

V. EXPEDITIONS AND OTHER EXPLORATION  
(contd from p.1120)

Noona Dan Expedition. In April 1961 the Danish schooner Noona Dan with a staff of 19, three of them botanists, left Copenhagen to explore in the Philippines during August and September on Palawan, then for two weeks on Balabac, then for a month on Tawitawi; the last two weeks of the year were spent near Zamboanga in Mindanao. The first half of 1962 was spent in the Bismarck Archipelago. In the middle of August, the Solomon Islands were visited; in September-October the expedition members returned to the University of Copenhagen. About 5000 herbarium specimens were collected; especially during the last part of the expedition attention was paid to fungi (T.Wolff in Nature 198, 1963, 1044-1045).

T h a i l a n d

Prof. Kai L a r s e n of Aarhus, Denmark, together with Mr. Tem S m i t t i n a n d of Bangkok, made a third Thai-Danish Expedition in the areas NE. and SE. of Bangkok, with the main aim to collect Zingiberaceae in June and July 1963, in the rainy season, for Herbarium and cytotaxonomic investigation. A report with a few vegetation descriptions is found in Nat.Hist.Bull.Siam Soc. 20 (1964) 205-227; the map and the review of collected numbers (from 9733 to 10727) were also published in Dansk Bot.Arkiv 23 (1965).

Cryptogams Expedition. From November 1965 to March 1966 a combined Thai-Dutch expedition will be made to several mountain areas. The Dutch participants are Mr. A. T o u w, who is curator for mosses, and Mr. E. H e n n i p m a n, who is curator for ferns, both of the Rijksherbarium, Leiden. The organisation in Thailand is in the hands of Mr. T e m S m i t i n a n d of the Royal Forest Department. The expedition is sponsored by some Dutch funds.

As the mosses and ferns of Thailand have never received more than scanty and occasional attention, the main goal is the making of collections in these groups, while phanerogams will be collected as far as possible.

The areas selected are Khao Yai at the southwestern border of the Khorat Plateau, Doi Inthanon (= Doi Angka), the highest mountain of the country and several other mountains in the North, and Khao Luang in the Peninsula.

The collections will be deposited in Leiden and Bangkok; duplicates will be distributed by the Rijksherbarium.

Dr. R. G. R o b b i n s of the Research School for Pacific Studies, Canberra, was in October-November 1963 in northern Thailand with Prof. M. E. D. P o o r e and Mr. T e m S m i t i n a n d. They climbed Doi Inthanon (= Doi Angka) and will publish a paper on it in Nat.Hist.Bull.Siam Soc. Also Doi Suthep and Doi Chiangdao were climbed. Dr. Poore collected mainly oaks, now probably at Kuala Lumpur, Dr. Robbins various plants and mosses (numbers 3536-3689). Duplicates were deposited at Bangkok, mosses also at Leiden. After the northern trip Dr. Robbins and Mr. Smitinand also visited the Khao Yai National Park; then Dr. Robbins proceeded to Malaya.

#### C a m b o d i a

At the end of August 1965 Dr. P. S. A s h t o n of Kuching proceeded to Cambodia on short-term secondment as a F.A.O. consultant in Forest Botany for the U.N. special fund project in the Cardamome area along the southern coast. Though the prime object was to advise on building up a reference collection for forestry purposes, it is hoped that general collections will be made so that a more complete knowledge of the flora of the important isolated area of mixed rain forest in the Kampot area may be obtained.

#### M a l a y a

Occasional collecting was performed in several localities by staff of the Singapore Herbarium; part of the material was gathered for cultivation.

Dr. R. G. R o b b i n s (see above) made quite extensive tours in the Forest Reserves in November-December 1963, which

resulted in a paper on the forest types of Malaya, in the Malayan Forester. Some mosses were collected (3690-3709).

### J a v a

Early in December 1964, Dr. A. J. G. H. K o s t e r m a n s of the Bogor Herbarium again visited Mt Pajung and the Ujung Kulong Reserve, in SW.Java.

