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Palm Collecting in Papua New Guinea.

III. Papua

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The southern half of the island nation of Papua New Guinea has been traditionally known as Papua, though in the early days of exploration this name was applied to the entire island. The Territory of Papua was administered separately from the Territory of New Guinea to the north, first by the British and later by the Australians, for over 100 years. During this time, Papua developed its own lingua franca, called Police Motu, which is based on a polynesian dialect from the Port Moresby area. Melanesian pidgin is the common language of the north. This language difference, along with differences in history, political and economic treatment, and basic differences in culture led to some incipient feelings of nationalism and some rivalry between the two sides of the island. They have now successfully combined into an independent nation, however, and in a very straightforward compromise have named their country Papua New Guinea.

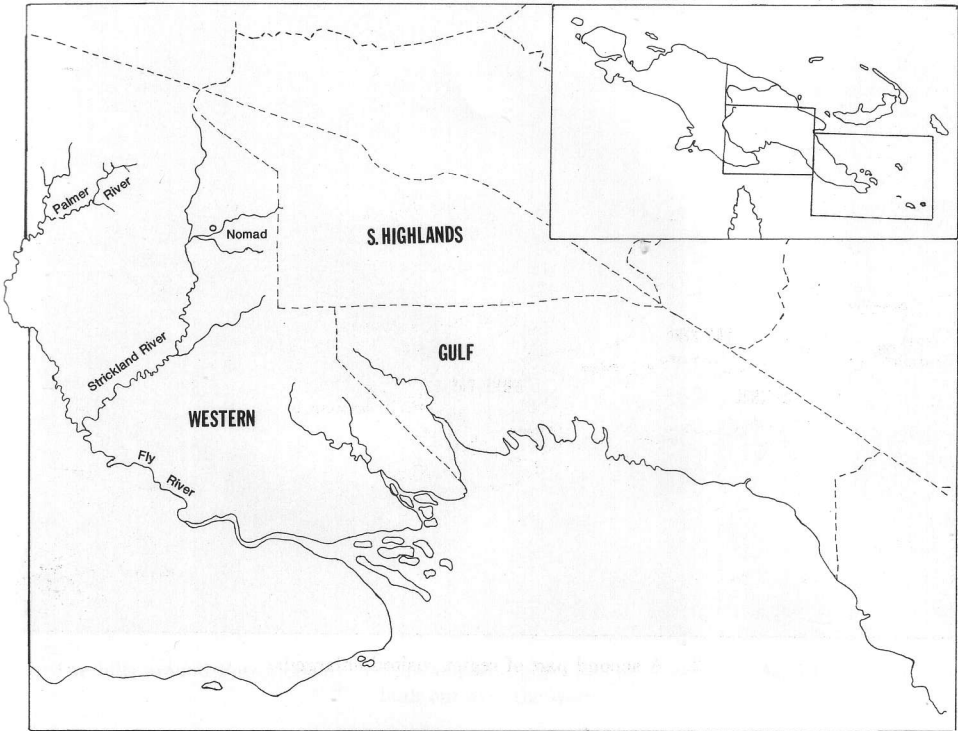
Papua, then, stretches from the Fly River Basin, at the border with Indonesian West Irian, to the D'Entrecasteaux and Louisiade archipelagos off New Guinea's southeastern tip. It encompasses vast areas of rain forest, great swamps, and long stretches of dry savanna along the coast. Some of the last tribes of people to be brought into the fold of modern civilization live in Papua, but here also

is the bustling modern capital of the nation, Port Moresby.

The Port Moresby Area

The senior author spent two weeks in the Port Moresby area in February of 1972, under the hospitality of Andrée Millar and the University of Papua New Guinea. Various trips were made from the city in the company of University field assistants, and on one trip we were joined by John Womersley from Lae.

