

VI. MISCELLANEOUS INFORMATION

a) Research and Publications (*continued from page 3749*)

Tropical Botany in Aberdeen University. This was started by Professor J.W.H. Trail, who held the chair from 1877 to 1919, and travelled in the Amazon Valley (1873-75) mainly collecting cryptogams and studying palms. He was succeeded by Prof. W.G. Craib (1920-33) who was never in the tropics but devoted his work to the Flora of Siam, based on the collections of A.F.G. Kerr, and assisted by Miss E.C. Barnett. After a considerable

lag, tropical botany was revived by the energetic efforts of Dr. P. Ashton as lecturer in systematics and ecology of the eastern tropics, establishing ties with Malayan colleges in teaching and research. This is at present perpetuated by two lecturers, Dr. K. Jong and Dr. M.D. Swaine, the latter's experience lying largely in the tropics of West Africa. In addition Dr. N.M. Pritchard, Dr. J.B. Kenworthy and Dr. G. Hadley have been on secondment to the University of Malaya, while Dr. I. Alexander made research visits to India, Ghana and Peru. Over the years the Department has provided undergraduate and research training to innumerable students from many different tropical countries, some of which attained responsible posts, e.g. Prof. E. Soepadmo. Important courses in tropical biology are given, not available elsewhere in the U.K. (started 1973). The benefits for Aberdeen students is important: amongst others they led to expeditions to various parts of the tropics, recently to Sabah and to the Ivory Coast.

Royal Society Tropical Rain Forest Collaborative Research Programme. Arising out of a feasibility study by Dr. T.C. Whitmore and P.F. Cockburn, the theme 'Recovery of tropical rain forest after disturbance' was adopted as the initial basis of the programme. Possible territories for the research include Sabah and the Philippines. Detailed plans for a 5-year project are being prepared in consultation with colleagues in Southeast Asia.

Wallaceana, a global newsletter for tropical ecology, is produced in Malaya. Information: Editor Wallaceana (Mr. A. Sasekumar), Department of Zoology, University of Malaya, Kuala Lumpur 22-11, Malaysia.

Asian Studies Newsletter Archives. At the University of Maryland, U.S.A., Frank Joseph Shulman has collected over 1000 books and periodicals dealing with Southeast Asia. He also maintains extensive archives of Western language newsletters and information bulletins published during the 1960s and 1970s in the area of East, Southeast and South Asian studies, and a comprehensive file for completed doctoral research on Asia. Vol. 5 of Doctoral Dissertations on Asia was published in 1982. The collection is available for scholarly use at his home, by appointment with F.J. Shulman, East Asia Collection, McKeldin Library, College Park, Maryland 20742.

Centres for Environmental Studies. Education in ecology, getting acquainted with the environment, is of course a sine qua non for penetrating the minds of people with the idea of conservation and prohibiting wastefulness of their heritage. Long ago the University at Bandung erected a chair for Ecology, which was occupied by Prof. Soemarwoto. There now seems to be a network of about 25 Centres for Environmental Studies in Indonesia set up by the Minister of Development Supervision (now Population) and Environment. Dr. A.J. Whitten, well-known by his book 'The Gibbons of Siberut' (1982), who now fills the post of Advisor at the Universitas Sumatera Utara (Jl. Prof. Maas 5, Kampus USU, Medan), informed us that two centres, the one just mentioned and the one at Hasanuddin are being assisted by a UNDP/World Bank project for training and education in

resources and environment, in which they are being supplied with equipment, books, fellowships, other forms of staff development opportunities, and an Advisor. Dr. Whitten is an ecologist, educated at the University of Cambridge; he spent 2½ years in the Mentawai Islands before his present post to which he was appointed in 1981. He is writing an Indonesian textbook on 'Ekologi Ekosistem Sumatera' for use by Master level students, staff of other centres, planners in BAPPEDA, and the general public. An English version has been requested but will be outside the scope of this project. The first chapter concerns geological and geomorphological history, vegetation and fauna history, present vegetation and fauna, biogeography, prehistory, and history of man. There follow chapters on mangroves, other coastal ecosystems, rivers and lakes, peat swamps, freshwater swamps, lowland forest, heath forest, ironwood forest, forest on limestone, mountains, caves, effects of disturbance, agricultural ecosystems and urban ecosystems. It will cover c. 100,000 words, some 200 figures and also photographs. Each of the c. 1000 references will be deposited in the library of this centre. In the book each reference will have a classification code with it, so that readers can easily order photocopies. In the preparation of the book Dr. Whitten has taken small parties of staff and students on small expeditions. He spent also some time in the island of Bangka. The book as outlined will be extremely welcome, and will be a great stimulant in educating both student and layman, possibly even enlighten decision makers and politicians who particularly need intelligent, digestible information on environmental matters. — v.St.

Flora of India. In 1982 the fascicles 8 (Derris), 9 (Aceraceae) and 10 (tribe Uvarieae, Annonaceae) were published. Revisionary studies are being continued.

Four beautiful books on the flora of Taiwan. Under the chief editorship of Dr. Kuo-shih Hsu the Taiwan Provincial Department of Education has published 4 small-octavo books on native and cultivated plants of Taiwan, for educational use in the Taiwan Provincial Keelung Junior High School, at Keelung. The chief editor is attached to the Taiwan Forestry Institute, Botanical Garden, 53 Nan-Hai Road, Taipei.

The Chinese text of each species is illustrated by a really magnificently reproduced colour photograph which occupies ½-¾ page, mostly close-ups. Family and species naming is accurate and features are very clear. They concern the following subjects:

Common trees and blossoms of campuses in Taiwan. 163 pp.

This contains of course a number of introduced ornamentals.

Pteridophytes of Taiwan. 138 pp.

The rare and threatened plants of Taiwan. 100 pp.

This is especially interesting; it doubtlessly contains pictures of species hitherto never illustrated.

Plants of Lanyu. 169 pp.

This island lies SW of Taiwan and belongs to a group of islands of which the flora has been frequently discussed by plant-geographers, because they contain a number of genera and species with distinct Philippine affinity. Rare and interesting plants also are depicted.

I doubt whether anywhere in the world high school pupils are so lavishly equipped with botanical illustration and information for their education. The books must infuse them with love and care of plants, raise their enthusiasm for botany and serve for the purpose of conservation.

The books are not for sale obviously and prices are not known. I feel they should have a wider dispersion in the botanical world.

The chief editor wrote me that he is going to publish two more books in the series, one on the Littoral plants of Taiwan and one on Plants of Heng-Chun Peninsula. — v.St.

Flore du Cambodge, du Laos et du Viêt Nam. Volume 20 is in press, the manuscript for volume 21 (Scrophulariaceae by T. Yamazaki) is with the editors.

Flora of Thailand. Early 1983 we received a copy of Flora of Thailand volume 2, part 4, dated October 1981. Nine families, mostly small, are treated largely by Mr. C. Phengklai, the largest being Ebenaceae and Elaeocarpaceae.

Bangi Forest Reserve Project, Selangor, Malaysia. A 5-year research project has now been approved to study the productivity of Bangi Forest Reserve, to be led by Dr. A. Latiff and Dr. Noraini Mohd. Tamin, Botany Department, Universiti Kebangsaan Malaysia. The reserve is about 881 ha in which the University is situated, composed of primarily little disturbed forest. While most of the work will focus on primary and secondary production, floristic and faunistic composition is to be studied to understand their role in this dynamism. Work may furnish comparative data in rain forest region (cf. Productivity of terrestrial Rainforest of Pasoh, Mal. Nat. J. 30, 1978).

The Limestone Flora of Malaya. After two papers in the Gardens' Bulletin (30: 165-219, 1977; 32: 64-203, 1979), part III, containing the monocots, is now in the press; this will complete Mr. S.C. Chin's publication on the subject; see pages 2168-2169 of this Bulletin. His address: Department of Botany. University of Malaya, Kuala Lumpur 22-11, Malaysia.