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

Flores. -- Dr. A. J. G. H. K o s t e r m a n s, Mr. N. W i r a w a n and party were away from Bogor from 20 March to 2 June 1965 for an exploration of Flores. One day was spent collecting at Waingapu, one at Ende, on the way to Mborong (S.Manggarai). The country is only passable in the dry season and with great difficulty. A base camp was provided by the missionaries at Kisol; from there the Mt Ndeki complex was explored, where deciduous forest was found, much like that in Lower Sumbawa and East Java. From there, one went to Wae Rana to make explorations southwards to the coast. Rests of primary forest were found with huge *Canarium* commune, *Pterygota horsfieldii*, *Beilschmiedia*, and forests of *Pterocarpus* cf. *cochinchinensis*, and arborescent *Pleomele* of 15 m tall.

At Ruteng (1100 m), Dr. Kostermans borrowed priests' clothes against the cold, which induced the population to kiss his hands with great frequency and reverence. The forest was explored up to 2400 m; between 1500 and 2000 m the forest was found remarkably rich in Sapotaceae. Dr. Kostermans then set out to explore the marsh forest West of Mborong towards the south coast, Mr. Wirawan going to the lake Rana Mesé near Sita. Joined again, they resumed exploration of the mountains above Ruteng, and further to the North, to Reo. Here much *Protium* was found, unknown from the island. The collections amounted to 1300 numbers; all were numbered in the field with a few additions later; there were about 6 duplicates.

### S a r a w a k

Dr. P. S. A s h t o n of the Kuching Herbarium made a six week expedition to the basalt table land of Bt. Kajang and the Ulu Mujong part of the Hose mountains in March and April 1964, during which time they collected 760 numbers, scaled the second highest peak, Bt. Temedu, 1800 m, and made an ecological investigation of mixed Dipterocarp forest on basalt and dacite derived soils at 1000 m altitude. A second collecting expedition was made to Bt. Lambir and Ulu Luak area near Miri, for two weeks in May, followed by two and a half weeks collecting on the Santubong Peninsula. From July to mid-October A. F. O. O t h m a n H a r o n led an ecological party, which made a limited area study of mixed Diptero-

carp forest on the basalt Tau range. General collecting was also carried out on this expedition and 600 numbers obtained. In November, collecting was done in the area of Bt. Raya, Pelagus, and Bah Sama P.F., Ulu Rejang; in December in the area of the Ulu Segan and Nyabau block, Similajau F.R., Bintulu.

Dr. J. A. R. Anderson visited two interesting areas untrod by a botanist: Bario in the Belabit uplands, and G.Selabor (Jurassic limestone), Serian District, where collections were made.

The total amount of collections made by the Forest Department during 1964 was 2456.

The lichenologist Dr. Mason E. Hale visited Sarawak between March 7th-14th, 1965, and collected on Mt Matang, Bako National Park, and in the swamps at Sibul.

Dr. P. S. Ashton and Mr. V. S. Murthy, timber technologist, spent a month in March and April 1965 in the Ulu Dapoi, Tinjar, on the dacitic plateau of Usun Apau, where about 600 numbers were collected. Following this Dr. Ashton proceeded for a further 3 weeks to his old collecting grounds of Ulu Temburong, Brunei. It was interesting to observe the effects of the catastrophic 1962-1963 floods, worse here than in other rivers; the river had changed its course in many places, most trees within 30 feet of the normal water level, including many of the magnificent *Dipterocarpus oblongifolius*, had gone, and the rheophyte population had been decimated. The whole river had the appearance of a giant storm drain and reminded one of Corner's description of the Pahang floods of the twenties.

In June three weeks ecological work was carried out in Bako National Park, followed in July and August by collecting and ecological study on the Arip rhyolites, Balingian.

Herbs and lianas wanted. At the Edinburgh Congress, Dr. P. S. Ashton of Kuching delivered a paper on "Recent exploration in Sarawak and future needs", which was printed in full in the *Malayan Forester* 27 (October 1964) 300-303. It contains the suggestion that general collecting in Sarawak is now no longer remunerative, and that specialized collecting (by monographers, for instance) and specialized ecological work should now be recommended.

