



PRINCIPES

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THE PALM SOCIETY

A non-profit corporation primarily engaged in the study of the palm family in all its aspects throughout the world. Membership is open to all persons interested in the family. Dues are \$10.00 per annum payable in May. Requests for information about membership or for general information about the Society should be addressed to the Secretary.

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JOURNAL OF THE PALM SOCIETY

An illustrated quarterly devoted to information about palms published in January, April, July and October, and sent free to members of The Palm Society.

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Cover Picture

Tinned palm cabbage (palmito), as commonly offered for sale, in the window of a Brazilian grocery store. See page 124.

Mailed at Miami, Florida
December 3, 1965

NEWS OF THE SOCIETY

Madame Ganna Walska was hostess to a group of about forty members of the Society on July 25th, at Lotusland, her beautiful estate at Santa Barbara, California. The group, including a bus-full from San Diego, met at the Santa Barbara County courthouse where member Henry Bauernshmidt has planted many palms to complement the fine old specimens for which the courthouse grounds are noted. They then proceeded to the Gillespie estate, which is now being subdivided, but where there are still some good examples of *Parajubaea cocoides*, *Rhopalostylis sapida* and *R. Baueri*, *Livistona Mariae*, *Archontophoenix Cunninghamiana* and *A. Alexandrae*.

At member Madame Walska's estate the visitors were amazed to see how much the plant collections have been increased and improved, even over the seemingly perfect effect created at the time of the biennial meeting last year. A large number of specimen plants has been added this year, and a superb job of labeling has been done, which adds greatly to the educational value of the collections. Seated in the out-door auditorium, the group heard a talk by Bruce Van Dyke, Santa Barbara garden consultant, and then was served some of Madame's famous refreshments. Vice-president Otto Martens presented her with an award, signed by all the officers of The Palm Society, commending her achievements in the realm of palm introduction, cultivation and educational value. Madame gracefully accepted the award and invited the Society to visit again sometime.

* * *

The Central Florida group met at the Daytona Beach home of Dent Smith, the Society's founder and first president, on July 31st. This meeting was arranged

by the acting chairman, Billings McArthur. David Besst, of Maitland, Fla., was elected chairman. After a rainy morning, the clouds lifted in time for a picnic lunch and one of Dent Smith's delightful tours of his collection. Seedling plants of *Sabal domingensis*, *S. louisiana* and *S. mexicana* were donated to the members by C. Albert Emmons, of Daytona Beach, and Mrs. Eileen Butts, of Ormond Beach, distributed seeds from her *Phoenix sylvestris*.

The Society gained several new members at this meeting, and one ex-member has re-joined. We are grateful to all who had a part in making this meeting a success.

* * *

Robert W. Read, botanist at Fairchild Tropical Garden, Miami, Fla., is taking an extended leave in order to complete the work necessary to receive his Ph. D. degree. Since his thesis is to be on *Thrinax* and *Coccothrinax* palms, he will spend the next year or longer in Jamaica, with headquarters at the University of the West Indies, Kingston. He asks his friends and correspondents to address him in care of the Botany Department of the University, rather than at Fairchild Garden, Miami.

* * *

Former president Dent Smith visited former president David Barry, Jr. and Mrs. Barry at their lovely house situated at the foot of Diamond Head, Honolulu, Hawaii, in September. After a delightful two-weeks' visit on Oahu, Mr. Smith made quick trips to the islands of Hawaii and Maui, returning to Florida much pleased with the beauty of the islands and his hosts' hospitality.

* * *

Member Jack Kobernick, of Key West, Florida, writes that salt water, driven into his nursery by Hurricane Betsy, covered many of his seedlings. After a

little more than two weeks he reports that in spite of his washing them thoroughly as soon as possible with fresh water he is losing many of the *Livistona chinensis* in four-inch pots; however, *Chamaedorea erumpens*, *C. Seifrizii*, *Veitchia Merrillii* and *Ptychosperma Macarthurii* seem to be surviv-

ing, and the washingtonias actually seem to be thriving from the salt dosage.

Mr. Kobernick is keeping meticulous records of germination times, and reports them to the secretary from time to time.

LUCITA H. WAIT

Palm Cabbage

W. H. HODGE

The family of the palms is one of the largest among flowering plants. It is also one of the most important, probably surpassed only by the grass family in its value to mankind. Edible fruits or seeds, oils, waxes, sugar and fibers are some of the more important contributions that these plants make to the economy of mankind.

On occasion, visitors to the tropics or subtropics, or residents there, may have the opportunity to taste one of the many lesser economic products of palms, namely "palm cabbage" or "heart of palm", as it is also known. Each of these names is appropriately descriptive when one understands that they both apply to the terminal bud of a palm tree. This bud, the active growing point of the tree, is composed of tender embryonic leaves located at the tip of the trunk where the bud is amply protected by the numerous imbricated basal sheaths of the mature leaves. The palm bud is thus certainly the "heart" of the palm, both with regard to its position as well as its function.

