



PRINCIPES

Journal of The Palm Society

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April, July 1966

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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PRINCIPES

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.

EDITOR: HAROLD E. MOORE, JR.

EDITORIAL BOARD

David Barry, Jr., Walter H. Hodge, Eugene D. Kitzke, Harold F. Loomis, Nixon Smiley, Dent Smith, P. Barry Tomlinson.

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Cover Picture

Ramu climbs *Metroxylon salomonense* to obtain specimens. See also page 84.

Mailed at Miami, Florida
September 2, 1966

NEWS OF THE SOCIETY

The Biennial Meeting

The Palm Society celebrated its tenth year of existence and its fifth Biennial Meeting under the most felicitous circumstances. The weather was warm and sunny, Fairchild Tropical Garden had recuperated from two severe hurricanes well enough to make a lovely setting for our meeting, everyone seemed to be in a delightful mood, and although some of us had never met before, we were friends.

One hundred members and guests were served at the luau. Unfortunately, we had to turn away some late-comers due to lack of space and food, but they were invited to come back later for the meetings. Long tables were set on the loggia of the Garden House, covered with pastel colored cloths and decorated with tiny potted palms, ferns and hibiscus. Mr. John E. Turner produced some spectacular flower arrangements for the buffet table, using strelitzias and anthuriums provided by Exotic Gardens. Our Hawaiian caterers provided delicious and exotic food, and later on entertained us with some Hawaiian dances.

The auditorium of the Garden House was enhanced by the series of exquisite palm paintings by the well-known Jacksonville artist, Lee Adams, which were donated to the Fairchild Garden by Dr. Arthur Montgomery, son of the Garden's founder. Miss Frieda Seemann placed numbers on the paintings and corresponding numbered lists of names close by, to help in identifying the palms. On the stage, as a background for the speakers, Mrs. George Adams and Miss Lesley Jackson arranged fronds, flowers and fruits of some of the more spectacular palms in interesting patterns. These decorations came from the grounds of Fairchild Tropical Garden and of the A. R. Jennings estate.

Under the chairmanship of Alix, of Alix Landscape Decor, a committee consisting of Messrs. Nat J. De Leon, Cecil Hartson, Paul Drummond and Scott Donachie arranged groups of the rarer palms in containers, labeled so that members could study them. These aroused much interest, since they were mostly new and unfamiliar to us.

The business meeting began at half past two. The out-going President, Mr. Nat J. De Leon, presided. He presented Dr. John Popenoe, Director of Fairchild Tropical Garden, who welcomed the members and guests of The Palm Society. Mr. De Leon then greeted all the members present, mentioning specially the five who came from California, two from Texas and one each from New York State and the District of Columbia. He also recognized the Society's founder, Mr. Dent Smith.

The minutes of the last meeting were read and approved.

The retiring Treasurer, Mr. T. R. Baumgartner, read the financial report, which will be found elsewhere in this issue. He and his wife, Frances, were warmly thanked by the Executive Secretary for their extremely valuable help during the past two years.

The Secretary reported that 85 new members have joined the Society during 1964-66. We now have 377 members in 23 states and possessions of the United States and 73 members in other countries, making a total of 410. This is a considerable drop in membership, she said, and a real effort should be made to recruit new members and reinstate some of those who have dropped out. During the biennium we lost four members by death: Dr. Max Burret, Mr. O. J. Priebe, Mr. Alvin B. Cutler and Mr. Erle Wirt, Jr. They are greatly missed.

The President called on Mr. Robert

Lair, Chairman of the Nominating Committee, to present the nominations for officers for the coming biennium. The slate of officers was read: for President, Mr. Otto Martens, Monrovia, Calif.; for Vice-President, Dr. John Popenoe, Miami, Fla.; for Treasurer, Mr. Wallace E. Manis, Miami, Fla.; for Secretary, Mrs. L. H. Wait, Miami, Fla. The President called for nominations from the floor; there being none, the slate was unanimously elected.

Mr. Lair then read the nominations for the Board of Directors. To serve for a period of two years: Mr. David Barry, Jr., Mr. Nat J. De Leon, Mrs. Alvin R. Jennings, Mr. Walter J. Murray, Dr. John Popenoe, Mr. Nixon Smiley, Mr. Dent Smith. To serve for a period of four years: Dr. Walter H. Hodge, Mr. Eugene Kitzke, Mr. Harold F. Loomis, Mr. Wallace E. Manis, Dr. Harold E. Moore, Jr., Mrs. L. H. Wait, Madame Ganna Walska. There being no nominations from the floor, the directors were unanimously elected.

Following the business meeting, four speakers were heard. Dr. Popenoe described some experiments carried out at Fairchild Garden on methods of germinating hard-to-sprout palm seeds, such as *Acrocomia* spp. and *Arenga engleri*.

Dr. Velva Rudd, Associate Curator of the Department of Botany, Smithsonian Institution, Washington, D. C., and Mr. H. F. Loomis, retired Director of the U. S. D. A. Plant Introduction Station, Miami, Florida, reminisced about the late Dr. O. F. Cook and his work with palms.

The newly-elected President, Mr. Otto Martens, gave an illustrated talk on the modern use of palms in landscaping in California and the renewed interest in them since 1950.

At the evening meeting Dr. H. E. Moore, Jr. took us on a fascinating trip via talk and slides, showing various

parts of the world where he has been palm hunting, with special emphasis on Lord Howe and Juan Fernandez islands.

On Sunday morning ten members flew to Nassau for the day. They were met by Mr. O. S. Russell, Chief of the Ministry of Agriculture and Fisheries of the Bahamas, and two of his assistants, Mr. William S. Neil and Mr. A. K. Murray, who devoted the entire day to showing them the unusual gardens and palm collections of Nassau. The morning was spent at "The Retreat", home of Mr. and Mrs. A. C. Langlois. The group had a wonderful time seeing the many rare palms hidden away in "pot-holes" among the native growth which has been allowed to remain. One climactic moment was the first sight of the beautiful *Areca Langloisiana* with its orange leaf-sheaths. Since the Langlois were away, it was most fortunate that Dr. Moore was one of the party, otherwise many rare palms would have remained unidentified.

After a most pleasant visit at Mr. and Mrs. Russell's delightful home and lunch at the Montague Beach Hotel, they drove to "Glenwood", the home of Mrs. A. Wentworth Ericson, O. B. E. The garden is on a slope, and a number of terraces lead down to level ground. Although we were impressed with the lush look of the growth, with palms of many sizes featured on each terrace, Mrs. Ericson, who graciously came out to greet us, grieves for the plants which were destroyed by the severe hurricane of September, 1965. One of the most interesting palms to be seen there is *Arenga undulatifolia*, with wide, wavy-edged leaflets of an almost steel-blue color, and long strands of immature fruits.

Having lingered so long at these intriguing places, time was getting short and the group had to hurry through Sir Harold and Lady Christie's impres-

sive example of an old garden near the center of town and skip two or three other places which had been on the itinerary. Bidding their hosts a grateful goodbye, the travelers sank into their airplane seats fully satisfied with their day.

The members who did not go to Nassau met at Fairchild Tropical Garden at half past two, and from there went to the Alvin R. Jennings estate, where they were welcomed by Mr. and Mrs. Jennings and taken on a tour of the grounds by Mr. Nat De Leon. This large acreage was developed by the late Col. Robert H. Montgomery, who imported palms and palm seeds with such success that the Montgomery collection became world-famous. Mrs. Jennings, (the former Mrs. Montgomery) has preserved it as she knows the Colonel would have done. With maturity the palms have become even more impressive than during his lifetime.

After being served refreshments the group returned to Fairchild Garden where its Superintendent, Mr. Stanley Kiem, took over the guide's job and led them on a more detailed trip than they had had time for previously.

To all the kind and generous friends who unselfishly contributed to the success of the meeting, our most sincere and hearty thanks.

New Officers Elected

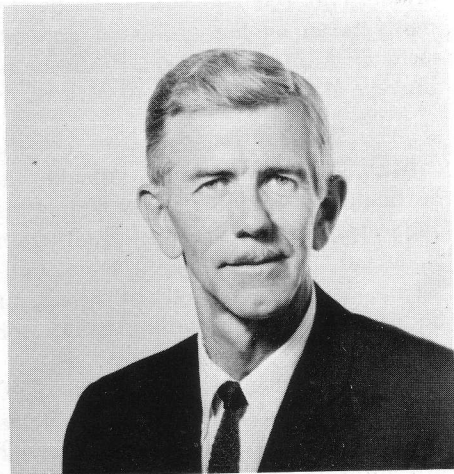
At the biennial meeting of The Palm Society, held on April 16th at Fairchild Garden, Miami, Florida, Dr. John Popenoe was elected Vice-President, succeeding Mr. Otto Martens, who was elected president. Mr. Wallace E. Manis was elected treasurer, succeeding Mr. T. R. Baumgartner.

Dr. Popenoe is a native Californian who was raised in the Los Angeles area. He graduated from the University of California, Los Angeles, with a B.S. degree in 1950. His graduate work was

done at the University of Maryland where he obtained the Ph.D. degree in horticulture in 1955.

