V. EXPEDITIONS AND OTHER EXPLORATION

a) Field Work *(continued from page 2558)*

I n d i a

On 31 May 1976 Drs. A. J. K o s t e r m a n s and C. E. R i d s d a l e, both of Leiden, set out on a 10 weeks botanical expedition to the Western Ghats in S. India as a summer holiday tour, partly financed by contributions from British Government Parliamentary Grant In Aid, administered by the

Royal Society, London and the Treub Maatschappij, Utrecht. This support is most gratefully acknowledged. Part of the expenses were paid by the botanists themselves. Here follows their itinerary.

The aim was to collect specimens of this area of the world where one of the earlier works on botany appeared: Rheede van Drakenstein, Hortus Malabaricus, 1678-1703. The area is greatly under-collected and many of the species are known only from a single collection. The area was studied by Bourdillon who was Conservator of Forests for over 30 years, but despite many efforts on his part he was unable to refind some 10% of the plants reported to occur in the area by Beddome and other previous workers. The later botanists collected in the hill stations and in the dry deciduous forest, the tropical evergreen forest, particularly its trees, being neglected.

Cooperation was obtained from the French Institute in Pondicherry in the form of a long-base Land-Rover with driver. Dr. F. B l a s c o, ecologist of the Institut du Tapis végétal, Toulouse, met us at Madras and transported us to Pondicherry. Here a few days were lost in making the last minute arrangements for the trip. Before daybreak on Friday 4 June we set off for the long drive through the parched country of the Carnatic Plain. At last the blue line of hills appeared on the horizon and at dusk we arrived at Courtallum. A mecca for early botanists; Wight in particular received and described many plants from there. Most of the forest has been destroyed, above the village some patches of dry deciduous forest remain, above which there is some rather dry evergreen valley forest. The wetter evergreen areas are in private ownership, and with considerable difficulty we obtained permission to collect in these private plantations of mangosteen, poor tea, nutmeg, etc. Some highly disturbed patches of forest remain along the river and in inaccessible areas. A few large trees such as Vateria indica and the enormous buttressed Stereospermum chelonoides were left standing. A sad fate for such a botanically important locality. A very moist area near the waterfall is now covered only with secondary forest trees and weeds.

On Monday we proceeded to Trivandrum and hoped to see another area of forest on the way, but this had been clear-felled and replaced with a rubber plantation for government resettlement schemes. In Trivandrum we made contact with the Forestry Department and started the process to obtain a license to buy methylated alcohol, and moved on to Poonmundi, where we found a home in a rather delapidated guest-house situated above the tea estates, which here were also in a poor state. One evening we managed to obtain a good meal in the house of a retired planter; this had to sustain us for

some time. The food situation in S. India does not appeal to European palates and it is a bit difficult to get accustomed to hot spicy curry for breakfast.

With the aid of the tea planters we started to get tree climbers, a luxury that Indian botanists cannot afford. We eventually selected two who were reasonable, but although willing were unable to climb the larger trees. Luckily we had a long arm tree pruner with interslotting segments which was invaluable, the tree climber ascending the nearest smaller tree carrying the first segment and string with him and when as high as possible hauling up the subsequent segments until the arm was long enough to reach the large tree. We collected lower down along the road in depleted, rather dry evergreen forest. Owing to drought in places the undergrowth had been burnt; even so interesting plants were collected, particularly Mitragyna tubulosa, Shorea parvifolia, Mastixia, and Garcinia. The last day we attempted to explore the forest patches on the lower slopes of the tea plantations. Although reported to be wild jungle only patches of evergreen forest remained, where solitary wild elephants roam of which we had to be careful. Other areas were much drier.

Unfortunately Dr. Blasco came in contact with Holigarna (Anacardiaceae) for which he is highly allergic, and his reaction was very bad. We returned to Trivandrum on the 12th to continue negotiations to obtain our licence to buy and carry alcohol. We settled in a reasonable hotel on the outskirts of the town, food mediocre, and waited for the paper work to be done. On Sunday we visited the zoo and botanic garden and examined the trees here. Dr. Blasco in the meantime got worse and left to be hospitalized in Madras. On the morning of the 15th we had all our permits and so departed for the distillery at Thiruvella, some 60 miles to the North. Some extra jerry cans could be obtained nearby, so eventually with the methylated alcohol in our possession we could continue. It took a whole day to get the methylated, blue alcohol (called here French polish). Night found us in the RestHouse at Kottayam, a magnificent building situated on a small hill, with a beautiful well kept garden and interior full of antique furniture, where good food was served. Ridsdale was very ill here. Leaving this brief paradise we drove on to Peermade where so little accessible forest remained that we continued our journey through Thekkadi and on to Devicolam in the valley of the High Range Mts. Along the road some 'forest' remains as it is used to provide the shade needed for cardamom cultivation. The sub-canopy, understorey and herb layer are scrupulously cleared and among the cardamom plants not a weed is found. This forest is doomed, as no regeneration is allowed. Kostermans has coined this forest 'skeletal forest' (forêt scéletique). In the older estates gaps in the canopy

occur and secondary forest trees are creeping in, these are maintained for lack of better. The devastating results of such land use were plainly visible, especially during the extra dry season of this year. Cardamom survived best where the forest canopy was intact but in other, more open and drier areas had died for lack of moisture, and many newly planted areas could be written off completely.

Our rest house at Devicolam (1600 m) was very primitive (but very cheap). Each day we drove back down the road through the excellent tea plantations to the forest. Many interesting trees could be collected: Mangifera sylvatica (extremely rare), Calophyllum sp.nov., Cinnamomum malabathrum (unknown since Rheede's days), Litsea bourdillonii and L. keralana (only known sofar from the type collections).

The transition to the sub-montane forest at Devicolam is gradual and boundaries cannot be discerned any more, since at the higher altitudes only patches are left on steep slopes and rocks where no tea could be planted. The area under tea must once have carried a more luxurious forest. The forest on the exposed ridges and slopes is composed of low stunted trees of even height. The lower forest is composed of the same species but the growth more luxurious and the canopy irregular. It is sometimes dominated by Cullenia exarillata (Bombacaceae), in other parts by Palaquium, Shorea parvifolia and Vateria. Amongst the tall trees left are Myristica, Artocarpus, in strictly localized places, Calophyllum elatum, Elaeocarpus, Bhesa indica, Cryptocarya wightii, Dysoxylum, Litsea oleoides, Diospyros affinis, Gordonia (which becomes a weed), Ficus, Canarium, Casearia, etc. The common trees of the second storey such as Nephelium and Garcinia are in most places cut out, and the shrub and ground layer absent. We gradually moved further down the road each day and then moved back to Thekkadi. Here is a nature reserve around the artificial Periyar Lake, a huge area of felled teak forest and some secondary semi-evergreen forest. The park is highly touristic, the main lodge more costly than the most expensive hotel in Trivandrum the capital, but there is a cheaper Periyar house where we stayed (unfortunately the kitchen cupboards are nearly always empty but one can eat in Kumil, a village near by. Dr. Blasco was sufficiently restored to health to rejoin the party. We moved to Munnar on 20 June and stayed in the comfortable High Range Club, a sumptuous oldfashioned colonial building with a magnificent bar (dry, unfortunately). Here we had excellent food – roast lamb with mint sauce! From here we made a quick visit to Mankulam forest. This remained the property of the tea company for many years and was partly untouched, but sadly it has been claimed for land resettlement and areas cleared and planted with Eucalyptus or sorry attempts to grow cardamom. In the lower areas some forest re-

mains and woody understorey, subcanopy shrubs and trees were seen for the first time and many herbaceous plants were present. The areas where we collected were heavily depleted but perhaps more extensive forest remains lower down, inaccessible by long-base Land-Rover but well with a jeep.