On the other hand, palm cabbage is in most ways best compared in flavor and use with ordinary cabbage. Primarily a texture food, it has a mild sweetish (or slightly bitter in inferior species) nutty flavor when eaten fresh, but a smoother asparagus-like texture when cooked. Moreover, the few assays that have been made of the composition

and food value of palm cabbage show that it is very similar to true cabbage (*Brassica*). Analyses made in Central America focused attention on two species, Mexican coyol (*Acrocomia mexicana*) and one of the deep forest palms, *Geonoma edulis*, while a Cuban analysis dealt with the Cuban royal palm (*Roystonea regia*). In food energy (calories), water content, protein, fat and total carbohydrate, the cabbages of these palms were almost identical with *Brassica*. Principal differences occur in calcium and phosphorus content which, in the palms, is double the value of *Brassica*. Palm cabbage has only traces of vitamin A as opposed to the considerable vitamin A content of true cabbage. On the other hand, palm cabbage has about the same content with regard to thiamine, riboflavin and niacin, but has only one half the ascorbic acid content.

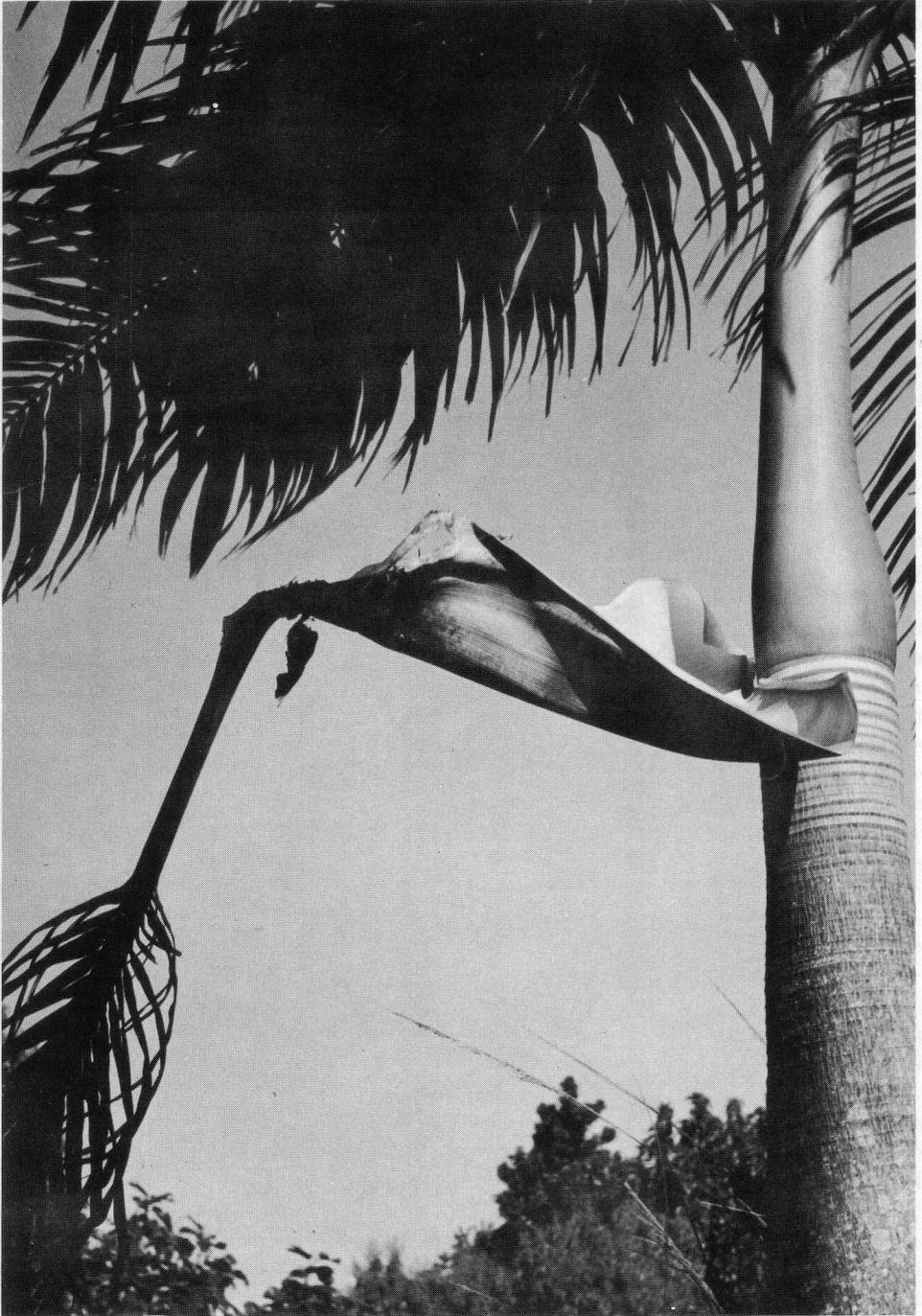
A difference in availability of these two vegetable foods that will always exist relates to the fact that cruciferous cabbage is an herb, grown in horticulture as an annual or biennial, whereas palms are perennial trees. True cabbage is grown economically on an annual basis and at time of harvest essentially the whole aerial part of the plant is used as food. In contradistinction, to enjoy palm cabbage, a mature tree must be sacrificed; and since the delicate bud represents only a minor portion of the

plant body that can be utilized, this is obviously a wasteful operation. Thus

palm cabbage is a delicacy that, in many areas, can only be enjoyed when a palm



111. *Euterpe edulis* ?, growing in mountain forests near Rio de Janeiro, Brazil. This slender, single-stemmed palm is probably the major source of palm cabbage widely available in the Brazilian market.



112. A young royal palm, *Roystonea*, showing the smooth green crownshaft typical of this genus. Within this imbricated cylinder of leaf bases is the tender cylindrical terminal bud, source of edible palm cabbage.

tree has to be felled for some other purpose.