After graduating from the University of Maryland he came to Florida where he was horticulturist with the U. S. Department of Agriculture from 1955 to 1958. He spent a year and a half at the Alabama Polytechnic Institute as Associate Horticulturist. In 1960 he was appointed Associate Horticulturist with the Florida Agriculture Experiment Station at Homestead, Florida where he spent three years. Since the middle of 1963 he has been Director of the Fairchild Tropical Garden in Miami.

Dr. Popenoe's interests are in tropical fruits and ornamentals as well as building up and maintaining the outstanding collection of palms and cycads at the Fairchild Tropical Garden.



W. E. Manis

The new Treasurer, W. E. (Gene) Manis was born in Montana and graduated in botany from the University of Montana in 1935. He received his Masters Degree in Forest Pathology from the University of Michigan in 1936 and continued graduate work there, with intermittent work periods at the United States Forest Products Laboratory,

Madison, Wisconsin until 1939, when he struck out for the tropics where he remained for the better part of 25 years. Except for three years in Costa Rica he was associated with research and development of natural rubber, *Hevea brasiliensis*. Work tours with the Firestone Rubber Company, the United States Department of Agriculture, Agency for International Development, Department of State and the United Nations were spent in the following countries, chronologically: Liberia, Brasil, Costa Rica, Nicaragua, Colombia, Panama, Costa Rica, Honduras, Ceylon, Nigeria, Thailand and Burma.

In 1963 he was at the University of Florida, Gainesville, Fla. In January of 1964 he became Research Horticulturist In Charge, United States Department of Agriculture Plant Introduction Station, Miami, Fla., where he still is. He has recently taken on the additional appointment of Adjunct Assistant Professor of Biology at the University of Miami.

William Hertrich Dies

Mr. William Hertrich, well-known horticulturist who for many years was connected with the famous Huntington Botanical Gardens at San Marino, California, died on May 18th, at the age of 88. He had been in failing health for some time.

Born in Baden, Germany, in 1878, Mr. Hertrich came to the United States in 1900, and five years later settled in California. Employed by Mr. Henry E. Huntington that same year, he began as head gardener, and soon progressed to Superintendent, assisting Mr. Huntington in transforming the 700-acre San Marino Ranch into an outstandingly beautiful estate. After Mr. Huntington's death Mr. Hertrich became Curator of the botanical gardens, and finally Curator Emeritus.

The collection of palms, now so out-

standing, was begun in 1913. In *Palms and Cycads As Observed Chiefly in the Huntington Botanical Gardens*, written in 1951, Mr. Hertrich gives a detailed account of the establishment and history of the palm and cycad collections. He also wrote *A Guide to the Desert Plant Collection* in 1937.

Mr. Hertrich was one of the earliest members of The Palm Society, having joined in December, 1955, and was on the board of directors from the Society's earliest days. At the board meeting held on April 16th, 1966, an honorary membership was created for him in honor of his pioneering work with palms and his continuing influence in maintaining interest in them in California, and by means of his writings, throughout the world.

Madame Ganna Walska Elected to Board

Madame Walska, owner and developer of that princely estate, "Lotusland", located at Santa Barbara, California, was elected a four-year member of the Board of Directors at the biennial meeting of the Society. When notified of her election, Madame Walska replied via telegram:

"I am deeply touched by the great honor bestowed upon me by The Palm Society and will try my best to deserve it a little bit by annoying everybody to search for new and rare specimens, with the help of Mr. Otto Martens, without whose knowledge and kindness Lotusland would be so much poorer. Kindly convey to The Palm Society my grateful thanks for their confidence in me. I hope at their next visit they will find an improvement. Ganna Walska."

We are honored to have Madame Walska on our board.

Photographs of Mr. Hertrich and Madame Walska appeared in the July 1964 number of PRINCIPES.

TREASURER'S REPORT

The Palm Society, Incorporated
1964-1966 Biennium

Receipts

Membership contributions	\$9245.33	
Subscriptions and Sale of Back Numbers (<i>Principes</i>)	1774.76	
Seeds	316.04	
Registrations for Biennial Meeting	509.50	
Refund of Wait Withholding Tax	114.86	
Total Monies Collected for Biennial Period 1964-1966		\$11960.49

Expenditures

Salary of Executive Secretary	\$2365.21	
Withholding tax and F. I. C. A. tax	439.93	
Printing <i>Principes</i>	6354.39	
Postage for mailing <i>Principes</i>	305.00	
Office Expenses — Petty Cash, Roster, Bank Charges, Stationery, Mimeographing, Repair of Equipment	1630.90	
Total Expenses for Biennial Period 1964-1966		\$11307.47
Net gain for Biennium		635.02
		\$11960.49

Respectfully submitted,

T. R. BAUMGARTNER, *Treasurer*

* * *

Some Comparisons:

Membership contributions, 1962-64	\$9402.55	
Membership contributions, 1964-66	9245.33	Loss of \$ 157.22
Publication sales, 1962-64	700.00	
Publication sales, 1964-66	1774.76	Gain of \$1074.76
Seed sales, 1962-64	276.25	
Seed sales, 1964-66	316.04	Gain of \$ 39.79

Message of the President

Thank you for the honor of being elected your president. Truly, for the 15 years while plugging away as a daily chore, at growing, re-introducing palms into Southern California and spreading the message 'Palmae sunt Principes', — for all these 15 years the thought never

came to me that someday there would be a compensation.

So that afternoon of April 16th at Fairchild Tropical Garden, feeling a little small in the presence of so many illustrious people, botanists, taxonomists, explorers, writers and experts of palms, I determined to do my best to

live up to what is expected of a good president.

It is apparent that in our Palm Society with members spread over 30 countries two factors are most important: 1) communications, 2) publications — issuance of a magazine of highest caliber, authentic, scientific, yet written in the language understandable by the layman. This magazine must be the tie between the members living throughout the globe. How fortunate The Palm Society is! We have both — and first class: communications, our Secretary Mrs. Lucita H. Wait; publications, Dr. Harold E. Moore, Jr., editor.

We ask the various chapters of The Palm Society to turn in regular reports on meetings to Lucita for PRINCIPES. We also ask the members in foreign countries to send to her notes of interest on palms for publication.

Seedbank. Let us be active, really ac-

tive, that's where the fun comes in! We Californians, after this 1966 meeting in Florida, learned that we can use lots of palm seeds from Florida, but we also saw that the Floridians can use lots of seeds from California. We know which varieties, and we won't let you down when harvest comes around.

Let everyone of us spread the gospel of 'Principes', the 'First ones', wherever he can. Let us increase our membership; not for the sake of having as large one as possible, but for the sake of letting others share in the joy and enthusiasm which we derive ourselves.

I had a note from a Californian who was in Florida for this year's 'Biennial'. "I can't get over it yet" — he writes, "I'm still so thrilled." Well, let me add two words to that: "Me too".

For a good year with palms!

Sincerely,

OTTO MARTENS

Chamaedorea metallica — A New Species from Cultivation

HAROLD E. MOORE, JR.

The species described here as *Chamaedorea metallica* was collected as long ago as 1905 by O. F. Cook at Córdoba in the state of Veracruz, Mexico, and from plants cultivated in St. Louis, Missouri, and Los Angeles California, in 1907, 1912 and 1914. Cook recognized it as a distinct species, and suggested the epithet which I have adopted here as appropriate because the usually undivided leaves have a distinctive metallic sheen. They are also distinctive in being cupped upward toward the tip.

Chamaedorea metallica has recently become prominent in cultivation, where it is usually labelled *Chamaedorea tenella* in error. True *Chamaedorea ten-*

ella is very similar to and perhaps no more than a form of *Chamaedorea genomaeformis*. It is a more slender species than *C. metallica* with yellow flowers, 10-12-nerved leaves similar in shape but smaller, and with inflorescences which droop. Only a few plants are known in cultivation. The male flowers have the petals united at the tip, covering the slender pistillode, and open only by lateral slits, while the stamens have distinct filaments. The female flowers have petals which are overlapping at the margins. *Chamaedorea metallica*, on the other hand, can be distinguished by its ascending to erect inflorescences with bright orange flowers which, in the male, are open at the tip, exposing the angled

and toothed cap of the pistillode surrounded below by incurved essentially sessile anthers, and which, in the female, are sunken in the fleshy unbranched rachis and have valvate, hooded petals.

CHAMAEDOREA (Eleutheropetalum) METALLICA O. F. Cook ex H. E. Moore, sp. nov.

Caudex solitarius, 1.3-1.5 cm. in diam. Folia 12-16, indivisa vel raro irregulariter pinnata, obscure viridia, 8-9-nervata, marginibus dentatis. Inflorescentia plantarum masularum ramosa, floribus sessilibus bifidis, pistillodiis capitatis, plantarum foeminearum spicata, floribus impressis, petalis valvatis aurantiacis. Fructus globoso-ellipsoideus 12 mm. longus, 9 mm. in diam., niger.