From here we moved to Palghat District, the most northern part of Kerala and visited Silent valley. It is not so Silent any more, selected logging has taken place since colonial period and now Mesua nagassarium, and Cullenia exarillata are logged, timbers considered worthless 50 years ago. Higher up contractors are busy with a dam. Casual forest fires are slowly but gradually causing the forest to retreat. We stayed in the forest Bungalow at Mukaly from where it was still ½ hours drive through secondary forest and teak plantation to what is left of the once magnificent Silent Valley forest. Many of the trees here are the same as those found between Thekkadi and Devicolam but the substage and ground storeys more intact. Here we found the rare Saprosma fragrans in full flower. With collections of trees from Thekkadi-Devicolam area and the scattered undergrowth collections it may be possible to reconstruct the original forest composition.

We moved on to Coimbatore in the state of Tamil Nadu, and made contact with the Botanical Survey of India. At this point Dr. Blasco left the party. From Coimbatore we returned to Silent Valley with Mr. B h a r g h a v a n from the above institute and collected a few more sub-canopy trees, Diospyros among them, for lack of tree-climber little could be done. Back to Coimbatore, where arrangements were made with the local forester to visit Top Slip. Here is a large area of secondary and deciduous forest in the middle of which is a patch of slightly disturbed rain forest, Karian Shola. The whole area forming the Anamalai Wild Life Sanctuary, with numerous Elephants, Deer and Wild Buffalo. The forester had kindly arranged to bring in a middle aged hill tribe man as tree climber who could manage the largest trees. Here we were able to collect some of the emergents that hitherto had been inaccessible to the climbers, one new Cinnamomum was found by Kostermans, and the forester pointed out a probably new Bombax which unfortunately was sterile. Numerous Zingiberaceae were in flower and these filled the shower room as day by day more flowers were pickled. On returning to Coimbatore Kostermans made a single day trip to the Nilgirrhis to collect the rare Cinnamomum macrocarpum, while Ridsdale missed the chance to catch up on reasonable food as he was ill with dysentery. The time in Coimbatore was filled in with work in the herbarium where it became clear that we had not found some of the endemic species restricted to the Tinnevelly District so plans were made to visit this area on E. slopes of W. Ghats, with Mr. Bhargavan. Ridsdale's fiancée, Miss M.J. Hiltermann,

joined us in Coimbatore for the last stage of the trip and we set out by night train for Tirunelveli, enjoying the pleasures of old steam transport. We all folded ourselves and luggage into a taxi and sped on to the forestry bungalow above Ambasamuderam, situated on an artificial lake in very dry deciduous forest and teak plantations. From this last rest house we were lucky to be able to make arrangements to stay in the forest at the Walaiyar Cardamom estate at 1,100 m which was reached by a forestry jeep, the winding road through the forest was so narrow that the spare wheel carried on the side of the vehicle had to be removed. It was formerly assumed that many of the trees found in the evergreen forest of Tinnevelly District were the same as those found in the SW. part of Ceylon. However, with more collections available it seems likely that the endemism is higher than suspected and that the trees are different. The evergreen forests of Ceylon are not so far away but are separated from the forests of S. India by the very dry Jaffna zone, which might have acted as a barrier for distribution. Much forest in the Walaiyar estate is cut out for cardamom cultivation but considerable areas remain and the canopy and sub-canopy are less disturbed. The canopy trees here were Calophyllum sp.nov., Dysoxylum, Buchanania, Semecarpus, Symplocos, Litsea, Elaeocarpus, Holigarna, Didymocarpus sp.nov., Diospyros, Eugenia etc. The sub-canopy and understorey was rich in species noteworthy the singular Octotropis (Rubiaceae) and masses of the herbaceous Acranthera grandiflora flowering on the forest floor. The newly described Garcinia rubrolignea (formerly confused with the Ceylonese G. echinata) was collected and also the rare Cinnamomum travancoricum, only a few trees of both species were seen and only one tree of the new Calophyllum was found. On inaccessible rocks on the other side of the river the endemic palm genus Bentinckia was observed.

This area is comparatively rich and should be further explored. Provision should be made to have private transportation (as Government vehicles have petrol rationing) and access to alcohol. Leeches are a problem, particularly to Miss Hiltermann, presumably because of her fresh blood.

The most interesting discovery was the existence of an efficient extensive lorry transport network which enabled the expedition to function. The material collected was placed in thick polythene bags made from tubing which was shipped into India, soaked in spirits, sown in hessian (guni) sacks and every few days forwarded by public lorry. In such a manner all our collections were forwarded to Pondicherry.

After the trip to Walaiyar, Kostermans went on to Ceylon to be hospitalized with amoebic dysentery, which had disabled him partly on the trip. Ridsdale proceeded via the swampy backwaters to Kottayam with view to collecting some of

the aquatic and swamp vegetation. On arrival he was exceedingly ill for days with dysentery and so had to proceed directly to Pondicherry. Here it took a week to check all the assembled plastic bags, repair some and repack others. And days of negotiation with Customs and other officials to try to ship the material to Leiden. Eventually we gave up and started anew in Madras where luckily the head of the customs department had just seen a documentary film about Kew Gardens and immediately offered full cooperation. Within 2 days we had all the shipping and customs papers in order and the plants crated ready for transport to Holland. The material arrived in Leiden in November, having been in plastic bags for 4-5 months and was in excellent condition. However, the crates, made of inferior timber, arrived partly consumed by beetles, which no doubt would also have destroyed the plants if they had not been sealed in the plastic. The material is gradually being processed in Leiden. The collections consist of 349 numbers, mainly trees (Kostermans nos. 26000-26349) and 451 numbers, mainly herbs, in Ridsdale's name, mostly in 10 duplicates.

The total cost of food, transportation and personnel (exclusive ticket and overseas freight) for these 10 weeks was $ 4,000 for the two botanists. A dollar buys 8-9 rupees.

Average cost of a rest house is c. 10 rupees, more primitive conditions, forest lodges, sheds etc. c. 4 rupees, luxurious such as Kottayam c. 20, luxurious hotels in main cities c. 90 : all prices calculated per room with 2 persons, slight extra surcharge for more than 2 persons in a room.

Meals in wayside restaurants 2-4 rupees, dinner in Kottayam 12 rupees, for former mentioned restaurants hygiene and food nutritional value both low. Two great problems are liquid refreshments, coke at 40° is rather tasteless and ice may be infected, water may not be properly boiled in tea etc. Transport of soft drinks is difficult as bottles are of greater value than their contents; you may take the drink with you but not the bottle. Canned meat and other such foods can only be obtained with difficulty in large towns and is very expensive, c. 8 rupees per tin and has taste and texture of cat food — it is usually refused by non vegetarian Indians. For the field excellent fruit cake can be obtained and lasts long. Bread is only available in larger towns.

Tree climbers vary in price : the average daily wage varies between 4 and 8 rupees, so we paid 8-15 rupees for reasonably good climbers but sent others away if they could not climb. Contract work for 3-4 weeks is possible with food, hotel if necessary and repatriation costs as extras above salary.

Petrol is the same price as in Europe, i.e. c. $ 0.40 a litre. Government jeeps have petrol rationing and usually

have enough petrol for 1 extra trip per month above normal routine. Taxi's generally cost between 1.50-2 rupees per kilometer, more on the steep ghat roads. However, this usually means 1.50 plus petrol! The cheapest ride obtained through negotiation of an Indian family, was at 1 rupee per kilometer with no extra charge, but this is exceptional. In the main towns and villages in the ghats jeep taxi's are available but we have no idea of the cost.