But what is in this context meant by "general collecting"? As for the tree flora, of which Dr. Ashton has great knowledge, the statement seems exaggerated; quite recently a new tree genus was collected, *Allantospermum* Forman, and a brand-new *Dacrydium* yet to be described. Furthermore, what about all the other plants? A certain amount have been collected in Sarawak, but while travelling there, I was time and again

surprised by the herbs in their extraordinary diversity and I also observed that the occurrence of many species seems to be very local. So little taxonomic knowledge on the herbs is still available, that there is simply no indication that collecting has been sufficient. The same holds good for lianas - those weeds to true foresters - and probably the more as particularly extensive material of these plants is needed for study. May the botanist who wants to make a contribution to fill these gaps through a firm drive of general collecting (as general as collecting trees, anyway!) in the future be welcomed as cordially in Sarawak as I was in 1958! -- M.J.

### S a b a h (North Borneo)

By the Sandakan staff, Mt Trusmadi was again attacked. Work in the Lubuk area was renewed during 1965. The botanical reconnaissance of the ultrabasic parts of the highlands has been completed and a start was made with the basaltic mountains. On the West Coast, the Sook plain was laid open by a new road; very interesting Dacrydium forest on white sandy soil was encountered with peculiar Sapotaceae, Eugenias, and much Nepenthes.

Collecting was vigorously continued; the Forest Botanist of Sabah now also claims to have a band of "M e i j e r 's c o l l e c t o r s", who begin making good collection on their own accord. See also under Herbaria.

### P h i l i p p i n e s

Mr. D. R. M è n d o z a of the Philippine National Herbarium collected from 1 to 28 June 1965 in various localities of Quezon Province, 398 numbers.

Mr. H. G. G u t i e r r e z did ethnobotanical work from 8 to 20 March 1965 in western Mindoro. From 12 April to 15 May he made a collecting trip to Basilan, with Mr. E. J. R e y n o s o, and with Mr. Z. C. F r a g a, who will be a curator of the Philippine Forestry Herbarium in Manila, for the training of the latter. From 25 to 29 May Mr. Gutierrez was in the field on Mt Canlaon, eastern Negros, with Dr. Aaron S h a r p and Dr. Z. I w a t s u k i for collecting mosses. He continued his collecting in SE. Samar, where he was joined by Mr. Reynoso, from 30 May to 28 June 1965. During June, Messrs. R. M. d e l R o s a r i o and P. A. C o r d e r o Jr collected mosses and flowering plants in Kalanga, Mountain Province, Luzon. The latter made collections of salt and freshwater algae from 9 to 30 November 1964 in Batanes and Camiguin, in connection with an expedition by the K a - g o s h i m a University from Japan. Dr. G. V e l a s - q u e z and Mr. P. A. C o r d e r o later went back to the place and worked again from 9 April to 7 May 1965.

Dr. J. T. W i e b e s, who at the Leiden Natural History Museum specialized in fig wasps (see this Bulletin p.912), made a collecting tour between 17 October 1964 and 23 January 1965. He travelled in Luzon: Mt Sto.Thomas and vicinity, Mountain Province; Mt Makiling and Mt Banahao, Laguna; Atimunan, Quezon; Taal Volcano, Batangas; Mt Isarog, Camarines Sur; Mayon Volcano, Albay; Bulusan Lake, Sorsogon. On Negros, in N.occ. In Mindanao: Davao, Marawi, Lanao del Sur. In Basilan and in Palawan: Puerto Princesa. The total yield was nearly 100 samples, which may contain 1-20 species of wasps; 150-200 species may have been collected in all.

He was accompanied by Prof. J. V. P a n c h o, who helped him in collecting the Ficus plants (43 species) and a few others; all were numbered in Pancho's series from 4161 to 4271. The plants were sent to Mr. Corner in Cambridge.

### N e w G u i n e a (E a s t)

Plans are ripening for a joint Lae-Leiden exploration in the Eastern Highlands, of the Doma-peaks (+ 3700-3800 m), where the first government patrol was by mid-1965. It is the idea that Mr. J. S. W o m e r s l e y, the Chief of the Division of Botany at Lae, whose cooperation is greatly appreciated, will explore the montane zone, while Dr. C. K a l k m a n and Mr. W. V i n k will work the summit region, for about 3 months.

