrove: Rotation time in Matang Reserve was in 1950 reduced from 40 years to 30 years. Rhizophora is preferred, but logging promotes the less valued Bruguiera. Regeneration after clear-felling cannot precisely be predicted; sometimes Acrostichum expands, of which the large form renders the area useless for further production, withstanding attempts at eradication. Damage to seedlings caused by logging may amount to 45%. Effects on soils are suspected to be a gradual loss of fertility in case of over-exploitation. Fifteen major desiderata for research are listed.

Most important was the address delivered on behalf of the Minister of Education and Culture of Indonesia. The larger part is given here. It shows that anyway the highest authorities are well aware of the dangers of over-exploitation: "The value of the forests should not be gauged in terms of the products harvested only. They also constitute a vital aesthetic component of the tropical landscape, serving to maintain water quality and regulating water flow particularly from mountainous area so as to lessen the danger of flooding, protecting the soil from erosion, and providing a range of habitat for the conservation of native flora, fauna and ecosystems as a whole. The capacity of the tropical forests in Southeast Asia in fulfilling the growing needs of recreation and tourism is largely undeveloped, partly because of failure to recognise their scenic attributes and the potential interest in the wildlife they contain. Meanwhile some tropical rainforests have been devastated by wasteful and destructive

logging, so that locally forest rehabilitation presents a formidable problem.

The vast amounts of timber accumulated in tropical forests in the course of natural evolution represent a valuable source for financing development. Consequently, there is some danger of forest resource depletion for short term gain making forest regeneration difficult. In more extreme cases irreparable damage may be caused to forest ecosystems through major environmental deterioration.

Southeast Asian countries do not have sufficient experience to fully assess the long-term effects of logging. Logging operations in tropical forests, like elsewhere, result in bringing about changes which are either biological, ecological, social or economic.

The tropical forests of Southeast Asia are such diverse and complex ecosystems which precludes generalization about management techniques. Since these forests are subject to change, attention needs also to be directed to ecosystem dynamics and to the probable disturbances by human intervention which may trigger successive ecological changes. Therefore, it is imperative that inputs of ecological knowledge be made available when policies are formulated and alternative programmes considered.

Inadequacy of scientific knowledge of the nature and dynamics of the tropical forests presents a serious obstacle to ensuring the formulation and implementation of wise use of forest resources. The public at large needs to be provided appreciation, and awareness if not understanding of man - environment interactions.

Many things certainly need to be done in trying to take benefit from forest resource and at the same time protects them from deterioration. Research and development need to be carried out to find new and modern technologies, while education and extension services, and especially non-formal education, must bring these innovations to the community.

Every country has problems of its own, requiring solutions particular to the specificity of respective societal and natural settings. You will have ample time during the symposium for intensive deliberations and exchanges of views. I hope that all possible efforts will be made to achieve the objectives of this meeting. I trust that the symposium will respond to the need of developing sound theoretical knowledge based on empirical data of Southeast Asian forest ecosystems, so as to ensure meaningful linkages between practice and theory, between policy and reality, and between present and future."

Cet in Cibodas. The surrounding forest, especially on the eastern side, is suffering badly from destruction. Inside the reserve, especially in the NE. part, tree cutting is going on and no control is exercised. Even worse is the damage done by tourists, mainly from Jakarta but also from Bogor. They come by the hundreds, to make a one day's trip to the Cibeureum waterfalls, but also to go higher up, for the top of Mt Pangrango, the crater of Mt Gede and the surrounding aloon-aloon. They spend nights up these mountains, cutting wood for tent poles and making fire, producing quantities of human waste, litter the trails with paper, bottles, cans, etc. and even take pots of paint (*tjet* in Indonesian, or now spelled *cet*) with them to inscribe the rocks. When leaving they carry orchids. Sad as it is to learn that these biologically holy grounds are being disgraced further (see pages 2183, 2354), it is certain that enough is left to save, and that this precious reserve will come high on the list of WWF Rain Forest Projects. An outline of a management plan has also been made. Although Cibodas is clearly appreciated by the public and in a way fulfilling its function as a reserve should, it is evident that its use must be regulated, in combination with nature education, for which it could be a very suitable focus.