We first drove westward from Port Moresby, along the Brown River Road, which goes through the savanna country that surrounds the city. This vegetation is dominated by grasses and a thin cover of scraggly *Eucalyptus* trees. There are occasional oases in the savanna, where water collects during the rainy season. In one of these we found a dense population of a species of *Livistona*, which reminded us of the Florida hammocks dominated by *Sabal palmetto*. Unfortunately, we were unable to find flowers or fruits among the *Livistona*. In another oasis further up the road, we found a densely wooded little water hole occupied by a population of *Ptychosperma microcarpum* and a few individuals of *Arenga microcarpa*. The *Ptychosperma* is an attractive, caespitose species related to *P. macarthurii*, but with its very narrow pinnae arranged irregu-



1. New Guinea and adjacent islands, with one part of region visited enlarged.

larly in various planes to create a plumose effect.

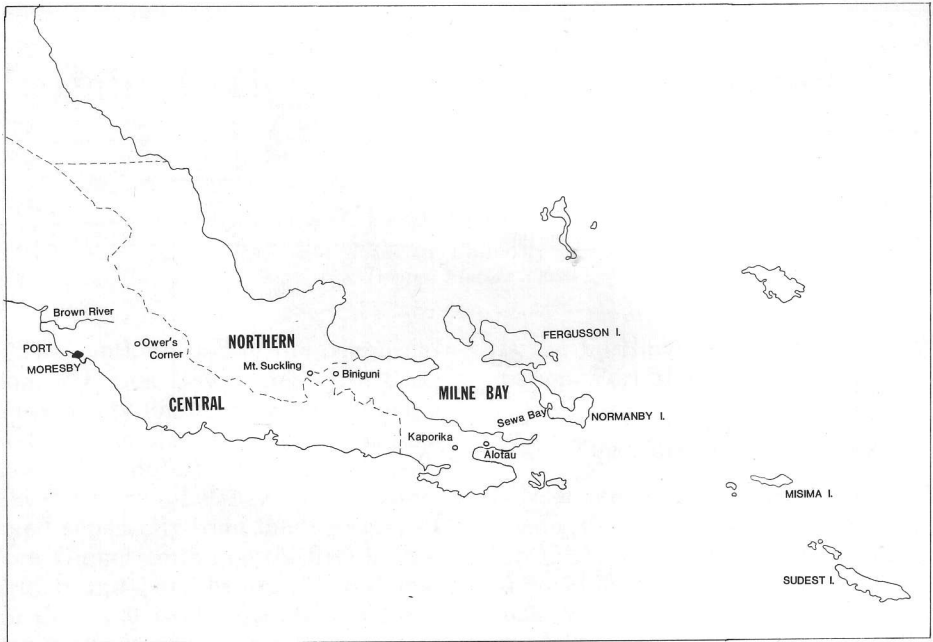
Shortly after passing the *Ptychosperma* oasis, the savanna gives way to rain forest. Along the road there are forestry nurseries, many logging areas, and some forest preserves. *Orania disticha*, a tall palm with its leaves arranged in a large fan, was common in this area. A rather robust species of *Calyptrocalyx* with bright red fruits about an inch long was also common.

Near the Kuriva River we found robust clumps of *Nengella* sp. growing along a streambank. This species had bright pink flowers as do most members of this genus. Also in the area, we found a small, single-stemmed *Ptychosperma* with narrow, evenly spaced pinnae, red flowers and inflo-

rescence axes, and black-purple fruits. This turned out to be a new species, which has been named *Ptychosperma streimannii*, in honor of Heinar Streimann who had collected a similar specimen a few years earlier.

The forest along the Brown River Road proved to be rich in palms. Other specimens collected included species of *Licuala*, *Areca*, *Cyrtostachys*, and an additional undescribed specimen of *Ptychosperma* with red flowers and broad, irregularly arranged pinnae. This one specimen was found in a logging area that was rapidly being demolished. It certainly represents a new species, but its naming has been held up in hopes that fruiting materials might be found.