Tree Flora of Malaya. For volume 4 the following families are at present under study: Boraginaceae by Dr. F.S.P. Ng, Lauraceae by Mr. K.M. Kochummen, Meliaceae by Dr. D. Mabberley, Myrsinaceae by Dr. B.C. Stone, Oleaceae by Dr. Ruth Kiew, Rhamnaceae by Dr. Abdul Latif Mohammad, Rubiaceae by Mr. Wong Khoon Meng, Sapindaceae by Dr. Yap Son Kheong.

New generic record from Ulu Kali. In Nov. 1982, B.C. Stone and J.B. Lowry discovered a few trees pertaining to the genus Melicope (Rutaceae) in an area already partly bulldozed just below the Genting Highlands hotel complex (at about 1550 m alt.). These proved on further study to represent a new species (the 14th new taxon of higher plants to be discovered on the Ulu Kali summit area). It is a new generic record, as confirmed by T.G. Hartley of Canberra, who is revising the genera of Zanthoxyleae. (He notes, however, that on publication of his results, there will be other members of Melicope in Malaya also.) Melicope had previous-

ly been known in India and Borneo, as well as Sumatra, but had not been recorded at all from the Malay Peninsula. The new species will be published shortly. The new taxa from Ulu Kali discovered since 1969 are: *Elaphoglossum robinsonii* Holtt., *Schefflera singularis* Stone, *Garcinia cantleyana* var. *grandifolia* Whitmore, *Neolitsea coccinea* Stone, *Dissochaeta spectabilis* Maxwell, *Medinilla selangorensis* Maxwell, *Maclurodendron magnificum* Hartley, *Ilex* sp. nov., *Symplocos ophirensis* var. *kaliensis* Stone, *Cyrtandra dispar* var. *glabriflora* Stone, *Vaccinium whitmorei* Ng, *Epigeneium kalianum* Stone, and *Coelogyne kaliana* Cribb. The list will most certainly be extended with continuing exploration. But discovery may be followed by extinction very quickly unless conservation steps are undertaken in this superb locality. — B.C. Stone.

Teaching Manual of Flowering Plants. Prof. Dr. Hsuan Keng, National University of Singapore, has handed in an emended version of his book 'Orders and Families of Malayan Seed Plants' for publication by Singapore University Press, April 1983. This will certainly be most welcome, as the number of teaching manuals is scarce in Malesia. For Indonesia there is the 'Flora voor de Scholen in Indonesië', in Dutch, in 1975 translated in Indonesian: 'Flora Untuk Sekolah di Indonesia'; but this is not useful in those parts of Malesia where English is the main language for students, e.g. the Philippines and Papua New Guinea. Dr. Keng's work can be used there with advantage.

Man-made dipterocarp forest in Lampung, Sumatra is the title of a 47-page report by Dr. E. Torquebiau, Biotrop, P.O. Box 17, Bogor (issued in 1983 at the same address). It deals with the 'damar' or resin of *Shorea javanica* in the region of Krui, enclosed by the Barisan Selatan Reserve (this Bulletin pages 3762-3763). Rappard (*Tectona* 30, 1937, 897-915) described this forest industry already in detail; and how well they could photograph in those days! Author looked into its possibilities as a variant of agroforestry. Seedlings are planted in native forest, in coffee or in pepper plantations, within four hours' walk of a village, to 100 in a ha. Tapping begins when the tree is c. 25 cm \varnothing and 20 years old. The holes are triangular, c. 15-20 cm wide and deep, in vertical rows. The resin is left to solidify, then scraped off and carried home, often too soon because of theft, and only the hardest damar fetches high prices, for application in paint and varnish. Several trucks leave Krui every day, loaded with damar, presumably to Telukbetung. The whole production of Lampung was 2053 tons in 1981, valued at US\$ 892,973; the entire harvest is exported.

Using the Hallé-Oldeman method of distinguishing trees of the future, present, and past, and quantifying the variables, recommendations are formulated for maintaining and improving this well-established branch of minor forest products utilization. Soil data, taken, reveal good potential in this region with its recent deposits of Krakatoa ash on clay. More comment should have been given on Rappard's data, and the peculiar tool be described, the 'damar axe' which enables the people in Krui to work the trees more effectively and with less damage than those in Lais, further North. — M. Jacobs.

Vegetation mapping of Sumatra 1:1,000,000 (see this Bulletin pages 3570-3571), the Biotrop project conducted by Dr. Y. Laumonier (P.O. Box 17, Bogor). Field work, which moves up the island from the South, has now reached Aceh, and will be completed early in 1984. The first of the 3 sheets to be printed is now in the press; the others and a booklet with text are soon to follow. Contact Dr. F. Blasco, Botanique, Université Sabatier, 39 Allées Guesde, 31400 Toulouse, France.

Fruit resources and patterns of feeding, spacing and grouping among sympatric Bornean hornbills (Bucerotidae), xv + 246 pp., 28 fig., was the (manuscript) Ph.D. thesis (1981, Anthropology, University of California, Davis, CA 95616) of Mark Leighton (now at Arnold Arboretum), who did extensive botanical collecting for the purpose; see Exploration.

From August 1977 he and wife Dede (who studied monkeys) worked in the northern part of the East Kutai Reserve, at 30-300 m altitude. In a 300 ha plot they established 30 km of trails, and built the platform described on pages 3432-3434 in a big tree now identified as *Shorea platyclados*. Except four old hand-logging swaths, the forest was pristine, and during the period, an estimated 900 species of trees and lianas bore fruit.

Hornbills, of which 7 species inhabit the area, differ conspicuously in habit, sex and age, and not having much to fear, are noisy creatures, easily located and followed. Territories are c. 1½ km Ø; the birds live in densities of a few per km² and operate in groups of 3-6, ranging c. 5.6-9.7 km a day. Although they are omnivorous — 2 cm beetles to 60 cm snakes, centipedes, and even small birds on the wing are snapped up — fruits make an essential part of their diet.

Leighton speaks of 'fruiting patches' of trees or lianas as units in hornbill ecology. These patches are scattered: those amounting to 5 grams dry weight of lipid-rich flesh were detected with an average of 3.5 in 15 ha, patches of 20 grams with 0.92 in 15 ha, which means a mere 1.17-1.23 grams of dry weight on a given day. Circa 265 spp. of hornbill fruit species are tabulated, among them c. 37 *Ficus*, which is an important component through the year. *Meliaceae*, 44 large trees rather close to the river, and *Myristicaceae*, 32 large trees farther away, were other important constituents, yet their combined density amounts to 1 tree in 4 ha on average.

Among the fruits 3 diameter classes are distinguished: to 10 mm, 10-20 and up, with 29 mm as the biggest item to be swallowed, but this is no match for the widest hornbill gape of 42-55 mm. The birds handle any kind of fruit, including the husked ones, with facility in no more than 30 seconds. Beside this category, that of the lipid-rich is distinguished; their flesh is hard and oily, like in *Canarium* and *Elaeocarpus*. A third category is the carbohydrate-rich, i.e. the sweetish or mealy ones, among which the figs are most prominent. While monkeys like figs better, the hornbills rather go for the lipid-rich ones, which contain more calories. Leighton's pet hornbill, *Cyrano*, showed signs of ill health after two days on an all-fig diet (90.3 grams dry weight a day, in 411 figs); an all-round diet restored him quickly.

The birds weigh 1-3 kg, depending on species. Meal size is 100-300 cc. After c. 1 hour, the seeds are regurgitated. Behaviour is determined by

group-size — foraging in small groups makes location of patches easier — and a balance between distance to be covered and fruit availability. Factors like these are analyzed statistically for all the species, with hypotheses examined, in dry, technical prose. Seasonal differences in fruiting account for fluctuations in hornbill grouping and behaviour; but it is the constant basic supply of fruits, a kind of mosaic-in-time, that makes this co-existence of species and the important role of hornbills as seed dispersers, possible. — M. Jacobs.

