

PRINCIPES

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THE PALM SOCIETY

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Cover Picture

Pollen of *Nengella*, ×2,200. From *Essig LAE 55167*, photograph by M. V. Parthasarathy. For a photograph of *Nengella* itself, see pages 8, 13.

PRINCIPES

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Palm Collecting in Papua New Guinea. II. The Sepik and the North Coast

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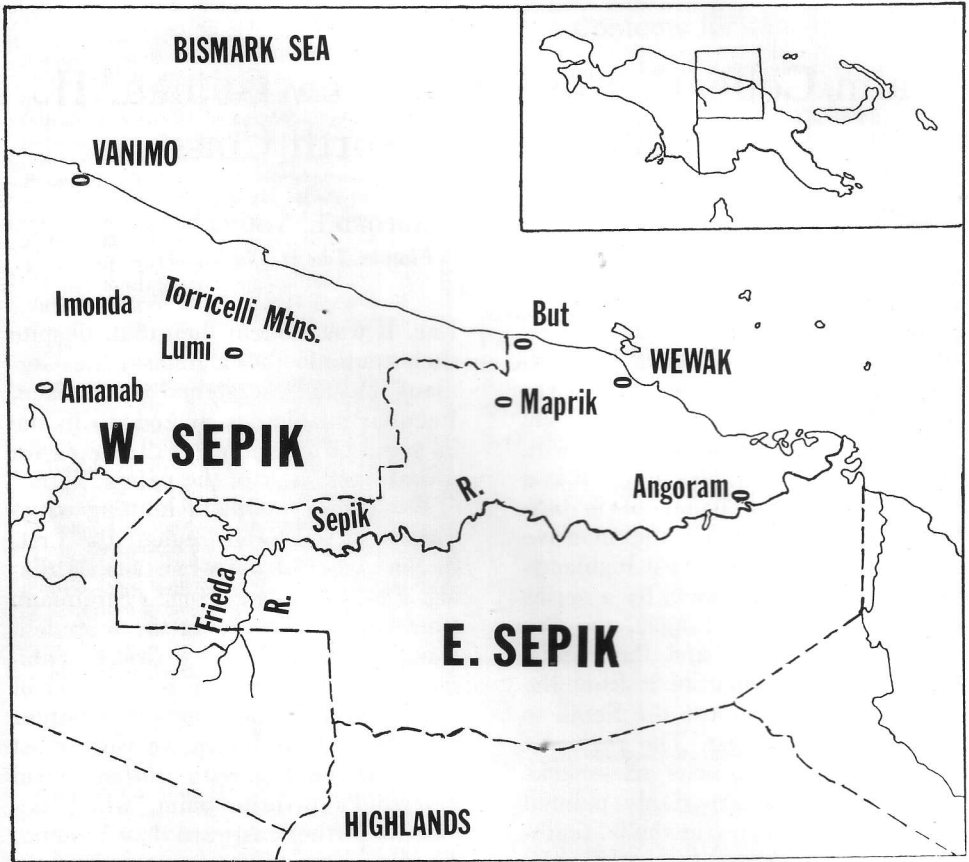
The northern part of Papua New Guinea is dominated by the Sepik River and its many tributaries. This river system forms a basin 250 miles long and up to 100 miles wide. Filled with jungles, swamps and savannas, it is a miniature Amazon basin. It is bordered on the south by the massive Central Range and the vast highlands beyond, and on the north by a series of ancient mountain ranges, the Bewani, the Torricelli, and the Prince Alexander, that separate it from the Bismarck Sea and force the Sepik to mouth far to the east. The region is famous for its indigenous art—masks and carvings that are richly painted and studded with cowrie shells, feathers and other ornaments—and for the steep-roofed *haus tambaran* (spirit house) found in every village.

The region has also proved to be extremely rich in palms, perhaps the richest in New Guinea. Many palms were discovered and named by the Germans during their brief colonial venture on the island around the turn of the century. Their specimens were rather meager, however, and for the most part were lost during bombing raids on Berlin during the Second World War. Although the Archbold Expeditions were exploring southeastern New Guinea during the 1920's and 1930's, exploration of the Sepik region did not pick up until the 1950's with the expeditions of the CSIRO from Australia and the Division of Botany in

Lae. It was evident then that, despite their teutonic thoroughness, the Germans had only scratched the surface. Peculiar specimens picked up in the 50's and 60's lured us to the Sepik for a first hand view of the palms there.

We made two palm hunting expeditions to the Sepik region, the first, in November of 1971, consisted of Essig, Paul Katik, and Heinar Streimann from Lae, and Nick Martin, a student from Australia. We flew first to Vanimo, in the far northwestern corner of Papua New Guinea, near the border with West Irian. Here we were most eager to see *Pigafetta filaris*, David Fairchild's favorite palm, which occurs no further eastward than Vanimo. There were several specimens in town, and we found many more in the forest west of town. These palms truly live up to their reputation. The trunks are a magnificent glossy green, resembling a giant bamboo. The crown consists of beautiful arching pinnate leaves. The petiole and sheath are lined with undulating, spiny ridges. The branches of the inflorescence hang in a single plane, like a fine beaded curtain. The fruits are small, somewhat larger than peas, and are covered by the small overlapping scales characteristic of the lepidocaryoid palms. Magnificent as they were, however, the *Pigafetta* were only the beginning of our exciting finds in the Sepik region.

As we headed down the road from



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

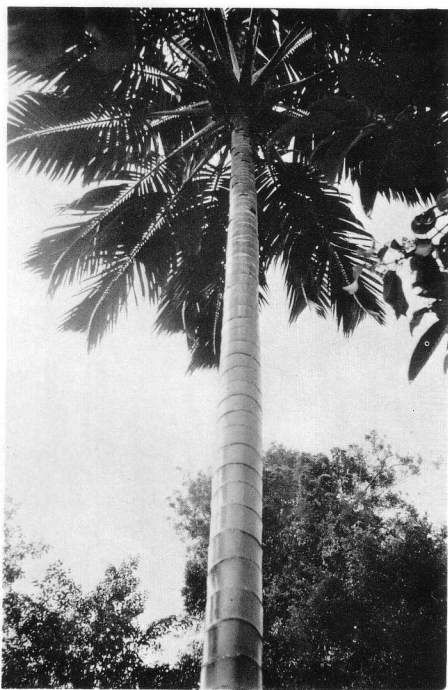
Vanimo toward the border with West Irian, we passed several magnificent beaches: crescents of white sand lapped by crystal clear, blue water. We were only a few degrees from the equator here. Trees behind the beaches were loaded with bird's nest ferns and other epiphytes. In one small grove of trees, growing beside a stream that was just entering the sea, we spotted a clump of palms. It was a clustering *Ptychosperma* bearing dull reddish fruits. Experience with this genus had already taught us that dull red fruits become black-purple at maturity. So this specimen matched

several other black-fruited specimens that had been collected along the north coast, and the locality here was the closest approach yet to the original collecting site of *Ptychosperma schefleri* along Humboldt Bay just to the west of us. We were sure that we had found wild material of this long-cultivated species.

In the next two days, we collected fifteen different palm species, including a couple of *Licuala*, a *Cyrtostachys*, several rattans, *Hydriastele microspadix*, and *Areca*, a *Calyptrocalyx*, *Actinorhytis calapparia*, and most notably, *Pinanga punicea*. Like



2. *Pigafetta filaris* rising above the forest near Vanimo.



3. A close-up view of the trunk and crown of the *Pigafetta*.

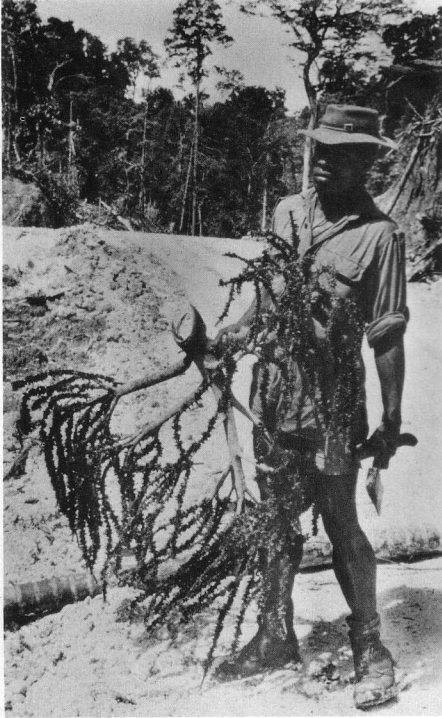
the genus *Pigafetta*, *Pinanga* is found no further east than the Vanimo area, though it is found at a corresponding longitude in the Fly River Basin to the south. *Pinanga punicea* is a tall, single-stemmed member of the genus. The fruit are red at maturity, but those on our specimen were unripe.

From Vanimo we took a small plane over the mountains into the Sepik Basin, to the outpost of Amanab. Almost immediately upon landing, we were struck by a very large palm growing on the perimeter of the post. It had very stiff, upright fronds, but we could see little else until the next day when we walked over to the palm and collected some material from it. It was an *Orania* that later proved to be a new species. Essig (1980) has given it the name *Orania glauca*, because the in-

florescence axes are devoid of scales and covered with a waxy bloom. This and other features distinguish the species sharply from all others known.

Aside from the *Orania*, Amanab was disappointing. We drove for several miles along a dirt road out of the settlement, but saw only poor secondary forest. The only other palm we found was a *Hydriastele microspadix*.

From Amanab we flew to another small patrol post, Imonda, in another part of the Sepik Basin. Here collecting was better. We found a *Licuala*, several species of *Calyptrocalyx*, a *Nengella*, and a *Ptychosperma*. The latter was a small, solitary, undergrowth palm with reddish flowers and black fruit. It was later determined to be *P. cuneatum*, described many years earlier from the Lake Sentani



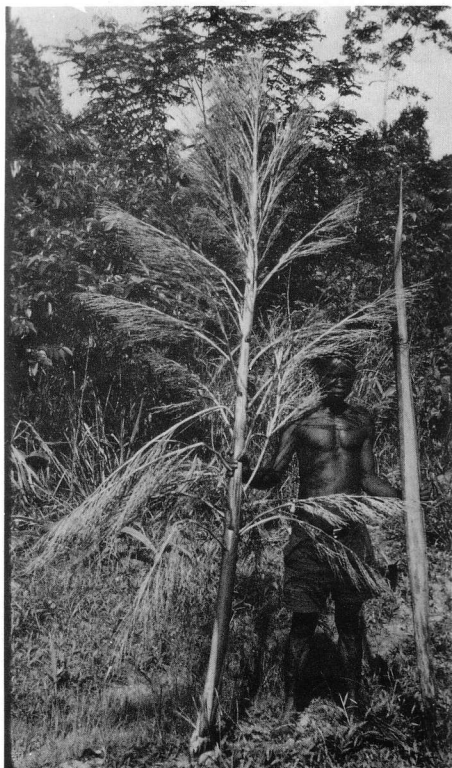
4. Our assistant holds the inflorescence of a *Cyrtostachys* collected near Vanimo.

area south of Humboldt Bay in West Irian.