Another road leads northward out of



2. A second part of region visited enlarged.

Port Moresby and winds into the Owen Stanley Range, eventually turning into the Kokoda Trail of World War II fame. We stopped at Rouna Falls, a local scenic attraction along the way, and found *Ptychosperma microcarpum* again, this time growing in the steep gorge along the river. At Ower's Corner, near the end of the paved road, we found a patch of forest and did some good collecting. The elevation here was about 2,200 ft. We found *Hydriastele* cf. *beccariana*, a very dainty *Calamus* with attractive orange fruit, a *Calyptrocalyx*, and a very small *Ptychosperma* with broad, wedge-shaped pinnae and red fruit. The *Ptychosperma* was *P. caryotoides*, which we had particularly wanted to find since it had been originally collected near Sogeri, not far from here. The species, as presently interpreted, is quite variable and widespread, with very robust forms in cer-

tain areas. The specimens from Sogeri and Ower's Corner, standing scarcely a meter tall, are the smallest known representatives of the species.

A final trip took us down the Rigo Road, which runs eastward out of Port Moresby. It was not too profitable as there is little forest and few palms along the road. We did find some populations of *Ptychosperma furcatum* growing along streams that ran through the savanna, however. This species is very similar to *Ptychosperma microcarpum*, differing only in the fact that its narrow, deeply furcate pinnae are regularly arranged along the rachis, instead of being clustered and variously angled.

The Milne Bay Region

Nowhere in New Guinea is the flavor of the South Seas more evident than in the Milne Bay Province. This



3. The hills around Port Moresby are covered with grass and scrubby trees. Note the native village built out over the water.

collection of mainland peninsulas and island archipelagos has been colonized by a variety of Melanesians, Polynesians and Micronesians all of whom build thatched huts beneath coconut palms beside incredibly blue lagoons. Outrigger canoes on the white beaches, naked brown children playing in the water, and the women in their rustling grass skirts all seem like props set up for the latest remake of *Mutiny on the Bounty*. Yet these are common sights along the endless coastlines of this province.

In October of 1972, Essig and Heinar Streimann joined some forestry personnel from Port Moresby on a cruise to inspect some sawmills around various islands of the D'Entrecasteaux and Louisiade chains. We departed from Alotau aboard the Poseidon, a small coastal service ves-

sel, and headed across the blue and rather calm sea toward Normanby Island. We were joined part way across by a school of porpoises who accompanied us for several miles. They seemed to take great delight in racing alongside the boat, frequently leaping over the surface of the water.

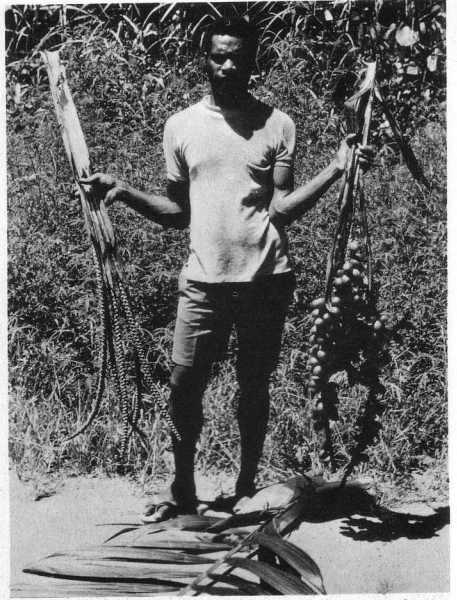
After passing many intriguing coastlines, we landed at Sewa Bay on Normanby Island. We set off exploring immediately and discovered some disturbed forest not far from the landing where there were many individuals of a slender, solitary *Ptychosperma* that had golden orange inflorescences and black fruit. The seeds, when cut revealed a ruminant endosperm, suggesting affinity with *P. elegans*. The unusual coloration of inflorescence and fruit, however, distinguish it as a new species which has been named



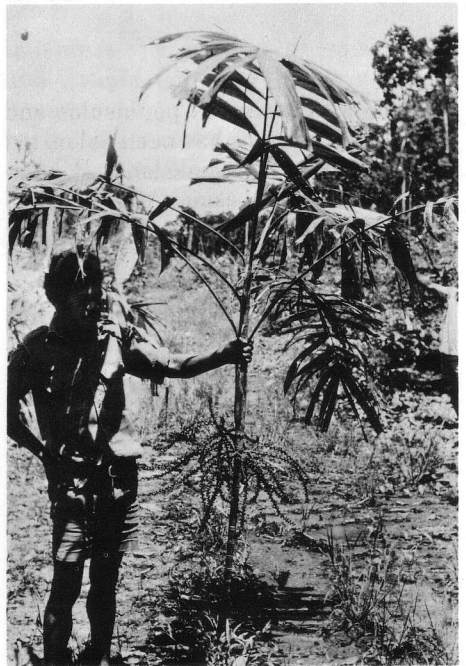
4. *Orania disticha* growing at the edge of the forest along the Brown River Road.