East Kalimantan MAB Project, 1982-83. 'Shifting Cultivation and Patch Dynamics in an Upland Forest in East Kalimantan, Indonesia' is the name of a US-Indonesian MAB project in the Apo Kayan near the Sarawak border. The project is headed by Dr. Andrew P. Vayda of Rutgers University (U.S.A.) and funded by the U.S. Forest Service. Dr. Kuswata Kartawinata of LBN is the senior Indonesian investigator. Field work began in May 1982 and is expected to continue until August 1983 near the Kenyah Dayak village of Sungai Barang on the upper Kayan River. 'Patch dynamics' (cf. Van Steenis' concept of 'spotwise regeneration') refers, in this case, to the changes in species composition and vegetation structure following natural and anthropogenic disturbances in primary forest and successional communities. Patches of different size and created in different ways (e.g., by windthrows, landslides, human cutting and burning) will be compared and implications for forest conservation and the design of nature reserves will be drawn.

Mr. Timothy C. Jessup and Ms. Cynthia Mackie, both of the Rutgers Ecology Program, will be based in Sungai Barang for 8 to 10 months. They will investigate the distribution, structure, and species composition of patches in primary and successional forest and in cultivated and old fields. A team from LBN, led by Dr. Kuswata Kartawinata, will make two visits to the area to establish permanent plots in primary forest for the purpose of determining variation in tree species composition on different types of soil and, in subsequent years, monitoring tree growth, treefalls, and seedling regeneration in gaps and beneath the canopy. Dr. Richard Curtin, a primatologist from Rutgers, will observe the activities of some large and medium-sized mammals that may disperse seeds between patches. Dr. Steward Pickett of the Rutgers Ecology Program is serving as a consultant to the project.

Ecological studies on primary, secondary and experimentally cleared Mixed Dipterocarp Forest and Kerangas Forest in East Kalimantan, Indonesia. This is the subject of research carried out by Mr. Soedarsono Riswan and the title of his thesis (Aberdeen). The project was designed in conjunction with Man and the Biosphere (MAB) Programme Project No. 1 to provide scientific data on the effects of tropical forest clearance with a view to future long-term management of kerangas and mixed dipterocarp forest.

Control plots from both forest types were described in detail together with secondary forest established for 35 years. Experimentally treated plots were clear-cut and burnt and the changes in soil and vegetation followed and described in detail for 1.5 years.

The two initial forest types represented a range of forest formations in the tropics from poor to rich conditions. Fluctuations in the control plots were followed for 1 year. The whole process of recovery was different in the two forests: in the strategy of individual tree species, the species composition and changes in soil nutrients.

A variety of conclusions about the trees, saplings, seedlings, shrubs and herbs components, turn-over periods, biomass, natural regeneration and species composition of these forests are dealt with and further conclusions outside the scope of this thesis will be published later.

Ethnobotany in Sarawak. Compilation of ethnobotanical data of plants native to Sarawak, is one of the priority projects at SAR. About 100 species were collected in 1982, making the total c. 450 species.

Ferns of Borneo. K. Iwatsuki and M. Kato (TI) are compiling their results of field surveys in East Kalimantan, 1979-1981. They intend to compile a checklist of the pteridophytes of Borneo.

Cryptogams in the Philippines. Dr. Romualdo M. del Rosario (PNH) is active in mosses (see Bibliography); his newly approved projects, financially supported by the National Research Council of the Philippines, are 'Hepaticae of the Cordillera Central, Luzon' and 'Survey of Philippine Bryophytes for Antibiotics', the latter also being conducted at the Medical Center, National Science Technology, with Dr. Flora B. Beloy, a pharmacist, as co-researcher.

Dr. Paciente A. Cordero (PNH) produced several papers (see Bibliography) and three manuscripts are in press. His present research projects are 'marine algae of Panay' and 'a study of the sea vegetable *Caulerpa* in Panay'.

Palynology in the Philippines. Dr. Pacifico C. Payawal, Assistant Professor, Botany Department, College of Arts and Sciences, University of the Philippines, Los Baños, Laguna and Honorary Researcher of the National Museum has used pollen rain calibration to infer the Holocene vegetational history in Southern Luzon. Sediment coring has been undertaken in selected areas of Laguna Lake to collect pollen data which will be subjected to multivariate analysis to determine possible changes in pollen influx. Consequently, the paleo-ecological events will be inferred.

Structural and functional aspects of tropical seagrass communities. The productivity and the ecology of the seagrasses, the macro-algae and the epiphytic micro-algae in the seagrass meadows have been studied in Papua New Guinea. The study was carried out at the research facility of the University of Papua New Guinea, at Motupore Island. F.M.L. Heijs and J.J.W.M. Brouns, Laboratory of Aquatic Ecology, Catholic University, Nijmegen, The Netherlands, collected field data from July 1980 until January 1983. In the predominantly monospecific seagrass meadows data were collected on:

- productivity, morphology and growth-patterns, phenology, standing crop and biomass of the seagrasses;
- productivity, biomass, spatial and temporal distribution-patterns of

the epiphytic micro-algae on the seagrass leaves and the rhizophytic macro-algae in the seagrass meadows.

In the mixed meadows the same data were collected with the addition of:

- the temporal and spatial distribution-patterns of the seagrasses;
- the species-specificity of the epiphytic algae on the seagrass leaves.

The seagrass meadows have been surveyed in Wewak, on the north coast of Papua New Guinea; in Lorengau on Manus Island; in Kavieng on New Ireland and in Rabaul on New Britain.

The data are now being processed in Nijmegen and will be presented in the course of 1983 and 1984.

Flora of New Guinea. Two important books have been published. The first is the 'Handbook of the Flora of Papua New Guinea', of which a second volume appeared from the Melbourne University Press, containing accounts of 14 families.

The second is the 3rd volume of P. van Royen's 'Alpine Flora of New Guinea', covering 40 families, from the Winteraceae to the Polygonaceae, Ericaceae being the largest family.

Christmas Island. Mr. L.L. Forman has been compiling data towards an up-to-date checklist of the flora of Christmas Island (Indian Ocean). The recent collections of D.A. Powell and H'ng Kim Chey have been particularly valuable.

b) Herbaria, Gardens, Organizations (continued from page 3754)

The International Working Group on Dipterocarps IWGD has produced its first newsletter called 'Mata kucing' (cat's eyes). It contains abstracts of the papers read at the 1st and 2nd Round Table Conferences, resp. at Paris, 1977, and Kepong, 1980, reports on these conferences, news about the 3rd Conference to be held in 1984, and several other news items. Editor: Mrs. Gema Maury-Lechon, Lab. Phanérogamie, Mus. Nat. Hist. Nat., 16 Rue Buffon, 75231 Paris Cedex 05, France.

Index collectorum principalium Herbarii Gottingensis by G. Wagenitz, Göttingen, 'im Selbstverlag des Instituts' (1982) 214 pp., many facsimile handwritings. A most valuable account of the principal collectors of plants represented in the Göttingen Herbarium. Of each a brief biography is given and an indication where the collections were made. A geographical index is provided to overview the holdings. Some 50 facsimile handwritings are added.

The Central Institute of Medicinal and Aromatic Plants, Postbag 1, P.O. Ram Sagar Misra Nagar, Lucknow 226 016, India, regularly produces the CIMAP Newsletter, containing research notes, papers published, personalia, etc. Information at the above address.

In 1982, about 19,650 herbarium specimens were incorporated into the various herbaria of the Botanical Survey of India, including CAL.