Tiger Paper is "an attempt to establish an information exchange system on matters relating to wildlife conservation, environmental and parks management in Asia and the Far East Region." Thus it announced itself in July 1974. It is intended as a quarterly; I saw 6 numbers, each of 24-32 pages printed in double column and provided with a variety of illustrations.

It is helpful in providing many addresses; it also gives lists of Bird Books, of Societies, of Floras. It is truly miscellaneous in character, the January 1976 issue carrying over 35 different items. It gives extracts from papers, letters, ordinances, agreements, newspaper clippings, book reviews, announcements, news from conferences, projects, WWF/IUCN and, of course, from FAO under whose aegis it is published, with support from UNEP. Emphasis lies on animals, but plants also find a place.

The enterprise looks healthy: the latest issue has been streamlined a bit, and states that "The opinions expressed by the contributing authors are not necessarily those of FAO or UNEP," a good thing in a journal that declares itself to depend on incoming items, and that is indeed filled from many quarters. We readily recommend our readers to enter a give-and-take relation with Tiger Paper. The giving: all kinds of conservation news as above indicated. The taking: a subscrip-

tion which is free on request. It is intended for wide circulation (1000 at present), to acquaint others with it all the way between India and the Pacific, as a vehicle for facts, comments, and discussion.

We wish the editors success. They are Peter E. E n d e r l e i n, and his assistant James F. M a x w e l l, FAO Office, Maliwan Mansion, Phra Atit Road, Bangkok 2, Thailand.

IUCN: reassessment in Kinshasa. At the 12th Assembly, proposals were worked out for 1976-78. They include: emphasis on action in developing countries; use of available expertise and opportunities; concentration on a certain subject; working mainly at a national level; integration of conservation in development planning.

The timing for listed subjects, as far as concerning us, is Regional: SE. Asia 1975, 1976 to 1979; IUCN/WWF Frontline: Tropical Rain Forest 1974, 1975-77 to 1980; Mountain Areas 1975, 1976-77 to 1980; Plant Conservation: Assembly of data 1973-74, 1974-79, Action programmes 1976-80.

A Threatened Plants Committee (Heslop-Harrison, Kew) is making a Red Data Book. A book on Ecological Guidelines for Tropical Forests is in preparation, one on Mountain Areas projected. A World Conference on Environmental Education is to be held in Tbilissi, U.S.S.R., in September 1976. All according to Agenda Paper GA 75'19 Rev.

Soil conservation in west-Java. The Agricultural Faculty, Wageningen, Netherlands (Dr. J. H. A. B o e r b o o m) and the Ecology Institute, Bandung (Prof. O. S o e m a r w o t o) are undertaking a 5 year NUFFIC project in the Jatiluhur area, where the lake behind the dam in the Tjitarum, near Purwakarta, that must supply Jakarta and Bandung with electricity is rapidly silting up. Vegetation, runoff and erosion will be studied in the abandoned fields, secondary growth, tree plantations, and in the little primary forest that the population have left on the mountain slopes in the catchment area. Proposals for measures and education will then result.

Ecology in Bornean rain forest. The Agricultural Faculty, Wageningen, Netherlands (Dr. J. H. A. B o e r b o o m) and the Ecology Institute, Bandung (Prof. O. S o e m a r w o t o) are undertaking a 5 year NUFFIC project in East Kalimantan. Ecological comparisons are to be made between a large tract of virgin forest, and one that has been logged over. Half of the latter will be left without interference, in the other half silvicultural treatments will be tested. Phenology and regeneration will be studied. Herbarium material is to be collected for identification. A follow-up by local staff is envisaged.

Extension of National Park area in Sabah. A well-produced Annual Report of the Sabah National Park Trustees for 1974 came in. It can be obtained from Mr. D.V. Jenkins, Forest Office, Kota Kinabalu.