Methylated alcohol (meths) bought in bulk direct from distillery cost 600 rupees for 200 litres. A permit is required to buy and to possess it. Meths for tilly lamps may be on the open market but only per bottle of ½ litre.

NEFA. By the Dehra Dun Herbarium, a start has been made on the Forest Flora of Arunachal Pradesh, formerly called the North East Frontier Agency. Though this area of c. 50,000 sq. km is extremely rich in vegetation, it is underexplored and without a Regional Flora. It consists of 5 districts, viz Kameng, Subansiri, Siang, Lohit, and Tirap. Late in 1976 a party was already in the field in Tirap district.

C e y l o n

Mr. A. J. M. J a y a s u r i y a, Flora of Ceylon Project, Botany Department, University of Peradeniya, Sri Lanka, has been active in collecting plants in Ritigale Nature Reserve, in N. central Ceylon N. of Kandy, where J.H. Willis sometime gathered data for his Age and Area theory. He is intensively scanning the region, and was already rewarded by the discovery of two new species there. All his specimens are fertile and of excellent quality, over 600 numbers, and he hopes to obtain more.

M a s c a r e n e s

In March 1974, Mr. M. J. E. C o o d e of Kew collected 3 weeks in Mauritius, 2 weeks in Réunion, rediscovering Elaeocarpus integrifolius, Evodia segregis, Tacca artocarpifolia.

A n d a m a n s

If everything goes as we hope, Dr. K. U. K r a m e r of Zürich and Dr. H. P. N o o t e b o o m of Leiden will make an expedition to these islands and perhaps the Nicobars, late in 1977, to join the activities of the recently established Circle of the Botanical Survey of India.

Sumatra

Isoetes found. During their 1972 trip to Kerinci (see *p. 2163*) R. J. Morley and J. R. Flenley of Hull, U.K. discovered Isoetes, first record for the island. The locality is 1°42' S 101°11' E, approximately midway between Lakes Sati and Landah Panjang on the western side of Mt Kerinci, at c. 2080 m. About 20 individuals were seen, a surprising 25 cm in diameter, all growing in muddy depressions c. 1-2 m diameter, under a light canopy of swamp forest consisting chiefly of Leptospermum and Engelhardia trees. The depressions may have been deer wallows. At the time of the visit, in the dry season, they held no water.

Material is deposited at Hull, Bogor, Leiden, and British Museum. Dr. A.C. Jermy suspects that it belongs to a new species, different from I. philippinensis in the megaspores. It resembles another suspected novelty from New Guinea, in addition to the 3 species recognized by A.H.G. Alston, Fl. Males. ii 1 (1959) 62-64.

Trigonobalanus found. Mr. Marcus Borner, who during his work on rhinos in the G. Leuser region, collected plants that serve as food for these animals, sent to Leiden the first specimen of Trigonobalanus (Fagaceae) ever found in Sumatra. The species is T. verticillata (see Fl. Males. i 7, 1972, 398), taken at 1500 m altitude in the upper Mamas area, on 30.VII.1974, sample 34. The specimen is sterile and probably a sucker shoot, but anatomical examination by Dr. P. Baas confirmed the identity without doubt.

Mr. Andrew Paterson of Kew, in J. Kew Guild 9 (1975) 310-313 reported to have collected living plants in various places in W. Java and Sumatra, early in 1974.

Malaya

Sungei Lebir, Kelantan. In April 1976 Dr. B. C. Stone and Dr. Kirk Endicott, Australian National University, with staff investigator Mahmud Sidek spent some weeks in the upper Sungei Lebir area with a small community of Bateq Orang Asli, investigating aspects of their anthropology (K.E.) and ethnobotany. About 225 specimens were obtained with accurate renditions and meanings of the Bateq names. It is hoped that a publication of this information can be arranged later.

Indonesia

The Sugarcane Germplasm Expedition from Bogor did 3 months of field work in Kalimantan, Celebes, Moluccas and W. New

Guinea. The yield was 570 items of species and clones of Saccharum, Erianthes and Miscanthus, sent to the Sugarcane Stations at Pasuruan, E. Java and Brisbane, Australia.

J a v a (all 1976)

A Bogorian party led by Mr. S o e d a r s o n o Riswan visited Mt Papandayan, took over 100 plants, dried and fresh.

Another party of Mr. Johanis P. M o g e a, Mr. J. B. C o m b u and others visited Jampang Kulon, S. of Sukabumi, W. Java, to collect orchids for the Gardens, among them the rare Calanthe zollingeri and Habenaria undulata.

Dr. K u s w a t a Kartawinata and other Bogorians visited two hills near Tjiwedej, W. Java: G. Tetukur and G. Tjadas Pandang, 15-17 October. They took 83 dried and 42 living plants, chiefly orchids.

Mr. H. S i w o n, pharmacognosist of Leiden University, made a collecting trip for Menispermaceae to Cibadak and Lengkong, W. Java.

Mr. Z. F a c h r u r o z i of Bogor visited the Halimun area in W. Java, took 45 dried and 128 living plants.

A Bogorian party of 10 climbed Mt Guntur, took 35 living orchids and 30 herbarium specimens.

L e s s e r S u n d a I s l a n d s

Bali. Early in 1976, Dr. I. G. M. T a n t r a of Bogor Forest Research Institute made a 2-weeks transect above Bedugul, collecting trees.

Lombok. Mr. S u h a r d j o n.o and Mr. P a d m o n o collected some 150 numbers of plants, including living orchids and several legumes, in 1976.

Mr. Ischak L u b i s of Bogor, pharmacist, made a 3-week legume collecting trip, also to Timor.

Flores. Late in 1976, Mr. J. P. M o g e a and Mr. E. D j a j a s u k m a collected 250 numbers in W. Flores, including living plants and 52 cultivars of legumes. Among them was an, apparently local, stolon-forming Arachis hypogaea.

The spelling of the name of the highest mountain in E. Flores is not Gélimutu but Kélimutu, according to Pater J.A.J. Verheijen; kéli means mountain.

B o r n e o

Sarawak. In mid-March 1976 the Kuching Herbarium organized a collecting trip to Bk. Salong in the Hose Mountains. In mid-August 1976 a field party spent one week on Santubong, the 800 m promontory that juts out into the S. China Sea not far from Kuching. Ecological work revealed that montane forest occurs on the summit area, much lower than at the c. 1600 m on Mt Mulu. This phenomenon is due to the poor soil conditions on ridges and summits of low isolated peaks in wet climates.

Dr. J. D r a n s f i e l d of Kew paid a lightning visit to Kuching to attend the Sago Symposium and was able to spend a precious day and a half in the forest, quickly adding yet more palms to the species list of Mt Matang.

Expedition to Mt Mulu, Sarawak. This mountain, nearly 2400 m, 04° N 115° E, in the 5th Division, inland of Brunei, was first climbed in 1932 by Lord Shackleton, of the Oxford University Sarawak Expedition. He is now the Patron of the big Royal Geographical Society who will explore the mountain from July 1977 to July 1978. The landscape is astonishingly broken and contains a vast limestone massif, with 15 miles of white cliffs nearly 1000 m high and spectacular limestone pinnacles soaring out of the lowland forest. The whole region was in 1975 established as a national park of ± 600 sq. km, from almost sea level up to the top. As members of the expedition 21 scientists of various description have been listed; among them Dr. J.A.R. Anderson, Dr. P.S. Ashton, Mr. Paul Chai, Mr. A.C. Jermy, Lord Medway, Dr. T.C. Whitmore. Dr. A. T o u w of the Rijksherbarium will join the expedition for 6 weeks to collect mosses.