The herbarium (TAI) of the Department of Botany, National Taiwan University, Taipei, Taiwan, now has the following staff:

- Dr. T-C. Huang, professor and curator (Daphniphyllaceae, local flora)
- Mr. W-T. Cheng, ass. professor (Labiatae, Liliaceae)
- Dr. C-F. Hsieh, ass. professor (Acanthaceae, numerical taxonomy)
- Mr. C-M. Kuo, Ph.D. student at Zürich (ferns)
- Mr. M-T. Kao (local flora)
- Mr. Y-F. Chen (local flora)

The herbarium welcomes exchange, especially wanted are the families mentioned, and also Araceae, Elatinaceae, Leguminosae, Lythraceae. There are no Fungi in TAI.

This information is additional to what Index Herbariorum mentioned.

Rattan Information Centre. This centre was established and started operation at the Central Library of Forest Research Institute, Kepong in May 1982 where sources of references are readily available. It is financially supported by IDRC (International Development Research Centre, Canada) the grant of which is expected to cover a period of 3 years.

Generally the objective of RIC is to seek, acquire, classify and store all relevant information on rattan and disseminate this information in various forms to those interested.

A quarterly newsletter/bulletin on rattan will provide current awareness on all aspects of rattan research; the first bulletin came out September 1982, the second in December.

Forestry Museum at Penang. The museum erected at Teluk Bahang Arboretum at Penang was opened in conjunction with World Forestry Day in March 1983; the museum will include displays on current silvicultural practices, important Malaysian timbers, utilisation of minor plant resources (rattan, bamboo, nipah, pandan, etc.), forest types of Malaysia and Forest Entomology.

Monocot Garden at FRI, Kepong. The Monocot collection (started as a small garden in 1975) was shifted to a new site within the FRI grounds at the end of 1981. The essential feature of this early collection was that it was practically a palm collection (25 species of rattan, 22 species of non-rattan palms).

Although in general all Monocots are accepted for the collection, emphasis will be given to rattans, bamboos and pandans in view of the fact that these plants are useful minor forest products and have much ethnobotanical interest attached to them.

While, unfortunately many of the rattan species have succumbed to the shock of transplantation to the new site, the bamboo collection within FRI grounds has achieved a total of 17 species.

The new Biology building at FRI, Kepong, will be ready for occupation in mid-1983. The herbarium will be housed in the 3rd and 4th floors of this 4 storey building.

SAR distributed almost 8000 duplicates to 13 different institutes in Asia, Europe, and America. The total number of specimens in the herbarium is now approx. 80,000.

Herbarium Bogoriense. The Government of Indonesia had agreed to provide funds for adding a new floor to the present 3-storey herbarium building at Bogor. The new floor will be used as the working space for all staff members. The present 3 floors will be used to accommodate all the herbarium (both dry and wet) collection.

The ground floor has been converted into the ethnobotanical Museum (Museum Etnobotani Indonesia). The museum was inaugurated by Prof. J.B. Habibie, the Minister of Science and Technology, on 18 May 1982, on the occasion of the 165th anniversary of the Botanic Gardens. On this occasion several events were organized:

a. Seminar:

1. Minister of Science and Technology: 'The policy of developing science and technology for increasing the utilization of biological resources'.
2. Chairman of LIPI (Indonesian Institute of Science): 'To uncover the potentials of biological resources with science and technology'.
3. Director of the Institute of Agricultural Research and Development: 'Utilization of biological resources in agriculture'.

b. Exhibitions with themes: history and function of the Botanic Gardens, forms and functions of seeds, conservation of plant germ plasm in the form of seeds and tissue culture, potential uses of pacing (*Costus speciosus*) and kecipir (*Psophocarpus tetragonolobus*) in family planning, and the role of animals in pollination and seed dispersal etc., were arranged.

The 'Museum Etnobotani Indonesia' is part of the Herbarium Bogoriense, and now accommodates about 1100 items (artefacts) on display.

Starting last year Herbarium Bogoriense has been in the process of replacing the tin specimen boxes with steel cabinets. At present the families Acanthaceae to Clusiaceae are already stored in steel cabinets.

In January 1983, Herbarium Bogoriense received an Apple II mini-computer. It is a donation from the International Board of Plant Genetic Resources to the Lembaga Biologi Nasional, primarily for computerizing data on inventory and evaluation of plant genetic resources that have been acquired by Dr. Setijati Sastrapradja and her co-workers. However, the Herbarium will also make use of it for storing data on herbarium specimens (data contained in each specimen will be recorded and stored) as well as for analysing ecological data. In connection with this Mr. Suhardjono Prawiroatmodjo received special training at the Agricultural Research Service, U.S.D.A., Beltsville, Maryland, U.S.A. in August 1982.

The Herbarium Bogoriense has recently recruited new staff members who are now working on various genera:

1. Mr. Nyoman Kabinawa on *Microcystis* (blue green algae);
2. Miss Mulyati Rahayu on *Cyrtococcum*;
3. Miss Diah Sulistiarini on *Luisia*;
4. Miss Tutie Djarwaningsih on the variability of *Capsicum* spp.
5. Mrs. Rugayah on the variability of *Ipomoea aquatica*.

Sabah. In the Danum Valley a Field Study Centre is being developed as an educational centre for Sabahans. It is hoped that the Danum Valley area, which has some fine undisturbed tracts of forest, will be available for joint research and training under the Royal Society's Rain Forest Programme.

The Philippine National Herbarium PNH is in the process of being transferred from Herran St. to the renovated Legislative Building at P. Burgos, Malate, Manila.

The Haribon Society is an association of nature lovers and conservation of the natural beauty and fauna and flora of the country, as an attractive leaflet tells us. Information: c/o Filipinas Foundation, room 435, Makati Stock Exchange Building, Ayala Ave, Makati, Metro Manila.

Large sets of Pteridophytes from New Guinea, of which the trace had been lost, have recently turned up and are again available for research at the Botanisches Museum Berlin-Dahlem (B). In the late 1930's these sets were studied by A.H.G. Alston who published a number of new species in J. Bot. 78 (1940) 225-229. They comprise 418 specimens collected by Cedric Erroll Carr in 1935 and 1936, and 326 specimens collected by (John and) Mary Strong Clemens between 1935 and 1938. The latter, being the original set with all of Alston's holotypes, is particularly valuable.

Lae Herbarium, Papua New Guinea. Disturbing news was received from the Herbarium at Lae. It resorts under the Department of Primary Industry, and forms a Division of Botany under the Office of Forests. From January 1st the Department abruptly stopped budgetary funds to the Herbarium, for maintenance as well as for exploration, for sending out loans, etc. This is of course associated with the worldwide economic depression which is also felt in Papua New Guinea.

The situation is very serious as decay through insects and fungi can be expected because the material is not permanently poisoned, as at Bogor and Singapore. The latest news we heard, is that the Government has reversed its decision but that funds have not yet been made available. The situation has become more complicated by the early retirement of Mr. M. Galore, the assistant-director (see page 3876) and of the energetic secretary, Mrs. Sue Osborn.

Several of the large herbaria in Europe and elsewhere have expressed their concern. In order to set the importance of the Lae Herbarium in perspective: originally it was intended as a deposit for tree species, storing information on vegetation, timber and forest products. However, it grew far beyond this modest aim to the considerable dimension of over 300,000 sheets, representing the whole flora of Papua New Guinea. From 1950 onwards exploration by many temporary scientific staff members, and also expeditions from the CSIRO centre at Canberra, and expeditions by botanists from abroad, led to this increase, while the herbarium was also enriched through exchange of duplicates. Apart from this, many publications were initiated, a series of handbooks, the second volume of which appeared in 1982, and the valuable work on Legumes by B. Verdcourt (1979).

During the past 30 years an immense amount of money has been invested, not only in staff salaries, but also in the expensive explorations of which the outcome has been laid down in the large collection. This investment runs probably into some tens of millions of dollars.