Single-stemmed, the green stem 1.3-1.5 cm. in diam. with prominent nodes, and internodes 1.5-2.5 cm. long, adventitious roots at length appearing near the base. Leaves 12-16, rather stiffly ascending or ascending-spreading with blades cupped upward toward the apex, the sheaths ca. 7-8 cm. long, green becoming yellowish in age, split opposite the petiole to within 1-1.3 cm. of the base; petiole short, 2.5-4 cm. long, green and very slightly channelled above, rounded below with a yellowish-white center stripe; blades dark green with a metallic sheen, cuneate-obovate in outline, 21-25 cm. long, 14-16 cm. wide, 7-8 cm. long on upper margin, undivided except at the apex, with 8-9 primary nerves on each side, these prominent but not much elevated above, impressed below, the margin toothed at apex of each primary nerve, secondary nerves 5-6 on each side of primary nerves, not prominent in life, rachis 15.5-19 cm. long, green with pale central stripe, minutely and irregularly toothed along the margin, especially toward the base, or sometimes the blades

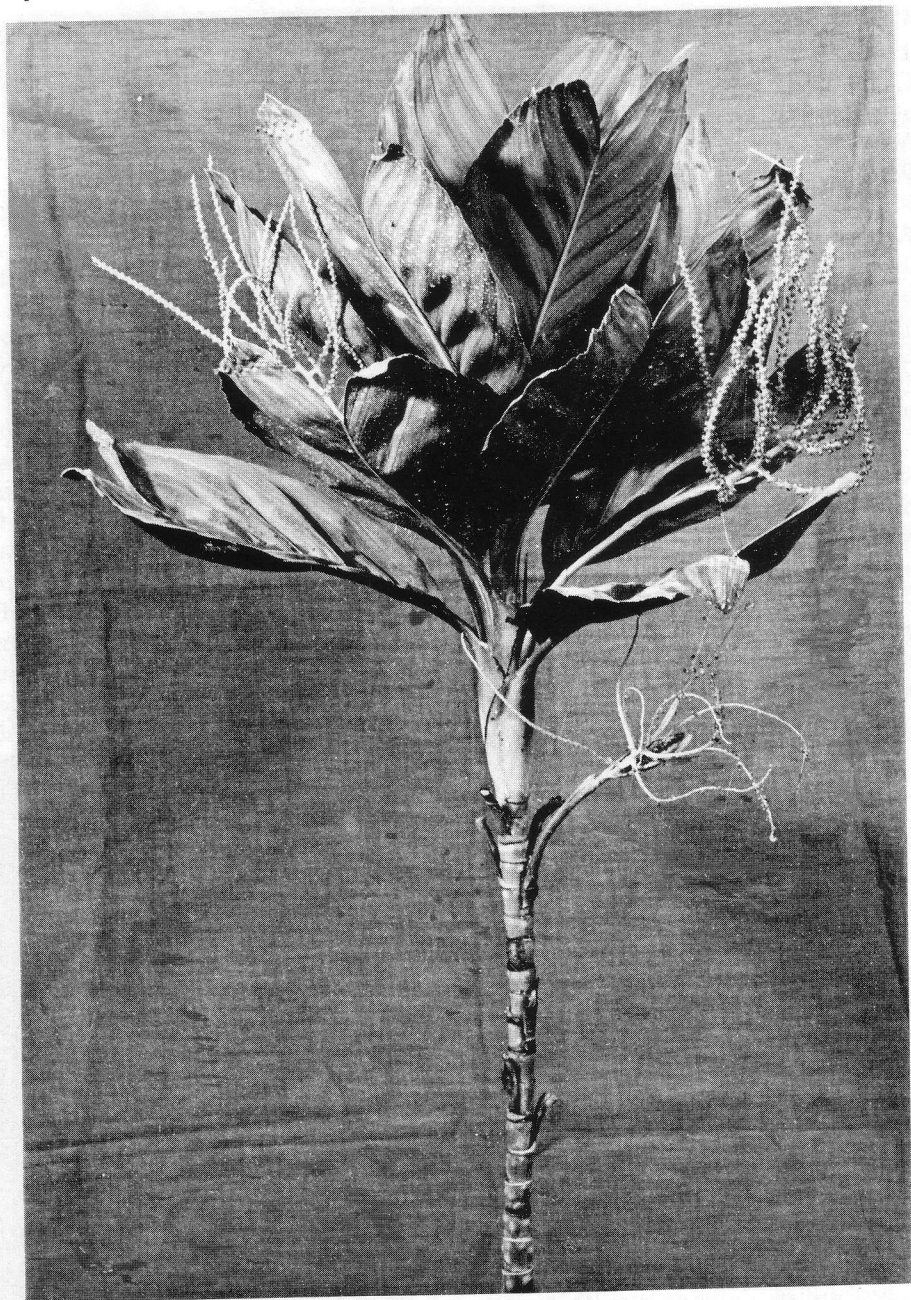
irregularly divided into 3-5 sigmoid 1-3-nerved pinnae on each side, these toothed along the lower margin above the middle and 2.7-6.5 cm. wide, the rachis then extending to 22.5-23.5 cm. long. Inflorescences solitary at the nodes, spreading-erect, the staminate subtended by (3-) 4 bracts, the lowest bract ancipitous and only ca. 3 cm. long, the upper longer, split on one side at the apex and the uppermost exceeding the peduncle 10-20 cm. long or more; rachis 4-6 cm. long; rachillae 10-12, undivided, ascending to erect, 9-14 cm. long, 1.5-2 mm. wide at base, usually flexuous at the apex: the pistillate spicate, subtended by 6 closely sheathing bracts, the lowermost bract ancipitous, ca. 3 cm. long, the remainder 6-14 cm. long, the uppermost about reaching the base of the spike, this erect, pale green at anthesis, 12-14 cm. long, ca. 4 mm. in diam. becoming orange and to 7 mm. in diam. in fruit. Staminate flowers solitary, sessile and superficial on the rachillae, 3 mm. long at anthesis; calyx white, 1 mm. high, shallowly 3-lobed, the lobes rounded and sometimes irregularly split; petals dull purplish-brown in bud, bright orange at anthesis, 3 mm. long, connate and adnate to the receptacle for about half their length, distinct, valvate and subcucullate above; stamens 6, the filaments white, connate and adnate to the pistillode, the anthers essentially sessile on the filament-tube, incurved, deeply bifid at apex and base; pistillode white, columnar with a broad flat 3-angled irregularly toothed cap exposed among and equalling the tips of the petals: pistillate flowers solitary, sunken ca. 1 mm. in the axis, ca. 3.5 mm. long; sepals white distinct, imbricate, rounded, 1.5 mm. high, 2.5 mm. wide; petals bright orange, distinct, valvate, cucullate, fleshy; staminodes 6, subulate, white, nearly as long as the pistil, this globose, of 3 carpels connate



1. A female plant of *Chamaedorea metallica* from which the type specimen was taken. Note the angle at which the spike is borne. Photo by M. H. Stone.

in the lower half but readily separable, stigmas 3, recurved, ovules attached near the base of the locule. Fruit dull

black at maturity, globose-ellipsoid when fresh, ca. 12 mm. long, 9 mm. in diam., drying 10-11 mm. long, 7-8 mm. in



2. A male plant of *Chamaedorea metallica*. Photo by M. H. Stone.

diam.; mesocarp thin, fleshy, green with slender elongate or branched flat fibers appressed against the thin endocarp; seed 10 mm. long, 7 mm. in diam.,

brown, with 2 arcuately ascending raphe-branches; embryo lateral, slightly below the middle; endosperm homogeneous.

MEXICO. Veracruz: Córdoba, May, 1905, *O. F. Cook*, s. n. (US 2086662).

CULTIVATED: Cornell University, Ithaca, New York, from seed collected in Mexico, 20 June 1966, *H. E. Moore*, Jr. 9373 (BH, holotype a pistillate plant) 9374 (BH, paratype, a staminate plant): 9375 (BH, paratype with divided leaves). Los Angeles, California, Doheny Estate, Nov. 1912, *O. F. Cook* s. n. (US 719354); Nov. 12, 1914, *O. F. Cook* s. n. (US 569722 & 2261357). St. Louis Missouri, 1907, *O. F. Cook* 257/04/187 (US 2261341).

The relationship of *C. metallica* is with three other species, all now in cultivation, which have sometimes been separated in the genus *Eleutheropetalum* — *C. Ernesti-Augusti*, *C. Sartorii*, and *C. stolonifera*. These four, all with bright flowers and pistillate flowers with valvate, hooded petals, may be separated as follows:

1. Plants stoloniferous, forming colonies in the wild, the stems slender, 5-6 mm. in diam.; leaves not divided into pinnae; pistillate inflorescence spicate or furcate; fruit globose, 7-8 mm. in diam. Native in the state of Chiapas, Mexico.

C. stolonifera

1. Plants solitary; stems more than 1 cm. in diam.; leaves undivided or pinnate; fruit longer than broad.
2. Pistillate inflorescence with more than 2 branches; leaves normally with about 9 sigmoid pinnae on each side, rarely the pinnae fewer and the terminal portion much broader than usual. Native from eastern Mexico to Honduras.