The Kuching Herbarium sent already two parties up there: in mid-February 1976 for 4 weeks, to establish plots for ecological and floristic studies, in the Hill Dipterocarp forest, Submontane and Montane forest. In mid-September, intermediate plots were marked out.

Sabah. A very busy year at Sandakan. Major expeditions were undertaken to G. Lutong by P. F. C o c k b u r n. This is a huge mountain cuesta of sandstone with coal seams abundant! Base camp was made near the only natural lake in Sabah, about 30 acres, and another camp at 1200 m altitude. 414 collections were made, some particularly interesting Theaceae, Zingiberaceae and Orchidaceae were included. The second major expedition was with the World Wildlife Fund of Malaysia to the Danum River in Ulu Segama to undertake a survey for the proposed establishment of a lowland National Park. The area,

c. 650 sq. km of mostly lowland rain forest in virgin condition, contains elephant, rhino, seladang and deer, as well as some 200 bird species. Three camps were made and botanists were P. F. C o c k b u r n and Dr. B. C. S t o n e of Kuala Lumpur. 476 collections were made this time including many ferns and herbaceous species as well as trees and lianas. A full report is in the making for the Government of Sabah (who lent considerable assistance to the survey) and it is hoped to publish more specialized results in Malayan Nature Journal.

Botanical collecting teams continued to operate in the Sook Plain and Witty Range, Beaufort, and Kalabakan and also from Sandakan.

Well in excess of 2000 numbers collected this year. Gregarious flowering in the Sandakan peninsula enabled us to collect Dipterocarp seed for experiments on storage at Kew conducted by the Commonwealth Forestry Institute. Consignments of Dryobalanops lanceolata and Shorea almon are under study at this time.

Dr. P. F. S t e v e n s of Arnold Arboretum visited Sabah in January for 4 weeks collecting in Sandakan, Telupid, Kinabalu, and in the Gunung Rara region near Tawau. He made extensive collections of Calophyllum spp. and spent much time on the SAN collections. Mr. J. G. R i c k a r d s visited Sabah in June to collect Nepenthes, Orchids etc. for Kew.

In August-September 1976 a Kyoto University Botanical Expedition operated for 3 weeks on and around Mt Kinabalu, ultra basics at Telupid, Gomantong Caves, then Madai Caves and Baturong near Kunak. Botanists were M. H o t t a and M. T a m u r a, who report to have collected as follows:

"Aug. 12-18: Mt. Kinabalu, Sosopodon
Aug. 20-22: Poring
Aug. 23-28: Ranau, Mamut
Aug. 30-Sept. 3: Telupid
Sept. 9-11: Gomantong
Sept. 15-18: Madai
Sept. 23-26: Gunung Alab
The samples collected amount to:

Pressed botanical samples	ca. 5,700
Timber bark and timber	ca. 20
Fruits and flowers for anatomical study	ca. 50
Living Plants	ca. 80

The collection includes about 600 sheets of Drimys piperita, famous as primitive vesselless angiosperm, whose study would indicate the local divergency of this interesting species. Besides, many examples of Polycarpales, such as Magnoliaceae, Myristicaceae and Anonaceae have been collected. In Araceae, Musaceae and Zingiberaceae not only some new species

have been found, but also some 60 living plants have been brought back to make their caryological researches.

In herbaria of the Forest Department in Sandakan and in Kuching as well as in the Botanical Garden of Singapore some 4,000 herbarium specimens belonging to Myristicaceae, Ranunculaceae, Winteraceae, Menispermaceae, Araceae, Musaceae, Zingiberaceae and Marantaceae were photographed. They are indispensable and also very benefitable for our researches.

That our collection includes many new species of plants are already affirmed by the herbarium study we have made in Sandakan etc. Among them such species is included as Circaeocarpus sp. of Saururaceae, which is known by one species from China.* It is also supposed that in Mt. Kinabalu area Drimys piperita is diverged into various geographical races adaptative to the ecological conditions of the loci. The samples would be sent to the Forest Department of Sandakan after they have been investigated. The duplicates would be preserved in the botanical Institute of the Kyoto University."

Kalimantan. Mr. Mark L e i g h t o n of the Ecology Graduate Group, University of California, Davis, Calif. 95616 U.S.A. hoped to leave in January 1977 for East Kutai, to investigate food plants for a variety of larger animals which are fruit-eaters. They are in touch with the Rijksherbarium for advice and identification.

Mr. Johanis P. M o g e a of Bogor did field work in South Kalimantan from 21 June to 21 July 1976, to hunt for Salacca. Prof. A. D i l m y, rector of Banjarmasin University, was once again most helpful. Just beside the Alai River on the road to G. Besar or G. Halau-halau he discovered 30 S. dransfieldiana, one of them with young male inflorescences.

In West Kalimantan, Mr. S u h a r d j o n o of Bogor early in 1976 made a 3-week trip to Sambas, returning with 332 herbarium numbers, besides living materials.

Messrs. D a r n a e d i and H i d a y a t, both from Bogor, collected 432 numbers in West Kalimantan.

* Dr. Van Steenis, whom I told about the case, was alerted and next day showed me the index of the anonymous work Iconographia Cormophytorum Sinicorum 1 (1972) 1157, where under Zippelia begoniaefolia Bl. (Piperaceae), Circaeocarpus saururoides C.Y. Wu is mentioned in brackets as a synonym! The reduction is correct beyond doubt; the glochidia clinch the matter. — Ed.

P h i l i p p i n e s

All the news that has reached the Editor came from Mr. M. J. S. S a n d s of Kew, who made a field study of Begonia subsequent to his expedition to eastern New Guinea. See his report under that island.

Rumors have it that insurgents are active in the region of Mt Pulog, central Luzon, and in the Sierra Madre mountains on the Pacific side of this island.

C e l e b e s

Makassar has been renamed Ujung Pandang. In scientific literature, of course, the name Makassar, well-known for centuries, should be retained.

After his trip of 1975 (see *p. 2555-2556*), Dr. W. M e i j e r of Lexington, Kentucky, U.S.A. again went to Celebes. By way of Leiden and Bogor he arrived at Makassar late in June 1976, to encounter the depletion of the new local Arboretum (see Conservation), lectured at the University, and with Mr. I d r u s M o g a, dendrologist of the University, went into the limestone hills for field work, also to Mt Bonthain for a quick trip, then c. 10 days to Malili at the joint of the SE. arm.

In this region, the Japanese company Zedsko has been logging since 1969, annually covering (or rather uncovering) 1250 sq. km of forest, extracting a maximum volume of 100,000 m3 a year, estimated value $ 3-5 million. The only place where Zedsko is not supposed to operate is N. of Mantano Lake and in a proposed nature reserve E. and W. of the Larona River where a hydroelectric dam is being built, for the International Nickel Company INCO, who are stripmining the area S. of Mantano Lake. Since 1968, $ 800 million has already been spent on the project; houses have been built for 826 expatriate staff.

Lake Mantano (N. of Lake Towuti) is 580 m deep. It is partly surrounded by natural forest on ultrabasic hills. Here were found Adinandra, a yellow-flowered Deplanchea, Gardenia celebica, Gonocaryum cf. littorale, Kjellbergiodendron, Lithocarpus moluccanus, Macadamia hildebrandii, Sarcotheca glauca, the brilliant red-flowered Xanthostemon confertifolium. and more common things like Casuarina sumatrana, Pandanus, Pinanga, Podocarpus, Tristania. The eastern shore of the lake is shallow, with interesting waterplants, the endemic Ottelia mesenterium outstanding among them.

The hydro-camp on the Larona River was visited, and proved to be in very rich surroundings.

The total harvest, several hundred numbers, is still being

processed and detailed identifications cannot yet be given.