Kinabalu N.P. of which some 5 years ago c. 64 sq.km was excised for copper mining on the E. side, has been extended with the Mt Templer reserve of c. 92 sq.km, a chunk of dipterocarp forest partly below 1000 m, a much needed contribution to save some of the endangered N. Borneo forest area (page 2359). The whole Kinabalu N.P. is now 780 sq.km, and received 14,554 visitors in 1974, 26% of them from overseas. To accommodate them, five new chalets are under construction, with street lights all along the roads toward them. There is also a Club House and a Youth Hostel. Native plants are cultivated around them, which seems better than the exotics of former years, and they are highly appreciated.

A second Park is the islets off Kota Kinabalu (formerly Jesselton), Pulau Gaya and P. Sapi, together 1460 hectares, under forest containing Dipterocarpus grandiflorus, Hopea tenuinervia, the rare Shorea obscura and Quassia borneensis. The beach-flora is very fine. The surrounding reefs, too, belong to this Tungku Abdul Rahman N.P. Trails and boats are being made.

The Sabah Government contributes annually c. US$ 250,000; visitors bring in another 50,000. The Staff of the two Parks consists of a Warden, 6 Rangers with 11 Assistants, 3 Drivers, 19 Artisans, 58 labourers, as well as 6 persons in the Kota Kinabalu office. In a paper on pages 12-18 of the Report, Dr. W. Meijer gave a well-argued plea for more botanical research.

The Sepilok Arboretum continues to expand and it is hoped that exchange of seed will start soon. Mr. Donald Ramsay, a Peace Corps Volunteer from Canada, arrived in August 1975 to be in charge for 2 years.

Negotiations have been started with various Government bodies to try to preserve 650 sq.km of the Ulu Segama as a new National Park. So far results have been encouraging and it is hoped that a World Wildlife Fund officer will visit the area in 1976.

From forest reserve to alang alang .... and back. The East Kutai Nature Reserve N. of Samarinda in eastern Indonesian Borneo just S. of the equator, declared in 1936 and originally 3000 sq.km in area, was surveyed in 1970 by a party consisting of Drs. Soegeng, Anderson, and Phung. Their descriptions and recommendations, accompanied by a fine set of maps, were published in a 35 page report in 1974 by BIOTROP, Bogor, thanks to the good care of Dr. Kuswata. The fauna was rich,

with orang-utans, two-horned rhino, mouse-deer and banteng as highlights; all were still there during the time of survey. The forest was rich in species, too, iron-wood, Eusideroxylon zwageri, among them.

In 1960, the coastal portion of the reserve, amounting to about 1/3 of its area, had already been excised and given out for logging to the company Kayu Mas; as a result it is now under alang alang. But on the NW. side an extension was proposed, and in 1970 the reserve still contained 2000 sq.km of primary forest, essentially untouched although surrounded by logging concessions. After the survey, the southern third part of the reserve was excised and given to Kayu Mas, in 1971.

Now we have learned that since that time the remaining part of the reserve has been traversed from East to West by the 'Silva Duta' logging road, with permission to cut down all the forest within 1 km from this road on both sides, and that further penetration, perpendicular on the road, has been planned.

Curiously enough, the East Kutai Reserve has recently been extended .... to cover once more the lands near the coast, the very part that was first logged over and is now under alang alang! So, while the budget for nature protection has been considerably increased recently, Indonesia allows one of her finest reserves of primary lowland rain forest gradually to be laid waste.

It is ironical to see that in the same year that WWF attempts to save some tropical rain forest through a carefully planned and well-publicized international action, one of the two remaining tropical lowland rain forest reserves in Kalimantan are allowed to be destroyed. Certainly, the initiative was taken by foreign contractors, whose money can buy a lot, but the responsibility lies with the Indonesian authorities who lack the strength to stand up for their irreplaceable heritage.

One lowland reserve in Indonesian Borneo is now still intact: Tanjung Puting near Samarinda, where the Brindamour couple (see National Geographic Magazine, October 1975) has energetically and successfully fought off the threats. But one reserve is by no means enough to represent the magnificent biological diversity of the Bornean lowland forests.