Mount Wilhelm. Mr. M. M. J. v a n B a l g o o y of the Rijksherbarium left Holland on 30 March 1965. By way of Sydney and Canberra he travelled to Lae where he attended the opening ceremony of the new Herbarium building on 12 April. With Dr. P. v a n R o y e n he made two one-day trips, to Busu River and Markham River. On 15 April he started from Goroka for Keglsugl (+ 2600 m), and from there on foot for the mountain, where he worked until 8 July, interrupted by a short trip for the Western Highlands.

Dr. D. Walker had caused a hut to be built on Mt Wilhelm, near Lake Aunde at 3560 m, which served as a base camp. Dr. and Mrs. W a l k e r were there from 7 April to 30 May, engaged in phyto-sociological and palynological studies. Van Balgooy's main objective was a complete survey of the alpine flora. He had compiled a list in advance from all available sources; virtually all the 125 genera from over 10,000 ft of this list were retrieved in the field, and several genera could be added as new records. All collections on Mt Wilhelm, 993 in number, were made above 2600 m, the majority consisting of "belly-plants" and (in the same number series) mosses. The natives say that most of the flowering on the mountain takes place simultaneously with the pandans; as the latter began to bud near the end of the expedition, it is possible that the

best season was missed. Plankton samples were taken and forwarded to Dr. K.Thomasson at Uppsala; also 24 vertebrates and + 500 insects were collected, which went to the zoological Museum at Leiden.

The essential features of the vegetation were written up by R.D.Hoogland (Blumea Suppl. 4, 1958, 220-238, 6 phot.). Like all others, Hoogland worked mainly in the Pindunde Valley, where, notwithstanding the relatively great human influence, the flora is richer than elsewhere, as was learned during many soaked excursions on the southern and northern slopes. The vegetation seems everywhere more or less anthropogeneously affected. The most recent memoir of the area is by L.J.Brass, Results of the Archbold Expeditions no 86 (Bull. Amer.Mus.Nat.Hist. 127, 1964, 145-216, map, phot.). In an interesting introduction Mr. Brass sketches the physiography, climate, history of the explorations, and gives an account of previous collections. Brass was on the mountain (whose disputed height he determined at 14,950 feet = 4550 m; Van Balgooy at 4500 m) for three weeks in June, 1959; he describes the vegetation and flora among complaints of the strong cold winds and rains. In a summarizing chapter on the vegetation he gives a comment on R.G.Robbins's memoir of 1958; both authors agree that the alpine grassland is a climatic climax.

British Museum - Newcastle upon Tyne University Expedition. The party from Europe, under Mr. A. C. J e r m y, arrived in Lae on 10 September 1964, and spent the next fortnight re-assembling stores and equipment and planning with the indispensable help and advice of Mr. J. S. W o m e r s l e y a ten-week foot patrol into the Finisterre Mountains by an approach up the Gusap (Naho) River valley. Whilst collecting between 1,000 and 11,000 ft from five major camps the party made special effort to study the region of a lake basin situated at 9,000 ft. The first ascent by Europeans of Mt Abilala was made to find only subalpine shrubbery and grassland (Rhododendron-Gaultheria-Styphelia with Poa-Deyeuxia-Danthonia tussock grassland) around the summit (11,300 ft = 3390 m) of this the highest peak in the range. Roy P u l l e n (C.S.I.R.O. Division of Land Research & Regional Survey) and C.D. S a y e r s of the Division of Botany, Lae, were seconded to the Expedition for this patrol. From the outset, it was planned to concentrate on the cryptogams.

From 3 January 1965 to 5 March, in order to get a representative cross-section of the cryptogams of the Eastern part of the Territory, the Expedition collected in the lowland forests around Lae; in the Hertzog Mountains (3,500 to 6,000 ft), Morobe District; around Aiyura and Okapa (5,000 to 8,000 ft), Eastern Highlands District; and at Keglsugl (8,000 ft), also E. H. District, from where Mt Wilhelm was worked (up to 14,600 ft). Dr. T. G. W a l k e r spent three weeks of this

time attached to a Forest Department Survey in southern New Britain, where he collected ferns mainly.