The INCO management was interested in Dr. Meijer's work and here, too, there is evidence of a growing environmental responsibility, and ideas are developing to set aside some of the area as a nature reserve. Meijer's advice to use local plant species as ornamentals, fruit trees, for revegetation, and for lawn making was well-received, and no doubt another visit by a botanist will be welcomed.

A party from Bogor, including Mr. D. D a r n a e d i, collected 161 herbarium numbers around the Lakes Mantano and Towuti, in the course of 1976.

Dr. Guy M u s s e r, zoologist of the American Museum of Natural History, New York, stationed for years in NW. central Celebes at the Loro Kalimanta Reserve (see *p. 2555-2556*), collected, on Dr. J. Dransfield's urging, some 60 species of palms, which he sent to Kew Herbarium.

Dr. K u s w a t a Kartawinata of Bogor joined a tour ensuing a symposium on tropical shallow water communities, and in S. Celebes collected 28 herbarium numbers including several sea-grasses.

M o l u c c a s

Ceram will be the goal of a big expedition of the Rijksherbarium in collaboration with the Herbarium Bogoriense, in 1978. Dr. M. M. J. v a n B a l g o o y will be the leader. If the considerable enthusiasm on the part of the authorities persists, transsects will be made from sea level to the highest point, over 3000 m, where a remarkable mountain flora has been reported.

N e w G u i n e a

Van Royen's mountain trip to East New Guinea. Dr. P. v a n R o y e n of the Bishop Museum, Honolulu, who saw his intention to explore the Carstensz mountains in West New Guinea frustrated, could persuade the National Science Foundation to support work in the eastern half instead. His report:

On 1 May, 1976, I departed from Honolulu for Port Moresby. After making a few collecting trips around the capital 6-16 May, the first alpine areas were explored between 16-29 May on Mount Victoria. Participants during that part were Mr. Paul Kores from the Wau Ecology Institute, Dr. David F r o d i n from the University of Papua New Guinea, and Richard Corlett from the Australian National University, Canberra as soil specialist. After an initial attempt on 15 May to fly the main part from Port Moresby to Manumu was thwarted by suddenly incoming clouds, on the 16th a second attempt brought

Kores, Frodin and Corlett to Manumu, while van Royen flew in by helicopter first to Manumu and from there to the base camp in the Iswan Swamp. A second helicopter flight brought Frodin in. Camp was set up on the edge of the swamp, and when this was built the team composed of Kores, Corlett and carriers arrived 3 days later after a long climb along the southwestern slope of a range leading to the swamp. Iswan Swamp is situated c. 2.2 km due SSW. of Mount Service, one of the three summits that composes with Huxley's Pinnacle the Mount Victoria group (8°55' S 147°30' E).

In the period of 17th of May to June 2nd the Iswan Swamp and surrounding areas were explored, including the area along the Koma River, one of the outlets of the swamp. From 22 till 26 May the southern slope of the Rock Pile, a small fore summit of Mount Service, the latter itself and Mount Victoria were climbed up to 4000 m altitude. The extensive alpine grasslands there were in full bloom and many species collected first by Sir William M c G r e g o r and subsequently described by Ferdinand von Mueller, were found once again. The most exciting find was an abundance of Arrhenechthites haplogyna (Compositae) of which now complete material is collected.

On 1 June Richard Cortell left with several of the carriers, followed on 2 June by Frodin, Kores and the rest of the carriers on their way to Manumu. Van Royen stayed for three more days in the camp awaiting the helicopter to fly back to Port Moresby.

On 6 June I flew to Wau to start the rest of the exploration as planned. The first trip made was to Mount Amungwiwa (07°25'30" S 146°33'30" E), accompanied by Mrs. B. Gagné-Harrison, field assistant for the Department of Botany of the Bishop Museum. Over a period of 12 days from a base camp at 3050 m, the summit area of Mount Amungwiwa was explored. The most surprising find of this trip was its extreme poverty of high altitude species. A check list prepared in the field showed that 52 species that were found on Mount Victoria, Mount Wilhelm and Mount Bangeta were not found here at all.

The very inclement weather of storms and hails forced ultimately departure to lower areas. At about 1800 m in a short camp in the oak forest the results were very gratifying. Much living material of orchids could be collected for the Wau Ecology Institute. On 19 June the Upper Watut River was reached again from where we returned to Wau.

After a few days of preparation the first step on a long trip that would lead us ultimately to the Victor Emanuel Range near the border of West New Guinea, was set on 22 June with our departure to Lae and Goroka. The team was composed of Paul Kores of the Wau Ecology Institute, with a special interest in Rhododendrons, and Mrs. B. Gagné-Harrison, later

to be joined by her husband, W. Gagné, entomologist at the Wau Ecology Institute and Dr. J.L. Gressitt, entomologist and Director of that same institute.

Taking time off in Lae for some final shopping we left on the 23rd for Goroka, staying the night there, and left on the 24th for Mount Hagen which was reached late that same day. The following morning we departed via the MurMur Pass for the village of Lagaip on the north slope of Mount Giluwe (06°04'S 143°53' E). Recruiting a few carriers the next morning we left for the NW. peak of Mount Giluwe, the Dekwak Peak, about 4100 m high. Camp was made at the end of the day at 3550 m altitude. The next few days were spent in studying the extensive alpine grasslands between camp and the summit of Mount Dekwak. Flowering was almost nil and recent fires had destroyed most of the recent flora, making collecting a difficult and time consuming activity. In spite of this the study of the ecology of the grasslands progressed amazingly well.

On the 28th of June we returned to the village of Laigap and after packing up our collections we set out for Mendi to catch an aircharter to Telefomin. We received word there that Gagné and Gressitt would join us in Telefomin, completing our team for the Victor Emanuel trip. On 1 July Kores, Mrs. Gagné and van Royen flew to Telefomin and stayed the night near the airstrip, awaiting the arrival of Gressitt and Gagné with their assistants. The night was spent in an empty government house, but sleep was denied us due to the clouds of ferocious biting mosquitoes. No mosquito-nets were available as nobody expected to have mosquitoes at this altitude of 1800 m. However, the extensive swamps on the Sirius Plateau proved a prolific breeding grounds for these pests.

On 2 July immediately after arrival of Gressitt and Gagné, a shuttle service carried out by a small plane of the Missionary Alliance Fellowship brought the team and equipment in 3 flights to Feramin, about 8 km SE. of Telefomin. This saved a full day's walk across deeply cut terrain, in which the Upper Sepik River had to be crossed and two of its larger tributaries between Telefomin and Feramin.

On arrival in Feramin by Kores, the first of our team to fly in, immediately carriers were hired to enable Gressitt and his assistant to depart for the Victor Emanuel Range. After the rest of the team was flown in, Gressitt departed at noon time, leaving the rest behind in Feramin. Gressitt could not walk more than several hours due to the heavy rains that set in.

On 3 July the rest of the team, the two Gagnés, Kores and van Royen, set out for the first camp in the direction of Oksapmin (05°17' S 142°15' E), about 7 hours walk along a gradually rising valley towards the east of Feramin. Crossing the Dotobi River within 5 minutes after departure from Fera-

min drenched us for a good start. Rains later in the day made the trek a difficult one, and this rain has been hindering us for the rest of the trip. We reached a native camp at Bolfim at 2380 m altitude. Gressitt in the meantime had climbed the slope of Lutikim, the southeastern crest of the Victor Emanuel Range, on the way to the 3200 m high summit of the range.