The tragedy is the more striking since, of all the Indonesian islands, Borneo bears the tallest primary forest, in plant species the richest, even more so than Sumatra since it exists longer geologically, and evolution has proceeded longer uninterrupted under stable conditions. The richest gene pool for maintenance and improvement of Indonesian fruit crops like mango, durian, rambutan is the lowland primary rain forest of Borneo, the richest source of rattans, resin,

gum, and other typical 'minor' forest products is again these forests and no other. These potential economic treasure, along with the world of animals which for its survival absolutely depends on the primary rain forest, which owing to wholesale cutting and exceedingly slow regeneration must be regarded as a non-renewable natural resource, is now squandered forever, for a quick catch of foreign currency. Because of its long geological history in wet climates, the soil in most parts of Borneo has been leached and is too poor to sustain agriculture. Forest is therefore the only soil cover with any good; if this is cleared or depleted, this natural capital of which the interest could be used for the benefit of the people forever, itself is gone, and nobody can replace it.

If Borneo is to have any future at all for say the grandchildren of the present generation of its population, this indiscriminate logging somehow must be brought to a halt, and the remaining concessions revoked and kept as true forest reserves. It is hoped that wise people take action to save what can be saved, for the benefit of those who must live when 25, 30 years from now the rain forests no longer exist and the present stream of revenues has dried up.

New reserves in Kalimantan. Another letter, which once again asserts that the East Kutai Reserve is gone for 60%, announces, however, that new reserves are being considered. In West Kalimantan: Mandor, 20 sq.km, Gn. Palung, 300 sq.km. In South Kalimantan: Tanjung Puting extended to 3050 sq.km (a game reserve only, less safe against exploitation), Pleihari, 500 sq.km (ditto), Martapura, 300 sq.km (ditto), Pararawen I, 22 sq.km and II, 40 sq.km, in the central mountain region Bukit Raya, 1500 sq.km. In East Kalimantan: Padang Luwai, 100 sq.km, and possibly two others also in the mountains.

We will follow developments as closely as possible, with critical but hopeful eyes.

Foundation Lestari for Nature Education and Conservation. One day in mid-1974 I was asked to attend a working meeting with Mrs. S. M a r t o s u h a r d j o, wife of the Indonesian deputy ambassador in The Netherlands. During her stay she had taken up a spontaneous interest in nature education and conservation, and intending to do something about it on her return to Jakarta, asked for advice. Following the meeting, she paid a visit to the Rijksherbarium, where she was informed about plant conservation and literature. Back in Jakarta she set out to interest people in the good cause and to organize things. On 10 July 1975 a foundation was officially established: the Yayasan Pendidikan Kelestarian Alam,

abbreviated Lestari. Patron is H.R.H. Sultan Hamengkobuwono IX, Chairman is Mrs. Azis Saleh, Secretary is Mrs. S. Martosuhardjo. Jalan Pulo Raya III/21, Kebaroran Baru. Blok Q5, Jakarta, Indonesia; several other board members are well-connected in the government.

One of the plans is to involve the scouts (Pramuka) in conservation propaganda and money collection activities, comparable to the WWF Rangers; as there are at least 6 million scouts in Indonesia this may have quite a future. In August 1975, Mr. and Mrs. Azis Saleh visited the Rijksherbarium for an exchange of ideas. We wish them the best of success and encourage persons who are interested to take up contact with Mrs. Martosuhardjo.

Philippines: a report. Following a mission from April to June 1974, a densely typed 37-page report by Mr. I. R. G r i m w o o d (now P.O. Box 45079, Nairobi, Kenya), National Parks and Wildlife Conservation in the Philippines, was published by FAO, Rome (FO: PHI/72/006 Working Paper) early in 1975. While not covering all parks and concentrating on the animals – although justly emphasizing the conservation of habitats rather than species – the report is quite informative.

According to it, there are some 66 national parks in the Philippine system, most of them defunct. (The United Nations List of National Parks, 2nd ed., Morges 1971, gives, with some hesitation, 23.) On the one hand, some 'parks' were proclaimed to protect important sites or monuments; on the other, no clear idea exists among the population of what a national park should be.