It is probable that the buds of most

palm species are edible. This is a useful bit of emergency food knowledge for anyone traveling in out-of-the-way parts



113. The fresh cylindrical cabbage of a palm, *Euterpe dominicana* (center), as extracted from the terminal portion of a tree. On either side are young inflorescences of this species, endemic to the Lesser Antillean isle of Dominica.

of the tropics. I can recall an instance, some twenty years ago, during World War II, while on quinine procurement work in eastern Peru, when palm cabbage was a regular Godsend. Slender palms of various genera were common in the montane forests where we were working. Food was plain — rice with such game as we could procure — but fresh vegetables and fruit were totally lacking. An occasional palm cabbage was our only source of fresh salad. As I remember it, that Peruvian cabbage was passable. I have said that the buds of most palms are probably edible. It has been reported that the bud of *Orania* is poisonous, and the majority may lack sweetness or may even be on the bitter side. There has been no systematic edibility survey of the genera of palms with respect to their “cabbages,” so we simply cannot say. On the other hand, certain genera — in particular *Euterpe*, *Prestoea*, *Roystonea*, *Sabal*, and *Welfia* — are well known for the sweetness and succulence of their buds. Others described in the literature as edible include species of the genera *Acrocomia*, *Astrocaryum*, *Bactris*, *Geonoma*, *Hyospathe*, and *Socratea*. All of these, as well as those above listed, are neotropical taxa. As a matter of fact there are but very few records that I know of referring to the use of paleotropical palms for cabbage; most pertain to palms of the New World.

Familiar to many is the common palmetto (*Sabal Palmetto*) of our South, the state tree of Florida and South Carolina. An alternate name, cabbage palmetto, refers to the not infrequent use of the bud of this common but slow-growing palm for cabbage. In the “glades” area of Florida, “swamp cabbages” — as palm hearts are more frequently known — often are offered as a special delicacy at picnics and barbecues. The

1964 annual jamboree of the Everglades Conservation and Sportsman Club saw some 10,000 visitors enjoying a gourmet salad made from 500 swamp cabbages.

Best quality palm cabbage appears to come from the genus *Euterpe*. Approximately a dozen species are involved, one or more being found in most parts of tropical America, generally in mountainous terrain. At least one, the *assai* palm (*Euterpe oleracea*), ranges widely in riparian sites in the lowlands of the Guianas and Amazonia. Palms of this genus are commonly known in English as “cabbage palms.” They are slender graceful plants (the Greek from which the name *Euterpe* was derived means “forest grace”) characterized by having a crownshaft (a readily distinguishable false trunk) surrounding the main trunk and made up of the sheathing green bases of the leaf stalks or petioles, which enclose the elongated apical bud within in protective fashion.

My first taste of palm cabbage was that of the then undescribed mountain palmiste (*Euterpe dominicana*), endemic to the Lesser Antillean island of Dominica where, in the late thirties, I was first introduced to the tropics. Pint-sized Dominica has magnificent mountain forests, and in those days the *palmiste montagne* was a common component of certain rainforest communities. Moreover, palm hearts, though not a regular item, were occasionally vended with other tropical vegetables in the town market at Roseau, and those planters living in the interior occasionally supplemented their meals with a serving of *coeur de palmiste*, as this vegetable was called in the local island patois.

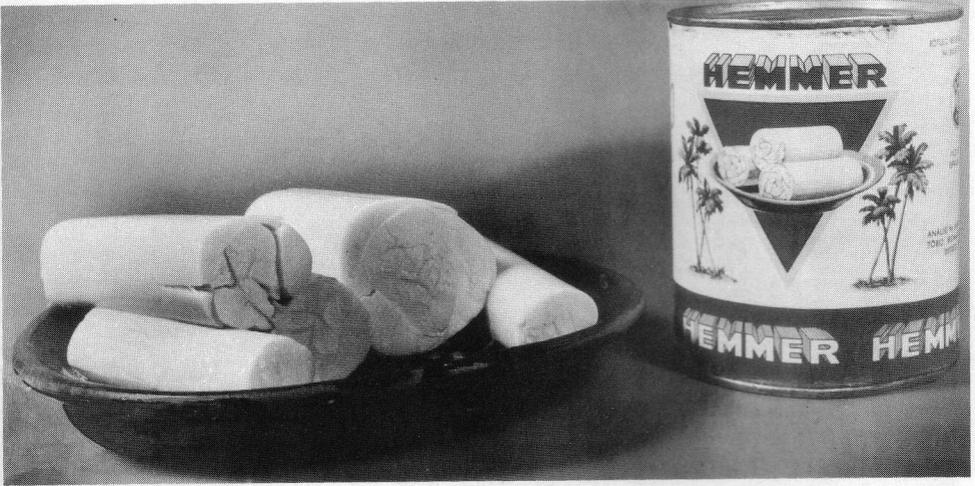
Morphologically the bud making up palm cabbage, like the garden cabbage “head” or bud, is a collection of imbric-



114. Preparing "swamp cabbage" salad from terminal buds of the cabbage palmetto, *Sabal palmetto*. Sharon Bullock, member of Miami's Everglades Conservation and Sportsman Club, helps prepare salad from some of the 500 palm hearts served to 10,000 people at the Club's 1964 Jamboree (Photo courtesy of the Miami Herald).