On 4 July the rest of the team climbed this same slope, a slope of about 70°, which took 1½ hour to climb, but after that the ridge was easily to follow. As so many areas in New Guinea this crest was heavily overgrown with dense shrubberies and most of the time one walked on the roots with the actual ridge sometimes about 6 meter lower. Camp was made in an amphitheater at the base of the summit, at a place called Bokulbet at 2840 m altitude. Nowhere, however, was any sign of alpine grasslands, though a well developed subalpine shrubbery was found on Lutikim Ridge. The heavy rains, some of them lasting 17 hours, made the camp a very miserable one, particularly as the drain off was non-existent in this valley. The forest was an open one, but heavily overgrown with moss cushions, and dead timber was scattered all around. The area, being limestone, offered no hope of finding running water and in spite of the heavy rainfalls some days no water could be collected. For several days the summit area was explored but an outbreak of dengue, first van Royen, later Kores and Mrs. Gagné, cut down the botanical activities. For the entomologists things were quite interesting though there too the rains hampered good collecting. The collecting of animals proceeded well, the most interesting catch being a woodcock.

In view of the sickness of so many team members, at that time we did not know what it was, it was decided on the 10th of July to return to Feramin. The dengue fevers, however, did not allow at first good progress and the first day not more than 2 hours walk could be carried out.

In the meantime Gressitt had left us one day earlier in order to climb a range south and parallel to the Victor Emanuel Range, given the native name of Mamasengdawon with an altitude of 3000 m. The vegetation from a distance looked to be grasslands but later study revealed that it was the same shrubbery as was found on Lutikim Ridge.

On 12 July we reached Feramin and after paying of the carriers we spent the day in clearing up our equipment, packing our collection. On 14 July another MAF shuttle brought Mrs. Gagné and van Royen back to Telefomin. Kores, and Gagné tried to walk from Feramin to Telefomin in 3 hours as was told them that it could be done in that time, but the trip took over 6 hours. This resulted in them missing the plane connection to Goroka and Mendi respectively. Van Royen and Mrs. Gagné were able to catch an earlier flight to Mendi which turned out to be a good thing. On arrival in Mendi it turned out that a

message (that we had sent off with an MAF pilot to have a plane come to Telefomin to pick us up on 15 July) had not reached the airline in Mendi. By arriving one day earlier we managed to charter a plane, that unfortunately was a bit smaller than the plane we wanted. The result was that next morning when Kores and his team had to be picked up, the plane was loaded to the maximum allowed weight with mousetraps being stowed all over and under chairs, crates etc., with the passengers unable to move.

After arrival in Mendi by Kores and Gagné, preparations were made to get Kores and Gagné off to Mount Hagen where Gagné was going to pick up a car from the Wau Ecology Institute left there when Gressitt and Gagné came up from Wau on their way to Telefomin. On 16 July Kores and Gagné left for Mount Hagen leaving Mrs. Gagné and van Royen to prepare the second part of the exploration of Mount Giluwe. Kores arrived back on the 17th in Mendi and after packing our car with new equipment and collecting gear Kores, Mrs. Gagné and van Royen left for Onim on the SE. slope of Mount Giluwe.

Due to difficulties in finding carriers for the trip to the Southwest summit of Mount Giluwe (4300 m) our departure was delayed for a few days but on the 20th we departed for the alpine grassland. After an overnight stay at the Upper Iaro River at 2840 m altitude, the grasslands were reached on the 21st at 3480 m altitude. Pouring rains and howling winds made it difficult at first to find the grass hut and when this was found the hut collapsed after an hour due to the heavy rains that collected on the roof. Building a new house with one of the groundsheets and setting up our own tents took the rest of the afternoon.

The next morning an attempt was made to reach the SW. summit but the heavy fog and persistent drizzle made this an impossibility. Only late in the afternoon the weather cleared up sufficiently to see Mount Jalibu and our own area. However, clouds soon came in and as the vegetation was a very disappointing one it was decided to leave the next day already instead of staying longer. Heavy rainfall made the terrain a large soggy swamp and with a sigh of relieve we reached the shelter of the lower shrubberies again. Another two days brought us back to base camp at Onim.

By this time dengue was taking its toll even more as Kores began to show the first signs of dengue fever, while van Royen was only slowly beginning to recover. In a rather forced trip the team went to Goroka to continue the exploration of the highlands by going to Mount Michael and Mount Piora. Unfortunately the attack of dengue developed so fast that all three members had to give up any idea of going to these two mountains and it was decided to return to Wau to recover somewhat from this disease. On 27 July the team with all the collections arrived in Wau.

On 2 August the last trip was started. This one was going to be to the southern ranges of the Finisterre Mountains where they gradually merge into the Sarawaket Range. Extensive alpine grasslands were seen there in 1965 when van Royen flew over this area. It was decided to fly from Lae to Wantoat and try from there to reach the unnamed range. Later a name was mentioned of Naitmambi Range but no confirmation could be obtained anywhere. On 3 August we flew in from Lae to Wantoat (06°07' S 146°27'30" E) and after a long haggling for carriers we started out that same day to the Naitmambi Range. A camp at 3050 m was established at Gangga, about 2 hours walk from the range. A later camp at 3550 m was established a few days later. From this camp large areas were explored. As quite a lot of plants were in flower the ecological studies we set out to do could be pulled off satisfactorily. On this trip we were accompanied again by Gressitt, Kores, and Mrs. Gagné, completing a team for a multidisciplinary study of an alpine grassland.

On 10 August we returned to Wantoat, somewhat earlier than was planned, as the carriers showed signs of unwillingness to continue the trip. Ultimately we could not hold them longer and it was decided to return on that day. This meant also the end of the New Guinea exploration.

After return to Wau a few days were needed to pack everything up and on the 16th of August van Royen departed for Honolulu. The harvest was 930 herbarium numbers, with c. 150 bottles of alcohol material, and nearly 800 black and white photographs, besides many more colour slides.

Researchers from the Department of Biogeography and Geomorphology were working in East New Guinea for several months from May 1976 onwards. Mr. S. G a r r e t t - J o n e s was working on the palynology of the lowland lakes in the Markham valley especially Lake Wanum near Lae. Mr. N. E n r i g h t was investigating the ecology of various stands of Araucaria. Mr. R. C o r l e t t was investigating the subalpine forest/grassland transitions, especially on Mt Wilhelm. A large scale investigation of the ecology and palynology of Lake Trist, near Wau, is planned by this department for 1977.

Mr. Alan P. S m i t h of the Smithsonian Tropical Research Institute, Balboa, Panama, is engaged in long-term work on alpine plant ecology in Mt Wilhelm.

Dr. Peter S t e v e n s of Arnold Arboretum spent about 4 weeks in March 1976 continuing his studies on the genus Calophyllum, especially in the Western Province of Papua New Guinea near Kiunga.

Mr. J. W o o d h a m s of Kew, in J. Kew Guild 9 (1975) 314-321, reported to have collected living plants in East New Guinea, in December 1973.

Kew Expedition to Papua New Guinea and field work on Philippine Begonias. In July 1975, three Kew botanists set out on a 5 months' trip. Leader was Mr. M. J. S. S a n d s, members Mr. G. A. P a t t i s o n who as a horticulturist collected living materials, and Mr. J. J. W o o d, who concentrated on orchids. After a trip to the mainland, they visited the Hans Meyer Range in S. New Ireland, between the Weitin and Kamdaru Rivers, and Manus Island. Mr. Sands kindly sent his report:

At the outset of the expedition in early August, to allow time for a proportion of the equipment shipped from England to travel on to Rabaul by sea, the party spent just over a week in the Gulf Province, accompanied by Mr. B. C o n n of the Division of Botany, Lae, and sponsored in part by the Purari River Development Committee. On 15 August the team of four left Lae in a chartered Pilatus Porter aircraft and flew to Baimuru in the coastal swamp forests of Papua. From here, after nearly two days travelling about 200 km upstream in a large canoe on the Purari River, the party reached a village by a small tributary called Wabo Creek. Until recently this remote region of primary forest had never been disturbed, but now a feasibility study was in progress, for it has been tentatively proposed that a dam should be constructed here to harness the power of the Purari, a river which exceeds in water volume both the Fly and the Sepik. The object of this brief visit was thus to take the opportunity of collecting in a locality which perhaps soon could be lost by flooding in an area scarcely known botanically. In addition, Mr. Conn's report on the vegetation would contribute to the overall assessment of the area in development planning. During four days of collecting (18 to 21 August) as well as LAE numbered collections, 166 items were gathered by the Kew personnel (Sands 1325-1490) and of these many were also represented by propagating material. The party returned to Lae on 23 August.