C. Sartorii

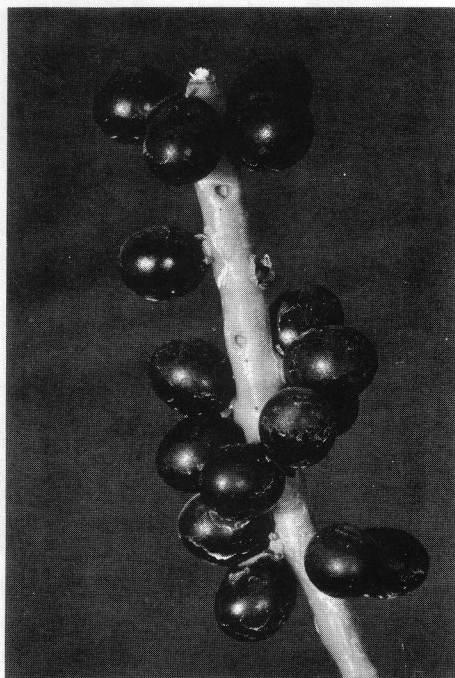
2. Pistillate inflorescence thick, unbranched; leaves normally undivided or irregularly divided into 3-5 pinnae on each side.
3. Mature leaves bright green, flat, or nearly so, with 13-16 pri-

mary nerves on each side prominently elevated on the upper surface in life; pistillate inflorescence erect, the spike not borne at an angle with the peduncle; fresh fruit 15-16 mm. long, 11 mm. wide on fruiting axis about 10 mm. in diam. Low elevations from southern Mexico to Honduras.

C. Ernesti-Augusti

3. Mature leaves deep green with a metallic sheen, cupped upward toward the tip, with 8-9 primary nerves on each side, these only slightly elevated above in life; pistillate inflorescence spreading-erect with erect spike borne at an angle to the peduncle; fresh fruit about 12 mm. long, 9 mm. in diam. on fruiting axis about 7 mm. in diam. Eastern Mexico.

C. metallica



3. Fruits of *Chamaedorea metallica* at maturity. Photo by M. H. Stone



4. A male plant of *Chamaedorea geonomaeformis* with pendulous inflorescences of yellow flowers. True *S. tenella* may be no more than an altitudinal form of this species with narrower leaves.

It is noteworthy that the leaves in *C. metallica* are normally undivided but rarely are divided into pinnae, as on one staminate plant at Ithaca and one or

more in Miami, Florida. The description has been taken from living plants grown from seed collected in Mexico by Horace Anderson of Leucadia, Califor-

nia, and forwarded in November, 1960, by Nat J. DeLeon of Miami, Florida. Flowers were pollinated by hand in November, 1965, with fruit reaching maturity in May, 1966. One to three fruits developed from each flower so pollinated. The plants are now about 6 dm. high (2 ft.) and have been flowering for three years. Apart from the collection of Cook, no specimens of this

plant collected in the wild have been located in herbaria, and it is obvious that it is not common, probably inhabiting a very restricted range in the state of Veracruz, Mexico.*

*Mr. Anderson has recently written to the effect that *Chamaedorea metallica* grows near large outcroppings of rock on rather steep hill-sides near the town of Tezenapa on the rail line about 80 kilometers south of Córdoba very near the border of Oaxaca just north of Tierra Blanca.

Parasitic and Free-living Nematodes Collected from the Soil and Roots Of *Sabal Palmetto*

R. P. ESSER and W. T. WALSH*

Cabbage palms (*Sabal Palmetto*) are among those plants largely disregarded by scientists in their investigation of pathological problems and search for plant pests. They are left, in fact, for the most part in Florida, to Darwin's "survival of the fittest" law, in short to their own devices. The reason for this disregard is that attention to and support for investigations of pathological problems tends to be restricted to plants of economic importance such as corn, tobacco, cotton and, among palms, the coconut when it is grown as a crop not as an ornamental. The chief edible product of the cabbage palms, swamp cabbage, is not of great economic importance and is obtained by botanical butchery, destroying the plant to obtain the relatively small heart, or terminal bud, rather than the more customary means of harvesting a product. The more important aesthetic value of cabbage palms, as can be expected, also fails to draw interest in the palm's existence by pest investigators.

A search of available literature failed to reveal a single record of nematodes associated with *Sabal Palmetto*. The lack of published data indicates that few or no investigations have been made on nematodes of this plant. The first Division of Plant Industry, Florida Department of Agriculture record of a cabbage palm examination was in March 1955 when Dr. B. G. Chitwood identified root-knot nematode (*Meloidogyne incognita acrita*) from a cabbage palm sample taken near Plant City. Four collections were made in 1956 from various parts of Florida and the following parasitic nematodes were detected: sheath nematode (*Hemicycliophora* sp.) and dagger nematode (*Xiphinema* sp.). Free-living nematodes found included *Aglenchus* sp., *Cryptonchus* sp., *Aphelenchus* sp., *Dorylaimus* sp. and *Enchodelus* sp. In 1962, the first cabbage palm sample from a Florida ornamental nursery was examined. At this and subsequent dates, nematode processing techniques had improved considerably and many more nematodes were consequently found. In addition to the sheath, root-knot and dagger nematodes detected previously,

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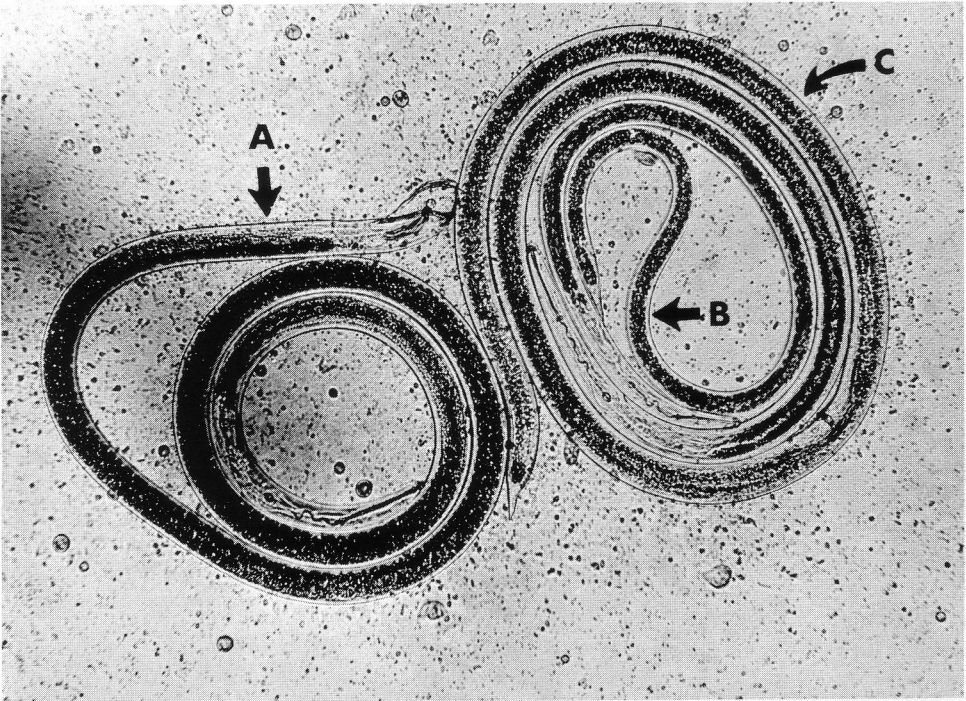


1. A tree island in the Everglades. Nematode samples were taken from a number of such islands. The large trees on the left are slash pines.

the nursery sample yielded the following nematode parasitic on plants: spiral nematode (*Helicotylenchus* sp.), sheathoid nematode (*Hemicrionemoides* sp.), lance nematode (*Hoplolaimus* sp.), stubby root nematode (*Trichodorus* sp.), stunt nematode (*Tylenchorhynchus* sp.) and spine nematode (*Criconema* sp.). Root-knot nematodes were most abundant in the sample.

In 1964, an intensive nematode survey of cabbage palms was conducted in the Florida Everglades. Cabbage palms had been dug indiscriminately in the Florida Everglades and other wild habitats for a number of years and transplanted to towns and cities about Florida as ornamental plants.

In 1963 and 1964, digging and transplanting palms from more or less virgin habitats had become quite a business, and it became necessary to survey the habitat to see if the burrowing nematode (*Radopholus similis*), a nematode subject to quarantine regulations, was present in the wild habitat. Since the area selected for survey is covered with water much of the year and consequently inaccessible to nematode sampling or palm removal, it was necessary to select a dry period in the early part of 1964 to make the survey. The survey area was located in the Florida Everglades near Copeland, Collier County, Florida. The land in the area is under water about six months out of the year with the exception of some of the tree islands



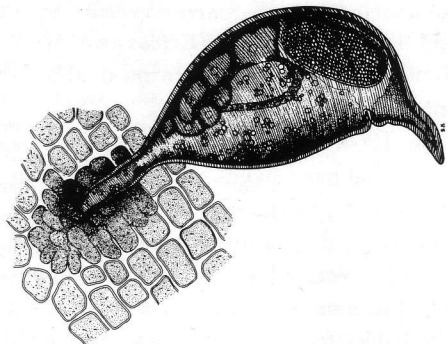
2. Awl nematodes associated with cabbage palms in the Everglades area. A. Male; B. Larva (coiled inside a female coil); and C. female awl nematode.