cated leaves which has been compressed into a tight vegetable package. Garden cabbage is spherical in shape whereas palm cabbage takes the cylindrical form of the tree trunk in which it occurs. It is a simple task to extract the bud from a felled palm tree. The cylindrical segment of the stem represented by the green crownshaft is simply cut out, — in Latin America usually with a machete. A slit is then cut longitudinally for the full length of the crownshaft. Once the outer leaf bases are removed, a white internal cylinder of tender immature leaves is obtained. This is the palm heart or cabbage. Depending upon the species of palm involved, this may vary in diameter from one to several inches,

and in length from one to several feet. Over 150 years ago, in his personal narrative of travels, Alexander von Humboldt described Indian women of the Orinoco serving their men "roasted monkey, fermented liquors and palm cabbage . . . six feet long and five inches in diameter." As in head cabbage, the tenderest leaves of the palm heart are the youngest and are innermost. Palm cabbage may be eaten raw, out of hand, or cut or chopped up in salad with salt or an appropriate dressing. On the other hand, and as with head cabbage, it may be simply cooked or incorporated in various food preparations such as soups, stews or omelets. For those who may have the chance to try tinned palm



115. Brazilian tinned palm cabbage (possibly from *Euterpe edulis*), as taken from a can.

hearts, here are a few simply recommended recipes:

Palm Heart Salad

Marinate slices of palm heart in a dressing of vinegar, olive oil, minced onion (optional), salt and pepper, and serve on lettuce or on top of tomato slices.

Canned palm heart is an excellent addition to any non-fruit salad.

Palm Heart Soup

Canned palm heart, chopped fine, makes an excellent cream soup. Chopped palm heart is also an interesting addition to cream of tomato soup.

Palm Heart Omelet

Add diced canned palm heart (which has been sautéed in a little butter) in an omelet before it has been folded.

Although I have said that palm cabbage is a rather infrequently used vegetable in most part of the American tropics, there is at least one area where it is so widely and regularly used that it has become almost a standard vegetable item in the diet. The area is Brazil. If any country can afford the destruction of a palm tree for each family serving of palm heart — or *palmito*, as it is known in Latin America — it should be

Brazil, for that land is noted for both the variety and numbers of its palms. Undoubtedly the world's palm flora reaches its zenith in Brazil. The cabbage palm genus, *Euterpe*, is likewise abundant — at least in individuals if not in species. As with the majority of palms, the latter are still incompletely known, and this may even be true of Brazil's *palmito*-producing palm, generally assumed to be *Euterpe edulis*. This non-clumping species forms very extensive stands in the humid montane forests along roughly a thousand miles of the Brazilian coast from Espirito Santo to Santa Catarina.

During two recent trips, I was struck by the almost universal use of *palmito*, at least in the population centers around Rio de Janeiro and Sao Paulo. Not only does one see fresh *palmito* in the markets, but every corner grocery store and restaurant seems to be well stocked with tinned palm cabbage. As one Brazilian botanist expressed it, "Almost everyone has his *palmito* salad or soup nowadays." Curiously enough, this same Brazilian, who is a well-traveled field botanist, had no idea where in Brazil all this tinned palm cabbage comes from — nor have I been able to ferret out this



116. Sliced Brazilian palm cabbage served on a fresh salad plate.

information from the limited local data that have been made available to me. Suffice it to say that the rate at which palms are being sacrificed for this industry will eventually deplete the natural supply, which at present undoubtedly seems limitless.

No figures are available on the present level of consumption of palm cabbage in Brazil. Export figures do show the following: export of tinned *palmito* has increased slightly from 586 tons in 1954 to 662 tons in 1961 (the latter

valued at U.S. \$22,000). Most of this goes to neighboring Argentina, but some has been shipped to Europe, and I have noted tins of Brazilian *palmito* recently in a new specialty grocery in downtown Washington, D.C. During the same period no fresh *palmito* was exported until 1956 when four tons appear in the record; in 1961 this increased to approximately 520 tons valued at \$12,000. From these figures we can infer that palm heart utilization in Brazil is substantial at the present time.



Geographic Distribution Of New World Palms

S. F. GLASSMAN

University of Illinois, Chicago Circle

In the process of preparing a revision of B. E. Dahlgren's *Index of American Palms* (Field Museum of Natural History Botanical Series 14: 1-456. 1936), I have compiled a separate list of palms native to the New World. Besides the original list, this enumeration includes new genera, species, varieties, forms and hybrids, new combinations, new distributional records and synonyms added since 1936. According to my totals, there are 82 genera and 1,439 species (including subspecific taxa) native to the New World. Palms known only from cultivation are not included in this list. It should be pointed out here that such a compilation leaves much to be desired since several large genera, e.g. *Chamaedorea*, *Geonoma* and *Syagrus* are currently being monographed, whereas a number of other genera, such as *Aiphanes*, *Astrocaryum*, *Bactris*, *Coccothrinax*, *Desmoncus*, *Euterpe*, and *Scheelea*, are in need of taxonomic revision. Furthermore, continued exploration of such countries as Brazil, Colombia, Peru, Venezuela, and Bolivia will undoubtedly alter the total number of palm taxa.

Table I lists the names of all of the genera I recognize along with the number of species for each. If a familiar genus is not on the list, it has been reduced to synonymy. For example, I am including *Arecastrum*, *Arikuryroba*, *Barbosa*, *Lytocaryum*, and *Microcoelum* under the genus *Syagrus*; and the genera *Guilielma*, *Pyrenoglyphis* and *Yuyba* are to be found under *Bactris*.