Over 6,000 specimens of Pteridophytes and over 1,000 numbers of phanerogams (in pentuplicate); 8,000 packets of bryophytes and lichens comprising over 10,000 specimens and 30 tubes of freshwater algae (mainly diatoms) were collected and duplicate sets will be deposited in Division of Botany, Lae, C.S.I.R.O., Division of Land Research & Regional Survey, and Leiden, and in certain other herbaria where specialists are prepared to name material. In addition to this some 500 plants have been established alive in Britain (ferns at Kew and at Newcastle upon Tyne; Orchidaceae, Gesneriaceae and Rhododendron at Edinburgh). Approximately 750 specimens were preserved in ethanol-formalin for future work on the anatomy of ferns; 1,100 cytological specimens (S.M.C.'s) were fixed as part of a world wide survey of the chromosome numbers of pteridophytes being carried out by Dr. Walker.

Material can be made available to any worker preparing an account for the Flora Malesiana or to any bona fide specialist monographing a group. In the absence of a specialist Mr. A.C.Jermy, Mr. A.Eddy and Mr. P.W.James, all of the British Museum (Natural History), will be responsible for the identification of the pteridophytes, bryophytes and lichens respectively. The pteridophyte anatomical researches will be carried out as part of a world-wide project under the direction of Dr. T.G.Walker and mainly at the University of Newcastle upon Tyne and will be published as and when completed. Annotated lists with taxonomical discussions will be published for various groups in the Bulletin of the British Museum (Nat.Hist.) Botany.

## P a c i f i c

Solomons. -- When the Spaniards, sailing for Peru, discovered the islands in 1568, they suppressed the data lest other people should find their treasures and claim them for themselves; subsequently the riches grew more and more fabulous in the minds of the discoverers, so as eventually to equal those of King Solomon's. For two centuries the islands laid forgotten, until in 1768 they were re-discovered by French, British, and Dutch sailors. Botanically they remained unknown for about another century.

The first botanical work was done by Guppy, who also wrote a fine book "The Solomon Islands and their natives" (1886). The first significant collector was Kajewski, about 1930, but he quit for the gold fields (where he was unsuccessful), and was succeeded by Brass, whose first trip to the tropics it was (1932-1933). E.S.Brown made, about 10 years ago, together with his native collector W a i b a t u, a collection of a thousand numbers of weeds from the plantations, sets of their



material being now in Honiara and the British Museum. Caution has to be taken: Waibatu started with number 1 in every new station.

Recently, Dr. T. C. W h i t m o r e spent two years on the Forestry Service at Honiara, collecting about 4000 numbers of trees, in 1964 Mr. D. S c h o d d e of Lae collected about 800 numbers, and in mid-1965 a Royal Society Expedition under leadership of Mr. E. J. H. C o r n e r, with three more botanists (and Dr. Whitmore attached for 2 months), will explore the islands further, concentrating on subjects out of the way of the forester: orchids (Mr. P. F. H u n t from Kew), gingers, aroids and other herbs, not to forget ferns (Dr. A. F. B r a i t h w a i t e from Leeds), lichens and mosses (Mr. D. J. H i l l from Sheffield) and the flora of the mountains. Carrying 16 scientists, one ton of old newspapers for the plants alone, and 200 gallons of preserving fluids, this is the biggest biological expedition of the Royal Society of the century.

The Solomons form a double chain of continental islands. Four hundred kilometers of ocean separates them from the Santa Cruz islands to the East, 180 kilometers in the Northwest from the Bismarck Archipelago. Between the islands themselves the distance is no more than 20-50 kilometers. The area is geologically very unstable; land and sea frequently change place, and from the perturbation of the orbit of satellites flying over the archipelago it was discovered that gravity in that region is the lowest of the whole earth. The highest mountain is an active volcano of 3000 m with a barren top; the second is 2500 m and botanically more promising; *Araucaria* may there be found.