We had to borrow some alcohol from the medical clinic at Lumi for use in preserving our specimens. We followed the standard technique used by the forestry botanists in New Guinea of bundling our freshly pressed specimens in plastic bags and saturating the papers with alcohol. The way we were moving around, it would have been impossible to dry out specimens in the field. Once doused with alcohol, they can be kept wrapped up for indefinite periods of time and dried back at the herbarium when convenient. The only drawback is the problem of maintaining a supply of alcohol in the field, because flammable materials cannot be carried on a plane with passengers.



5. *Orania glauca* thrusts its bold foliage above the surrounding vegetation near Amanab.



6. The inflorescence of *Orania glauca* dwarfs our assistant.



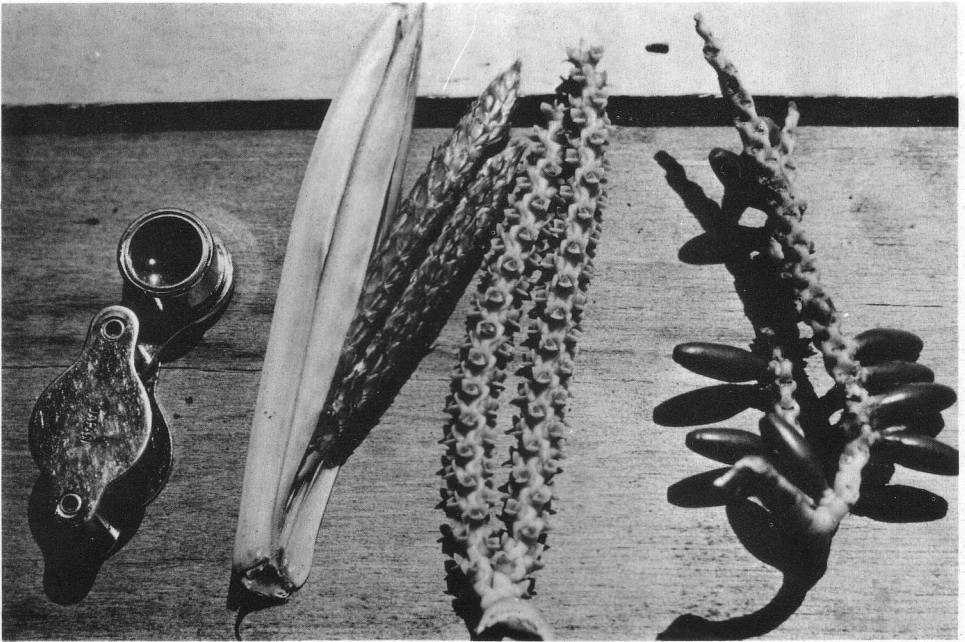
7. The fruit of *Orania* can be one-, two-, or three-seeded, as displayed here.

We usually had to have drums of alcohol shipped ahead of us.

With our specimens all packed away, we boarded another small government charter plane and flew back to Vanimo. We had only a short stop-over there, however, before joining some other forestry officials on an inspection trip to Angoram near the mouth of the Sepik. While the foresters were inspecting a logging operation, we had a couple of hours to do some exploring. Setting off on the road leading out of the post toward the village of Gavien, we were fortunate to find a small patch of forest that was literally full of palms. Within half an hour we were able to collect specimens of five different species of

palms, and there were several rattans that we didn't have time for. We collected a small *Licuala* with bright orange fruits, *Brassiophoenix schumannii*, *Ptychosperma lauterbachii*, a small *Calyptrocalyx*, *Hydriastele microspadix*, and some fruit only from a *Ptychococcus*.

The last leg of our trip was back up to the north coast, to Wewak, a pleasant little town that had been a Japanese stronghold during the Second World War. Our first afternoon in town was spent touring the Japanese war memorial and taking a swim in the warm, clean Bismarck Sea. The next day we set off on the road leading out of town to the west. Our destination was the small village of But, where Roy Pullen, another botanist from Australia, had collected an interesting little *Ptychosperma* a few years back. Along the way we made collections of *Ptychococcus* (*elatus?*), *Gulubia costata*, and *Orania lauterbachiana*. At But, we hired some assistants who led us quickly to the population of *Ptychosperma*. The species, which has since been named *Ptychosperma pullenii* (Essig 1978), is a small, single-stemmed palm with wedge-shaped pinnae, similar to *P. waitianum* and *P. cuneatum* but with delicate, salmon-colored in-



8. The delicate inflorescences and fruit of a *Nenggella* sp. from near Imonda. Pistillate flowers are at anthesis in the central inflorescence.

florescences, purplish flowers, and black-purple fruit.

We returned to Wewak that afternoon and the next day headed south in a forestry jeep toward Maprik, a major cultural center of the Sepik. We saw little forest and few palms on the trip, but we did find one little boggy patch of forest beside the road a few miles east of Maprik. Stopping to investigate, we were delighted to find a totally new species of *Ptychosperma*. This one was growing on little mounds of black muck rising from the flat swampy terrain, a unique habitat for *Ptychosperma*. The species, named *Ptychosperma vestitum*, has wedge-shaped pinnae and reddish inflorescences, so it belongs in the same section of the genus as *P. waitianum* and the others mentioned above. Its most distinctive characteristic is the coating

of unusual hairlike scales on the undersurface of the pinnae.

We returned to Lae quite happy with the many palms we had found, but knowing that if we could return to probe deeper, we would find many more.

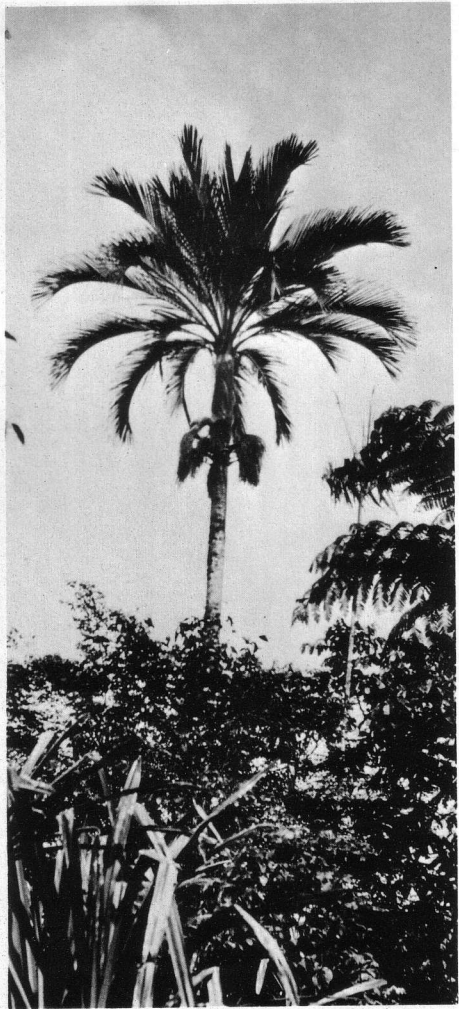
In April of 1978, Essig and Young, accompanied by forestry botanists, Karl Karenga and Yakas LeLean, returned to the Sepik region for a more intensive probe of a small area. We wanted to get into the foothills of the central highlands along the northern rim of the Sepik, since the Germans had done some collecting here in the early days, to learn more about some of their poorly known species. We were extremely lucky to find that there was a mineral exploration camp along the Frieda River, a perfect location for our purposes, and that the owners of

the camp were quite hospitable to scientists. So we visited the Frieda River for about a week as the guests of the Carpentaria Exploration Company, a joint Australian-Japanese venture testing copper deposits in the area for their mining potential. The area is rough and would have been nearly inaccessible without the resources of Carpentaria. We would have had to come in the way the Germans did, by canoe and foot, and it would have taken us months.

We were flown in to the lower Carpentaria camp by the company plane and learned almost immediately what kind of treatment we would have as we sat down to lunch. We were treated to cold fruit juice, fresh meat and vegetables, and had ice cream for dessert! We were then shown to very comfortable quarters, with real beds and hot showers. When we later learned that the company helicopter would be available to take us to any of the dozens of landing pads the company had built in the surrounding area, and that their boat would take us anywhere along the river, all at no cost to us, we realized that we had reached botanist's heaven.

