



124. The girl holds a single male spike.

and the stately screw pine *vaquois parasol*, *Pandanus Hornei*.

In or about the valley may also be seen a number of endemic birds, such

as the Seychelles bulbul or merle, *Ixocinclia crassirostris*, the beautiful fruit pigeon or pigeon *hollandais*, *Alectroenas pulcherrima*, and the rare Praslin black parrot or *cateau noire*, *Coracopsis barklyi*.

The Vallée de Mai is open to the public and may be visited at any time during the day. A tour of the valley by the circular path takes about 2 hours. Shorter tours, of one hour or less, may be made by the central or other paths. Landmarks in the valley are the kiosk, the tallest coco-de-mer palm, which is 102 feet high, the "pink" coco-de-mer, which is a tree whose immature nuts contain a pink jelly of the white one to be found in the nuts from other palms, and especially the palm and pandanus grove, which gives the visitor an inkling of how beautiful the valley and the whole of Praslin must have looked originally.

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## Palm Hunting Around the World

HAROLD E. MOORE, JR.

### III Sabah and Australia

#### Sabah

Headquarters for the Forest Service is in Sandakan where, after changing planes in Jesselton, I was met by Dr. Meijer and launched, figuratively and

almost literally, into a whirl of palm activity commencing the morning of January 14th when, after attending to drying preparations for Bintulu collections, we visited the nearby Kebon China for-

est to find robust *Daemonorops rutilis* and the delicate *Calamus divaricatus*. Later, we visited Mt. Walker on the Sibuka road to get *Plectocomia Muelleri*, another stout climbing rattan, stems of which die after flowering or, in the female, after producing an abundance of grape-sized brown roughly scaly fruits, and a splendid series of *Cyrtostachys Lakka*, here rather common in the open and sandy moist soils and even more colorful than the shaded trees seen in Malaya and Sarawak.

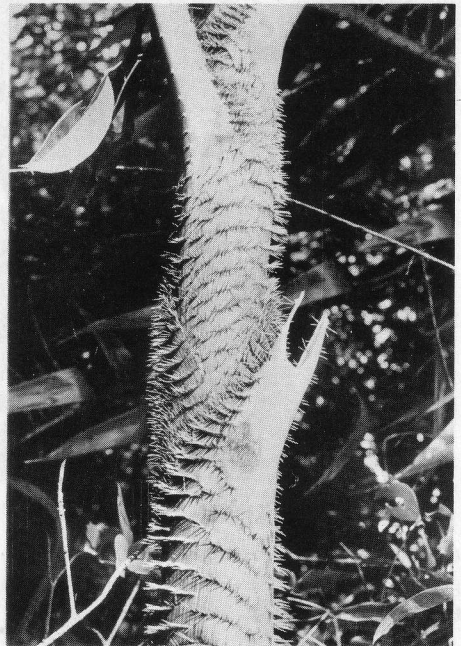
The literal launching was reserved for the morning of the 15th when, with two assistants and a boatman, we set out in a small outboard forestry launch for the Sepilok Forest Reserve 15 miles down Sandakan Bay. Here no rough sea interfered with observations of the shore nor of the mangroves lining the channel that leads to the forest camp, our headquarters for two days. Several trails traverse the reserve and on this first morning, walking on the trail to Uchung Tanjong, we found *Calamus divaricatus*, *C. javensis*, *Daemonorops periacanthus*, a little *Licuala* and, most exciting of all, a new species of *Arenga*, *A. retroflorescens*, growing in colonies at the edge of the mangroves and rather resembling *A. Engleri* in appearance. The spicate inflorescences and unusual manner of flowering, however, are quite distinct and have been elaborated elsewhere.

Striking out in a different direction in the afternoon under rather wet conditions, we added *Korthalsia macrocarpa*, a multiple-stemmed climber to 30 feet or more whose elongate leaf-sheaths were filled with vicious ants making a noise like sawing wood and reminiscent of *K. Chev* in Sarawak. A handsome *Salacca* also grows in the swampy areas along the trail which led to Kabili as do *Daemonorops periacanthus* and what



125. *Plectocomia Muelleri* has a terminal inflorescence and vicious leaf-tips.