In this way it has become the national centre for botanical storage and information for Papua New Guinea. Its status as a minor subdivision under the Forestry Service in the Department of Primary Industry is no longer appropriate. It has become a national asset of Papua New Guinea and it should be considered a 'National Herbarium', comparable to other similar botanical centres in other countries. The Government of Papua New Guinea has every reason to congratulate itself with this basic representation of the plant species in the country.

It is hoped by botanists all over the world that the value of the Lae Herbarium as a national centre of botanical science is recognized by the Government and that it will be given the national status it deserves.

As any other service it will have to economize its funds, but this curtailing should not go beyond reasonable measures. — Van Steenis.

During the FORUM on Systematics Resources in the Pacific, held at the Bishop Museum, Honolulu, it was decided that an Association of Pacific Systematists should be formed, if there is sufficient interest in the systematic community. Information: Dr. S.H. Sohmer, Department of Botany, Bishop Museum, Box 19000-A, Honolulu, Hawaii 96819.

The herbarium (NOU) of the 'Centre ORSTOM de Nouméa', New Caledonia (address see Index Herbariorum) possesses c. 6000 specimens from the Vanuatu Archipelago, formerly the New Hebrides. A large number of duplicates come from the Royal Society expedition of 1971, and the botanists of the Centre collected regularly during their visits during 20 years. The material can under normal conditions be borrowed.

Other news from ORSTOM. In 1981 a botanical laboratory and herbarium were founded in Papeete, Tahiti. Goals include collection of the vascular flora of French Polynesia.

The Botany Department of the Bishop Museum, Honolulu, Hawaii, was renovated thanks to a grant from N.S.F. The installation of a compactor system increased the herbarium's storage capacity by 23,4%. The Department also received a grant which will make it possible to start work on a one-volume Guide to the Flowering Plants of the Hawaiian Islands, to be written by S.H. Sohmer, D. Herbst and W. Wagner.

Two herbaria in the Northern Territory, Australia, Alice Springs (NT) and Darwin (DNA), were per 1 February 1983 transferred to the Conservation Commission of the Northern Territory. New postal addresses: Box 1046, Alice Springs, N.T. 5750, Australia, resp. Box 38496, Winnellie, N.T. 5789, Australia. The staff at Alice Springs consists of Mr. J.R. Maconochie, Mr. B. Thomson, Mrs. D. McKey, the staff at Darwin includes Ms. C.R. Dunlop, Mr. G. Wightman, Mrs. S. Cousins.

c) Symposia, Congresses, Societies, Meetings*(continued from page 3757)*

Proceedings of the 8th World Forestry Congress, Jakarta, October 1978, can be ordered from: Direktorat Jenderal Kehutanan, P.O. Box 3668, Jakarta, Indonesia. There are seven volumes, ranging from 700 to 2600 pages. Price \$ 250, separate volumes \$ 50, including postage by surface mail.

The Proceedings of the International Symposium on Conservation inputs from Life Sciences held in Bangi in October 1980 were published. The price is M\$ 50. Order from Dr. A. Latiff, Botany Department, Universiti Kebangsaan Malaysia, Bangi.

The Proceedings of the Symposium on Tissue culture of economically important plants, held at Singapore, April 1981, have been published. Info: Prof. A.N. Rao, Botany Department, National University Singapore, Lower Kent Ridge Road, Singapore 0511.

Studies on Aquatic Vascular Plants is the title of the Proceedings of a Symposium held at Brussels, January 1981. Apart from the opening address by Prof. Cook on the pollination mechanisms in the Hydrocharitaceae it contains papers in the following categories: systematics & morphology, physiology & reproduction strategies, ecology, metabolism & production, phytosociology, water quality & weed control, and introduction & conservation. The majority of papers are devoted to subjects in European countries, but several are of importance for the study of tropical aquatics, notably on the family Limncharitaceae and Hydrocharitaceae, and a paper on the applicability of mangroves for the development of ecologically based mariculture systems in subtropical and tropical coastal deserts. See Symoens in the Bibliography.

The Botanical Survey of India and the Department of Environment, Government of India organized a Regional Workshop on Conservation of Tropical Plant Resources in South-East Asia at Delhi in March 1982. The Workshop was inaugurated by Dr. B.P. Pal and well-known scientists from India and abroad participated. Recommendations on the conservation of plants, setting up of biosphere reserves and gene pools were taken up. Dr. S.K. Jain, Director, Botanical Survey of India as organizing Secretary was nominated as a nodal point for processing the recommendations.

The first Conference on the Palaeoenvironment of East Asia from the mid-Tertiary up to the emergence of man was held at the Centre of Asian Studies, University of Hong Kong, from 7-13 January 1983. The conference divided its work into the following sessions: Geology, tectonics, orogeny, geomorphology; Palaeoclimates and the evolution of modern climate; Palaeobotany, palynology and the evolution of vegetation; Palaeontology and the evolution of faunas; The physical and biological environments in which man emerged. Some 70 scientists participated, from the People's Republic of China (14), Japan, Korea, Australia, Britain, Canada, France, Germany and the United States of America. It is hoped that the proceedings will be published early in 1984. It was decided that a newsletter

will be published to ensure continued contact till next conference. Information: Dr. Edward K.Y. Chen, Director, Centre of Asian Studies, University of Hong Kong, Hong Kong.

The 7th Aberdeen/Hull Symposium, organized by J.R. Flenley (Hull) and P.A. Stott (London), will be held in Hull, England, 16-18 September 1983. The topic will be 'The impact of Man on the vegetation of Malesia'. There are only four major papers and much time will be left for discussion. Participants will be limited to 40. For information: Dr. J.R. Flenley, Department of Geography, Hull HU6 7RX.

At Wageningen, the Netherlands, an International Symposium on strategies and designs for afforestation, reforestation and tree planting will be held 19-23 September 1983, under the name Let there be forest. Information: Ing. J. Drijver, International Agricultural Centre, P.O. Box 88, 6700 AB Wageningen, The Netherlands.

d) Conservation (continued from page 3767)

Understanding Mangrove Ecosystems is an audiovisual presentation comprising 60 colour slides, an illustrated script, and a pre-recorded cassette. Written by Prof. Lawrence Hamilton, a member of the Working Group on Mangrove Ecosystems of IUCN's Commission on Ecology, this program explains the ecology of the mangrove ecosystems and their importance to man. It describes many of the treats facing the world's mangroves and suggests ways in which careful management could allow them to become an important renewable resource for the future. Further information: The Executive Officer, IUCN Commission of Ecology, 1196 Gland, Switzerland.

Sabah: the forest situation. Reports on the forest situation in Indonesia (p. 3020-3024), the Philippines (p. 3416-3417), Thailand (p. 3582) and Sarawak (p. 3764-3765) were summarized in earlier issues. In 1975 (p. 2359-2360) remarks on Sabah were given; the big FAO study Forest Resources of Tropical Asia (1981) contains materials for an updated overview (see Reviews, page 3939). Main features are a) the western lowlands, narrow in extent but inhabited by c. 70% of the population; b) the Crocker range, with Mt Kinabalu but mostly only 1200-1800 m high; c) the Central Uplands, with Mt Trusmadi and some vulcanism in the NE; d) the Eastern Lowlands with some swamps behind the coast.

Population in 1976 was c. 800,000, with annual growth of 4.7%. Many thrive in the timber boom, but c. 350,000 are poor shifting cultivators.

For the forests the classification of Fox (Tropical Ecology 19. 1978) is followed. Lowland and hill dipterocarp forest by 1980 covered 54% of total forest area; montane dipterocarp forest, 14%. Mangroves cover 3500 km² or 7% of the total forest area; the 650 km² peat swamp forest have mostly been exploited. Beach, freshwater, and kerangas forests are small in extent.