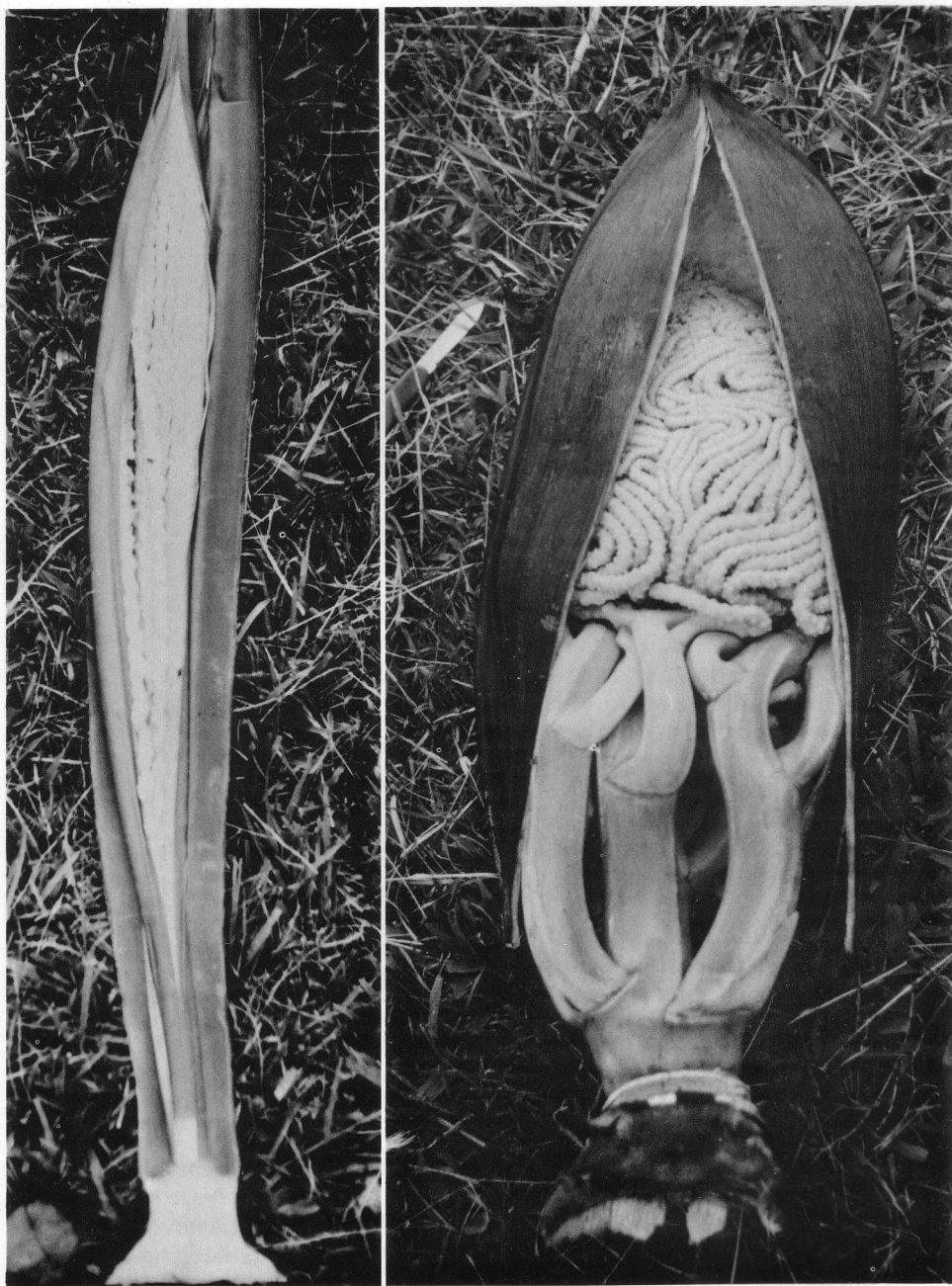
The airstrip camp is located beside the Frieda River at nearly its uppermost navigable point. Steep mountains descend to the river, which is about 60 meters in elevation here, on both sides. We did our first collecting in the secondary forest near the airstrip, where we found a caespitose *Calyptrocalyx*, and a small, solitary *Licuala* with orange fruit that proved to be common along the streams of the area. Also of note on that first day was a rather tall ginger with a panicle of blue fruit. It was the first of many odd gingers we were to see in the area.

The next morning, we headed upstream in the company jetboat to where a clear stream enters the muddy

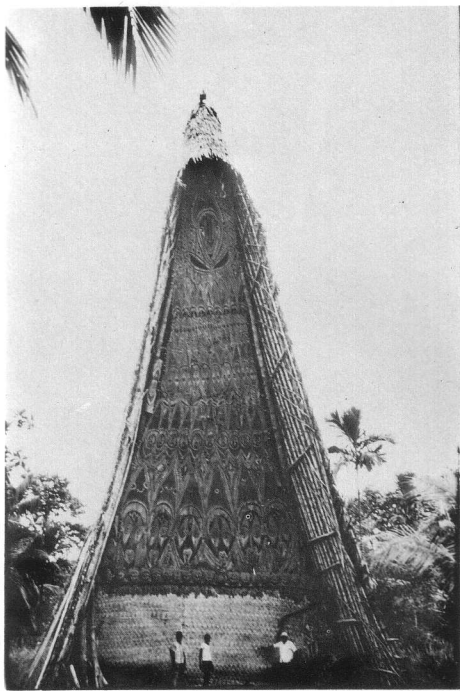


9. An undetermined *Gulubia* growing near Lumi.

Frieda several kilometers from the camp. Along the way we saw the beautiful New Guinea flame vine, *Mucuna bennettii*, with its hanging racemes of brilliant scarlet blossoms. As the native driver roared into the crystal clear water of the side creek, the first striking sight was an attractive *Calyptrocalyx* growing along the bank. The palms had slender, solitary stems and



10. Contrasting forms of packaging in palm inflorescences. That on the left is of the *Gulubia* sp. pictured in Figure 9. That on the right is of a species of *Rhopaloblaste* growing in the same area.



11. An example of a "haus tambaran" standing near Maprik. This spirit house can be entered only by men.



12. *Ptychococcus* cf. *elatus* growing near Lumi.

were about 5 meters tall. The two-meter-long leaves were dark red upon emergence and the pinnae were irregularly arranged. The infructescences each consist of six elongate spikes covered with red fruit. Adjacent to the creek the terrain was swampy, and we found a *Nengella* similar to that found throughout northeastern New Guinea, and a fairly large *Licuala* with orange fruit.

On the south side of the creek, the swampy ground gave way to a gentle slope, upon which we found an attractive *Cyrtostachys*, growing to about 20 meters in height, and possessing a pale green, slightly glaucous crownshaft. Specimens of *Hydriastele microspadix*, which seems to be almost everywhere in northern New Guinea, were common, as were specimens of

what appears to be *Rhopaloblaste ledermanniana*. Our most surprising discovery, however, was a totally new species of *Orania* growing on the slopes. The species has been named *Orania parva* (Essig 1980) because of its rather small dimensions. The tallest individuals were no more than four meters in height and the stems about eight centimeters in diameter. The small, glabrous, simply-branched inflorescences were in early fruit in all the specimens we could find.

The slope ran abruptly into a rather steep ridge that appeared to consist of a pile of limestone boulders covered with tree roots and moss. Footing became treacherous as we moved upward. An attractive pitcher plant (*Nepenthes*) was common, but palms were few on the steep slope. Our efforts were well rewarded, however, when

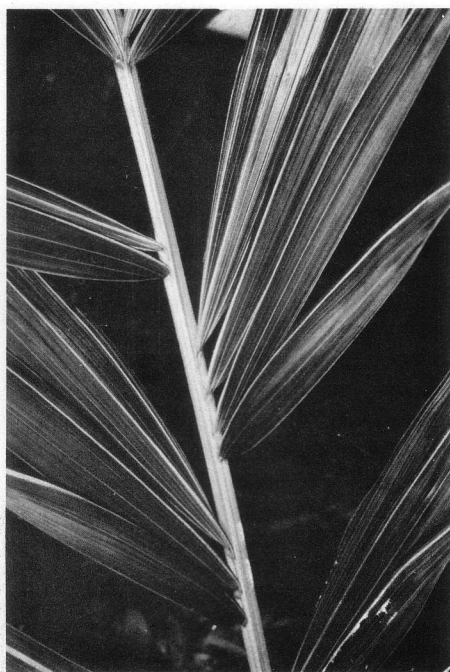


13. Brad holds a leaf and an inflorescence of a *Calyptrocalyx* sp. growing near the Frieda River airstrip.

we found a very different-looking *Nengella* growing in full sun on the exposed ridgetop. This species had a single trunk, and leaves with more numerous and more elongate pinnae than the common lowland form. Also, the flowers were lavender and white, as opposed to the bright pink flowers of the other known species.

On our last day at the airstrip camp, we took the jetboat downstream into the swampy forest of the Sepik floodplain. We found *Gulubia costata* and the same *Licuala* as the day before. There were some interesting gingers and other herbaceous monocots, but no new palms.

The next day, we moved by helicopter up to the main Carpentaria camp, where conditions were even more comfortable. This camp was several



14. The leaf of another species of *Calyptrocalyx*, in which the pinnae are clustered.

kilometers south of the airstrip camp and had been built and supplied entirely by helicopter. We will not soon forget the view of the river and the un-



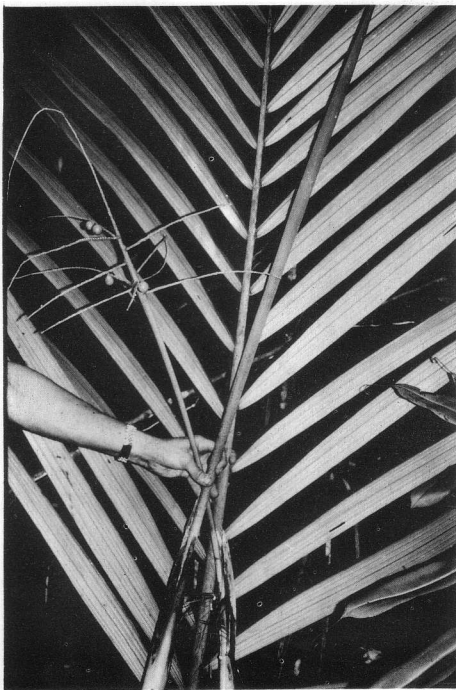
15. A pitcher plant of the genus *Nepenthes* is abundant on the rocky slopes east of the Frieda River.



16. An undescribed species of *Neggella* growing on exposed ridges above the Frieda River.

touched blanket of rainforest we had on our first helicopter trip that morning. We explored the area immediately around camp that afternoon and made plans for the next day's collecting trip.

In the morning, we were ferried up to the helicopter pad on Antap Mountain at an elevation of 1,390 meters. The four of us from Lae were joined by two guides from the company. We were instructed to descend to another helicopter pad a few kilometers away by 6 that evening. Near the pad the forest was wet and mossy. The first palm encountered was a dainty pencil-thin rattan (*Calamus*) that unfortunately bore neither flowers nor fruit. Descending into the montane forest via a rocky creek bed, we encountered an astonishing abundance of palms. One



17. A young infructescence of *Orania parva*, a new species discovered near the Frieda River.



18. The Carpentaria Company helicopter ferries part of our party up to a mountaintop landing platform.



19. *Gulubia* sp. growing in the mountains above the Frieda River.

species after another greeted us as we moved down the creek. First was a small single-stemmed *Heterospathe*, flowering and fruiting within arm's reach. There were two or three species of *Calyptrocalyx* along the way, a form of *Areca macrocalyx*, and a large *Licuala* with orange-red fruits the size of ping pong balls. We found also some specimens of *Orania lauterbachiana* in which the inflorescences are densely red-brown-tomentose. We hunted for specimens of a large *Livistona* bearing red fruit that we had seen from the helicopter, but found only a few sterile individuals. It took us some time to find the lower helicopter pad, as it had become overgrown with weedy vegetation and young trees. With visions of having to spend the night there, we set to work furiously to clear the pad before the helicopter



20. A juvenile specimen of the mysterious *Livistona*, of which mature, red-fruited specimens were spotted from the air.

arrived. A brief rainstorm dampened our hopes of getting back to our luxury accommodations that night, but the helicopter pilot did manage to find us just before it became too dark.