Settlers have penetrated the (unmarked) fringes of many parks, recreation pressure on some parks is heavy, and parts of other parks have been given out to loggers, sometimes under the pretext of 'stand improvement'. One of the most disastrous drawbacks has been the reduction in 1972 of the Parks and Wildlife Office to a mere advisory body under the Bureau of Forest Development, while the responsibility for the administration of parks and conservation affairs went to the Forest Protection and Utilization Division; other responsibilities like research and preparation of legislation were given to yet other divisions. The result has been confusion and paralysis in the field of conservation, and indeed one of the important recommendations of the Report is, that the Philippines shall have an independent and powerful agency to take care of its conservation affairs.

Grimwood also calls for more modern legislation to clarify the true status of national parks. He notes that there is no control of entry in any one of the present parks, so hunting goes on and forest products are collected. No boundary mark-

ing has even been done. Shifting cultivators happily work the steepest slopes, causing serious erosion and damage to watersheds, and the areas they abandon after several years are invaded by cogon grass (i.e. Imperata cylindrica). The effect of their temporary occupation is to permanently destroy the land, for cogon grass does little to check erosion and creates a serious fire problem. But in most cases, the shifting cultivators have settled only in the perimeter of the parks, which as a whole can be left intact by re-defining the boundaries and marking them properly, and keeping them under strict control.

Basilan National Park of 65 sq.km has been destroyed by logging, and "parks are still subject to similar pressures, most of which, it must be regretfully recorded, arises within the Bureau of Forest Development itself, the very body that is now charged with maintaining the integrity of the parks and the park system as a whole" (p. 6), "... and a proposal to reduce the Mt. Apo National Park (perhaps the most valuable park in the country) from 73 000 to 13 000 hectares, so as to make the rest available for settlement and logging, was endorsed by the Director of the Bureau of Forest Development — all without any reference being made to the head of the Parks and Wildlife Division" (underlinings mine, M.J.).

Another main recommendation is to redefine some parks so that the remainder has a distinct identity as a Park, and can be protected as such. Some parks are better revoked altogether, like Mt. Data National Park of 5500 hectares, which have been destroyed except for ten hectares, Rizal, Manila Bay Beach, Quezon, now recreation areas, and Mainit Hot Springs, 1400 hectares, now under logging and squatters. Each of the remaining Parks in the true sense should be administered as one unit, not under Forestry Law but under National Park Law, by a resident warden and staff whose only job this is. Areas suitable for national park but at present under 'small rights' are proposed to be declared Conservation Area or National Reserve* awaiting these rights to expire, and meanwhile being protected like the others, hunting, of course, being prohibited under all circumstances. While it is vital to establish and mark boundaries and set up points of entry without delay, first the problem of kaingeros (i.e. settlers) must be overcome; in Grimwood's view by trading some losses for a good boundary and preventing the settlers to re-enter. Great caution is to be observed in setting up visitor-attracting facilities.

As for the fauna, the Philippines are relatively poor, but have a high endemism. Palawan is richest and holds a place of

* The Philippine Law also recognizes Game Refuge & Bird Sanctuaries, but they have a lesser status and can easier be abolished.

its own. Important mammals, reptiles, and birds are discussed by species and by island. A list at the end gives 38 endemic true species of mammals. Endemic bird species number 145, subspecies 207. With their protection in mind, some parks are evaluated and recommendations made (also in the Appendix). The proposal made by M. Jacobs (stencilled reports, and an article in Environmental Conservation 1: 232-233, with map and 2 phot. 1974) to include all the virgin 'mossy' forest on Luzon's Highest Mountains: Pulog, Panotoan, and Tabayoc, in a new national park, to replace the lost Mount Data one is strongly endorsed, under addition of new faunistic arguments. In Mindoro, the 1200 sq.km Mt. Iglit-Mt. Baco N.P., the 445 sq.km Mitchell-Harrison Game Refuge, and the 150 sq.km Mt. Calevite G.R. give hope for the fauna. In Palawan, St. Paul Park (limestone) is only 30 sq.km but in good condition; it is urgent to establish other safe areas for the Mouse Deer, the Calamian Deer and, we add, primary forest.