126. *Plectocomia* sheaths are fiercely armed.





127. *Cyrtostachys Lakka* in its native habitat is handsome for habit as well as color.

may be an undescribed species of that genus, unfortunately collected only in the sterile condition.

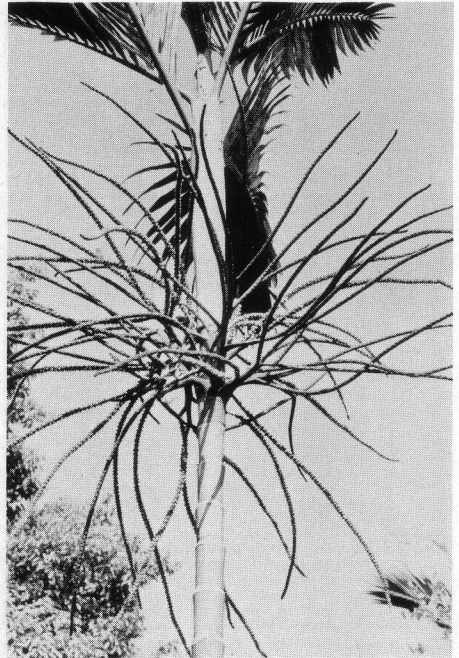
On the 16th, amid trees dripping from

rain, we retraced our steps along the Uchung Tanjong trail to collect three sterile *Calamus* species, more material of *Daemonorops*, *Licuala* and in seasonal

flooded forest *Korthalsia ferox*, *K. scaphigera*, and *Calamus aquatilis*. This predilection of some species of *Korthalsia* for swampy ground was noted again in New Guinea where *K. Zippelii* similarly required foot-wetting in order to collect it.

We had planned to set out early on the 17th for the return to Sandakan but though baggage and personnel were assembled at the boat in good time there was some delay in getting started. Our boatman had forgotten the tides so that our boat was better located for land transport, sitting as it was atop the knee-deep to thigh-deep mud of the mangrove swamp. Lunch was well earned by tugging the craft along the mud channel to shallow water many yards distant where, after more trips for baggage, it could be loaded and floated to the bay. But this is good practice for any botanist who wants to collect swamp palms such as *Nypa* and *Metroxylon* and it proved not to be the last encounter with such conditions.

Back in Sandakan, specimens cared for, preserved material airmailed, we then prepared to leave for the northwest coast and a base of operations at Jesselton. Only one hitch flawed plans — the tree-climbers who were to have accompanied us had somehow missed the boat on which they were to have travelled in advance. Thus, on the morning of the 19th, Dr. Meijer and I climbed aboard a plane accompanied by Sitim Gindarah, an agile Dusun who, with Anthony Ranganj and Jawanting Ampuria from the forest office at Jesselton climbed, cut and generally made life interesting for two weeks. Sitim accepted his first plane trip with complete nonchalance though he, like ourselves, was excited by a magnificent view of Mt. Kinabalu, highest mountain between the Himalayas and New Guinea, which often is hidden



128. *Cyrtostachys* inflorescence forms a delicate pattern against the sky.

by clouds.

At Jesselton, we set off by rail for the Kimanis Forest Reserve near the Mandahan Station on the rail line to Beaufort, where both swamp forest and kerangas forest were available. In the sandy kerangas margins, *Salacca conferta* forms clumps of short erect leaves from underground stems which terminate in scarcely visible short inflorescences ending the life of that particular stem. *Salacca* was on the "want" list so these inflorescences were viewed with delight as were plants of *Licuala spinosa*, common enough in cultivation but here first truly observed in the wild state. *Oncosperma tigillarum* also grew on the mangrove margins calling for heavy gloves to obtain a good suite of specimens in fine flower. *Daemonorops* too, added its share of spines to our difficulties. In the swamp forest, we were lucky enough to find fruiting ma-