The next day, we were dropped off at helicopter pad number K-27 on a ridge 1,000 meters in elevation. Our goal this time was to walk from here back to the camp. From the helicopter pad we could see many individuals of a *Gulubia* species with very slender trunks and strongly arched leaves. It was in all stages of flowering and fruiting, so we were easily able to collect good specimens. The fruit were bright red, globose, and the size of peas. It appears to be the *Gulubia crenata* described by Beccari from the German collections of many years ago. Also, along these ridgetop areas we found again the single-stemmed, lavender-flowered *Nengella* that we had found earlier. We made our way back to camp with little incident, but found no other palms of interest. We occupied

ourselves that day by collecting gingers, of which there were many, including some dainty epiphytes.

Our time at Frieda was over the next day, so we bid farewell and boarded the Carpentaria plane for a flight back to Madang and Lae. On the way we had exceptional views of much of the Sepik basin. The foothills were covered with virgin forest and largely uninhabited. The lowlands were largely swampy and filled with vast populations of the sago palm, *Metroxylon sagu*. The large terminal inflorescences of these palms looked like a field of daisies from the air.

Another brief foray into the Sepik had ended, but we knew that this re-

gion would be fertile hunting ground for palms for many years to come.

Acknowledgments

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An Invitation to Contribute to Principes

The goal of *PRINCIPES*, Quarterly Journal of The Palm Society, is to inform its readers about palms in all their aspects. Members of The Palm Society, are invited to contribute manuscripts likely to be of general interest as lead articles or in any of the regularly featured sections—Culinary Notes, Letters, Natural History Notes, Notes on Culture, Palm Briefs, Palm Literature, Palm Portraits, Questions and Answers, Photo Gallery, What's in a Name?, or comparable headings. Material for classified ads or News of the Society should be forwarded to the Editors. Materials of a horticultural nature or experiences in growing palms are particularly welcome. Articles are normally reviewed by one or two qualified persons for accuracy and suitability before they are finally accepted for publication. Authors will be sent proofs of their articles and will have an opportunity to order reprints from the printer before publication if desired. Authors of one page or more of print are entitled to six copies of the issue in which their article appears.

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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.

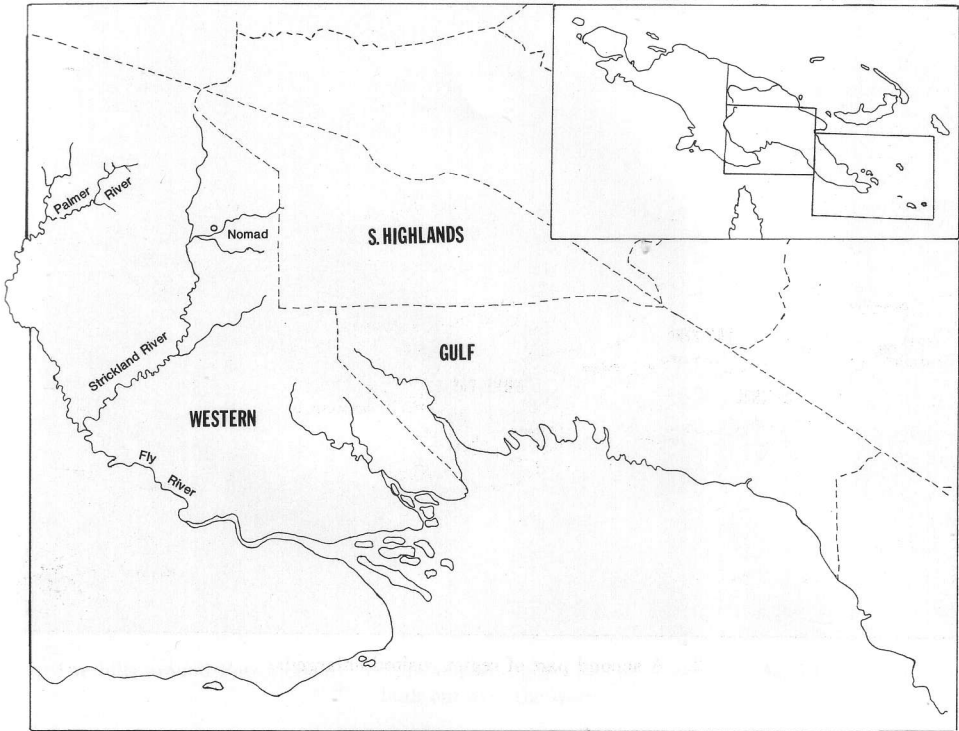
Papua, then, stretches from the Fly River Basin, at the border with Indonesian West Irian, to the D'Entrecasteaux and Louisiade archipelagos off New Guinea's southeastern tip. It encompasses vast areas of rain forest, great swamps, and long stretches of dry savanna along the coast. Some of the last tribes 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.

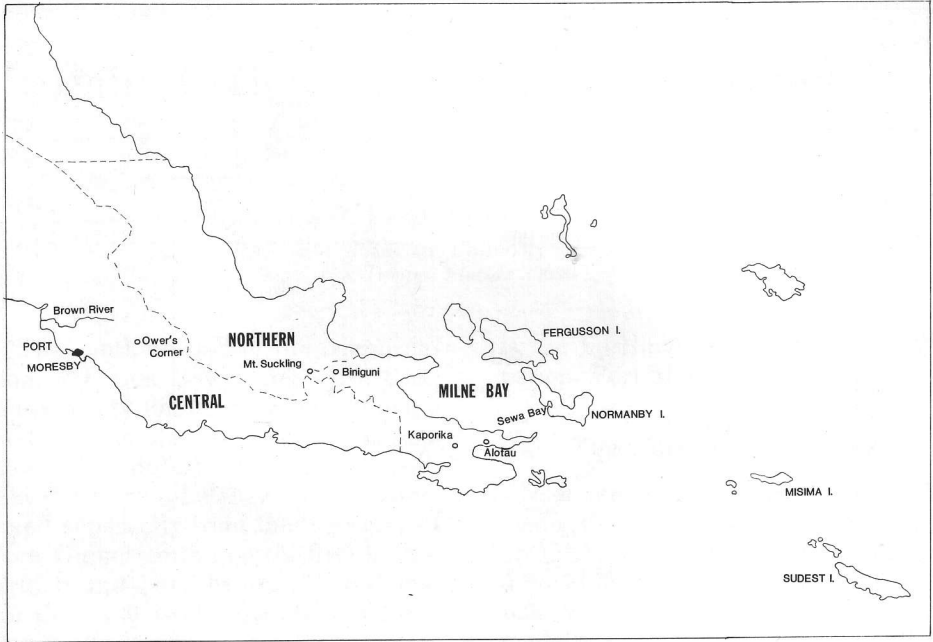
Shortly after passing the *Ptychosperma* oasis, the savanna gives way to rain forest. Along the road there are forestry nurseries, many logging areas, and some forest preserves. *Orania disticha*, a tall palm with its leaves arranged in a large fan, was common in this area. A rather robust species of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

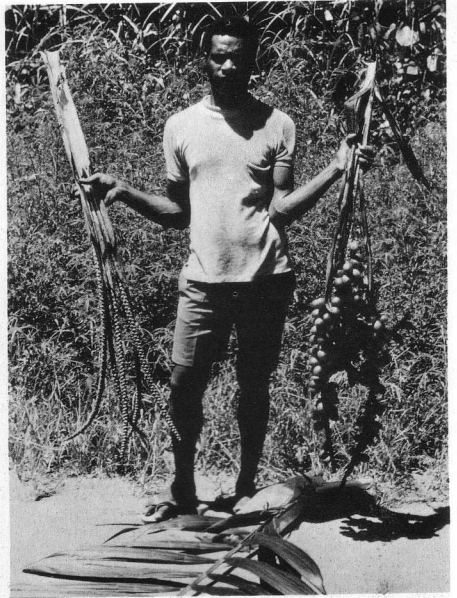
After passing many intriguing coastlines, we landed at Sewa Bay on Normanby Island. We set off exploring immediately and discovered some disturbed forest not far from the landing where there were many individuals of a slender, solitary *Ptychosperma* that had golden orange inflorescences and black fruit. 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



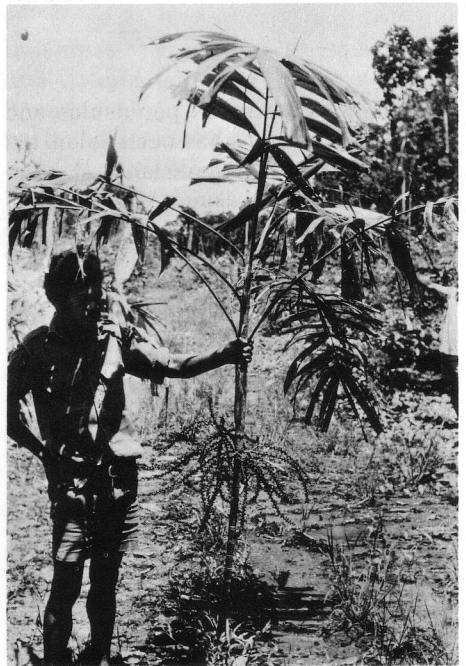
4. *Orania disticha* growing at the edge of the forest along the Brown River Road.

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

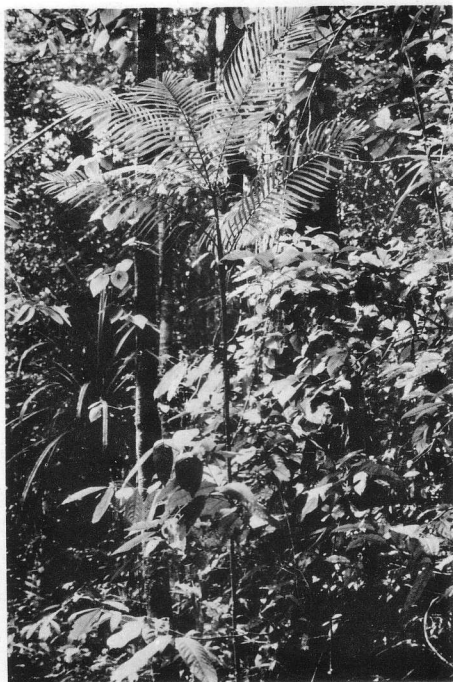
to find the other two species as they were from distant parts of the island.