From the above list of palms, the geographic distribution of species for

each country and possession in the New World was determined. Table II enumerates the genera and species of native palms for these countries. Each country is listed in geographic order starting with the United States and ending with Argentina. A complete list of names of genera and species for each country will be included in the revision of the *Index of American Palms* when it is published.

It is interesting to note that more than one-third (488) of the known species of New World palms are distributed in Brazil. Of this total, the genera *Bactris* (149) and *Geonoma* (91) comprise one-half the number of Brazilian species. Colombia, Peru and Venezuela with 294, 144 and 106 species, respectively, have the next richest palm floras. Cuba, with 89 species, has an unusually large palm flora for a country its size; however, the genera *Copernicia* with 24 and *Coccothrinax* with 35, account for about two-thirds of the species. In Central America, outstanding palm floras are found in Costa Rica (81), Guatemala (76), Mexico (74) and Panama (72).

Bolivia, with 48 species, has a relatively poor palm flora compared to other countries of similar size such as Venezuela, Colombia and Peru. This could be due to insufficient exploration or to its being a greater distance from the equator than the others. On the other hand, smaller countries like Ecuador (55), British Guiana (45) and Trinidad (37) have a fair number of palms for their size. Argentina (7), Uruguay (3) and Chile (2) have very poor palm

Table I
Genera and Species of American Palms

<i>Genus</i>	<i>No. of Species</i>	<i>Genus</i>	<i>No. of Species</i>
Acanthococos	4	Leopoldinia	4
Acoelorrhaphe	1	Lepidocaryum	8
Acrocomia	28	Manicaria	4
Aiphanes	37	Markleya	1
Allagoptera	6	Mauritia	6
Ammandra	1	Mauritiella	15
Asterogyne	2	Maximiliana	10
Astrocaryum	52	Metasocratea	1
Attalea	29	Morenia	11
Bactris	254	Neonicholsonia	1
Barcella	1	Oenocarpus	17
Brahea	7	Opsandra	1
Butia	9	Orbignya	24
Calyptrogyne	11	Parajubaea	2
Calyptronoma	7	Parascheelea	2
Catoblastus	15	Pholidostachys	2
Catostigma	2	Phytelephas	14
Ceroxylon	20	Polyandrococos	1
Chamaedorea	99	Prestoea	12
Chelyocarpus	3	Pseudophoenix	2
Chrysalidosperma	1	Raphia	1
Coccothrinax	50	Reinhardtia	8
Colpotherinax	1	Rhapidophyllum	1
Copernicia	29	Rhyticocos	1
Corozo	1	Roystonea	17
Crysophila	8	Sabal	25
Desmoncus	67	Scheelea	43
Dictyocaryum	6	Serenoa	1
Erythea	9	Socratea	12
Euterpe	52	Syagrus	47
Gaussia	2	Synechanthus	6
Geonoma	241	Taenianthera	10
Haitiella	1	Tessmanniodoxa	2
Hemithrinax	4	Thrinax	12
Hyospathe	18	Trithrinax	5
Iriartea	7	Washingtonia	2
Iriartella	2	Welfia	2
Jessenia	5	Wendlandiella	3
Juania	1	Wettinia	5
Jubaea	1	Wettiniicarpus	2
Kalbreyera	1	Zombia	1
Totals		Genera 82	Species 1,439

floras. This can probably be attributed to the great distance from the equator. *Juania australis* (Mart.) Drude, from Juan Fernandez Islands (belonging to Chile) at about 35° S. Latitude, apparently ranges farther south than any

other native palm. In the northern hemisphere, at approximately 35° N. Latitude (at the level of North Carolina, Arkansas and Oklahoma), *Sabal minor* (Jacq.) Pers. probably ranges farther north than any other native species.

Table II
Geographic Distribution

Country	No. of Genera	No. of Species	Country	No. of Genera	No. of Species
United States	9	13	Dominica	6	8
Mexico	18	74	Martinique	6	6
Guatemala	22	76	St. Lucia	4	4
British Honduras	17	34	St. Vincent	2	2
El Salvador	5	5	Barbados	1	1
Honduras	16	27	Grenada	3	3
Nicaragua	11	27	Tobago	6	8
Costa Rica	23	81	Trinidad	15	37
Panama	23	72	Curacao	1	1
Bermuda	1	1	Colombia	50	294
Bahamas	5	5	Ecuador	20	55
Cuba	16	89	Peru	34	144
Jamaica	7	12	Chile	2	2
Navassa Island	2	2	Venezuela	30	106
Hispaniola	13	20	British Guiana	18	45
Puerto Rico	9	10	Surinam	9	23
Virgin Islands	2	3	French Guiana	7	14
Anguilla	1	1	Brazil	39	488
Saba	2	2	Bolivia	23	48
St. Christopher	2	2	Paraguay	10	25
Barbuda	1	1	Uruguay	3	3
Antigua	1	1	Argentina	5	7
Guadeloupe	6	6			

The Vallée De Mai And The Coco-De-Mer Palm

J. F. G. LIONNET

The small British Colony of the Seychelles, in the Indian Ocean, which is only 157 miles in area and consists of central granitic and outer coral islands, is renowned the world over for being the home of the coco-de-mer palm.