Ptychosperma mooreanum, in honor of Professor Moore of Cornell University (Essig 1975). Also in the area were specimens of *Orania lauterbachiana* and an undetermined *Calamus*.

Later in the day, a local forestry officer drove us up to a logging area in the center of the island. Here we were delighted to find another undescribed species of *Ptychosperma*. This one



5. Our assistant holding flowers and fruit of the large *Calyptrocalyx* found in the Brown River area.



6. The unnamed *Ptychosperma* salvaged from a logging area near the Brown River.



7. A coastal village beneath coconut palms, Milne Bay.

had narrowly wedge-shaped pinnae, bright red inflorescences and dark purple flowers. There were no fresh fruits, but the partially decayed remains of some seeds around the base of the palm revealed that the endosperm was homogeneous and that the species therefore belonged in subgenus *Actinophloeus*, probably close to *P. waitianum*. The new species has been named *Ptychosperma burretianum* after the famous German palm taxonomist, Max Burret. In the logging area there was also a small *Paralinospaxis*.

An earlier herbarium search had revealed that Leonard Brass had actually collected four very distinct *Ptychospermas* on Normanby Island, a surprising number of endemics for an island of this size. We didn't have time

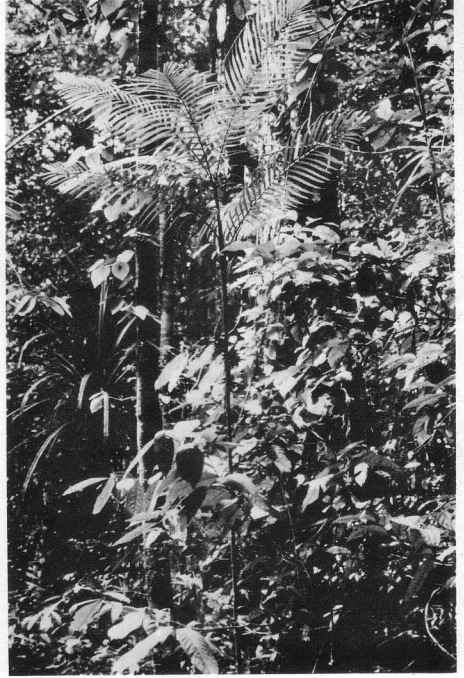
to find the other two species as they were from distant parts of the island.

We had to move on the next day and made a brief stop at Salamo on Fergusson Island. There we managed to get out and find some disturbed vegetation along the coast in which another species of *Ptychosperma* was growing. (We were becoming quite impressed by the diversity of this genus in this area!) This species proved to be *P. lauterbachii* which we had encountered earlier near Madang. In this population, however, all individuals were single-stemmed, rather than caespitose as in the northern populations. The orange fruit and weakly ruminant endosperm were unmistakable markers for the species, however.

The next four days passed quite pleasantly as we visited several small



8. *Ptychosperma waitianum* growing in the deep forest near Kaporika.



9. A delicate *Areca* sp. growing near Kaporika.

islands, but we did not find any palms. On Misima Island we collected *Caryota rumphiana*, a *Calyptrocalyx* sp. and an unidentified *Heterospathe*. We unfortunately could not go on the Rossel and Sudest Islands where still more unusual species of *Ptychosperma* had been collected in the past.

In May of 1978, Essig and Young returned to the Milne Bay Province, along with Michael Galore, and attempted to return to the islands. Our efforts to prearrange transportation had failed so we hoped to find some transportation by personally beating the bushes around Alotau, the main port for the province. After several days it became apparent that there was no transportation to be found at that time, so once again we had to give up on Rossel and Sudest Islands. For

the time being, we contented ourselves with a trip into the interior of the province.