(Fig. 1), which become flooded only occasionally.

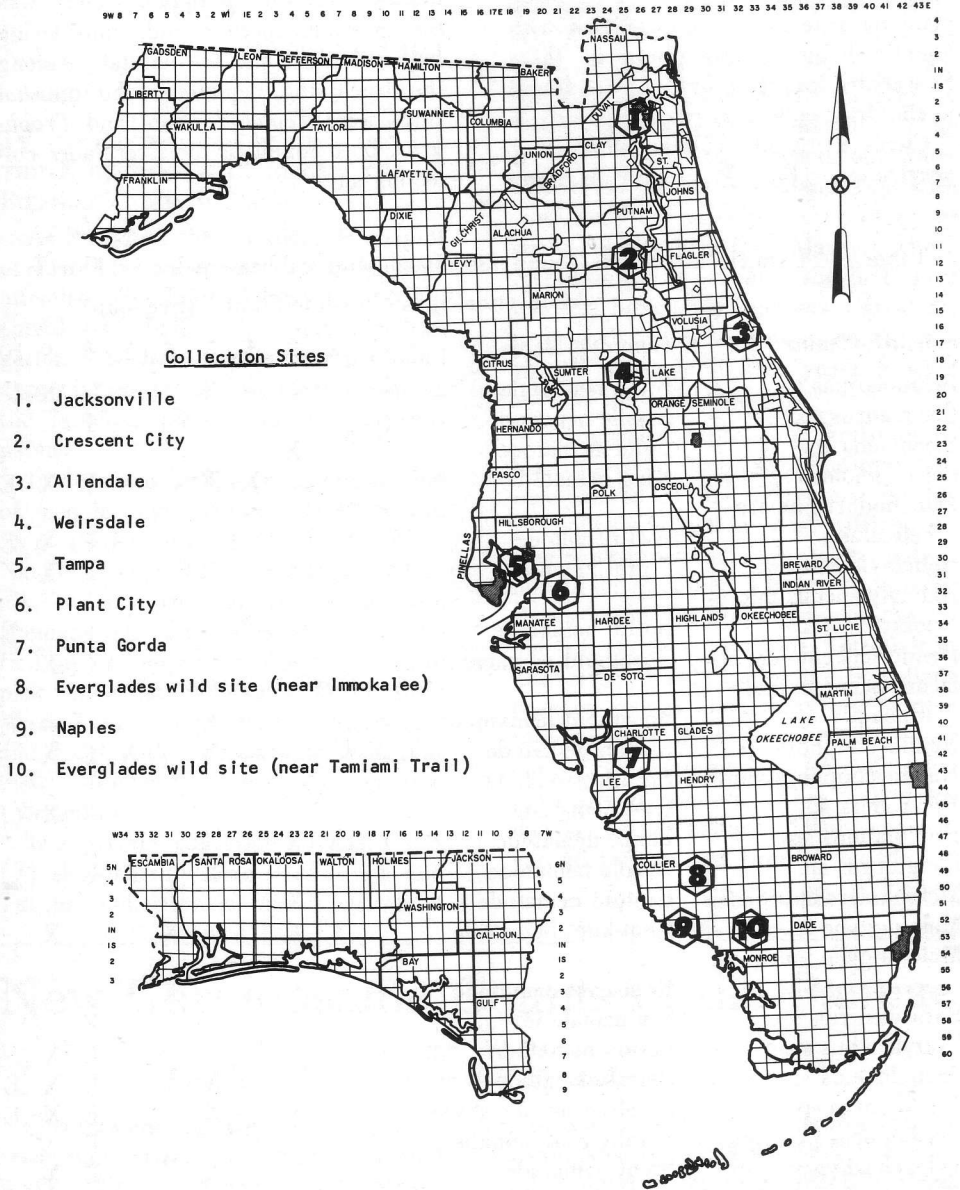
The palms grow in a shallow sandy soil underlaid by Tamiami formation consisting of calcareous sandstones and sandy limestones with frequent outcroppings. This shallow soil makes them relatively easy to remove with a minimum of root damage. They are dug using straight shovels with lead-filled pipes for handles. The heavy handles facilitate cutting through the tough root system to shape the root ball. After the ball is formed, the palm is lifted out by a winch truck. It was interesting to note the nearly perfectly compacted basal portion in the ball of roots possessed by trees after removal. This was result of the natural rocky pockets that did not allow downward root growth. If one were not aware of the conditions under which these plants grow it would appear

that the trees had been grown in a man-made container. A comprehensive list of plant parasitic nematodes found in soil and roots associated with *Sabal Palmetto* in Florida since 1955 is shown in Table 1. Collection sites in Table 1 are shown on the Florida map (Fig. 4).

Several interesting points were indi-



3. Citrus nematode showing head and neck embedded in plant cells. (After Gutierrez).



4. Location of collecting sites in Florida.

cated by the Table. Of 27 genera of nematodes commonly found parasitic on plants in Florida, 21 were found associated with cabbage palm. This is an unusually high number of genera to be associated with a single plant species,

particularly on such a limited survey basis. None of the genera of nematodes were consistently associated with cabbage palm in the ten localities. Ring nematode was found in six of the ten localities. Awl nematode (*Dolichodorus*

heterocephalus), (Fig. 2), a devastating plant parasite normally associated with aquatic habitats, was found in three Everglades localities, but was not found in the drier collection sites.

Citrus nematode (*Tylenchulus semipenetrans*), (Fig. 3), found in large

numbers in three Everglades sites, was the most unexpected find, considering both the plant and the habitat. Among the free-living nematodes the unusual finds were *Ecphyodophora* and *Trophurus*, both found in the Everglades collecting sites.

Table 1. Parasitic nematodes found associated with cabbage palm in Florida
Collection Sites (North to South) (See map)

Scientific Name	Common Name	1	2	3	4	5	6	7	8	9	10
<i>Belonolaimus</i> sp.	Sting nematode					X				X	
<i>Cacopaurus</i> sp.	Sessile nematode								E		
<i>Criconema</i> sp.	Spine nematode			X							
<i>Criconemoides</i> sp.	Ring nematode				X	X		X	E	X	E
<i>Dolichodorus heterocephalus</i>	Awl nematode										
<i>Helicotylenchus</i> sp.	Spiral nematode			X		X			E	X	E
<i>Helicotylenchus microlobus</i>	Spiral nematode								E		E
<i>Hemicriconemoides</i> sp.	Sheathoid nematode			X					E	X	
<i>Hemicriconemoides wessoni</i>	Sheathoid nematode					X					E
<i>Hemicycliophora</i> sp.	Sheath nematode	X				X		X	E	X	
<i>Hemicycliophora similis</i>	Sheath nematode								E		
<i>Heterodera</i> sp.	Cyst nematode								E	X	
<i>Hoplolaimus</i> sp.	Lance nematode		X	X		X					
<i>Longidorus</i> sp.	Needle nematode					X		X	E		
<i>Meloidodera floridensis</i>	Cystoid nematode			X							
<i>Meloidogyne</i> sp.	Root-knot nematode		X	X		X	X			X	
<i>Meloidogyne incognita acrita</i>	Root-knot nematode						X				
<i>Paratylenchus</i> sp.	Pin nematode								E		
<i>Pratylenchus</i> sp.	Lesion nematode				X	X			E	X	
<i>Scutellonema</i> sp.	Spiral nematode					X			E	X	E
<i>Trichodorus</i> sp.	Stubby-root nematode			X		X			E	X	E
<i>Trichodorus proximus</i>	Stubby-root nematode								E		
<i>Tylenchorhynchus</i> sp.	Stunt nematode			X		X			E	X	
<i>Tylenchorhynchus tri-lineatus</i>	Stunt nematode										
<i>Tylenchulus semipenetrans</i>	Citrus nematode				X	X			E	X	E
<i>Xiphinema</i> sp.	Dagger nematode			X		X		X			E
<i>Peltamigratus christiei</i>	Spiral nematode								E		

X — Denotes occurrence on a non Everglade site.

E — Denotes occurrence on an Everglade site.

LETTERS

2615 So. Santa Fe
Vista, Calif.
April 26, 1966

TO THE EDITOR OF PRINCIPES AND ALL
THE FLORIDIANS WHO HOSTED THE
BIENNIAL AT MIAMI, 1966.

As President of the California chapter of The Palm Society and a member who attended The Palm Society's 1966 Biennial, on behalf of the California delegation I wish to express my profound appreciation to the wonderful people, the fabulous places and the gorgeous palms.