Lowland and hill dipterocarp forest areas were estimated in 1975 at 29,300 km², in 1977 at 26,520 km², and in 1980 'incorporating changes on account of shifting cultivation, transfer of land to permanent agri-

culture, and reclassification of part of inaccessible montane forest into commercial forest' at 32,000 km², of which 19,200 was undisturbed and 12,800 logged. Under secondary forest was 13,900 km², under grass 1550 km².

As protected is listed 1200 km² national park, 390 of which 'virgin forest', and 150 'amenity forests'.

Landownership is through Reserves (27,700 km²), State Lands (27,680), and Alienated Lands (18,560). Most of the existing forests are either located in 'Forest Reserves' or in State Lands. Forest reserves (now 36,380 km²) are supported to be dedicated to sustained yield management and thus are of greatest potential for timber production or greatest value for watershed protection. The situation of the State Lands is rather confusing and far from satisfactory (p. 299).

Damage caused by logging is extensive: 'areas of forest ranging from 14-40% are made bare by tractor tracks and landings (loading areas). There is significant damage to natural regeneration and advance growth' (p. 309).

Canadians air-photographed the whole state in 1969-1972 at scale 1:25,000 and 1:40,000, resulting in a 1:50,000 map. Commercial forests were classified into 8900 or more m³/ha (area 9900 km²), 6200-8900 (area 20,770 km²), 3500-6200 (area 4620 km²), subdivided by province. Extensive breakdowns are made of stands, virgin and after logging. Unlogged natural forest under concession amounted in 1980 to 20,290 km², under a total of 1766 licenses, most of these valid for 1 year only, others for 21 years at most. Dipterocarps make up 77.6% of the total volume. Log production reached peaks in the late 1970's of c. 13 million m³ and is expected to decline towards 7.5 million by 1985. At that time 14,700 km² of virgin forest will be left, plus 14,300 of logged over forest, 1,750 under legal protection, and 16,000 under shifting cultivation. Intensively managed forest is apparently not projected.

Plantations are intended for a larger role in the wood supply; 1880 km² having been established in 1980. It was decided to plant agricultural crops like cocoa under valuable forest tree species, and interest has grown in rattan planting in the logged-over forest.

Brunei: the forest situation. From Forest Resources of Tropical Asia (FAO 1981) 143-149, we take a few data. Population in 1971 c. 136,000 of which 65% urban, annual increase 4.5% (1.2% due to immigration). 2500 families are shifting cultivators: many figures are 10 or more years old.

Undisturbed mixed dipterocarp forests cover 2293 km², virtually all accessible; this may be 1990 in 1985; logged over is 120 km², this may be 170 in 1985. Secondary is 2370 km², expected to be 2620 in 1985. Undisturbed peat swamps cover 410 km², 50 of which has been logged; in 1985 this may be 100 km². Kerangas covers 220 km², mangrove 70 km².

There is almost no reserved forest, nor has much forestry planning or inventory work been done. Air photographs may be available. Logging has increased: 37,000 m³ in 1961-65, 81,000 in 1966-70, 92,000 in 1971-76, 140,000 in 1976-80. In this oil producing country with the highest per capita income of Asia after Japan, 390 tons of fuelwood and 412 tons of charcoal were consumed annually in 1975, but the trend was downward. Most logging is concentrated in the western part where 90% of the lands is

below 60 m. About 290 km² was concessioned for logging in 1975. Deforestation, estimated at 70 km²/year during 1976-80, is expected to decrease to 50 km²/year during 1981-85. Nevertheless, with this rate, the 2290 km² of MDF in 1980 will be reduced to 1990 km² in 1985 and will have gone in less than 40 years, i.e. by anno 2034. The magnificent forests of Brunei!

Brunei protects its wildlife, an article of Russell A. Mittelmeier in *Borneo Research Bulletin* 14 (1982) 85-87, 'although Brunei does not yet have any national parks or sanctuaries, an important Wild Life Protection Enactment was passed in 1978, empowering the sultan and his council to establish wildlife sanctuaries by decree.' As potential sanctuaries are listed, i.a., several habitats of the endangered Proboscis monkey, still thriving in the Brunei Bay area near to a small mainland village and unaffected by regular boat traffic, and Pulau Siarau, an uninhabited island in Brunei Bay which is the roosting site for an enormous population of the large fruit bat *Pteropus vampyrus*. There is also potential for a large sanctuary or national park along the uninhabited stretch of coast between Pulau Siarau and the Sungei Labu, and east to the Batang Trusan. This would encompass the entire coastal region of the smaller part of Brunei and would be a protected area of considerable international significance. Several potential park sites also exist in the interior.

An IUCN/WWF Conservation for development programme in Indonesia 1982-1986 is outlined in a paper dated March 1983. This programme is based on the agreement on cooperation in the field between WWF and the Republic of Indonesia, signed in 1977, covering the period 1977-1981. The last agreement included 17 conservation projects involving a WWF component of about \$1.4 million to which were added 18 projects worth \$300,000. The agreement was renewed and extended for the period 1982-86 on 10 November 1981. The new programme has been influenced by the launch of the World Conservation Strategy (WCS), in March 1980.

A new, more comprehensive IUCN/WWF conservation programme is outlined based on an initial commitment from WWF-Netherlands to provide fundings for an additional five years. It should aim at the further establishment of protected areas, their better management, measures to protect species, and should also be seen in the wider context of the maintenance of essential ecological processes, the preservation of genetic diversity, and sustainable use of renewable resources (the three major objectives of conservation in the WCS). The new programme should contribute to improve methods and practices in development planning to achieve sustainable development, growth in public awareness and support for conservation action, stimulation of appropriate administrative and legal measures, and the provision of increased environmental education and training opportunities for Indonesians.

Under the potential projects in the programme are mentioned amongst others:

- Irian Jaya. Establishment of a network of reserves, developing a model reserve (Mamberamo), costs US\$ 180,000.
- Kalimantan. Development of National Parks and Reserve Areas. This includes the preparation and/or updating of management plans, e.g. for

Kutai and Bukit Raya. Costs US\$ 190,000.

- Sumatra. Protection of large mammals and their habitat, this with particular reference to the Sumatran elephant and the proposed translocation of the Javan rhino. Costs US\$ 170,000.
- Development of a Marine Resources Conservation Programme, i.a., the development of a nation-wide turtle management and conservation program. Costs US\$ 212,000.
- Environmental Education and Training. Costs US\$ 300,000.

Wholesale felling versus selective felling. Minister: 'yes' to total tree felling system, (from the 'Indonesia Times', April 14th, and the 'Indonesia Observer', May 26th, both 1982). Agriculture minister of Indonesia, Soedarsono, argues that Indonesia would be short of logs for its domestic industry in the year 2000 if forest exploration continues using the selective tree felling system. For that reason he recommends total felling, followed by replanting. His ideas were modified by minister Emil Salim, who argued that wholesale felling should not be carried out indiscriminately, but selectively and conditionally. Any way, the forests should not cease to function as water catchments and erosion preventors. Nevertheless, he argues that, with wholesale felling, the denuded portion of the forest can immediately be planted with certain kinds of trees for paper, pulp, plywood and chips industry. Or it can even be replanted with the trees which have been felled, thus a man-made or artificial forest being produced. Imam Chourmen, member of DPR, commented that the newly planted trees would impossibly function right away but require some time to grow, and denuded areas over vast stretches will cease their function to prevent erosion. He is of the opinion that wholesale felling may convert forests into deserts and it would be better to maintain the selective method under stricter control and easy disposal of the so-called rejuvenation fund (which is, because of bureaucracy, difficult to be used).

Different sounds could be heard from Dr. Achmad Soemitro, forestry economist at Yogyakarta's Gajah Mada University, presenting a paper for the Indonesian Association of Sylviculturists in Jakarta.