If a good program is carried out, with education and law enforcement, the results are remarkable. This is evident in Grimwood's brief accounts of two Special Conservation Programmes. That for the Tamaraw (Anoa mindorensis) was launched in 1969 by President Marcos himself and supported by WWF; it is estimated that after 5 years the population has doubled to 150-200. That for the Monkey-eating Eagle (Pithecophaga jefferi) started in 1970, was conducted by three teams patrolling Mindanao in WWF-vehicles, who ended the hunting; 100 birds may now be surviving. "The present campaign can be considered a success in so far as checking man's *direct* depredations on this species are concerned. *While its remaining forest habitat continues to disappear at the present rate, however, the prospects for the long term survival of the Monkey-eating Eagle must continue to be poor.*"

A WWF survey of the rain forests. From WWF progress Report no. 92 (Oct. 1975) we learn:

1. As part of a general survey of Tropical Rain Forest in all 3 continents Dr. T. C. W h i t m o r e has prepared a report describing the range of variation in tropical forest types in S.E. Asia and, for each of the 20 countries involved, giving a review of the areas at present conserved, how far these cover the range of types in the region and making recommendations for further action. The whole report will be published by IUCN very shortly.
2. Whitmore and Grimwood will be co-operating in preparing a report on the best lines for conservation action in S.E. Asia based both on the report mentioned above and a survey to be made by Grimwood in the first half of 1976 on the systems of protected areas in the region and their effectiveness. The work being done by Blower for FAO will be

fully taken into account in this. A report will be submitted by IUCN by the end of July 1976.

3. Action will be taken to follow up the recommendations of this report as soon as it is received. Priority should, in our view, be given to those areas where the conservation problems are urgent but there is some opportunity of success. It should also be directed specifically at those factors, whatever they may be, which seem to be most significant in limiting progress.

This is not, of course, to propose that action should be postponed until the report is available. Some urgent problems are already well identified; but it does suggest that it would be advisable to hold back a considerable portion of the funds until a more precise series of priorities can be worked out. This should be in August and September 1976.

A natural arboretum in SW. Celebes. A letter of Ir. Yusri Zakaria, Head of the Forest Service of S. Sulawesi (= Celebes) to Dr. W. Meijer says that the Governor of that province has approved creation of a 1000 hectare reserve 54 km N of Makassar (now called Ujung Pandang), on the road between Maros and Singkang. This is near Pangkadjene where Teijsmann in 1877 collected many remarkable plants on the limestone.

A total of 126 tree species have already been enumerated from the area, where Diospyros celebica occurs in a natural stand, the famous Celebes Ebony, generally used for wood carvings in Bali (after depletion of the brown Manilkara kauki). Hornbills are there, black tailless monkeys, and other animals described by A.R. Wallace (The Malay Archipelago, chapter 16) who was there in 1857.

The Forest Service had started a modest plantation of the Ebony nearby before realizing that a natural stand was present. After a conference of Meijer with Mrs. Kartono, Dean of the College of Agriculture and Forestry of Hasanuddin University and Mr. Zakaria, in April 1975 and a visit to the spot, it was decided to declare the limestone hills with its rich flora a nature reserve for education of foresters and biologists in S. Celebes where 5 million people have left very little forest untouched. Action was taken promptly: tentative boundaries were marked, transsects were made, 20 m apart and all trees over 10 cm Ø were sampled.

The place is near the famous Bantimurong Waterfall described by Wallace, where the marvellous butterflies that he found still flutter. Plans are now made for a summer course and for further botanical collecting. Congratulations!

Ashton: Some suggestions for effective action. This is a condensation of a long letter to the editor from Dr. P.S. Ashton at Aberdeen.

Tropical countries attempting industrialization are assailed by shortage of capital, chronic unemployment, and land hunger among the rural populations. All these evils find immediate short-term relief by forest destruction. Though these forces - as well as corruption, and seeping morale in the forest services who are charged with an impossible task - are beyond the control of biologists, we can act more effectively than we did. First of all, duplication of effort and conflict of opinions should be avoided. In particular I note:

— Lowland tropical rain forest will never become a profitable amenity in the tourist industry, even in well-developed reserves.

— 'Quality of life' arguments don't help when it is too late; industrialization must consider them in the planning stage.