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.

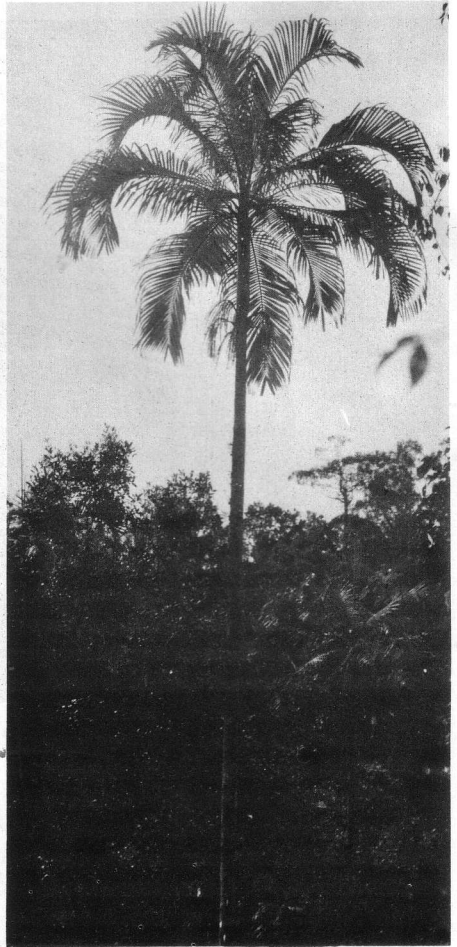
The Mount Suckling Expedition

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.

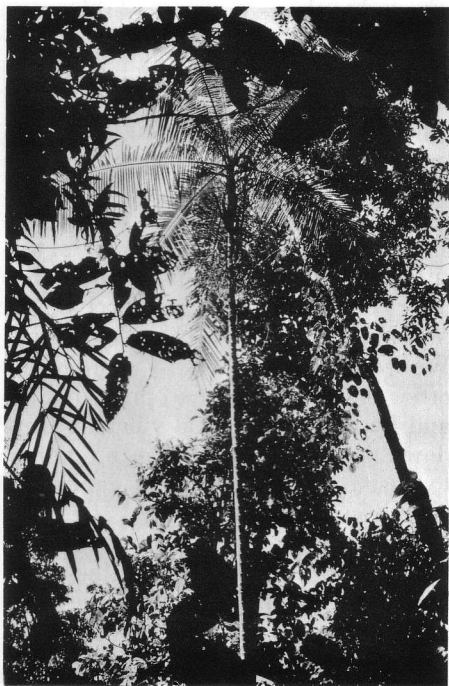
The lowest camp was located at the Biniguni airstrip in the Kwagira River Basin on the eastern side of Mt. Suckling. Biniguni had also served as a camp for the Archbold Expedition of 1953, during which Leonard Brass had made extensive collections of palms and other plants. In the lowlands, we hoped to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

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



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

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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 ———. 1980. The genus *Orania* Zipp. (Arecaceae) in New Guinea. *Lyonia* 1(5): 211-233.
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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 Herbarium, 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

Principes, 25(1), 1981, pp. 29-35

Odoardo Beccari (1843-1920)

HAROLD E. MOORE, JR.¹

*The L. H. Bailey Hortorium, Division of Biological Sciences,
Cornell University, Ithaca, NY 14853*

Odoardo Beccari, one of the great students of palms, was born in Florence, Italy, on 16 November 1843. His mother, Antoinetta Minucci, died soon after his birth and his father, Giuseppe di Luigi Beccari, in 1849, so he was brought up by a maternal uncle. On 26 April 1853, he entered a school in Lucca, the Collegio Fernandino, where his love for botany was nurtured by the Vice Rector and Prefect of Studies, the Abbé Ignazio Mezetti. Upon completion of his studies at Lucca in June 1861, Beccari commenced studies in the Faculty of Natural Science of the Royal University of Pisa, where he distinguished himself, especially in botany, so much so that the celebrated botanist Pietro Savi made him an assistant to the Chair of Botany in January 1863, while he was still an undergraduate. Dissatisfied with the conservatism of Savi, however, Beccari gave up his assistantship and transferred to the University of Bologna from which he graduated on 1 July 1864. Thereupon commenced a period of 14 years devoted largely to botanical exploration in Borneo, Sumatra, and New Guinea.

Beccari as Explorer

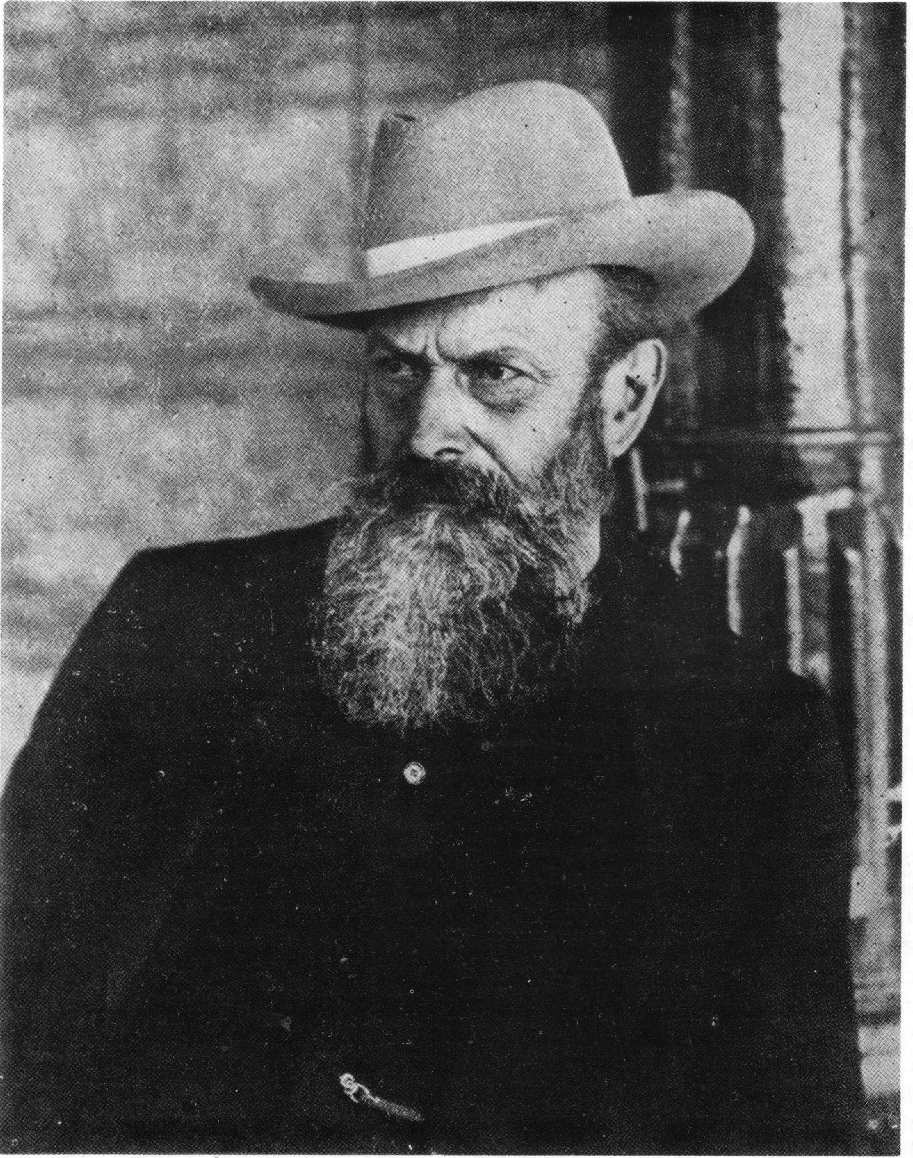
Shortly after graduation, Beccari visited Genoa and there met Giacomo

Doria, an impassioned naturalist, patron of science, and founder of the museum at Genoa that bears his name. The two young men, counselled by the celebrated naturalist and explorer John Ball, decided to explore Sarawak in Borneo. As part of his preparation, Beccari spent the period from February to April 1865, studying in the herbaria of the British Museum and Kew in London, where he met Sir William Hooker and Joseph Hooker, Charles Darwin, and Sir James Brooke, the Rajah of Sarawak, who assured him of the assistance of the Tuan Mudah, Charles Brooke, in Borneo.

Beccari sailed from Southampton on 4 April 1865 and met Doria and his own brother, Giovanni Battista Beccari, at Suez. Then, by way of Aden, Ceylon, where Beccari visited the Botanic Gardens at Peradeniya and made his acquaintance with the tropical flora, and Singapore, the voyagers arrived at Kuching, capital of Sarawak and their base of operations. Beccari's brother left for Japan after three months and Doria returned to Italy in March 1886, but Odoardo Beccari remained for nearly three years until January 1868, when he returned to Florence to work on his collections. His experiences have been set forth in his book *Nelle Foreste di Borneo* (1902) translated as *Wanderings In the Great Forests of Borneo* (1904).

Despite further exploration in Ethiopia from February to October 1870, Beccari's fascination with tropical

¹ Based on a translation by the late Russell B. Kurtz of a much more extensive article by Beccari's student, Count Ugolino Martelli, in *Webbia* 5: 295-353. 1921.