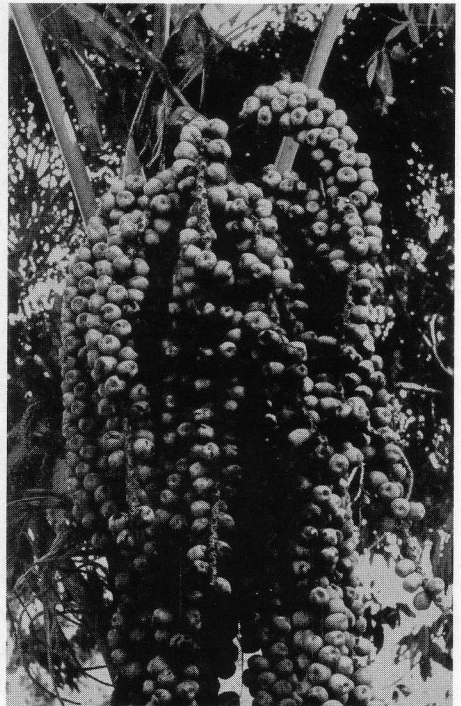


129. Sitim, in white shirt, provides aerial scale for *Borassodendron* near Beaufort.

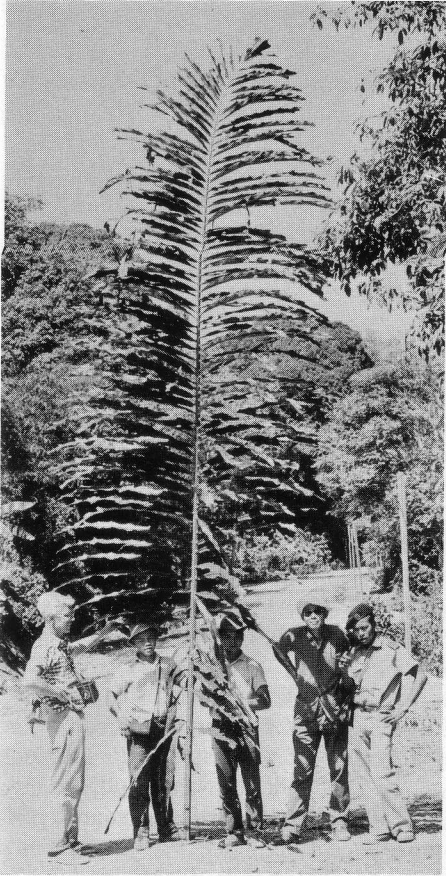
terial of *Plectocomiopsis geminiflorus* var. *borneensis*, an odd relative of *Calamus*, with the leaves arranged in three distinct vertical rows on a three-angled stem and terminal inflorescences with zigzag branches.

From Kimanis we went again by rail to Beaufort on June 20th, arriving in time for an afternoon on Beaufort Hill back of the town. Here good forest has been preserved and in it two species of *Korthalsia*, a *Caryota*, *Licuala*, *Daemonorops ruptilis*, and *Borassodendron* occur. The last is probably the same as the Malayan species. The knife-like petiole-margins make collecting hazardous and unfortunately only immature fruit was obtained. This, however, is large enough to make one wonder how the seeds are distributed. When we saw an isolated young plant at Sepilok, Dr. Meijer suggested that elephants might be the dispersing agent though this is at best a conjecture.

Beaufort was only an overnight stop on the way to Tenom which we reached by way of a chartered small rail car over the narrow-gauge line that runs beside the swift-flowing river in Padas Gorge. A stop at Rayoh was not very productive but the following day we spent hours on the slopes above Sungei Masanoi 14 miles south of Tenom to collect several *Calamus* and *Daemonorops*, *Korthalsia echinometra*, a possible new species of *Korthalsia*, but best of all a complete series of *Plectocomiopsis* in flower from both male and female plants, thus supplementing our earlier collection from Kimanis. Also near Tenom we climbed the slopes of Bukit Tenom in the Crocker Ridge Reserve to find *Arenga undulatifolia* again, a little *Licuala*, and two *Calamus* species, one apparently being *C. javensis* with



130. The terminal inflorescence of *Arenga undulatifolia* in Sabah.



131. The leaf of *Arenga undulatifolia* dwarfs Dr. Meijer and assistants.

very slender clustered stems, delicate leaves and pale fruits on slender inflorescences. This species forms rather extensive tangles and varies in being sometimes spiny, sometimes not.