— We biologists must use scientific arguments, which in the medium to long range are irrefutable economically, but we must rally expert economic advice if we are to maintain plausibility. Four principal arguments are: 1) gene pool for crop diversification and flexibility, 2) maintenance and even enhancement of hardwood productivity, 3) water catchment, 4) soil conservation.

— Theoretically, forest plantations might be as effective in water and soil conservation, but we are a long way from doing this and I know of no research to prove it. Poorly planned exploitation in West Malaysia is laying the sure foundations of massive-scale human suffering through erosion as we see in Luzon and Java.

— Management of forest as a timber resource is irreconcilable with genetic conservation, because silviculture aims at removal of the non-commercial species. The ecological changes resulting of uncontrolled felling are in urgent need of research, and different results can be expected in different areas.

Training and research are urgently needed, and we botanists must support our colleagues in the region who are doing their best to stem the tide of catastrophe, often with unsung success. As courses for action I recommend:

1) Mobilize expertise. A directory of staff in Britain who could teach in ecological field relating to conservation in the tropics is available from the British Ecological Society Tropical Group c/o Dr. P.S. Ashton, Botany Department, University, St. Machar Drive, Old Aberdeen, U.K. (Information on the considerable body of tropical expertise in The Netherlands can be obtained from the editor of this Bulletin).

2) Gear training facilities to tropical problems. The above directory includes a list of such courses in Britain, also Dr. A.G. Marshall has established a one week course in Aberdeen for future decision makers who are not biologists.

3) Establish cordial relations with such groups in other nations; the B.E.S. Tropical Group will welcome them.

4) Collect and circulate information, on activities of agencies like UNESCO, IUCN, WWF, SEAMEC with its sub-agency BIOTROP and others, and inform them in return of problems and possibilities. UNESCO is now completing an International Survey of Institutes in Developed Countries Engaged in Research and Experimental Development on Problems of Developing Countries, and coordinates the Man And Biosphere programme. They often have valuable data and their advice can be sought for negotiations at government level.

5) Strengthen contacts with SE. Asian scientists on a non-competitive basis. Personal relations are invaluable. Wallaceana, edited by Prof. J.I. Furtado, School of Biological Sciences, University of Malaya, Kuala Lumpur, and this Bulletin may be fruitfully consulted.

6) National groups should monitor impact on environment resulting from development aid.

7) We should raise money for research bearing on environment in SE. Asia: jointly with resident scientists; involve training; sites should be selected with regard to conservational status; local people should be made enthusiastic; local and central decision makers be kept informed. The University of Malaya and that of Aberdeen have fruitfully worked together along these lines for 2½ years with 3 more to go (see page 2333: Reproductive Biology of Rain Forest Trees), on genetic processes in rain forest. One aim is to know the minimum size of a viable forest reserve.

8) Publish work in accessible form.

9) Rather than by whistle-stop visitors, policy makers should be advised by our better-informed local colleagues whom we should give all support they may require.

10) (Editor's addition) Build up a common basis of literature that is knowledgeable, comprehensive, popular, recent, and cheap. We name Dasmann e.a., Ecological Principles for Economic Development (page 2380), IUCN Ecological Guidelines (see Reviews), W. Meijer, Indonesian Forests and Land Use Planning (page 2395), and the chapter on flora and fauna conservation by IUCN in the UNESCO-book Natural Resources of Humid Tropical Asia (page 2441).

Prince Regent River Reserve, at c. 15°30'S on the NW.coast of Australia, where Adansonia grows, has an area of 6338 sq. km. Since 1971 a series of biological surveys has been made,

with the botanists A. S. G e o r g e, K. F. K e n n e a l l y, and P. G. W i l s o n, all from Perth. The plant taxa now known are 19 fungi, 43 lichens, 19 ferns, 2 gymnosperms, 419 angiosperms; 40 collections are still unnamed. New records for W. Australia amount to 3 families and 16 genera, nearly all Malesian, namely: Aegialites, Aristolochia, Blyxa, Boehmeria, Calophyllum, Drynaria, Drypetes, Erythroxylum, Glycosmis, Jacquemontia, Malaisia, Merremia, Micromelum, Paramignya, Polyalthia, Thunbergia.