I hesitate to list the palms and the list of people must include Dent Smith, Stanley Kiem, Dr. Moore, Lucita Wait, Nat De Leon, John Turner, Jack Koebernik, and my personal friends the Dale Bremermans. The palms at Nassau defied my best superlatives and if I had to pick the best at the Langlois I'd say their *Areca Langloisiana*, the big *Pritchardia* and the gigantic *Latania lontaroides* plus their *Phoenicophorium Borsigianum* (*Stevensonia*).

The private collection of the Flints (?) shown us by Dale Bremerman and Turner's collection in Miami had about

the best specimens in Florida. I can't really tell everyone how fortunate we were to attend Miami's meeting. Dr. Moore's lecture was worth the trip by itself, the weather was too good to be true (we never opened our rain-coats), the people were so generous with their time and so helpful that after that show I really pity Otto Martens whose responsibility it probably will be to host the next biennial. (That was a great act to have to follow — I hope we can forget all or some in two years for the sake of the Californians).

I must also express my gratitude to Mr. Russell of Nassau for the tour and food served at his nice home by his gracious wife. It is most difficult to single out individuals, places and palms, but all in all I had a most memorable six days and I'm praying my slides turn out O.K. to show at our next meeting in California. I didn't think the Floridians bragged enough about *Chrysalidocarpus Cabadae* and they should really plant more *Erythea armata* and *Rhopalostylis*, especially *R. Baueri*. (They will when they see Dent's palms). Thank you one and all for the best time of my life.

DR. M. E. DARIAN

New Chromosome Counts in the Palmae

ROBERT W. READ

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Chromosome numbers in palms have been summarized by Darlington and Wylie (1955), Sharma and Sarkar (1956), and Read (in press). More recent counts have been reported by Cocucci (1964) and Read (1963, 1964, 1965). The following list contains additional reports made as part of a broader study of palms* under the direction of Dr. H. E. Moore of Cornell University. Chromosome numbers were deter-

mined at pollen-tube mitosis from pollen germinated on a colchicine-lactose-gelatin medium as reported earlier by Read (1964). The list is alphabetically arranged by subfamilies. Abbreviations for herbaria where voucher specimens are deposited or for place of origin when not otherwise noted are: (BH) L. H. Bailey Hortorium, Cornell Uni-

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versity, Ithaca, New York; (FTG) Fairchild Tropical Garden, Miami, Florida; (UCWI) University of the West Indies, Mona, Jamaica; (USDA) United States Department of Agriculture Plant Introduction Garden, Miami, Florida.

It will be noted that among the Arecoideae several genera (*Calyptronoma*, some species of *Chamaedorea*, *Gaussia*, *Geonoma*, *Neonicholsonia*, *Opsandra*, *Pseudophoenix*, *Roystonea*) depart from the predominant number of $n=16$. In the Caryotoideae and Borassoideae there is also variation though to a somewhat lesser extent and the count for *Nypa* differs from that previously reported. The Cocoideae divide into two groups, the spiny bactroid alliance having $n=15$, and the remaining genera which, with two exceptions, have $n=16$.

Literature Cited

- Cocucci, A. E. 1964. Sobre la embriología de *Butia paraguayensis* (Barb. Rodr.) Bailey (Palmae). Revista de la Facultad de Ciencias Exactas, Físicas y Naturales, Universidad Nacional de Córdoba. 25: 15-29.
- Darlington, C. D. & A. P. Wylie. 1955. Chromosome atlas of flowering plants 396-399.
- Read, R. W. 1963. Palm chromosomes. Principes 7: 85-88.
- . 1964. Palm chromosome studies facilitated by pollen culture on a colchicine-lactose medium Stain Technology 39: 99-106.
- . 1965. Palm chromosomes by air mail. Principes 9: 4-10.
- . (in press) Chromosome numbers in the Coryphoideae. Cytologia 30: 7 pp.
- Sharma, A. K. & S. K. Sarkar. 1956. Cytology of different species of palms and its bearing on the solution of problems of phylogeny and speciation. Genetica 28: 361-488.

Taxon	Number	Origin and Voucher Number	Native to
Subfamily Arecoideae			
<i>Archontophoenix Alexandrae</i> (F. Muell.) H. Wendl. & Dr.	$n=16$	Cult. FTG: Read 826 (BH, FTG)	Australia
<i>Areca Catechu</i> L.	$n=16$	Cult. USDA: Read 913 (BH, FTG)	Old World
<i>Bentinckia nicobarica</i> (S. Kurz) Becc.	$n=16$	Cult. USDA: Read 1412 (BH, FTG)	Nicobar Islands
<i>Brasillophoenix</i> sp.	$n=16$	Cult. FTG: Read 980 (BH, FTG)	New Guinea
<i>Calyptronoma occidentale</i> (Sw.) H. E. Moore	$n=14$	Jamaica: Read 1573, 1610 (BH, UCWI)	Jamaica
<i>Chamaedorea alternans</i> H. Wendl.	$n=16$	Cult. FTG: Read 1309 (BH, FTG)	Mexico
aff. <i>Arenbergiana</i> H. Wendl.	$n=16$	Cult. FTG: Read 1568 (BH, FTG)	Guatemala
<i>catractarum</i> Mart.	$n=16$	Cult. home of R. W. Read, Miami, Fla. Read 1382 (BH, FTG)	Mexico
<i>elegans</i> Mart.	$n=13$	Cult. FTG: Read 1238 (BH, FTG)	Mexico, Guatemala
<i>Ernesti-Augusti</i> H. Wendl.	$n=13$	Cult. FTG: Read 803 (BH, FTG)	Mexico to Honduras

Taxon	Number	Origin and Voucher Number	Native to
<i>Chamaedorea</i> contd.			
<i>erumpens</i> H. E. Moore	n = 13	Cult. FTG: <i>Read 1379</i> (BH, FTG)	Mexico, Guatemala
<i>microspadix</i> Burret	n = 13	Cult. FTG: <i>Read 613</i> (BH, FTG)	Mexico
<i>monostachys</i> Burret	n = 13	Cult. Longwood Gardens, Penn.: <i>Read 1527</i> (BH, FTG)	Mexico
<i>oblongata</i> Mart.	n = 13	Cult. FTG: <i>Read 1363</i> (BH, FTG)	Mexico to Honduras
<i>radicalis</i> Mart.	n = 13	Cult. FTG: <i>Read 614</i> (BH, FTG)	Mexico
<i>Sartorii</i> Liebm.	n = 13	Cult. FTG: <i>Read 1324</i> (BH, FTG)	Mexico to Honduras
<i>Schiedeana</i> Mart.	n = 13	Cult. FTG: <i>Read 1297</i> (BH, FTG)	Mexico
<i>Seifrizii</i> Burret	n = 13	Cult. FTG: <i>Read 1380</i> (BH, FTG)	Mexico
aff. <i>Tepejilote</i> Liebm.	n = 16	Cult. FTG: <i>Read 1301</i> (BH, FTG)	Mexico
aff. <i>Tepejilote</i> Liebm.	n = 16	Cult. FTG: <i>Read 1325</i> (BH, FTG)	Mexico
aff. <i>Wendlandiana</i> (Oerst.) Hemsl.	n = 16	Cult. FTG: <i>Read 1378</i> (BH, FTG)	Mexico, Guatemala
aff. <i>Wendlandiana</i> (Oerst.) Hemsl.	n = 16	Cult. FTG: <i>Read 1383</i> (BH, FTG)	Mexico, Guatemala
sp.	n = 13	Cult. FTG: <i>Read 805</i> (BH, FTG)	
sp.	n = 13	Cult. FTG: <i>Read 1384</i> (BH, FTG)	
sp.	n = 13	Cult. Nat J. DeLeon, Parrot Jungle, Miami, Fla.: <i>Read 1372</i> (BH, FTG)	
sp.	n = 13	Cult. FTG: <i>Read 1385</i> (BH, FTG)	
<i>Chrysalidocarpus</i>			
<i>lutescens</i> H. Wendl.	n = 16	Cult. FTG: <i>Read 1410</i> (BH, FTG)	Madagascar
<i>madagascariensis</i> Becc.	n = 16	Cult. Hope Bot. Gard., Jamaica: <i>Read 1659</i> (BH)	Madagascar
<i>Dictyosperma</i>			
<i>album</i> (Bory) H. Wendl.	n = 16	Cult. FTG: <i>Read 918</i> (BH, FTG)	Mascarene Islands
<i>aureum</i> (I. B. Balf.) Nicholson	n = 16	Cult. FTG: <i>Read 919</i> (BH, FTG)	Mascarene Islands
<i>Drymophloeus Beguinii</i> (Burret) H. E. Moore	n = 16	Cult. USDA: <i>Read 1395</i> (BH, FTG)	Moluccas
<i>Gausisia attenuata</i> (O. F. Cook) Becc.	n = 14	Cult. FTG: <i>Read 757</i> (BH, FTG)	Puerto Rico
<i>Geonoma Camaná</i> Trail	n = 14	Cult. Nat J. De Leon, Parrot Jungle, Miami, Fla.: <i>Moore 8502</i> (BH)	Peru