In contrast, as a second, two-week phase, Mt Piora (3600 m, 06°40' S 145°55' E) was climbed accompanied by Mr. J. C r o f t and Mr. O. A k a k a v a r a, also of the Division of Botany, Lae. The village of Habi'ina at the foot of the mountain was reached on 27 August on a very rough road from Kainantu, and the ascent accomplished in three days allowing for collecting en route. Further collecting continued for several days, working from a camp established at about 3500 m on tussock grassland, amongst low shrubby thickets in a very extensive summit area, and before returning to Lae on 10 September more specimens were gathered in montane Nothofagus forest not far from Habi'ina. From 27 August to 9 September 303 specimens (Sands 1491-1793) as well as duplicates were collected by the Kew team while others were gathered under LAE numbers by Mr. Croft, particularly fern species. Two species of Symbegonia and a new species of Begonia were collect-

ed in the Nothofagus forest, while a blue flowered species of Helicia from a higher altitude is thought to be hitherto undescribed. In the summit area, among several ericoid shrubby compositae, the genus Piora (Compositae), so far endemic to the mountain, was collected for only the second time (P. ericoides), while quite near to Habi'ina a new species of Calanthe was discovered which has subsequently flowered in cultivation at Kew.

On 16 September, Papua New Guinea celebrated its independence and the occasion inevitably resulted in some delay in preparing for further field work. However, during the previous weekend a short visit was paid to the Kaisinik logging area at 2000 m within the Wau subprovince, in forest which includes Nothofagus, Podocarpus, Phyllocladus and Castanopsis species. In the company of Mr. N. H o w c r o f t, a specialist on the orchids of the area, the collection of representatives of this family became a primary objective on 14 September when altogether 84 items (Sands 1794-1877) were gathered, mostly from within the forest. Living material of many of these collections comprised the third consignment to be flown back to Kew for cultivation and further study.

The brief venture to Mt Piora had afforded a suitable preparation period as a precursor to the major six-week enterprise exploring the southern New Ireland mountains. After the arrival of the team, including Mr. J. Croft, in Rabaul on the Gazelle peninsula of eastern New Britain on 19 September, reconnaissance of New Ireland in a Cessna 207 at 6.30 one morning over the rugged and densely forested Hans Meyer ranges, provided an opportunity to consider in advance the best possible approach route to the highest ground. On 21st, the almost bare slopes of Matupi volcanic crater near Rabaul were climbed, where a few collections were made (Sands 1878-1883), and several days later a small coastal ship landed the expedition personnel and their cargo on an open stretch of New Ireland's east coast not far from the small village of Taron. The team now also included Mr. R. K e n e, a local field officer from the Regional Office of the Department of Forests in Rabaul.

A deserted Aid-post in the village provided a useful coastal base and from there, taking a complete day, a path was cut inland to where, at almost 600 m, a base-camp was built not far from a lake called Mandih, one of the very few stretches of standing fresh water in the whole of the island. Only one elderly man knew the way to the lake from the coast, the last survivor of the people who several decades earlier had lived inland. Now only the coastal strip is inhabited and, indeed, sufficient carriers willing to leave their fishing, gardens and coconuts, were difficult to find in such a small population. Father T. Genduza of the Silur Catholic

Mission at Cape Narum to the south of Taron, was most helpful in giving backing to their recruitment as well as in arranging for despatch by mission plane of living plant consignments. From the Mandih camp, the route became difficult and steep, as over a period of several days, a steady advance was made, ascending by a series of ridges. A more elaborate camp was constructed at about 1350 m, where field drying or 'wet' method parcelling could be undertaken and a nursery maintained for living material awaiting packing for despatch. For higher altitude collecting, three smaller advance camps were established; firstly at 2050 m, then at 2200 m close to the highest point in New Ireland, known locally as Angil, and finally a bivouac in a saddle some way beyond the peak, all of them in mossy forest.

Apart from the low altitude collections of P e e k e l and the 1970 British Museum Danfu expedition which collected up to 900 m, southern New Ireland was previously very little known botanically, and yet it would appear to command a phytogeographically strategic position at the junction of the New Guinea mainland-New Britain axis and the Bismarck-Solomon chain. Accordingly, general collecting was undertaken at all levels from the coast to the summit. It is confidently expected that, apart from the possibility of some new species, the higher altitude specimens especially will provide many new records to add to those at present known from the island. A rich fern flora was of particular interest to Mr. Croft, especially the discovery of Christensenia aesculifolia and a considerable number of Cyathea species. Among the many interesting flowering plants collected were two Rhododendron species, the first records of the genus for New Ireland. They were discovered above 1500 m, one of them with white fragrant flowers up to 12 cm across, which, though probably close to R. superbum, when studied in more detail may well prove to be distinct. During the collecting period in New Ireland, which extended from 30 September to 3 November, 682 Sands numbers (1884-2565) were collected as well as several hundred in the LAE series.

On 5 November, the party arrived back in Rabaul, and by 11th, Messrs. Sands, Pattison and Wood, the three Kew staff members, flew to Manus island, commencing collecting on 14th. Like New Ireland, this final phase of the New Guinea expedition in Manus Province was also aimed at collecting in an area still relatively little known botanically. The visit was planned to take place in the Centenary year of the 'Challenger' expedition's visit to the north coast of Manus when the first collections in the island group were made. Unlike that first visit, however, when time only allowed M o s e l e y to collect close to the shore near which the 'Challenger' was anchored, the Kew party was able to penetrate into the heart

of the island, collecting in the limestone Mundrau depression; on Mt Dremsel (the highest point on the main island); the forests and mangrove swamps around Kabuli in the west, on the outlying islands of M'buke and Lou and on the relatively recently emerged volcanic islet of Tuluman, still in the process of colonisation. Between 14 November and 9 December 490 numbers were collected (Sands 2566-3055), as in New Ireland using field-drying and 'wet' method preservation. A field assistant, Mr. P. Lulou, from the Department of Agriculture, Stocks and Fisheries, accompanied the team on some phases of the visit.

After returning to Lae where the collections and equipment were packed ready for shipment to Kew, Messrs. Pattison and Wood left on 14th to return to England and Mr. Sands trevelled to Australia on 20 December, for a period of leave until the end of January 1976.

It is not possible here to mention all the many people who were instrumental in the successful completion of the expedition. Acknowledgement of their valuable help is recorded elsewhere. However, because of their involvement from the early stages of planning, it is very appropriate to record grateful thanks to Mr. J.S. Womersley and the staff of the Division of Botany, Lae, for providing as much support as was possible during a period of particular financial stringency and for their participation in all but the Manus phase of the expedition.

At the beginning of February, Mr. Sands travelled via Singapore to the Philippines to commence a five-week period on behalf of Kew, collecting and making field observations of Begonia species in as many localities as possible in the time available. In addition, with the visit also having the sanction of the Threatened Plants Committee of I.U.C.N., this field survey was to be linked with observation of the associated vegetation cover and the factors affecting its onwards survival in the face of exploitation and economic pressures. Any information and first hand experience, however limited, as to current Begonia species distribution and their actual or potential habitats, it was hoped would be of interest to botanists both at Kew and in I.U.C.N. as well as to those who might, in various ways, be working in the conservation field within the country.