The last trip led us to the other and northern end, of Sabah. Leaving Jesselton by landrover on the 25th, we stopped near a Malay kampong about eight miles north of the city to investigate *Eugeissona utile* which we found here with handsome red stamens protruding from the large brown vicious flowers. Near mile 33 we found the same palm rather abundant and in fruit, these much resembling those of *E. insigne* but on much

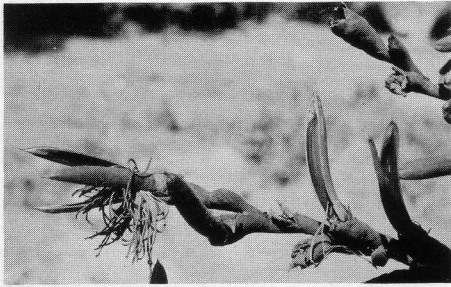


132. A Malay kampong near Jesselton.

more branched inflorescences. We paused along the road also to collect specimens of sago, *Metroxylon Sagu*, which Sitim climbed nimbly despite the prickly leaves, only to reappear at the top dwarfed by the great inflorescences. Preparing such bulky palms occupied



133. *Eugeissona utile* has a more massive inflorescence than *E. insigne*.



134. Male flowers of *Eugeissona utile* have bayonet-like petals and maroon anthers.



135. Anthony and Dr. Meijer hold sections of trunk and tip of fruiting inflorescence of *Eugeissona utile*.

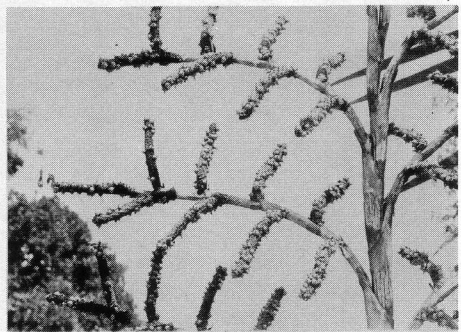


136. Sitim gives scale to inflorescence and entire tree of sago palm, *Metroxylon sagu*.

the afternoon and put the front of the resthouse at Kota Belud in complete disarray for some days as we left pieces of trunk and inflorescence to dry in the sun until our return.

By evening, however, the job was done and after dinner Dr. Meijer and I walked down the dusty road under a brilliant full moon in a clear, clear sky, always with the splendor of Kinabalu's magnificent profile in view. Now and then one experiences something unforgettable. To me, that night in Kota Belud — moon, Kinabalu, the sound of drums from a distant village, the tjock of night-jars like the pounding of a pile-driver, and the sheen of coconut fronds in the moonlight — will long be Borneo exemplified. Even at dawn the mountain was clear, wreathed only by a ring of wispy clouds and reddened, then paled, by the rising sun.

The next day was market day at Kota Belud — and few botanists can resist the temptation to sample fruits and look at the vegetables so beautifully heaped in little piles, tended by young girls in blue cotton shirts and red-painted bamboo chest-bands, to say nothing of the baskets and mats made from *Nypa*. But the road soon called and we were on our way to Maruda Bay, pausing en-route and collecting what seems to be the first record of *Orania* from Borneo,



137. A portion of *Metroxylon* inflorescence in very young fruit shows characteristic arrangement of branches.



138. *Orania* crowns appear above the top of a ravine between Miles 75-77 on road from Jesselton to Maruda Bay.

probably *O. paraguayensis* previously known only from Palawan in the Philippines, and *Corypha*. Of the *Corypha*, we were to see much more, for it covers the hillsides along the south side of Maruda Bay opposite Kudat, both in sands back of the beach and to the summits of the low hills. This *Corypha*, identity not yet certain, is also abundant elsewhere in the region but is threatened because it is thought to harbor the Rhinoceros beetle so destructive to coconuts and thus is being destroyed. Unfortunately we did not see this species in flower anywhere and as time had run out we headed back to Jesselton. There the quantity of specimens was left for drying and reluctantly I bade farewell to tree-climbers, forestry staff and Dr.