Taxon	Number	Origin and Voucher Number	Native to
<i>Heterospathe</i>			
<i>elata</i> Scheff.	n = 16	Cult. FTG: <i>Read 1294</i> (BH, FTG)	East Indies
<i>humilis</i> Becc.	n = 16	Cult. FTG: <i>Read 1293</i> (BH, FTG)	New Guinea
<i>Hydriastele</i> sp.	n = 16	Cult. FTG: <i>Read 1370</i> (BH, FTG)	New Guinea
<i>Mascarena</i>			
<i>lagenicaulis</i> L. H. Bailey	n = 16	Cult. FTG: <i>Read 770</i> (BH, FTG)	Mascarene Islands
<i>Verschaffeltii</i> (H. Wendl.) L. H. Bailey	n = 16	Cult. FTG: <i>Read 1387</i> (BH, FTG)	Mascarene Islands
<i>Neodypsis Decaryi</i> Jumelle	n = 16	Cult. FTG: <i>Read 827</i> (BH, FTG)	Madagascar
<i>Neonicholsonia Watsonii</i> Damm.	n = 18	Cult. Longwood Gardens, Penn.: <i>Huttleston 1943</i> (BH)	Central America
<i>Nephrosperma</i>			
<i>Vanhoutteanum</i> (H. Wendl. ex Van Houtte) I. B. Balf.	n = 16	Cult. Castleton Bot. Gard., Jamaica: <i>Read 1557</i> (BH)	Mauritius
<i>Opsianandra Maya</i> O. F. Cook	n = 14	Cult. FTG: <i>Read 776</i> (BH, FTG)	Mexico, Guatemala
<i>Paralinospadix stenoschista</i> Burret?	n = 16	Cult. FTG: <i>Read 1426</i> (BH, FTG)	New Guinea
<i>Phoenicophorium Borsigianum</i> (C. Koch) Stuntz	n = 16	Cult. Castleton Bot. Gard., Jamaica: <i>Read 1550</i> (BH)	Seychelle Islands
<i>Pinanga Kuhlil</i> Blume	n = 16	Cult. FTG: <i>Read 822</i> (BH, FTG)	East Indies
<i>Pseudophoenix</i>			
<i>Sargentii</i> H. Wendl. ex Sarg.	n = 17	Cult. USDA: <i>Read 839, 1397</i> (BH, FTG)	Caribbean
<i>vinifera</i> (Mart.) Becc.	n = 17	Cult. USDA: <i>Read 759, 1456</i> (BH, FTG)	Hispaniola
<i>Pychosperma Macarthurii</i> (H. Wendl.) Nicholson	n = 16	Cult. FTG: <i>Read 1481</i> (BH, FTG)	New Guinea
<i>Roystonea</i>			
<i>altissima</i> (Mill.) H. E. Moore	n = 18	Jamaica: <i>Read 1585</i> (BH, UCWI)	Jamaica
<i>elata</i> (Bartr.) F. Harper	n = 18	Florida: <i>Read 838</i> (BH, FTG)	Florida
<i>princeps</i> (Becc.) Burret	n = 18	Jamaica: <i>Read 1570</i> (BH, UCWI)	Jamaica
sp. (<i>elata</i> ?)	n = 18	Cult. FTG: <i>Read 602</i> (FTG)	
sp. (<i>elata</i> ?)	n = 18	Cult. FTG: <i>Read 917</i> (FTG)	
sp.	n = 18	Cult. Jamaica: <i>Read 1566</i> (BH, UCWI)	
<i>Siphokentia Beguinii</i> Burret	n = 16	Cult. FTG: <i>Read 604</i> (BH, FTG)	Moluccas

Taxon	Number	Origin and Voucher Number	Native to
<i>Synechanthus mexicanus</i> L. H. Bailey	n = 16	Cult. FTG: <i>Read 1421</i> (BH, FTG)	Mexico
<i>Veitchia</i>			
<i>Merrillii</i> (Becc.) H. E. Moore	n = 16	Cult. FTG: <i>Read 1235</i> (BH, FTG)	Philippine Islands
<i>Montgomeryana</i> H. E. Moore	n = 16	Cult. FTG: <i>Read 1436</i> (BH, FTG)	New Hebrides?
Subfamily Borassoideae			
<i>Borassus flabellifer</i> L.	n = 18	Cult. USDA: <i>Read 818</i> (BH, FTG)	Africa
<i>Latania</i>			
<i>Loddigesii</i> Mart.	n = 14	Cult. FTG: <i>Read 1475</i> (BH, FTG)	Mascarene Islands
<i>Iontaroides</i> (J. Gaertn.) H. E. Moore	n = 14	Cult. FTG: <i>Read 1486</i> (BH, FTG)	Mascarene Islands
<i>Verschaffeltii</i> Lem.	n = 14	Cult. FTG: <i>Read 616</i> (BH, FTG)	Mascarene Islands
<i>Lodoicea maldivica</i> (Gmel.) Pers.	n = 17	Cult. Hope Bot. Gard., Jamaica: <i>Read 1488</i> (BH)	Seychelle Islands
Subfamily Caryotoideae			
<i>Arenga</i>			
<i>caudata</i> (Loureiro) H. E. Moore	n = 32	Cult. FTG: <i>Read 1374</i> (BH, FTG)	S. E. Asia
<i>pinnata</i> (Wurm.) Merr.	n = 16	Cult. FTG: <i>Read 772</i> (BH, FTG)	S. E. Asia
aff. <i>porphyrocarpa</i> (Mart.) H. E. Moore	n = 16	Cult. Hope Bot. Gard., Jamaica: <i>Read 1567</i> (BH)	S. E. Asia
<i>tremula</i> (Blanco) Becc.	n = 16	Cult. FTG: <i>Read 1376</i> (BH, FTG)	Philippine Islands
<i>Wightii</i> W. Griff.	n = 16	Cult. Castleton Bot. Gard., Jamaica: <i>Read 1660</i> (BH)	S. E. Asia
<i>Caryota</i>			
sp. (<i>Cummingii</i> ?)	n = 17	Cult. FTG: <i>Read 1381</i> (BH, FTG)	S. E. Asia
sp. (<i>mitis</i> ?)	n = 17	Cult. FTG: <i>Read 1429</i> (BH, FTG)	S. E. Asia
sp. (<i>mitis</i> ?)	n = 17	Cult. FTG: <i>Read 1435</i> (BH, FTG)	S. E. Asia
sp.	n = 17	Cult. FTG: <i>Read 1482</i> (BH, FTG)	S. E. Asia
Subfamily Coccoideae			
<i>Acrocomia</i>			
<i>aculeata</i> (Jacq.) Lodd. ex Mart.	n = 15	Cult. FTG: <i>Read 1425</i> (BH, FTG)	West Indies

Taxon	Number	Origin and Voucher Number	Native to
<i>crispa</i> (HBK) C. F. Baker ex Becc.	n = 15	Cult. FTG: <i>Read 821</i> (BH, FTG)	Cuba
<i>spinosa</i> (Mill.) H. E. Moore	n = 15	Jamaica: <i>Read 1661</i> (BH, UCWI)	Jamaica
<i>Aiphanes</i>			
<i>caryotaefolia</i> (HBK) H. Wendl.	n = 15	Cult. FTG: <i>Read 905</i> (BH, FTG)	No. South America
<i>erosa</i> (J. Linden) Burret	n = 15	Cult. FTG: <i>Read 1357</i> (BH, FTG)	West Indies
<i>Allagoptera arenaria</i> (Gomes) O. Kuntze	n = 16	Cult. FTG: <i>Read 955</i> (BH, FTG)	Brazil
<i>Arecastrum Romanzoffianum</i> (Cham.) Becc.	n = 16	Cult. FTG: <i>Read 911</i> (BH, FTG)	Brazil
<i>Arikuryroba schizophylla</i> (Mart.) L. H. Bailey	n = 15	Cult. FTG: <i>Read 824</i> (BH, FTG)	Brazil
<i>Astrocarpum mexicanum</i> Liebm.	n = 15	Cult. FTG: <i>Read 902</i> (BH, FTG)	Mexico
<i>Bactris</i>			
<i>Gasipaes</i> HBK			
sp.	n = 15	Cult. FTG: <i>Read 1413</i> (BH, FTG)	Tropical America
<i>Butia capitata</i> (Mart.) Becc.	n = 15	Cult. FTG: <i>Read 901</i> (BH, FTG)	
<i>Cocos nucifera</i> L.	n = 16	Cult. FTG: <i>Read 906</i> (BH, FTG)	Brazil to Argentina
<i>Elaeis oleifera</i> (HBK) Cortés	n = 16	Cult. FTG: <i>Read 944</i> (BH, FTG)	Old World
<i>Jubaea chilensis</i> (Mol.) Baill.	n = 16	Cult. A. R. Jennings Estate, Coral Gables, Fla.: <i>Read 1388</i> (BH, FTG)	Central and Northern South America
<i>Orbignya</i> aff. <i>Cohune</i> ? (Mart.) Dahlgren & Standl.	n = 16	Chile: <i>Moore 9366</i> (BH)	Chile
<i>Polyandrococos caudescens</i> (Mart.) Barb.-Rodr.	n = 16	Cult. USDA: <i>Read 1398</i> (BH, FTG)	
<i>Rhyticocos amara</i> (Jacq.) Becc.	n = 16	Cult. Castleton Bot. Gard., Jamaica: <i>Read 1662</i> (BH)	Brazil
<i>Scheelea</i> sp.	n = 16	Cult. USDA: <i>Read 1415</i> (BH, FTG)	West Indies
<i>Syagrus</i>			
<i>comosa</i> (Mart.) Mart.	n = 16	Cult. USDA: <i>Read 1428</i> (BH, FTG)	Brazil
<i>coronata</i> (Mart.) Becc.	n = 16	Cult. FTG: <i>Read 910</i> (BH, FTG)	Brazil
<i>quinquefaria</i> (Barb.-Rodr.) Becc.	n = 16	Cult. FTG: <i>Read 1424</i> (BH, FTG)	Brazil
sp.	n = 16	Cult. FTG: <i>Read 1408</i> (BH, FTG)	
sp.	n = 16	Cult. FTG: <i>Read 1489</i> (BH, FTG)	
sp.	n = 15	Cult. FTG: <i>Read 1371</i> (BH, FTG)	