Of the three coco-de-mer reserves in

the granitic island of Praslin — Vallée de Mai, Fond Ferdinand and Anse Marie-Louise — the first is the best and the most worthwhile to visit. It was acquired by the Seychelles Government in 1948.

This reserve, which is a little less than

46 acres in area, is situated in the midlands of Praslin and can be reached, after a few minutes' drive, both from the villages of Grand'Anse and Baie Ste. Anne. The origin of the name "Vallée de Mai" is unknown; it is believed to have been bestowed upon the reserve by its previous owner. In it, some 4,000 coco-de-mer palms are growing in grandeur and beauty.

The coco-de-mer, *Lodoicea maldivica* (Gmelin) Persoon, is one of the most famous palms in the world and is a unique tree which is comparable with other famous trees of the world, such as even the Lebanon cedar or the giant sequoia of California. The coco-de-mer was endemic to only Praslin, Curieuse and the little Round Island, off the coast of Praslin, and was prominent in the vegetation which covered these islands. It has now disappeared from Round Island, but is still to be found on Praslin and Curieuse. On Praslin, apart from the reserves, it occurs as small stands or isolated trees. On Curieuse there are fewer palms still. The coco-de-mer palms to be found on the main island of Mahé and in other parts of the world have been planted.

The reason why the coco-de-mer existed only on Praslin, Curieuse and Round Island originally is very difficult to explain. It is thought, however, that when the large land mass, of which the granitic Seychelles are believed to be the remnants, split and disappeared in geological times, during which numerous plant species must have become extinct, the gregarious coco-de-mer was isolated on these islands. As the fresh and viable coco-de-mer nuts do not float on water, they could not be carried away by the sea, and the species therefore became restricted to Praslin and two of its satellites.

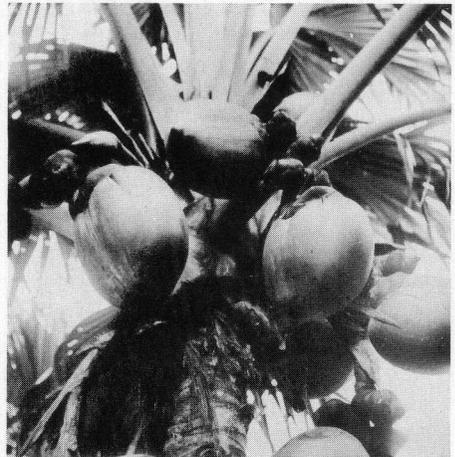
The coco-de-mer is an extremely slow-



117. A young female *Lodoicea* with fruits.

growing palm. The seed-nut takes about a year to germinate. The palm does not start bearing before it is 25 years old and takes one hundred years to reach its full size, which is about 100 feet. The nut takes seven years to mature. Usually only one of the huge palmate leaves, with a span of 20 feet, and four flowering shoots are produced in one year.

The tall coco-de-mer palms in the Vallée de Mai have been estimated to be some 800 years old. The huge bilo-



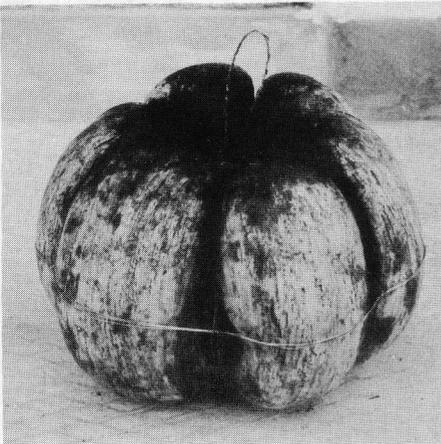
118. Close-up of coco-de-mer fruits.



119. Two seeds from a single fruit.



120. A trilobed coco-de-mer seed.



121. Three seeds from a single fruit.

bed nuts, which are contained in the heart-shaped fruits, are not only most suggestively-shaped, looking like a female pelvis, but also constitute the heaviest seeds of the vegetable kingdom, weighing between 20 and 40 pounds. Some of the fruits, which contain two or sometimes three bilobed nuts, weigh over 100 pounds. Rarer still are fruits with trilobed nuts. Belonging to the *Borassaideae* subfamily of the large family *Palmae*, the *coco-de-mer* is dioecious; there are therefore "male" and "female" trees with respectively staminate and pistillate flowers. The male inflorescence, — a large catkin, 3 to 4 feet long and 3 to 4 inches thick, bearing numerous, small, yellow flowers — is especially striking.

Before the Portuguese rounded the Cape of Good Hope and came into contact with the inhabitants of the Maldive Islands, India, and Indonesia, the *coco-de-mer* was unknown in Europe. It had been known, however, to the inhabitants of these lands, who on rare occasions picked up on their shores the partly-decayed, empty, bilobed shells which, being lighter than water, had floated away and had been driven by sea currents. The strange shape and the mysterious origin of these empty nuts, and their rarity, captured the imagination of the people who found them. All sorts of powers or virtues were attributed to them and many legends were created about them. The partly-decayed, ivory-like endosperm of the nuts was thus believed to be an aphrodisiac and the shell an antidote, while the tree which produced them was believed to be a giant submarine one. As a result these nuts were highly-prized and became precious possessions. It is reported that the nuts picked up on the shores of the Maldive Islands, just like ambergris, were by right the property of the kings

of the islands and that persons retaining them in their possession could be put to death or have their hands cut off. Through early European explorers the coco-de-mer nut was introduced into Europe, where it also became a coveted possession. It is thus recorded that Rudolph II of the Hapsburgs offered, in vain, no less than 4000 gold florins for one such nut, which belonged to the heirs of the Dutch Admiral Wolfert Hermanssen, who had received it as a reward from the Sultan of Bantam, for saving his capital from the Portuguese besieging it in 1602. Closer to us, the coco-de-mer so inflamed the imagination of the pious English General Gordon, hero of Khartoum, who visited the Seychelles in 1881, that he depicted it as the fruit of knowledge and Praslin as the Garden of Eden.