139. *Corypha* comes to the water's edge on Maruda Bay opposite Kudat.

Meijer to return to Singapore and the long hop to Darwin in Australia's Northern Territory.

### Australia

The evening flight from Singapore to Darwin in Australia's Northern Territory arrives at about 4:30 a.m. with just sufficient time to clear customs, get to bed and doze before another day begins. Darwin, which to me was somehow reminiscent of some Texas towns, was an important stop. Over a century ago, when first attempts were made to settle this part of Australia, a colony was established for a short time at a place called Escape Cliffs located on the west side of a narrow peninsula bounding Adam Bay on the east and not too far from Darwin. Before 1875, some fruits and a small (probably young) leaf from a palm collected at Escape Cliffs by C. Hulls reached Hermann Wendland and Otto Drude, two of the foremost palm students in Europe at the time. On the basis of these fragments, they described *Kentia acuminata* (Linnaea 39: 207. 1875), at the same time questioning whether it truly belonged to *Kentia*. Knowing the palm only from this same description, Beccari erected the genus *Carpentaria* ten years later, naming it for the Gulf of Carpentaria in Arnhem Land.

By contemporary standards, these fragments are inadequate to understand the palm. Through correspondence, I learned that *Carpentaria* has apparently been rediscovered only a few years ago at a place closer to Darwin by Mr. Caulfield from the Brisbane Botanic Garden and Mrs. Eddy of Darwin. Thus an opportunity to collect a full series at or near the type locality was not one to be neglected.

The staff at the Forest and Timber Bureau in Darwin were most helpful. On February 5th, Reginald Spence and





140. *Carpentaria acuminata* as cultivated in Darwin. Reginald Spence serves as scale.

I set off with an assistant for Berry Springs, about 40 miles from Darwin where *Carpentaria* was supposed to grow. Along the way, we saw quantities of *Livistona humilis* in the open grassy *Eucalyptus* forest, the slender short trunks often blackened by burning and bearing a crown of green leaves with



141. The stem of *Livistona humilis* is about as high as a man.

sometimes several erect-arching inflorescences covered with greenish flowers or black ellipsoid fruits. If it survives in the United States, this palm should be an excellent one for small yards and gardens as it is usually only about five feet high.

Once at Berry Springs, where abundance of water makes a richer "oasis" in the open *Eucalyptus*-grassland association, we commenced to work upstream from the main pool and in a short distance came across a palm in mature fruit. Our assistant, knife in teeth, shinnied up the trunk to cut the inflorescence and a leaf. The bright crimson fruit in a yellow perianth had all the appearance, not of a *Kentia* (or better *Gronophyllum* today), but of a *Ptychosperma*, though the seed is not grooved as in that genus. Further upstream we were able to obtain flowers which made certain the affinity to *Ptychosperma*.

Now knowing what *Carpentaria* looked like — a solitary gray-trunked tree reaching a height of 40 ft., a diameter of 8 inches, with leaves spreading in a horizontal crown above a long crown-



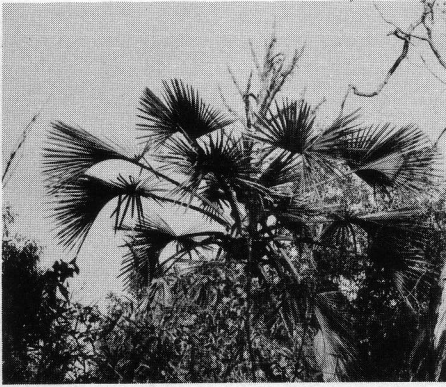
142. The bright red fruits of *Carpentaria* load inflorescence in Darwin.

shaft (which is poorly developed in immature trees) — we found it rather frequently cultivated as we looked about the streets of Darwin and in the Botanic Garden. It is a distinctly ornamental species and should be of easy culture allowing for sufficient moisture.