The local government officer provided us with jeep transportation up to Kaporika Village at the end of the road leading northwestward out of Alotau. We were provided an empty house by the villagers and we were soon off exploring the woods. Michael had promised us that we would find *Ptychosperma waitianum* growing here, and sure enough it was the first palm we found, growing in relative abundance. It was a thrill to see this species growing wild. The senior author had described the species from herbarium specimens (Essig 1972) during his first stay in New Guinea. The species has also been growing at Fairchild Tropical Garden since first collected by Brass in 1956. *Ptychosperma waitian-*



10. The leaf and inflorescence of *Orania gagavu* found near Kaporika.

um is quite distinctive by virtue of its delicate dimensions, broadly cuneate pinnae, and reddish flowers covered with dark scales.

What we weren't prepared for was the discovery of another, closely related species of *Ptychosperma* growing in the same area. At first we thought we had an exceptionally tall individual of *P. waitianum*, but we found that the flowers were completely glabrous. Analysis of other features revealed it to be *Ptychosperma burretianum*, described earlier from Normanby Island. We later found this species growing abundantly along the road east of Alotan.

Also on our first day in the Kaporika area we found a *Cyrtostachys* sp., two forms of an *Areca* sp. related to *A. macrocarpa*, a *Calamus* sp., *Hydriastele* sp., and a *Nengella* belonging to



11. Leaves and infructescence of *Licuala lauterbachii* found near Biniguni.

the widespread species (cf. *N. pinangoides*).

On the following day, our target was Mt. Daraia, which rose up to the northeast of Kaporika Village. We managed to climb up to 750 m, collecting along the way and finding an acaulescent *Heterospatha*, a species of *Calyptrocalyx*, more of the same *Nengella* sp., and a large specimen of *Orania*, which turned out to be a new species on the basis of unique inflorescence characters. Our guides called the palm *gagavu*, which has been adopted as the scientific name (Essig 1980).

We returned to Lae, disappointed at not having gotten out to the islands, but at least not empty handed.

The Mount Suckling Expedition

In June and July of 1972, the Division of Botany in Lae, in conjunction with



12. The rugged and heavily forested terrain near our Mt. Suckling camp. The population of *Gulubia* sp. is barely discernible near the bottom of the picture.

several other institutions, mounted an expedition to the little known area of southeastern Papua New Guinea centering around Mt. Suckling. The principal objective of the expedition was to explore the unexplored higher slopes of the mountain, which reaches over 12,000 ft. Many scientists who were interested only in the lower elevations also participated, however. All of the botanists from Lae were involved in the expedition, as were biologists from the University of Papua New Guinea and other governmental agencies, from the Australian National University and CSIRO in Australia, the Bishop Museum in Honolulu, the University of Leiden in Holland, and various other places. The senior au-



13. One individual of the *Gulubia* sp. on Mt. Suckling.

thor spent several weeks at the low and intermediate level camps.

The lowest camp was located at the Biniguni airstrip in the Kwagira River Basin on the eastern side of Mt. Suckling. Biniguni had also served as a camp for the Archbold Expedition of 1953, during which Leonard Brass had made extensive collections of palms and other plants. In the lowlands, we hoped to learn more about the palms that he had collected, and of course we hoped to make new discoveries on



14. *Orania archboldiana* growing at the edge of the forest near Nomad.



15. An individual of *Rhopaloblaste* cf. *brassii* growing in the forest near Nomad.

the mountain. In the forests around Biniguni, particularly in the fine forest along Peria Creek, *Brassiophoenix schumannii* was abundant, recognizable by its peculiar three-pronged pinnae and large yellow fruits. A single-stemmed species of *Ptychosperma* with broad wedge-shaped pinnae, red fruits and seeds with ruminant endosperm was also common on the rocky, well-drained areas of the valley. This species has since been determined as a form of the widespread *Ptychosperma caryotoides*. Our collections here helped to tie together many seemingly distinct forms of this species. Also in the Biniguni area were common species of *Orania*, *Gulubia*, *Licuala*, and *Hydriastele*.