1. Odoardo Beccari. Photograph from *Reale Società Geografica Italiana Bolletino*, series 5, 12: 190, 1923 from the collection of R. B. Kurtz.

places was not satisfied and on 26 November 1871, after steeping himself in geodetics, astronomy, and meteorology, he set out from Genoa for New Guinea with Luigi Maria d'Albertis, an

Italian gentleman who was passionately fond of hunting and natural history. Aden, Bombay, Singapore, and Jakarta (Batavia) were among their ports of call and from the last Beccari had an op-

portunity to visit the famous botanical garden at Bogor (then Buitenzorg) and to climb Mt. Megamendung and Gunung Pangarango. Further stops were made at Flores, Timor, Banda, and Ambon (Amboina) before the explorers reached New Guinea on 4 April 1872. There, despite many difficulties, they were able to land at the small island of Soron, which proved to be an unhealthy spot, and from there to reach Andai on the mainland at the base of Mt. Arfak which they hoped to climb. It was at Andai that Beccari really was able to begin his collecting, assisted by four or five natives and amassing a collection of about 700 species of plants as well as birds, mammals, reptiles, insects, and minerals. D'Albertis, however, became ill so that the two men returned after some difficulty to Ambon, where d'Albertis was fortunate enough to obtain passage on an Italian naval vessel, leaving Beccari alone to care for his collections and to prepare for a trip to the Kei and Aru Islands on which he departed on 7 February 1873. Stricken with smallpox enroute, he nonetheless reached the Aru Islands on 25 February 1873 and, based at Wokan, collected until 6 July, when he moved to the Kei Islands, suffering shipwreck on the east coast of Grand Kei. He found the flora and fauna of these islands unexpectedly poor and on 4 October 1873 left on a small vessel for Ambon where he disembarked on 23 October 1873 and stayed until 5 November when he sailed for Celebes to stay until June 1874 visiting chiefly Makassar and Kandari.

Funds nearly exhausted, yet desiring to return to New Guinea, Beccari was befriended by Giacomo Doria, who convinced Genovese authorities to contribute 15,000 lira toward a new expedition. In preparation, Beccari went to Java and Ternate to recuper-

ate and then to Ambon whence the expedition of the Museo Civico di Genova sailed on 15 January 1875, prepared for a stay of eight months. Sorong, Wakre on Waiges Island, Dorei, Andai, Geelvink Bay, Momi, Warbusi, Ansus on Japen Island, Mios Num Island, Kerido, are some of the places visited in what is now Irian Jaya. A further attempt to explore Mt. Arfak in June 1875, was cut short by the necessity to return to Ternate because of beriberi among the crew on his schooner.

From August to November 1875, Beccari arranged his collections on Ternate. Learning that a Dutch expedition was being prepared, he received permission to accompany it but the expedition was short and the scientific results were few. Finally, he left Ternate on 13 March 1876 and arrived in Florence on 18 June 1876.

Beccari made one further voyage in late 1877 and early 1878 but less for science than for pleasure. He and Enrico d'Albertis, cousin of his earlier companion, went to Australia by way of Singapore and Kuching, where he found a warm welcome. On the return, however, Beccari undertook an expedition to Sumatra in search of Orangutan.

Professor Filippo Pariatore, Director of the Botanical Center in Florence had died in September 1877, and despite some opposition Beccari was nominated for the post as the person best qualified. He received the post on 28 March 1878 but entered upon it only in December 1878, after his return from a productive expedition in Sumatra in the course of which he discovered the famous *Amorphophallus titanum*, largest of the aroids. This expedition effectively ended his years of exploration.

Beccari as Administrator

In the post of director, Beccari infused new life into the operations of the botanical garden and the herbarium, introducing methods that differed from those long used. His ambition was to make the herbarium, already possessing the herbaria of Webb, Cesalpino, Micheli, and Targioni, equal in influence to the largest in Europe. His reforms, however, were unpopular among some of the staff, who felt that he lacked respect for the memory of his predecessor, and who sought to create an atmosphere hostile to change among administrative personnel of the Royal Institute of Superior Studies. This hostility, combined with a dispute over the proposed use of money left by Philip Barker Webb for the maintenance of his herbarium and library instead of Institute moneys to purchase Beccari's collections, led to Beccari's resignation on 26 July 1879 in protest over a contract for sale from which he could not withdraw.

Following this move, Beccari left for Ethiopia to stay with Giacomo Doria until 26 February 1880, when he returned to Florence as caretaker of his own collections.

Beccari's Publications

Beccari had founded the *Nuovo Giornale Botanico Italiano* on his return from Borneo and directed it from 1869 to 1871. Many results of the study of his own collections appear in the three volumes of his work *Malesia* (1877–1890), the last of which was completed with the aid of funds from the Bentham Trust provided by English botanists. At one point, Beccari retired from Italian botanical life but Professor Oresti Mattiolo, a new Director of the Botanical Garden, ulti-

mately convinced him to resume his work.

It is from this period that Beccari's concentration on palms led to the great monographic and floristic studies listed in the appendix that appeared from 1900 to and following his death. The chief of these, *The Asiatic Palms*, were made possible by Dr. G. King, Director of the Botanical Garden at Calcutta beginning in 1908 and terminating in 1933, 13 years after Beccari's death. These works are truly monumental and remain standard treatments even today. Text and illustrations, whether drawings by Beccari or photographic plates, are detailed records of his observations.

Beccari the Person

Martelli described Beccari as a proud, almost misanthropic spirit who, from his youth, was set apart, destined to travel alone in new and different places. He faced dangers that he recounted with some indifference but his ability to inspire respect and love rather than fear among aboriginal peoples served his single purpose and sole end—science. Among his Italian colleagues, however, he was thought autocratic, intolerant, proud, independent, and somewhat overwhelming, though the characteristics were devoted to upholding what he thought right for botany. At the same time, his resignation resulted from his concern for the propriety of things.

In his private life, Beccari married Signorina Nella Goretti de Flamini of the noble family of the Casentino in 1882 and was the father of four sons—Nello, Dino, Baccio, and Renzo. He commanded the devotion of his student and friend, Count Ugolino Martelli, who edited some of his posthumous works, he lived modestly, and he

died peacefully in his sleep on 25 October 1920 at the age of 77. His remains rest in the Cimitero della Misericordia at Soffiano near Florence.

Many honors were given Beccari. The city of Florence conferred honorary citizenship upon him in July 1876, and offered him a gold medal. Gold medals were also awarded him by the Societa Geografica Italiana, the R. Societa Toscana d'Orticoltura, and the Facolta di Scienze Naturali del R. Istituto di Studi Superiori di Firenze. He was an honorary, corresponding, traveling, or regular member of some 15 societies, both Italian and foreign.

Beccari's Publications on Palms

Taken from a listing by Martelli and from Bibliography of Palms and Cycads on punched cards at the L. H. Bailey Hortorium and the Fairchild Tropical Garden.

ODOARDO BECCARI

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- 1877a. Della disseminazione delle palme. Bull. Soc. Tosc. Ort. 2(6): 167-173.
- 1877b. Il sagù della Nuova Guinea, (*Metroxylon rumphii* Mart.). Bull. Soc. Tosc. Ort. 2(8): 247-249.
- 1877c. Le specie di palme raccolte alla Nuova Guinea da O. Beccari e dal medesimo adesso descritte, con note sulle specie dei paesi circonvicini. Malesia 1: 9-96, pl. 1-2.
- 1877d. Nuove osservazioni sulle palme della Nuova Guinea. Malesia 1: 97-102.
- 1877e. Piante nuove o rare dell'Arcipelago Malese e della Nuova Guinea, raccolte, descritte ed illustrate da O. Beccari: Palmae. Malesia 1: 171-175.
1881. Notes on the plants collected by Sig. L. M. d'Albertis in New Guinea: Palmae. In L. M. d'Albertis, New Guinea: what I did and what I saw, ed. 2, 2: 391-395, 399.
1884. Piante ospitatrici: Palmae. Malesia 2: 62-79, pl. 5-7.
1885. Reliquiae Schefferianae. Illustrazione di alcune palme viventi nel Giardino Botanico di Buitenzorg. Ann. Jard. Bot. Buitenzorg 2: 77-171, pl. 1-15.
- 1886a. Piante ospitatrici: aggiunte. Malesia 2: 275-279, pl. 64.
- 1886b. Nuovi studi sulle palme asiatiche. Malesia 3: 58-149, pl. 6-11.
- 1887-1888. Le palme incluse nel genere *Cocos* Linn.: studio preliminare. Malpighia 1: 343-354, 441-454, pl. 9; 2: 85-95, 147-156.
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- 1889b. Palmae. In K. M. Schumann and M. Hollrung, Die Flora von Kaiser Wilhelms Land (Beiheft zu den Nachrichten über Kaiser Wilhelms Land und den Bismarck-Archipel), 15-17.
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- 1890b. Rivista monografica delle specie del genere *Phoenix* Linn. Malesia 3: 345-416, pl. 43-44.
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- 1902a. Nelle foreste di Borneo. Salvatore Landi, Firenze, 667 pp., illus.
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- 1904a. Palmae. In J. Perkins, Fragmenta florum Philippinae 1: 45-48.
- 1904b. Wanderings in the great forests of Borneo: travels and researches of a naturalist in Sarawak (transl. by Enrico H. Giglioli, rev. and ed. by F. H. H. Guillemand), A. Constable, London, 424 pp., 61 figs.
- 1905a. Le palme del genere "Trachycarpus." Webbia 1: 41-68, fig. 1-16.
- 1905b. Note anatomiche sul frutto dei "Trachycarpus." Webbia 1: 68-72, fig. 17-18.
- 1905c. Notizie sul "Nannorhops Ritchieana" H. Wendl. Webbia 1: 72-73.
- 1905d. Palme nuove papuane. Webbia 1: 281-313, fig. 1-8.
- 1905e. Le palme delle isole Filippine. Webbia 1: 315-359.
- 1905f. Palmae. In K. M. Schumann and C. A. G. Lauterbach, Nachträge zur Flora der Deutschen Schutzgebiete in der Südsee, 60-61.
1906. Palmarum madagascariensium synopsis. Bot. Jahrb. Syst. 38(3), Beibl. 87: 1-41, fig. 1-4.
1907. Notes on Philippine palms, I. Philipp. J. Sci., Bot. 2(3): 219-240.
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- 1908b. Le palme americane della tribù delle Coryphaeae. Webbia 2: 1-343.
- 1908c. Le palme "Dum" od "Hyphaene" e più specialmente quelle dell'Affrica italiana. Agric. Colon. 2(3): 137-183, *fig. 1-2*, *pl. 1-3*.
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- 1910g. Contributo alla conoscenza della "Lepidocaryeae" africane. Webbia 3: 247-294.
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Note: This paper was prepared by Dr. Moore shortly before his death on October 17, 1980.