For the purist, however, there is nothing as good as a specimen from the original locality for then there can be little or no question about identity. With this in mind, John Hauser and Reg Spence arranged with the owner of a boat to get us to Escape Cliffs the next day by sea. By morning, however, the sea was too rough to make the journey so Reg and I, as a second best, chartered

a small plane for an hour and flew over the area. Escape Cliffs is not an imposing place from the air nor are there many palms there but by circling we did manage to find a few which hopefully may some day be reached by land for the clinching evidence.

Apparently *Carpentaria acuminata* grows farther east also. By a stroke of good fortune, the Forest Bureau was sending a small plane on February 7th to pick up a party at Manangride, a small station in Arnhem Land, and I was invited to fill an empty seat. Flying out, I tried to orient myself as we passed over rugged cliffs and open forest in which the peculiar narrow mud



143. *Corypha* sp. near the Liverpool River.  
Photo by Geoffrey Stocker.

nests of magnetic termites generally directed North-South were conspicuous. The return flight was more devious, including a detour along parts of the Liverpool River where a *Corypha* forms extensive and clearly natural stands in low lands and where an occasional *Carpentaria*, judging by aspect, could be recognized leaning over the river from the bank.

Geoffrey Stocker had first located the *Corypha* during an exploratory trip along the river and when adequate material can be obtained for study, not an easy task with these huge monocarpic



144. *Livistona australis* remains after land is cleared near Mooloolaba.

palms, we may know for certain whether the stands represent a range extension of a previously known species or whether there is in Australia a species not yet described. Further detours to the north took up over areas where *Livistona Benthamii* formed small stands in wetter places and after a magnificent view of the impressive Jim Jim Falls, which drop sheer from the top of a massive cliff, we put down on a small airstrip to lunch on water buffalo steak at a hunting camp before heading back to Darwin.

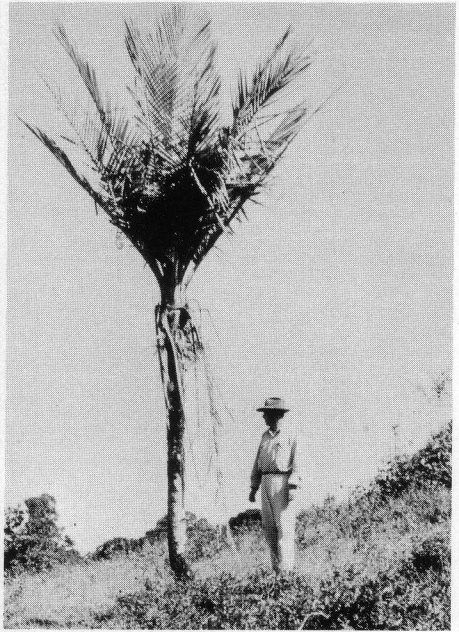
Northern Territory would have been an exciting place for a whole period of field study, but too much lay ahead and the schedule was too close to permit lingering. On February 8th, therefore, I left Darwin on the morning plane to cross the desolate dry central region of northern Australia before picking up the green of forests again winging into Brisbane on the east coast. There Mr. Everist, Government Botanist for Queensland, and his wife met me to settle me into a hotel and make plans for a Sunday excursion the next day.

Australia has been described by too many people to merit any attempt on my part, but an American seems often to feel very much at home there. A picnic lunch, travel over paved roads in inhabited country in a comfortable car all made for a slightly nostalgic Sunday. But the palms made the day. Mr. Everist knew just the places to go to see *Archontophoenix Cunninghamiana* and *Livistona australis* "at home" in the general region of Mooloolaba about 70 miles north of Brisbane. Here individuals of both species were occasionally numerous in wet sandy soils though unfortunately none was in good flower or fruit. Returning to Brisbane, we encountered *Calamus Muelleri* in flower, the slender stems forming tangles by a

gully next to the road near Montville, and at Mary Cairncross Park near Melany a first sight of *Linospadix monostachya* in the wild was an event. In this park, *Archontophoenix Cunninghamiana* grows by a small stream in the rain forest where, on a rainy afternoon, one experiences the full impact of these palms in their native habitat.