Before heading up the mountain, Essig and Streimann took a jaunt down toward Moi Biri Bay on the coast. We went through much swampy terrain and passed with great difficulty through an area of forest that had recently been flattened by a typhoon, ending up in a mangrove forest some distance from the open water. We passed through several friendly villages along

the way, and were invited at one point to share in some freshly boiled sweet potato that had been prepared in beautifully crafted clay pots. We also encountered a traveling tapa cloth salesman and his wife and acquired some finely decorated cloth from them. The only palms of interest were *Ptychosperma lineare* which occurred in dense populations in the swampy areas along the river. These are caespitose palms, very similar in appearance to *Ptychosperma macarthurii*, but with black-purple fruits rather than red fruits. We returned quickly to Biniguni to begin our trek up Mt. Suckling.

The flanks of Mt. Suckling are virgin wilderness, even to the tribes who live around it, but the trail up to the main expedition camp was well-worn by the time we went up. The wildlife

attested to the remoteness of this area. We were particularly struck by the abundance of hornbills, the large noisy birds reminiscent of the neotropical toucans, that are becoming scarce in many parts of New Guinea. There were also cockatoos and other birds, as well as many arborescent marsupials. After a day's walk and several terrifying river crossings (on slippery logs over rocky gorges) we arrived at Mai-u I, the main expedition camp. We were greeted there by some of the other biologists who had preceded us, and by a horde of local villagers from down the mountain who were retained to assist in the numerous camp and scientific activities.

The area around the camp was essentially undisturbed and palms were abundant. During the next week we made forays out in several directions from the camp. Our first find was a rather dense population of a species of *Cyrtostachys* growing on a steep slope. The palm had very slender, solitary stems and slightly glaucous, green leaf sheaths. Also growing on the steep slopes were specimens of an acaulescent *Heterospathe* bearing purple inflorescences and flowers. The species appears to be *Heterospathe delicatula*, which was first collected by Leonard Brass on nearby Mt. Dayman in 1953 and described recently by Moore (1969). There seemed to be an altitudinal gradient within the population. Specimens on the lower slopes had leaves rising to nearly 2 m, but as we went up a ridge not far from camp, the specimens were progressively smaller, until at the highest point we collected a mature, blooming individual scarcely 30 cm in height.

Our most interesting find on Mt. Suckling was a colony of a *Gulubia* sp. growing on a steep, exposed ridge only a short walk from camp. This species has slender stems, strongly arched

fronds, and red fruit. It is very similar to the species growing in the upper reaches of the Sepik River reported on earlier. These types of *Gulubia* with strongly arched pinnae seem to be widely scattered in New Guinea, apparently always on these high ridges, and seem to be more closely related to species from the Solomon Islands than to the common *Gulubia costata*. Other palms collected in the area were unremarkable, consisting of various common species of *Calamus*, *Areca*, *Hydriastele*, *Nengella*, and *Calyptrocalyx*.

Nomad

In April of 1978, Essig and Young visited Nomad, in the Upper Fly River Basin. We were accompanied by Karl Karenga and Yakas Lelean from Lae. The prospect of exploring this area intrigued us very much, as it was one of the last frontiers in the country. The various nomadic and cannibalistic tribes in the region had only come under governmental control after 1968. We therefore hoped to see elements of indigenous New Guinea culture here as well as to find some interesting palms. Leonard Brass, on the Archbold Expedition of 1936, had collected along the Fly and Palmer Rivers north of Nomad, and had found palms that were quite different from those of the eastern part of the country.

As the pilot of our small charter airplane was looking for the right airstrip, we noted that the terrain of the river plain was rather uneven. It consisted of numerous small hills, looking as though the ground had sunk or eroded around domes of harder material. Dense forest covered the entire area except for the small settlement itself, so we were optimistic about the prospects for collecting.

Landing at Nomad we were greeted

by the patrol officer, a young man native to the Central Province, who helped us settle into an unoccupied house. The same afternoon, we set off for the nearest patch of forest to see what the vegetation looked like. We were disconcerted as we passed the government headquarters to notice that the walls and floors of all the buildings were built entirely of palm logs. When we got into the forest our fears were confirmed. There were very few large palms present. In fact, during the next three days, we found that all the forest within walking distance of the settlement had been cleaned out of the large palms. Only *Orania archboldiana*, known locally as *tsukwa*, seems to have been left standing, for it is still fairly common. This species is odd in the genus in having plumose leaves (pinnae oriented in different directions).