The climate is everwet, except for a 6-month dry period in the northern part of Guadalcanal, which has transformed into a fire-climax of grassland. Who therefore does not go beyond Honiara will never know what the Solomon Islands really look like. They are otherwise all under forest, but the human population has declined in the latest centuries, and the vegetation, even in the most inaccessible places, may still bear signs of ancient habitation.

The flora is very homogeneous all over; it is impossible to tell specimens of one island from those of another, and even from those of New Guinea. This is at variance with the avifauna, wherein Mayr found distinct racial differences among the birds from island to island. The flora is rather poor at that; after three days in one camp site little new remains to be collected. The forests are not very mixed either: a few species may dominate with some subsidiary species, which is rather like a rich temperate forest than like a tropical one.

The vegetation has a peculiar composition. It abounds with Melastomataceae, with Pandanaceae, particularly Freycinetia (very abundant but seldom fertile) and Sararanga (with its cone of fibrous roots at the trunk base and no prop roots), with Winteraceae and a few species of Calamus in great quantity.

As for the floristic composition, the Solomons are a poor relation of Malesia. Dipterocarps and Fagaceae are wanting; while New Guinea has over 100 species of Elaeocarpus, the Solomons have but 6-8; New Guinea has hundreds of Ericaceae, the Solomons but 3 Rhododendrons and 1 Vaccinium. But there are remarkable features in the flora: typically Australian elements are completely absent. Agathis, conspicuous enough and known from Santa Cruz, New Caledonia, eastern Australia, the New Hebrides, and the whole of Malesia, somehow is wanting in the Solomons. Local endemism is possibly low. There are some noteworthy Pacific plants: the beautiful Cominsia, Crossostylis, and also plants with enormous disjunctions in their distribution. First, Lepinia solomonensis (Apocynaceae) with its strange fruits, the 4 carpels being hoop-like curved to meet at the top, very common in the Solomons but otherwise only known from Micronesia and Tahiti. Second, Metrosideros ornata (Myrtaceae), confined to high mountains in the Pacific, with its most westerly station in the Solomons.

It is hoped that the Royal Society Expedition will bring home many first data of the mountains (partly of limestone, partly of ultrabasic rock and extremely difficult to penetrate), a good deal of the non-tree flora, and perhaps some species so far thought confined to New Caledonia. When the expedition will have left, nine dexterous natives who have already been specially trained as "Whitmore's collectors", will continue the collecting for another two years and get another 3-6000 numbers. Then it may be said that the forests have been reasonably well explored.

New Hebrides. Dr. R. G. Robbins (see above) made a trip to Efate and Espiritu Santo in June-September 1963, collecting the numbers 3813-3875; moss duplicates were sent to Leiden.

New Caledonia. Dr. H. C. McKee is engaged in research and exploration of the island. Dr. L. Bernardi, Geneva, undertook an expedition for collecting plants in 1965.

Lord Howe Island. From Lae (see above) Mr. M. M. J. van Balgoy went to Sydney to obtain a permit for collecting (granted, but one twig a plant only) on Lord Howe Island where he was from 16 to 30 July, unfortunately in the cold (minimum 10° C) season. The damage caused by introduced goats, pigs, rats, is considerable, and particularly dangerous as

seedlings are preferred. Most of the plants were in fruit; 152 collections were taken because a cyclone held up the work. The mountains are of limestone and basalt, up to 865 m, extremely rugged and partly inaccessible. Some botanical novelties may there be found. The impression was obtained that the local population (120) takes great care of the natural resources of the island and is anxious to preserve the indigenous flora and fauna.

S.J. Paramonov published three papers on geology, fauna, and flora in Pacific Science 12: 82-91, 14: 75-85, and 17: 361-373. There are 209 species of vascular plants in 169 genera, 4 of them endemic. The relationships are rather evenly divided among New Zealand, Australia, and Polynesia, the endemics having the closest relationship with New Zealand. Lord Howe is considered a fragment of a foundered continent ("Howeania"), long isolated from Australia.