Following a day and a half at the Brisbane Herbarium, I took a late plane to Cairns in northern Queensland where Mr. S. E. Stephens of the Department of Agriculture and Stock was my host. "Ernie" had arranged with Mr. Ed Volk of the Forest Department to meet us at Kuranda where, in the forest on Black Mountain road, we found *Calamus australis* climbing to 35 feet, the dense red-brown spines on the leaf-sheaths contrasting with straw-colored to nearly white fruits. Nearby we found another *Calamus* close to if not identical with *C. Moti*. This species has leaves arranged in nearly regular vertical rows giving a two-sided or four-sided effect to the stems. The upturned basal leaflets of the sessile leaf-blades catch litter so that the plants have a distinctive untidy appearance. In this same forest, the solitary gray stems of *Licuala Muelleri* rose to 20 ft. The nearly circular green leaves arch outward on long petioles but unfortunately neither flowers nor fruits of this handsome palm were obtained. With the diminutive *Linospadix minor*, however, we had better luck here and elsewhere. It forms attractive clumps in the forest understory and is brightened by the bright red fleshy fruits when these are present.

Instead of returning to Cairns, I continued with Mr. Volk to Atherton, stopping on the way to collect *Orania appendiculata* by a stream in the Davies Creek forest reserve. This species had an aspect quite different from species



145. Leaves of *Orania appendiculata* are stiff and ascending when left in open.

seen in Malaya and later in New Guinea. The 30-40 foot trunk is crowned by 15-20 ascending-spreading leaves with pinnae gray below. The smallish bright yellow fruits have a mealy flesh which separates readily from the seed. This bright color was a help in locating fruits, many of which fell into the stream as the tree was felled.

Cairns in February was very hot, probably the hottest place I visited. Atherton, by contrast, is situated on a beautiful tableland reminiscent of upper New York State and framed on the west by the Dividing Range of mountains. It was to the crest of this range, near Herberton, that Mr. Volk drove me on the following day. By a stream in the rain forest, we collected a fruiting specimen of *Archontophoenix*, identity not yet quite certain, and on both sides of the crest of the main watershed at 3600-3800 feet elevation, we found *Laccospadix australasica*. Now that I



146. An unidentified *Archontophoenix* graces the rain forest of the Dividing Range.

have seen this beautiful palm and collected adequate material, it is quite clear that the genus *Laccospadix* should not be united with *Calyptrocalyx* (as

was done, following F. M. Bailey and others, in the Checklist of Cultivated Palms, *Principes* 7: 133. 1963). *Laccospadix* is a cluster palm with three to



147. *Laccospadix australasica* in forest of the Dividing Range.

several stems in a dense clump. Usually one is taller than the others, perhaps reaching a height of 12 ft. before dying and being replaced by others from the clump. The dark-green leaves are long-petioled and among them the pendulous spikes bear successively dirty yellow male and female flowers then small red fruits.

On another day, we found *Calamus caryotoides* in flower and fruit near Atherton, the slender clumped stems forming considerable tangles and the plants spreading by short rhizomes. This is one of the species of *Calamus* that might find a comfortable place in a garden despite its habit of tearing at ones clothing by means of the spiny cirrhi. Elsewhere on the tableland we

saw more puzzling *Calamus*, *Linospadix Palmeriana*? and *Orania appendiculata*, the last left in cleared fields.

After several cool nights in Atherton, I took a bus back to sweltering Cairns. There were compensations, however, for Mr. Stephens took me north to the Daintree River where we got collections of *Normanbya Normanbyi* and *Linospadix minor* and near Mossman *Ptychosperma elegans* in low swampy forest. On the 18th we saw *Arenga australasica* near the foot of the Barron River north of Cairns and got a fine series of *Archontophoenix Alexandrae* near Smithfield. This species is extensively cultivated in the region, one of the too-few instances in which native ornamental material is favored over exotic materials. The last



148. *Archontophoenix Alexandrae* in the forest near Mossman.

day we took boat passage to Green Island off the coast where *Arenga* is common in the open forest that manages to survive on the sand.

From Cairns, the palm hunt continued on Lord Howe Island which needs a chapter of its own in the continuation of this account.

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