Notice

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PALM BRIEFS

A House in Thailand

In March 1979, while I was carrying out a rattan survey in South Thailand, Mr. Charal Bhoonab, the Director of the Khao Chang Botanic Garden, Trang, took me to an area of lowland forest near Trang, forest much disturbed but with a superabundance of *Salacca wallichiana* in the undergrowth. There was much evidence of the fronds being collected and used for something but it was not until we emerged from the forest into a village that we discovered why the fronds of the *Salacca* were being cut. There before us was a house constructed almost entirely from *Salacca wallichiana*; only the roof (made from *Nypa* thatch), the main corner posts and some of the rafters were not made

from *Salacca*. Petioles of the palm are cut and stripped of their spines with quick flicks of a jungle knife. The smoothed petioles can be used whole for main walls and doors. Alternatively they are split lengthwise, and the soft pith removed, the hard outer part then being flattened out; the flattened out petioles are then woven into each other. The woven petioles produce instant paneling or partitioning analogous to *bilek* made from opened-out and flattened bamboo in Java and elsewhere in bamboo rich areas. Even the hen coops outside the house were made of split *Salacca wallichiana* petioles.

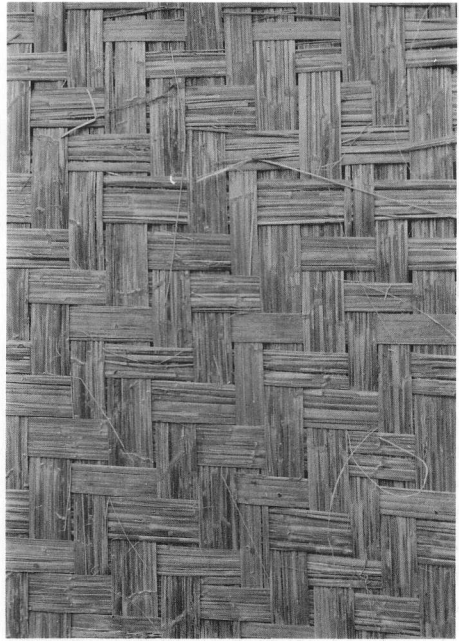
What seemed most surprising was that a bamboo was abundant in the forest nearby—elsewhere, where bamboos are abundant, they seem to be preferred, above palms, for constructional purposes. Thus, in West Java



1. A village house near Trang, S. Thailand. The roof is thatched with *Nypa* leaflets; Walling is constructed from *Salacca wallichiana* petioles as are the hen coops.



2. *Salacca* petioles, spines removed, nailed on a framework, make an airy wall; note the scars where spines have been removed.



4. Flattened petioles woven into paneling.



3. Charal Bhoonab holds an opened and flattened-out petiole, and a pile of petiole pith lies discarded on the left.

bamboo is used for corner posts, walls and partitions, and rafters in village houses. In scattered parts of the Malaysian region such as in Kelantan (Malaya) and parts of South Celebes (Indonesia) petioles of *Metroxylon sagu* are used in a way exactly analogous to those of *Salacca wallichiana*.

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An Early Account of Palm Utilization in Surinam

Walter Hodge's bringing to our attention Barco's eighteenth century account of palm utilization in Mexico (Hodge 1980), prompted me to check another source of that century for early reports from Surinam in South America. I refer to John Stedman's *Narrative* of his five-year residence (1773-1778) in Surinam (Stedman 1972). Stedman was a member of the Scots Brigade of the Low Countries and had been sent to Surinam as part of a military force charged with capturing Black slaves who had escaped into the forest. His description of pursuing rebellious slaves through the swamps and dense tropical forest is a harrowing account of guerrilla warfare. I should add that the Dutch were unsuccessful in putting down these slave rebellions and ultimately signed peace treaties giving the Blacks local tribal autonomy. Stedman saw a lot of the colony and took the time to record detailed descriptions of Surinam's natural history and the material culture of the Amerindians.

First published in 1796, Stedman's *Narrative* has since appeared in about a dozen editions and translations, the most recent one a 1972 edition with extensive notes on the scientific names of the plants and animals men-

tioned in the text. Eight palm species are identified. Most interesting to me is what may be the earliest description of extracting palm cabbage in South America.

The palm is referred to as "mountain cabbage" but is the royal palm (*Roystonea oleracea*). Here are Stedman's words (p. 258): "If the cabbage is wanted, the whole tree must be cut down, when it is divested first of its branches, and next of that fluted green husky tegument that forms them; after this, the heart or cabbage is taken out, white, and about two or three feet long: it is as thick as a man's arm, and round like a polished ivory cylinder; it is composed of a kind of tender longitudinal white flakes, like silk ribands, ready to form the succeeding green tegument, but so close that they form a crisp solid body. This, when eaten raw, is in taste something like the kernel of an almond, but is more tender and more delicious; when cut in pieces and boiled, it eats like cauliflower: it may be also peeled in the above-mentioned long thin flakes, and then it makes an excellent sallad; but too much of it, whether eaten raw or dressed, is unwholesome, as it is apt to occasion a diarrhoea." Elsewhere, it is stated that *Geonoma baculifera* furnishes palm cabbage, as well as *Cocos nucifera*, but that the latter is too valuable a fruit source to cut.

Other palm products and their respective species described in the *Narrative* are: fruits and hard seeds used to carve rings, *Astrocaryum vulgare* and *Attalea maripa*; trunk wood for house construction, *Euterpe oleracea* and *Geonoma baculifera*; leaves for thatch, *Manicaria saccifera*; leaf fiber for making bows, nets and thread, *Mauritia flexuosa*.

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Palm Plantings by Local Groups on Public Property

The Palm Society, through its local groups or chapters, has made some fine public palm plantings in community parks and around public buildings in California, Florida, and perhaps elsewhere. Plans for planting in Houston appeared in *Principles* 24:138, 1980. If others have similar plans, let us hear about it. This is one of the best ways to arouse public interest in palms while beautifying an area. At the same time, people are made aware of The Palm Society, since public plantings are usually accompanied by favorable and generous publicity.

There are occasions when a great opportunity to do public planting comes along and the local Palm Society group or chapter just does not have the funds to "do it up right." I believe it should be the policy of The Palm Society, Inc. to encourage and back local groups in this activity, including advancing funds when necessary.

I propose the following guidelines in these instances: 1. The chairman or chairwoman of the local group or chapter should submit plans for the planting to the Promotional Committee for approval. All facts should be included, stating the full cost of the project and the amount locally available together with a statement of funds desired from the society. (Note: the total to be contributed by The Palm Society, Inc. shall not exceed 50% of the project cost or \$500.00). 2. If the Promotional Committee approves the plans, it

should forward the request for funds to the Secretary of the society, and copies to the President and Treasurer for circulation to the Board of Directors for approval or disapproval.

Providing funds are available, your present President encourages and approves of such activity.

PAUL A. DRUMMOND

PALM PORTRAIT

The making and drinking of palm wine are the subject of this aluminum panel $3\frac{1}{2} \times 2$ ft by the contemporary Nigerian artist Asiru from the town of Ashogbo of the Yoruba tribe. He has



exhibited in London, Paris, and New York, where his work is now hanging in the United Nations Building. The panel is the property of Vera and Ben Kesler of St. Croix, Virgin Islands and the photograph was forwarded by Mrs. M. Hu. Hilder. The wine palm is probably *Raphia hookeri* which, according to Russell (Kew Bull. 19: 181. 1965), "... is a source of palm wine, obtained by boring the stem below the growing point."

PALM RESEARCH

JAMES H. BEACH, Department of Botany, University of Massachusetts, Amherst and Finca La Selva, Organization for Tropical Studies, Universidad de Costa Rica, Ciudad Universitaria, Costa Rica has two research projects underway. A study is near completion on the reproductive biology of two *Bactris* species at La Selva, one of which is the pejivalle palm. This work will complement previous studies on the genus by Drs. Essig and Jorge Mora, by expanding on behavioral aspects of the flower visitors and by providing additional information on why various insects visit the inflorescences and the extent to which they are involved in cross-pollination within the two species. An attempt is also being made to characterize the chemical nature of the beetle-attracting floral odors.

A three-month study of a population of *Asterogyne martiana* will also be completed by the end of the summer, 1980. The project design includes monitoring the reproductive status of 200 individuals on a daily basis to see ultimately what effect the floral display of neighboring plants has on an individual's reproductive success. Coupled with this phenological study will be an experimental approach using fluorescent dyes to determine the

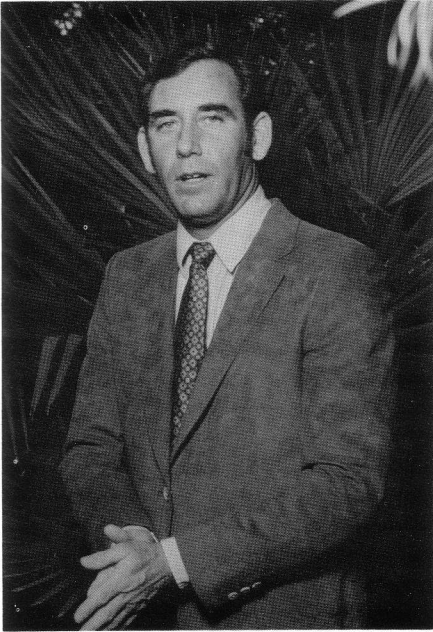
extent of pollen movement between individuals in the population.

SHAFAT MOHAMMED and HASSAN R. SHABANA, Palm and Dates Research Centre, FSR, Baghdad, Iraq have three research programs underway. One includes development of techniques for collection, drying, storage, and viability of pollen, freeze-drying and storage of pollen in organic solvents, metaxenic effects of pollen from date palm and other *Phoenix* species and development of different pollination techniques, and collection of pollen on a large scale to create a "pollen bank."

A second includes studying the effects of several growth regulators (NAA, IAA, Kinetin, 2,4,5-TP, Ethrel, GA, CCC, MH, etc.) and other chemicals (antitranspirants) to improve fruit quality and yield in the date palm. Already application of NAA and 2,4,5-TP during depressed periods has proved beneficial. Further investigations are being planned to study the usefulness of these growth substances.

A third project is the evaluating and identifying of different Iraqi female date palm cultivars. This includes description of characteristics of fruit (physical and chemical), flower, leaf, trunk, etc.

HASSAN R. SHABANA and S. SHAFAT MOHAMMED list two research projects. They are studying the effect of different levels of nitrogen supplied through urea fertilizer with phosphorus and potassium at constant levels on yield and quality of 'Zahdi' dates and the foliar application of nitrogen through urea fertilizer. They are also investigating the root system of date palm. In this investigation, attempts are being made to find out depth, distance, and distribution of feeding roots, and types and classification of roots in mature palms of the 'Zahdi' cultivar.