The Plunder of our Forests is the title of its review in the 'Indonesia Observer' of 19 Jan. 1983. He told the 200 assembled forestry experts 'that our forests have by and large come to be seen as a thing to be doled out (among certain people) and to be fully consumed', 'our forests have become everyone's target for massive unrestrained plunder'. The Financial Note on the Bill for State Budget 1983/84 mentioned that timber production shot up from 8,107,000 m³ in 1969 to 31,094,000 m³ in 1978, whence it came down to 15,376,000 m³ in 1981. At the height of the plunder 86.4% of the timber was exported to make it the second largest foreign currency maker after crude oil. The same Financial Note on the Bill states that up to December 1981 there were 518 timber companies, out of which 87% was classified as national, whatever that means. The total surface of all the forestry concessions covered 52,172,000 hectares.

Dr. Soemitro also criticised the concessionaries. He saw them lacking the initiative to replant their contracted plots and never bother to make

maximum use of one whole tree. They just take the most profitable part of the trunk and leave the rest of the tree to rot.

Regarding replanting the forests, it appears that only very few people are aware of the fact that not only in many instances the soil is too poor to produce any appreciable amounts of wood, when the original forest has disappeared, but also that for the most valuable kinds of wood, the different kinds of Meranti, cultivation is extremely difficult or — for the moment — even impossible for many species.

Growing wood for pulp, chips, and paper fabrication, can only be done on fertile soils that often also are suitable for agriculture. For every forest area a soil survey should be done, and cutting prohibited when the soil belongs to the poor soil types where reforestation, plantations and/or agriculture will be impossible, or only possible at costs that are too high for the government to pay.

In the *Malayan Naturalist* of February, 1983, an extract is published from a paper in *Asian Environment*, June 1982, by George A d i c o n - d r o, Executive Director of the Indonesian Environmental Forum Forest Wealth: Exploitation in Indonesia. He states, in sharp contrast with the statements of the Minister of Agriculture, that the great rate in cutting down the Indonesian forests will make that Indonesia runs out of tropical hardwood in another eight years. In 1980 Indonesia earned more than US\$ 2 billion from timber. In Kalimantan most timber companies prefer the yarding technique which not only destroys a large part of the forest and young trees, but is also responsible for soil erosion and landslides. Furthermore the roads are built by a cruiser technique, in which tractors push their way through dense forest to clear a path while the timber companies are supposed to build roads according to the landscape. They even do not hesitate to blow up parts of a hill to make logging roads easier and shorter. Floods occur with increasing severity in Kalimantan and in one serious accident the Barito River rose eight meters, destroying 96 houses, 6,600 hectares of crops and dislocating 20,000 people. Silting of the Barito River because of mud and earth erosion is a problem admitted by the river port authorities. They say that the river is being silted faster than it can be dredged.

Forest firms fear conservationists' backlash (New Scientist, 24 March 1983). Britain's timber importers are worried that public concern about the destruction of the rainforests could harm their business. They have recently succeeded in persuading the World Wildlife Fund to change the wording of an advertisement that launched an international campaign to save tropical forests. A phrase blaming 'the greed of commercial interests' for the destruction of forests has been changed to point the finger at 'ever increasing consumer demand'. The National Hardwood Importers Section of the British Timber Trades Federation donated money to the WWF after the advertisement was changed. Comment: does not the consumers' demand originate from the supply?

Mr. Patrick H o m m e l finished his field work in Ujung Kulon, Java. The main objectives were to make a vegetation survey, estimating the importance of each vegetation type for the main animals, and to in-

investigate possibilities for the active vegetation management to increase availability of foodplants and assisting in the planning of the translocation of a restricted number of rhinos to other well protected areas as soon as the population size allows to do so. The vegetation map will be made at ITC, Enschede, the Netherlands. As possible area for introducing the Javan rhino, the Way Kambas Reserve, Lampung, Sumatra, at first impression seems to be suitable (WWF/IUCN project 1963).

A big win for nature groups: Tembeling dam scrapped. The conservation news of most importance to Malaysia this year was the final decision (January 1983) to cancel the proposed Tembeling dam, a hydroelectric project. The dam required was to have blocked the sgei Tembeling, the principal boundary river of Taman Negara, the only large National Park in the Peninsula. Persistent, solid, wellfounded and logical resistance to the project helped to persuade the authorities of the irrevocably disastrous consequences of the approval of such a project. The deputy Prime Minister, Musa H i t a m, announced the cancellation of the project. It appears that responsible National Park policy in Malaysia has been accepted by the Malaysian government as a sensible necessity. There were many voices raised in support of the park, not least that of the Malayan Nature Society. The benefactors of the cancellation, hence of the longevity of the park and the values of the park system, are however the entire Malaysian population, and for that matter, all those in the world who treasure the richness of the tropical wilderness.

Genting Highlands. This resort area near Kuala Lumpur continues to develop in a way which can only produce shock and unbelief to the naturalist visitor. Unprecedented damage to the sensitive elfin forest at the summit, where the hotel complex is situated, continues, due not only to the hotel construction, but to reckless and harsh road works, waste disposal and tipping, and unnecessary practice 'bivoucking' by army forces units. Cutting of 300 year old conifers and Leptospermum for the purpose of making temporary latrine and seating arrangements have occurred. In the main valley, expansion of the open area continues unabated. Spur ridges from the main summit are being totally cleared for no visible purpose. All the while, the casino continues to function almost round the clock, providing the Genting Highlands Corporation with much profit. The extraordinary and still hardly known flora of the Highlands continues to surprise the investigators. The Malaysian government has entertained suggestions that Muslims ought to be barred from gambling in the casino, but even if this is done it would not solve the problem. Genting Highlands is inherently a magnificent place; the Corporation seems determined to transform it into something shabby, phoney and entirely discordant. (Communication by B. C. S t o n e).

Conservation in Australia. Mr. C. H. P r a t t e n, Chairman of the Nature Conservation Council of New South Wales informs us that, after a plea from many people as well as from conservation institutions, the N.S.W. Government late last year finally decided on a rainforest policy which involved the conservation of the c. 100,000 ha of remaining rain-

forest in National Parks and Nature Reserves. The six major areas previously under threat from logging and now protected are:

- | | |
|---------------|---|
| Border ranges | 30,000 ha adjoining Queensland's famous Lamington National Park. |
| Nightcap | Includes the Terania Creek Basin (see this Bulletin page 3766). |
| Washpool | Containing the largest undisturbed coachwood forest in the world. |
| Black Scrub | Virgin area added to New England National Park. |
| Hastings | Forbes River Valley added to Werrikimbe National Park. |
| Barrington | Extensions to existing National Park. |

Because the settlement of the dispute was conditional on the maintenance of employment within the timber industry, some logging will continue until 1985, but effectively the conservationists won 93% of the disputed rainforest areas. The government's landmark decision to preserve the scientific and other values of the remaining rainforest for the benefit of mankind was both courageous and farsighted and deserves to be fully acclaimed. Our congratulations also to the Hon. Neville Wran Q.C., M.P., Premier of New South Wales.

People unite against Unilever (from 'Sun', Oct. 28th, 1982). The people of North New Georgia, Solomon Islands, have become aware of the damage a large timber operator like Levers Pacific can do to their forests. A group of 200 villagers went so far as to attack and destroy a Unilever logging camp. The Solomon Islanders have lived through twenty years of Unilever logging to see one of their biggest and best timber resources cut out. Unilever exports logs straight to Japan. The present Levers Pacific Timbers logging operation makes no special effort to protect streams and rivers. Logging continues to the edge of many waterways and occasionally logs are hauled directly across smaller streams. The immediate effect of these practices upon streams is readily visible in recently logged catchments where water is brown and obviously carrying high sediment loadings.