In 1768, however, no less than 26 years after the first exploration of the Seychelles by the French, a French engineer, by the name of Barré, while surveying the island of Praslin, recognized the coco-de-mer. Not believing his eyes, he collected 30 nuts and took them to Pierre Poivre in Mauritius, who was then Intendant of the French Colonies beyond the Cape of Good Hope and who was a keen botanist and a great plant lover. Poivre was delighted with

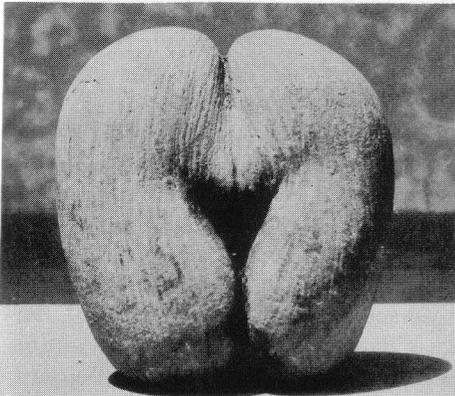


123. Male inflorescence of coco-de-mer.

Barré's discovery and asked the Abbé Alexis Rochon, a French astronomer who was to visit the Seychelles one year later, to bring back young coco-de-mer plants to Mauritius, which the abbé did. Soon after, coco-de-mer nuts were dumped on the Indian market by the shipload and lost their tremendous value forever.

Nowadays the coco-de-mer is only moderately prized for its nuts, which in the immature stage contain a white, sweetish jelly considered a dessert delicacy, and in the mature stage are bought as curios, and also for its leaves, which are used as materials for hat and basket making and sometimes also for making attractive and original light partitions in huts and cottages.

In the Vallée de Mai may be found other endemic trees of the Seychelles, such as the broad-leaved bois rouge, *Dillenia ferruginea*, and capucin, *Northea seychellana*, the beautiful palmiste, *Deckenia nobilis*, the striking palm *latanier latte*, *Verschaffeltia splendida*,



122. Close-up of *Lodoicea* seed.



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 ruptilis* 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.

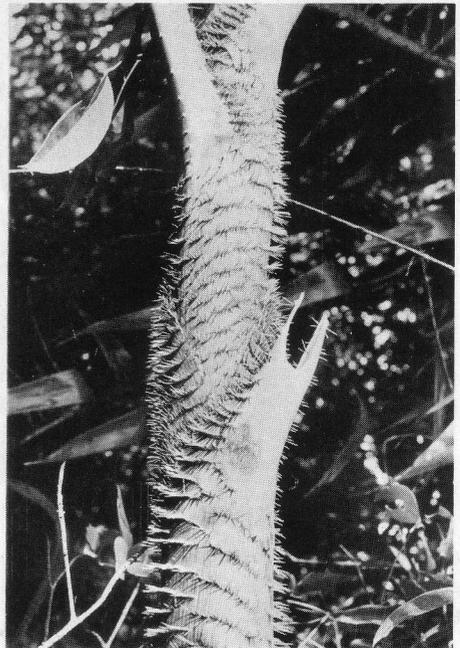
The literal launching was reserved for the morning of the 15th when, with two assistants and a boatman, we set out in a small outboard forestry launch for the Sepilok Forest Reserve 15 miles down Sandakan Bay. Here no rough sea interfered with observations of the shore nor of the mangroves lining the 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.