Over the next few days we collected several species in the *Calyptrocalyx-Paralinospadix* complex, several specimens of *Nengella* that were not very different from others we had seen, a diminutive *Licuala*, several rattans, and very isolated individuals of larger palms. We felt very fortunate to find an individual of *Pinanga punicea* bearing nearly ripe fruit. This is a single-stemmed species and one of the larger members of the genus, our specimen being about 12 m in height and 6 cm in diameter. We also found a few individuals of *Rhopaloblaste* cf. *brassii* that were up to .16 m in height, and had narrow, spreading pinnae. We found many interesting gingers in the area, mostly alpinias, and spent some time collecting seeds of these.

Two of our local assistants informed us that there were several large palms that we had not collected yet growing in the forest around Honinabi, a mission station north of Nomad. It was farther than we could walk and return

in one day, and we could not move camp up there as we were expecting the plane to come for us the next day, so our two assistants volunteered to run up to Honinabi and collect the palms for us. They made the trek up and back in about 14 hours, returning with rather good collections of four palms. The first palm was the common sago palm, *Metroxylon sagu*. It didn't excite us particularly, but we kept it for a voucher. The second was *Hydriastele* sp. similar to what we collected in the Milne Bay Province. The third was *Caryota rumphiana*, also widespread and of little interest. The fourth however, was a *Ptychococcus*, apparently *P. archboldianus*, which is found only in the Western Province of Papua New Guinea, so we were glad to have it. This species has profoundly ruminant endosperm, unlike the *Ptychococcus elatus* of northeastern Papua New Guinea which has homogeneous endosperm. We of course didn't see the tree from which the specimen was taken, but judging from the leaf dimensions, it appeared that it was a rather robust palm, similar to *P. elatus*.

We finished packing up our specimens that evening, expecting our plane to come for us the next day. Unfortunately, bad weather kept our plane away for two extra days, but not knowing when it would come, we had to stick close to the airstrip and essentially wasted the whole time. We occupied ourselves with watching the native people come in and out of the market, reading, swimming, and cleaning seeds. Brad and Karl tried to catch fish in the river, but without any success. Finally the plane came and we were off to the Frieda River in the Sepik Basin (reported earlier).

This completes the description of our experiences in New Guinea. We hope that it has been of interest to all

palm enthusiasts and that it will stimulate others to visit this beautiful country and find more of the many palms known to occur there.

Acknowledgments

We are indebted to the National Science Foundation, grants #GB-20348X and DEB 77-17319, for making this field work possible, and to Michael

Galore and the Division of Botany-Lae for much additional support.

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Notice

The Southern California Chapter has chartered a small ship for a trip to Guadalupe Island on the coming Memorial Day weekend. If you are interested contact: Al Bredesen, 2347 Peppermint Lane, Lemon Grove, CA 92045.

News Relating to Harold E. Moore, Jr.

A Contribution

The Palm Society has contributed \$2000 to the Harold E. Moore, Jr. Memorial Fund, Cornell University, Ithaca, N.Y. Proceeds from the fund will support projects on palms, tropical research, and other work that was of special interest to Dr. Moore.

The Genera Palmarum

John Dransfield spent December 1-11 at Cornell University in consultation with Natalie Uhl, and David M. Bates, Director of the L. H. Bailey Hortorium, on plans to finish the book that Dr. Moore had worked toward for 32 years. A proposal is drafted and if all goes well, Dransfield and Uhl assisted by Bates and others will begin work in July 1981 and hope to complete *Genera Palmarum* in three years.

A Special Memorial

The editors are working on a memorial for Professor Harold E. Moore, Jr. to appear in Volume 26, 1982. If you would like to contribute articles, letters, anecdotes however short, or photographs relating to Hal Moore and his lifetime of work on palms, please send them to us as soon as possible for consideration.

JOHN DRANSFIELD
 NATALIE UHL