From the outset, Mr. H. G. G u t i e r r e z and the staff of the Philippine National Herbarium were most helpful and at least two of them took part in each of the 10 stages of the field work. A very full itinerary was established soon after arrival and after its necessary approval by the National Museum and the Philippine Centre for Advanced Studies, the programme began on 7 February. Six localities were visited in Luzon: Mt Makiling, Laguna Province, with Mr. M.G. Price of

the College of Agriculture, Los Baños, 7-8 February (Sands 3056-3075); Mt Banahau, Quezon Province, 8-9 February (Sands 3076-3108); Quezon National Park, Quezon Province, 10-11 February (Sands 3109-3118); Mt Isarog, Camarines Sur Province, 13 February (Sands 3119-3131); Mt Mayon, Albay Province, 14 February (Sands 3132-3136); and Mt Santo Thomas, Benguet Province, 17-18 February (Sands 3137-3162). After flying to Mindanao, two mountains were climbed: Mt Apo, Davao Province, 21-24 February (Sands 3163-3171 and 3173-3203), and Mt Hilong Hilong, Agusan Province, 28 February (Sands 3172 and 3204-3220). Soon afterwards in the Oriental Province of Negros island Mt Talines (Cuernos de Negros) was climbed, 1-2 March (Sands 3221-3258) and finally, after returning to Manila, the mountains in the western peninsularof Panay, Antique Province were visited (Mt Balingaso), 7 March (Sands 3259-3276).

Detailed results of the work are in preparation but it may be said that of the 221 collections, 43 were of Begonia species, many of which are now flourishing in cultivation at Kew, 42 were of orchids, 25 of ferns and fern allies, 13 of Gesneriaceae, and 12 of Ericaceae (including 7 Rhododendrons). Mr. Sands left the Philippines on 12 March and, travelling via Hong Kong, arrived back in England on 15 March.

Specimens from both the Philippine and New Guinea expeditions have been received at Kew for identification and further study and there will be duplicates for distribution in due course.

The American Palm Society has provided funds to the Lae Herbarium for the collection of palm seed. These funds have supported collections from around Lae, Port Moresby and Alotau. They also helped the cost of an expedition to Fergusson and Normanby Islands. The members involved were Messrs. Ted Henty, Jim Croft (leader), Paul Katik, Yakas Lelean and Oso Akakavara. The expedition lasted eight weeks, most of the time being spent on Fergusson island. Ted Henty returned to Lae at the completion of the first week. L.J. Brass's early collection localities of the south coast of Fergusson island were recollected, the party traversed the island from south to north, and the highest peak, Mt Kilkerran (1900 m) in the north east of the island, was climbed. The vegetation of this mountain was an almost pure Nothofagus carrii forest. 540 botanical specimens of flowering plants and pteridophytes were collected and over 200 wood samples. It is hoped that late in 1977 or early 1978 another expedition will be able to visit Goodenough island and perhaps some of the islands of the Louisiade Archipelago.

Mr. Paul K o r e s, of the Wau Ecology Institute has been working for the last two years on Rhododendron. His extensive

collections have greatly increased ranges for a lot of species, and have resulted in the establishment of many of them in the nursery at Wau. He is conducting field trials on pollination and compatibility of various species, and is working on a handbook to the common New Guinea species.

b) Cyclopaedia of Collectors. Additions. II
(continued from page 2560)

M i c h o l i t z, W.
(Cycl. Coll. Fl. Males. I, 1, 1950, 360).
Literature. (1) Add: Correspondence with F. Sander is now in the Kew Archives (Dr. R.E. Holttum i.l.) and will certainly reveal more accurate data.

N o r o ñ a, F r a n c i s c o
(Cycl. Coll. Fl. Males. I, 1, 1950, 388, and Suppl. II in l.c. 8, 1974, lxxii).
After making an inquiry of the Director of the 'Deutsche Staatsbibliothek Berlin DDR' (Unter den Linden 8) about the set of Noroña's 'Icones plantarum Javanicarum', I received the following information.
The set of 111 (sic) drawings, listed under 'Libr. pict. A 101' forms part of the 'Deutsche Staatsbibliothek (D.D.R.)'. It was transferred during World War II for safety reasons and is at present still kept back in the 'Staatsbibliothek Preussischer Kulturbesitz' in Berlin-West (D-1 Berlin 33, Archivstrasse 12-14).
The copy was bought at the second-hand bookseller Weigel in Leipsic in 1868. It is supposed that it formed part of Blume's inheritance; it had been presented to him by J.K. Hasskarl. Reinwardt's name is not mentioned in the registers of the library.
There seems little doubt that this is the copy seen in Java by Reinwardt in 1819.

Z o l l i n g e r, H e i n r i c h
(Cycl. Coll. Fl. Males. I, 1, 1950, 593-596; Suppl. I in l.c. 5, 1958, cccxxxvi; Suppl. II in l.c. 8, 1974, cxl).
An extensive diary of Zollinger, covering the years 1835-36, 1839-41, 1842-48 (unfortunately not of the period 1855-59, with the exception of some letters to his wife written when he was at Kandangan for recovery of his health without result), and an incomplete MS 'Java', existing of over 700 pages, was still kept in the family (Höchli-Zollinger at Baden, Switzerland), and was unearthed by Prof. Dr. Hans Wanner, whose interest was excited by Sudjana Kasan of the Bogor Botanic Gardens, when paying one of his visits to Java. Dr. Wanner advised the family (great-grand-daughter) to de-

posit the original manuscripts in the 'Zentralbibliothek' in Zürich. He is engaged in making them available by typewriting and eventually at least part of them might be published.

In 1975 Dr. Wanner succeeded in finding the locality of Zollinger's grave (in accordance with Scheibener's biography) be it that the roof over it had been taken away and the stone slab with inscriptions was found in pieces.

Marelaan 55 M.J. van Steenis-Kruseman
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An unrecorded Forsten collection of varieties of Cinnamomum verum Presl from Java. — In the Leiden Rijksherbarium, a package of 9 herbarium sheets was discovered, collected by E. A. F o r s t e n. These specimens are numbered 1-8 (no. 7 is missing, nos. 5 and 8 are represented by two sheets each), but no date, nor locality is indicated. Each specimen has a dirty white slip of thickish paper, stating in faded ink the number, the Singhalese name and its translation in Dutch and in Malay.

A clue to this collection was found in Hasskarl's Tweede Catalogus 's Lands Plantentuin (1841) page 87, where is referred to an article of A. Botter in Tijdschrift voor Nederl. Indië 2 (1839) 116-138, where the same varieties are described in the same sequence and the same numbering as Forsten's specimens.

On page 118, Botter remarked, that these 8 varieties were represented in the Gardens at Krawang, c. 50 km E. of Jakarta. This is corroborated by Van Gorkom (Oost Indische Cultures 2, 1881, 496), stating that the cultivation of Cinnamomum verum in 1833 was restricted to that of nurseries in Krawang.

As Forsten (cf. Cycl. Coll. Fl. Males. I, 1, 1950, 179) filled in September 1839 temporarily the post of Director of the Natural History Museum at Batavia (Jakarta), the specimens have been apparently collected about that year in the Krawang nurseries.

It should be added here, that the Singhalese names do not cover the same varieties and/or species, under which they are known in Ceylon and were enumerated for the first time in Goeller, Disputatio de Cinnamomum (Regensburg, 1709).

c/o Rijksherbarium A.J. Kostermans
Leiden, The Netherlands