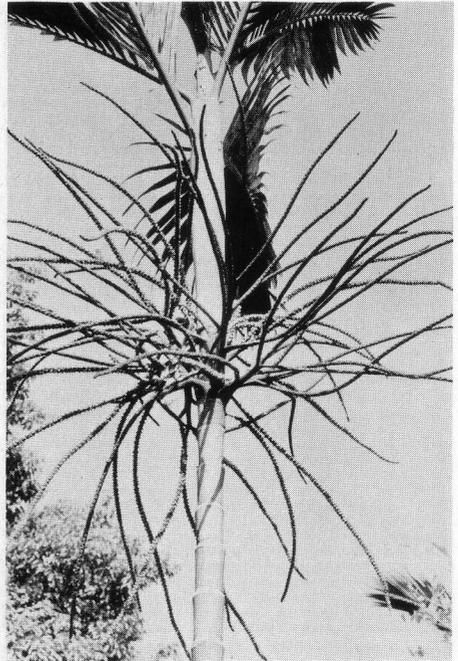
On the 16th, amid trees dripping from

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-

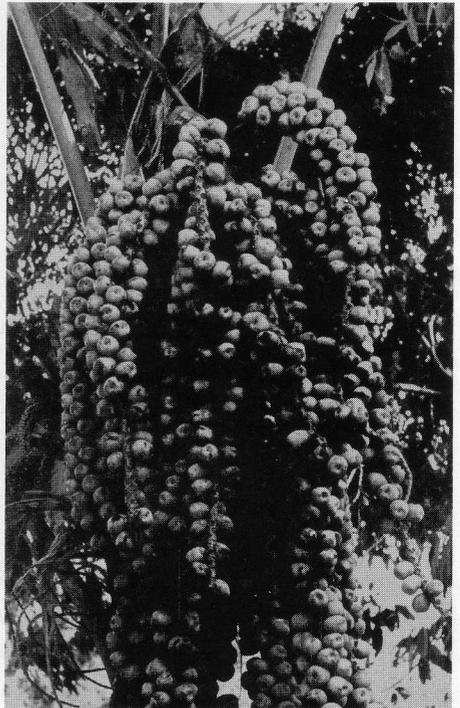


129. Sitim, in white shirt, provides aerial scale for *Borassodendron* near Beaufort.

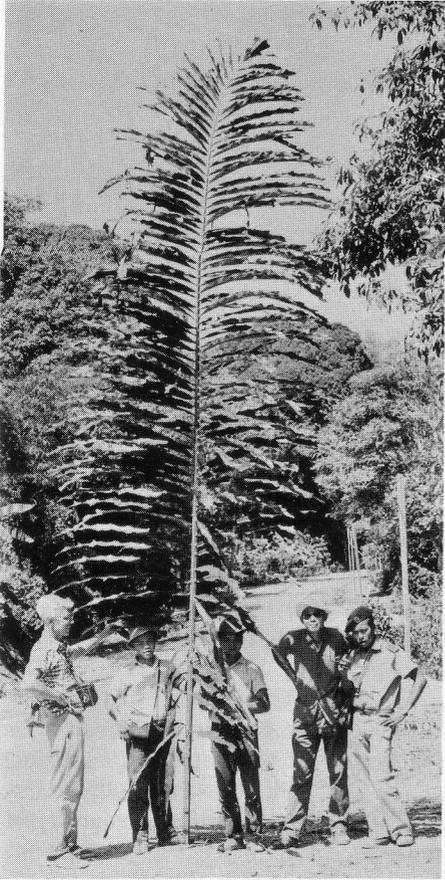
terial of *Plectocomiopsis geminiflorus* var. *borneensis*, an odd relative of *Calamus*, with the leaves arranged in three distinct vertical rows on a three-angled stem and terminal inflorescences with zigzag branches.

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

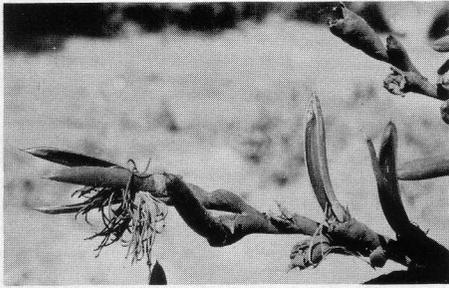


132. A Malay kampong near Jesselton.

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*.

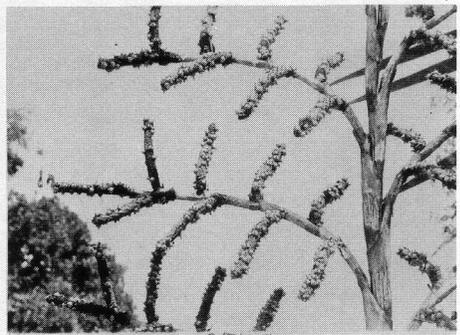


136. Sitim gives scale to inflorescence and entire tree of sago palm, *Metroxylon sagu*.

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-



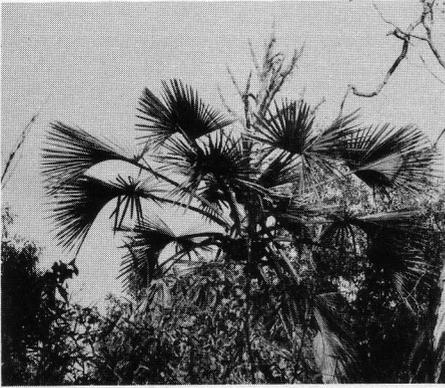
142. The bright red fruits of *Carpentaria* load inflorescence in Darwin.

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.

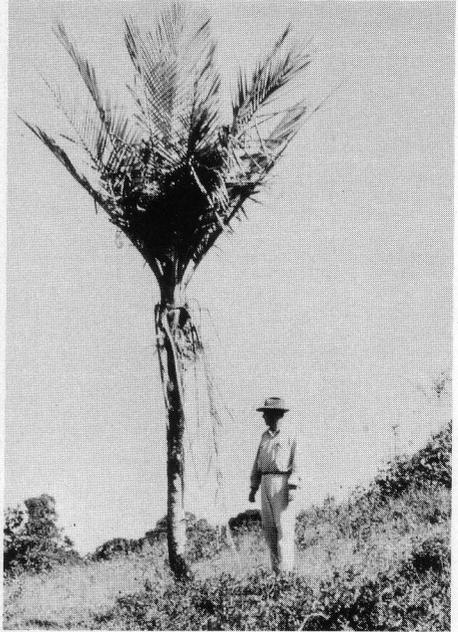
Northern Territory would have been an exciting place for a whole period of field study, but too much lay ahead and the schedule was too close to permit lingering. On February 8th, therefore, I left Darwin on the morning plane to cross the desolate dry central region of northern Australia before picking 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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