1. Richard Douglas, New Vice President.

NEWS OF THE SOCIETY

Richard Douglas, Vice President of the Palm Society, 1980-82

Richard Douglas was born in Southern Georgia in 1938. As a boy he became interested in the local flora and fauna. After studying landscape architecture at the University of Georgia, he visited Miami, Florida and fell for the tropical vegetation of South Florida. Dick moved to Miami where he worked until Uncle Sam called him into the U.S. Army for two years. Following his military duty, he returned to Miami and decided to study commercial aviation for a living. At the same time his interest in palms was expanding greatly.

After earning his pilot's license, Richard was hired by his present employer, United Airlines, and stationed

in San Francisco. His interest in palms continued. As a co-pilot he now lives in Walnut Creek California where he has a very fine collection of cold hardy palms. He is also an expert at growing and hybridizing *Chamaedorea* species.

Note on the Biennial Meeting for 1982

The Palm Society Biennial Meeting is usually held on the home turf of the President of the society. During the great 1980 Biennial Meeting in Hawaii, some thought was given to and interest expressed in having the 1982 meeting in San Francisco, USA and Sydney, Australia. After much discussion with the Californians, who would bear much of the burden of such a meeting, and in consideration of the steadily rising cost of aviation fuel and airline tickets, it was decided to wait and see whether perhaps the 1984 meeting might be in California with a tentative trip to Australia.

Present plans call for the 1982 Biennial Meeting of the society to be held in Miami, Florida. The time will be either in late May (about the last weekend to coincide with the Memorial Day holiday weekend) or in November (perhaps to coincide with the Thanksgiving weekend holiday). At these times of year the climate of Miami is much kinder than summer and the rates are "off season."

The meeting will probably include a stop on Florida's West Coast and perhaps a Disneyworld tour, and the Florida Keys and Key West. Details will come later.

If you have definite ideas for alternate plans and lots of money to back them up, please don't hesitate to write to me!

PAUL A. DRUMMOND

News from Australia

The first annual meeting of the New South Wales Chapter was held in June 1980 when the following were elected as officers: President, Nicholas Heath; Vice President, Bruce Boddington; Treasurer, Richard Budd; Secretary, Brian Preston; Committee Members, Ken Veness, Tony Rodd.

At our August meeting I was asked by members to extend to the President and Directors of the Society the warm invitation of this chapter to visit Australia. We have about 40 members of whom 15-25 attend meetings. However, some come from more than 100 miles to Sydney for meetings, and we expect to have a membership drive in the next few months. We are proud of our city and think you would enjoy visiting it. There are several excellent palm groves containing a wide variety of species in the Royal Botanic Gardens, as well as surf beaches, a beautiful harbour and other attractions.

NICHOLAS HEATH

News from California

The Northern California Chapter of the Palm Society held its summer meeting on August 18th in the beautiful garden of chapter president, Warren Dolby, in Oakland. After a tour of the hillside garden with its outstanding collection of rare palms and other exotic plants, a highly successful plant auction was held. The proceeds of the sale will help defray the expenses of the chapter's project—the establishment of a palm garden in Lakeside Park, Oakland. Work is well under way and several fine specimens have already been planted. The handsome plan was drawn by landscape architect, Allen Fernandez of Coral Gables, Florida. When completed, this garden will be

the only one of its kind north of Santa Barbara.

The fall meeting of the chapter took place in the garden of Dr. Herbert Weber in Greenbrae, Marin County. A poolside, potluck buffet supper was enjoyed by the members present after a tour of the garden and a plant sale. Among the palms auctioned were two *Parajubaea cocoides*. Over \$632 was realized by the sale.

MARY BELL HAWKINS

The San Diego Wild Animal Park hosted the second annual Palm Show and the Southern California chapter's May meeting. Many members arrived early to set up their palm displays in hopes of winning a ribbon. At 1 o'clock, we hiked up the long hill to the site of the future palm garden. We ate our lunch there and enjoyed the spectacular view of the park far below. A short talk was given by Jim Gibbons on the future plans for the garden. Upon our return to the palm display area, various ribbons were awarded to the many gorgeous palms on display.

Despite the warm weather, approximately 70 people came to the July meeting. The meeting began at Murdy Park with a slide presentation by Lois Rossten and Pauleen Sullivan that took us on their travels through Australia and New Guinea. After seeing all those wonderful slides, I'm sure many of us have visions of going there also. Following the slide show, everyone journeyed to the Rossten and Ketchum homes to see and enjoy their gardens. Hot dogs and cold drinks preceded a giant raffle of the many plants donated by members. The Southern California Chapter won an Honorable Mention ribbon for its palm display at the annual Fern Show held at the Los Angeles Arboretum on July 19 and 20.

The September meeting was held at Elysian Park in Los Angeles. This beautiful park is surrounded by high wooded hills except on the south side which affords a view of the Los Angeles skyline. The palm garden, located on a hill next to the new lodge, is frost free. Many new specimen palms have been planted and one day this will be a very beautiful garden. Our meeting began with members eating their picnic lunches. There were approximately sixty people present. Following lunch, a talk and tour of the palm garden was given by Don Nelson and Marion Spence. After the tour, a plaque was presented to Bill Gunther in appreciation of his fine job as editor of our newsletter. Final event of the day was a giant palm sale. Many palm species were offered for sale by members.

November provided another chance for Southern California members to view the magnificent collection of palms belonging to Pauleen Sullivan in Ventura. More than seventy-five people enjoyed the beautiful pool room and many rare specimen palms. Everyone was surprised but delighted at the attendance of Palm Society President, Paul Drummond, and Vice President, Dick Douglas. A short business meeting was held and several new members introduced. A palm auction was conducted afterwards with How-

ard Gillett and Allan Bredeson taking over the auctioneering duties. Members were then invited to take a tour of Pauleen's apartment complex to see the specimen palms used in their landscaping.

FRANK KETCHUM

Seed Bank News

For the information of those members who are supplying seed to the seed bank, the bank has now been located in Southern California for 18 months. There are still some supporters, however, who continue to send seeds to the old location in South Florida. Seeds meant to go to the seed bank for dissemination to members must be sent to Mrs. Lois Rossten, 6561 Melbourne Dr., Huntington Beach, CA 92647, USA. Seeds sent to the Florida address are not being forwarded to the seed bank.

All written communications and inquiries concerning the seed bank should be sent to the Seed Procurement Officer, Ernest B. Chew, San Diego Zoological Garden, P.O. Box 551, San Diego, CA 92112, USA.

CLASSIFIED

HAWAIIAN PALMS AND PLANTS. Special for Palm Society members. *Licuala grandis* seedlings \$5.00 postpaid, *Hyophorbe lagenicaulis* (*Mascarena lagenicaulis*) seedlings \$5.00 postpaid. HANA GARDENLAND, P.O. Box 248-PS, Hana, HI 96713.

SUBZERO PALMS. Seedlings and large plants of *Rhapidophyllum hystrix*, *Sabal minor*, *Sabal louisiana*. All have tolerated below zero temperatures. Send for list. Dr. David Griggs, 3412 McClure Bridge Road, Suite C, Duluth, GA 30136.

BOOKSTORE

INDEX TO PRINCIPES (Vols. 1-20, 1956-1976, H. E. Moore, Jr., 68 pp.) -----	\$ 3.00	FLORA OF PANAMA (R. E. Woodson, Jr., R. W. Schery, 1943, 122 pp.) ----	17.00
CULTIVATED PALMS OF VENEZUELA (A. Braun, 1970, 94 pp. and 95 photographs.)-----	4.50	FLORA OF PERU (Palms) (J. F. MacBride, 1960, 97 pp.) -----	3.50
THE INDIGENOUS PALMS OF SURINAME (J. G. W. Boer, 1965, Part of Flora, 172 pp.) -----	21.00	INDEX OF AMERICAN PALMS (B. E. Dahlgren, 1959, 412 pp.) -----	18.95
PALMS OF SOUTH FLORIDA (G. B. Stevenson, 1974, 251 pp.) -----	6.00	PALEM INDONESIA (in Indonesian) (Sastraprdja, Mogeja Sangat, Afriastini, 1978, 52 illustrations beautifully done, 120 pp.) -----	5.50
PALMS OF THE WORLD (J. C. McCurrach, 1960, 290 pp.) -----	19.00	PALMEIRAS DO BRASIL (in Portuguese) (G. Bondar, 1964, 155 pp.) ----	13.00
SUPPLEMENT TO PALMS OF THE WORLD (A. C. Langlois, 1976, 252 pp.) -----	25.00	PALMS OF MALAYA (T. C. Whitmore, 1973, 132 pp.) -----	16.95
THE MAJOR GROUPS OF PALMS AND THEIR DISTRIBUTION (H. E. Moore, Jr., 1973, 115 pp.) -----	4.50	THE HARDEST PALMS (J. Popenoe, 1973, 4 pp.) -----	1.00
THE GENUS PTYCHOSPERMA LABILL. (F. B. Essig, 1978, 61 pp.) -----	5.50	FURTHER INFORMATION ON HARDY PALMS (J. Popenoe, 1973, 4 pp.) ----	1.00
PALM SAGO (K. Ruddle, D. Johnson, P. K. Townsend, J. D. Rees, 1978, 190 pp.) -----	7.50	FRUITS OF THE PTYCHOSPERMA ALLIANCE (F. B. Essig, 1977, 16 pp.) --	1.00
HARVEST OF THE PALM (J. J. Fox, 1977, 244 pp.) -----	15.00	PALMS—ANCESTRY AND RELATIONS (B. Ciesla, 1979, a chart) -----	4.00
THE DATE PALM (H. Simon, 1978, 155 pp.) -----	8.95		

The palm books listed above may be ordered at the prices indicated plus \$1.00 extra per book to cover packaging and postage. (California residents please add 6% sales tax.) Send check in US currency payable to The Palm Society to Pauleen Sullivan, 3616 Mound Avenue, Ventura, California 93003, USA. We also buy and resell old palm books.

Notice

Pinehurst Farms listed under Nurseries Offering Palms, PRINCIPES 34(3): 96, does not sell palm seeds. They have palm plants available in truckload lots only.

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I certify that the above statements made by me are correct and complete. Signed, Dr. Natalie W. Uhl, Editor.