These and other results are written up in J.M. Miles & A.A. Burbidge (ed.), *A biological survey of The Prince Regent River Reserve, North-West Kimberley, Western Australia, in August 1974*, Wildl. Res. Bull. West Austr. 3 (1975) 1-116, many phot. It describes history, geology, environment, the main sites visited, and animals. Plant names are listed with habit, habitat, sites, and sometimes number. The vegetations are mangrove (Bruguiera gymnorhiza and B. parviflora new for West Australia), microphyll vine-thickets, these particularly rich, more or less closed forest and woodland types of Melaleuca, Eucalyptus, scrubland of Acacia, and closed grassland. Aquatics are noteworthy: Blyxa aubertii, Aponogeton elongatus, Eriocaulon setaceum, Limnophila chinensis, Myriophyllum, Nymphoides ? hydrocharoides and parviflora, Ondinea purpurea, Pseudoraphis abortiva, Utricularia.

Further conservation measures are proposed. Scenery is beautiful. The paper is very well produced and documented.

Gunung Leuser Reserves in North Sumatra are the ground of a continuous battle, against poaching, penetration by overpopulation, and illegal woodcutting, but the situation is not worsening and this itself is a kind of victory. Mr. H.D. Rijksen left mid-1975; his place has been taken by Mr. N.J. van Strien. The latter has recently prepared a 82 page digest of all literature on Dicerorhinus sumatrensis, and is now looking for rhino's, and was let down from an helicopter in a valley in the midst of the reserve - only to discover a number of traps on which the population had been silent all the time, but they were quite impressed by the discovery and destruction of the traps.

Dr. & Mrs. De Wilde botanized the area for the second time; see under Exploration. At Leiden, they identified a great and varied collection made by Rijksen of plants on which orang-utans feed. The 3-cornered agreement between Indonesia, WWF, and the Gunung Leuser Committee (of which your editor is a member) set up in 1971 and expiring 5 years later is about to be renewed. For the projected Field Station (page 2375) prospects are opening up. If we look back on these 5 years of joined effort in the field, in the office, and

around the table, the results are inpressive and hopeful. Although the Trans Sumatra Highway has been designed to separate the two halves of the complex, and all sorts of difficulties are likely to turn up, we hope that this joint effort of Indonesian management and Dutch advisers will hold out successfully.

The WWF Rain Forest Action. The WWF Netherlands Appeal took the worldwide action seriously. Articles were written, lectures held, TV propaganda made, collections organized, with a result of about $ 1,000,000. The aim is twofold: to develop rain forest reserves and to improve nature education. Most of the money will go to Indonesia, for reasons of efficiency because of available expertise and mutual acquaintances, smaller amounts to Suriname and tropical Africa. For Indonesia, a tentative list of projects for support has been drawn up. Early in 1976, Mr. I. R. G r i m w o o d undertook a journey through SE. Asia and Malesia for conservation purposes and to judge the feasibility of the Indonesian projects. Later in the year, mutual consultations will follow and plans worked out. Thereafter, the final list of projects with details can be published. It is a very satisfactory result: about one dime from each head of the population. I don't have data from other countries but Holland seems to compare quite favourably. So let us take heart again. If you have a friend in the timber business, tell him of the action: WNF, Bank Mees & Hope, Amsterdam, account 21.36.50.797. It is not too late to give.

Botanical Award for Prince Bernhard. The New York Botanical Garden has established an annual Awards for World Leadership in Environmental Affairs. The first recipient, on 1 October 1975, was H.R.H. Prince Bernhard of The Netherlands, President of the World Wildlife Fund.

The Prince delivered an address 'Plants and the Future of Man', in which he remarked that the tropical rain forests are now being destroyed at a rate of 14 acres a minute (i.e. 336 hectares an hour). In an 11-page speech, he expertly and eloquently explained the necessity of plant conservation.

A special word of appreciation and congratulation is here written to both the Prince and the New York Botanical Garden's Board of Managers.

Persons who like to have a copy of the text can ask the Editor of this Bulletin, under enclosure of a check for WWF; see above.