In 1979 the Solomon Islands Government had passed a special Act of Parliament setting up a new Statutory Authority investing it with control of the 75,000 ha of forest keenly sought by Unilever. An employee of Unilever became the temporary chairman, and by 1980 all the timber rights were signed over to Unilever. In a recent interview a community leader from the area, Mr. Job Dudley Tausinga, suggested: that the Act (setting up the Statutory Authority) be suspended, the negotiation procedures and the agreement be reappraised, and that Levers Pacific Timbers halts its operation because of the continuous dispute.

In the same issue of the 'Sun' Mr. Geof Dennis, a former government Forest Officer, gave a lengthy comment on the subject mentioning all the effects of deforestation. He also points to the uniqueness of flora and fauna in the Islands and that many endemic species are threatened with extinction due to extensive logging. He also strongly suggests that the forestry section of the Ministry involved should be concerned with botanical collecting and identification and continue to develop the herbarium

as a highly valuable scientific and national collection, together with the botanic gardens as a living plant collection to supplement the herbarium collections.

Irian Jaya Conservation Programme, IUCN/WWF project 1528, from a report by Dr. Ronald Petocz. Considerable time was devoted in producing the general reserve design for the province which was approved by the Government during the last reporting period. It was possible, during 1982, to closely examine each reserve using aerial photographs, satellite imagery and additional aerial reconnaissance. The result has been a definition of reserve boundaries at a scale of 1:250,000 which will enable the Government to move ahead with gazettelement and marking of boundaries in the field. Two additional area proposals were also identified and incorporated into the provincial reserve design: the Merauke River Strict Nature Reserve (126,810 ha) to protect a unique vegetation transition zone where tropical rain-forests intergrade with the monsoon forest of the dry south-east, and the Teluk Lelintah Wildlife Reserve encompassing a section of the southeast coast of Misool Island and numerous offshore islets in the bay. The project continues to play an important role in alerting Government authorities and advisors to other forms of land use and planning including logging and transmigration settlements that conflict with declared and proposed reserves. This has resulted in cancellation of three major logging concessions in the Mamberamo Basin, the alteration of cutting plans in other concessions, the removal of transmigration sites from the Salawati Reserve, and the cooperation of transmigration authorities to protect the new Merauke River Reserve proposal.

The Second World Conservation Lecture delivered at the Royal Institute (London) on 18 March 1982 by Emil Salim, Minister of State for Development Supervision and the Environment of the Republic of Indonesia, published by World Wildlife Fund.

An impressive lecture, given by a great man who is conscious of the impact of nature degradation, 'with environmental degradation and destruction, mankind's future is grim indeed.'

Minister Salim gives a summary of all the major problems related to conservation, the increase of population being the most important and the most difficult to handle. He gives a picture of the sombre economic perspectives of the third world countries, the gap between them and the industrialized countries becoming larger every year. Lowering the birth rate in the poor countries was overtaken by an even sharper reduction of death rate, making the net population growth only higher. A trend of further decline in death rates is still feasible in the coming decades.

Improved health services and the resulting drop in crude death rates have altered the traditional relationship between the rate of population growth and the state of industrial development. In the North, industrial development has brought the social changes that seem to have slowed down birth rates, but this is not the trend we can anticipate taking place soon in the developing countries of today.

It is obvious that the mentioned trends will have great impact on the amount of land needed for agriculture, giving rise to a situation where

cultivable land is rapidly running out and whatever land now under cultivation is approaching the limits of its carrying capacity. Agriculture will therefore tend to become more dependent on capital inputs such as fertilizers, insecticides, and mechanisation with all the environmental and social problems that these imply. To pay for all this, industrial development is necessary, which also will put a heavy strain on the environment.

The conclusion of the above is that the plight of man in the developing countries — his poverty, his bleak existence — 'has coloured our concern'.

'We must therefore continue with both development processes and conservation efforts simultaneously. We are convinced that in the end development and conservation share the same objective, namely: the wisest possible management of natural resources in order to achieve the highest possible quality of life for man.'

'Limiting ourselves to environmental matters, we have perceived that the richer countries have been able to obtain disproportionately large shares of the global natural resources that should have been equitably shared. Because of such a greater use of natural resources, we also perceive that the richer countries have a greater capacity — and we now suspect, a greater propensity — to do damage to the world's natural resources. The tankers that transport oil from the South to the North leave in their wakes the pollution that befouls our shores, the factories that foreign interests establish in our countries are without the environmental safeguards mandatory in their home countries. At the same time we are told that, should we want a non or less polluting industry, we should pay for it a high price.'

'The idea of a common responsibility for the world's environment was conceived by the countries of the North. At Stockholm, ten years ago, it was the North that first provided the impetus towards environmentalism.'

'Many things have been done by the South in favour of environment, but now the North, facing the recession, shows a growing indifference towards the global environment. While we are told to safeguard our tropical forests as they constitute a global treasure, we are also pressured to allow the exploitation of those same forests in order to feed the pulp mills of the North.'

'We are now on the eve of the tenth anniversary of the Stockholm Conference. We should once again rededicate ourselves to the cause of the global environment. We should link our concern for the environment to our concern for man's plight, and for men who so far have been denied an existence worthy of being called human, for men who should be provided with hope for tomorrow lest in despair they succumb to the resentment towards those more fortunate. Our global society will only be sustainable if there are no longer such resentments.'

As to the task of Indonesia, Minister Salim states that the Indonesians are committed to take the course of eco-development, that there is the political will to proceed, that they started to train the necessary manpower for which a chain of environmental study centres throughout the nation have been established (see page 3897). He admits that Indonesia still lacks the knowledge and the capabilities to deal successfully with

environment and development and that he likes to see developed countries to devote much more of their capabilities etc. to enable developing countries, like Indonesia, to grow along the course of eco-development. To eradicate malaria DDT has to be used, forbidden in most industrialized countries because of its toxic effects while so much money is spent on heart disease, typically a disease of rich people. Could some of that money not be used to find other means to attack malaria? Billions of scarce resources are spent on the production of armaments, while small fractions of these same resources will not be available to finance research into means of combating soil erosion, flood, and diseases in the South.

Indonesia is on the verge of industrialisation, moving away from agricultural dependency towards developing industry. In doing so Minister Salim emphasises the historical opportunity not to repeat the mistakes and the environmental damage that has been committed in the past. All this means increasing pressure on the environment and, unless managed wisely, will impede conservation efforts. But 'we do not believe that conservation and development have to be antithetical opposites it is incumbent upon us to carry out both aspects of conservation.'

Regarding the conservation for its own aspect, Indonesia plans to set aside 48 million hectares for protected forest, not to be exploited. Ten million hectares are to be developed for natural reserves. Twenty-five million are earmarked as reserve forest and the remaining 40 million are provided for production, partly by selective cutting and partly by clean cutting. Between the areas left as sanctuaries and those which will be exploited intensively, there will be extensive areas, although already settled by man, which are to be designated as buffer zones. These are the areas where fauna, flora, and man should co-exist in harmony. Great problems will be met, especially regarding the big animals that can be dangerous to man. It is difficult to answer the question whether to remove the population in the area where the last 5 tigers of Java live, in order to protect those animals, or let the tigers die out. Many problems are met with elephants in transmigration areas in Sumatra.

'What we wish to achieve in the buffer zones is the improvement of the interaction between man and nature in such a way that both will stand to benefit. For man this will mean the search for a new life style voluntarily placing limits on his material well-being.'

Much more is said by Minister Salim in his plea. It is clear, however, that population growth is the greatest enemy of nature. Will conservation of enough forest area be possible, viewing the still increasing population, and, as the minister so rightly states, the 'growing sense of disdain for our plight and disdain for our environment as well' in the North? Many more people will suffer in the future when the forests have disappeared and the populations are far greater.