Taxon	Number	Origin and Voucher Number	Native to
Subfamily Coryphoideae			
<i>Coccothrinax</i>			
<i>acuminata</i> Sargent ex Becc.	n = 18	Cult. FTG: <i>Read 1431</i> (BH, FTG)	Cuba
<i>crinita</i> Becc.	n = 18	Cult. USDA: <i>Read 1440</i> (BH, FTG)	Cuba
<i>inaguensis</i> R. W. Read	n = 18	Cult. USDA: <i>Read 1439</i> (BH, FTG)	Great Inagua
<i>Martii</i> (Griseb. & H. Wendl.) Becc.	n = 18	Cult. USDA: <i>Read 1400</i> (BH, FTG)	Cuba
<i>Miraguama</i> (HBK) Becc. var.	n = 18	Cult. FTG: <i>Read 1406</i> (BH, FTG)	Cuba
<i>Miraguama</i> (HBK) Becc. var.	n = 18	Cult. Langlois' Garden, The Retreat, Nassau, Bahamas: <i>Read 1480</i> (BH, FTG)	Cuba
<i>Rhapis excelsa</i> (Thunb.) Henry	n = 18	Cult. FTG: <i>Read 701</i> (BH, FTG)	China
<i>Sabal jamaicensis</i> Becc.	n = 18	Jamaica: <i>Read 1618</i> (BH, UCWI)	Jamaica
<i>Schippia concolor</i> Burret	n = 18	Cult. Langlois' Garden, The Retreat, Nassau, Bahamas: <i>Read 1445</i> (BH, FTG)	British Honduras
<i>Washingtonia filifera</i> (L. Lindlen) H. Wendl.	n = 18	Cult. FTG: <i>Read 812</i> (BH, FTG)	California
<i>Zombia antillarum</i> (Descourtillz ex Jackson) L. H. Bailey	n = 18	Cult. FTG: <i>Read 721</i> (BH, FTG)	Hispaniola
Subfamily Lepidocaryoideae			
<i>Raphia taedigera</i> (Mart) Mart.	n = 14	Costa Rica: <i>Read 1483</i> (FTG)	Central America
Subfamily Phoenicoideae			
<i>Phoenix reclinata</i> Jacq.	n = 18	Escape from cult. Key Biscayne, Fla.: <i>Read 1373</i> (BH, FTG)	Africa
Subfamily Nypoidae			
<i>Nypa fruticans</i> Wurm	n = 17	Cult. FTG: <i>Read 734</i> (BH, FTG)	S. E. Asia and Pacific Islands
Subfamily Phytelephantoideae			
<i>Phytelephas</i> sp.	n = 16	Cult. Castleton Bot. Gard., Jamaica: <i>Read 1629</i> (BH)	Tropical America

PALM LITERATURE

Wessels Boer, J. G. 1965. The Indigenous Palms of Suriname, pp. i-xx, 1-172, pls. I-XVIII, figs. 1-10 and Flora of Suriname, volume 5, part 1: Palmae. E. J. Brill, Leiden, Netherlands.

The treatment of palms for the *Flora of Suriname* was printed separately but constitutes the major part of Dr. Wessels Boer's Ph.D. thesis, *The Indigenous Palms of Suriname*, thus the two are reviewed together. For anyone concerned with the bases for the taxonomy of palms in this flora, the introductory matter to the thesis (pp. vii-xx) is important reading.

Dr. Wessels Boer spent about a year studying and collecting palms in Suriname, supplemented by work in Trinidad. Drawing from this experience, he has attempted what he describes as "a hesitant beginning of the consolidation phase" of four overlapping phases in the knowledge of the world's flora distinguished by Davis and Heywood (*Principles of Angiosperm Taxonomy* 3 1963). To what extent he has consolidated may be gauged by the extensive synonymy given for both genera and species.

Seventeen genera are listed, of which *Phoenix* and *Roystonea* are naturalized from cultivation and the coconut is cultivated as in most parts of the tropics. To one who for many years has been studying palm genera in the herbarium and the field, Dr. Wessels Boer seems to have consolidated overly well, uniting the genera of *Iriarteae* into *Iriartea* and *Wettinia*, uniting *Corozo* with *Elaeis*, *Jessenia* with *Oenocarpus* and placing *Maximiliana*, *Markleya*, *Orbignya*, *Parascheelea*, *Scheelea* within the confines of *Attalea*. The argument for so doing seems largely to be practicality — to be able to provide a generic name for materials — and clearly if

this is a major objective then the fewer the genera the easier the finding of a name to use.

To identify a palm to species and to provide it with a correct name, however, requires sufficient information about the palm. All too often, as Wessels Boer notes, palms have been described on the basis of a few fragments in an herbarium. To relate these to a palm in its entirety is often difficult, sometimes nearly if not quite impossible. The only remedy is to visit the region which an incompletely known species inhabits and there to obtain the kind of information and specimens which are required for a full understanding.

But with complete material, there is usually little difficulty in identifying the palm to genus and hopefully, as palms become better known, it will be easier to identify species as well. To use uncertain species and practicality as criteria for lumping a number of distinctive genera into one evades the issue of knowing enough about the plants. Wessels Boer, for example, considers that in the *Iriarteae* "the genera seem to be on a specific level." He thus would unite *Iriarteae*, *Socratea*, *Iriartella*, *Dictyocaryum* and *Metasocratea* into one genus, *Iriarteae*, on the basis of experience with one species (of *Socratea* as I understand it) and an assessment of the literature, and the remaining genera with *Wettinia* (p. 61, 62). As I have pointed out earlier (*Gentes Herbarum* 9: 276, 277. 1963; *Principes* 5: 8. 1961), at least the genera *Iriarteae*, *Socratea*, *Iriartella*, *Dictyocaryum* are abundantly distinct to me, not only on one characteristic but on correlated characteristics which Wessels Boer dismisses as unimportant (p. 62). Given complete material, including the very important inflorescence with its bracts, there is no problem in identifying to genus. When a palm flora

is well studied, species also become easy to identify, as I know from experience with two species each of the first three genera in Amazonian Peru and one each of *Socratea* and *Iriartea* in Costa Rica. To merge such diverse and well marked genera, often with parallel distribution patterns, tends to obscure the evolutionary patterns unnecessarily.

The genera placed in *Attalea* are generally well distinguished by male flowers alone, though the evidence suggests that inflorescences have distinctive morphology also. Again it seems to obscure relationship to unite them without more intensive study and certainly not because male flowers are not always produced at convenient times for the collector. It behooves the collector to remedy this lack by returning at a convenient time for the plant. The apparent variability of the male flower in *Maximiliana* as shown in Fig. 8 of the Flora would be more convincing if one were to show as much in a single inflorescence, but each is from a distinct collection and one wonders whether the types figured are uniform in their respective inflorescences.

It is not the intent of this reviewer to criticize "lumping" or consolidation but to point out briefly that Dr. Wessels Boer's concepts of genera and species are much broader than usual. Specific synonymy is often very extensive, more so than is perhaps called for in a floristic study when all the types of submerged species seem not to have been studied critically as in *Bactris simplifrons*.

Unless one is thoroughly familiar with palm literature, it will be difficult to determine what is meant by many of the references to published papers in the text since the list of literature on page seven is remarkably incomplete. Burret published many papers on palms and is

frequently cited by Wessels Boer, but the entry under Burret merely refers one to Potztl's list of his papers in *Principes* 2: 87-91, 1958, and one must then attempt to determine which of six papers published in 1938 is meant by Burret (1938), of eight in 1930 by Burret (1930) and that Burret (1920) on page fifteen is a misprint for (1930). Similarly one must look elsewhere or search through the text and synonymy for clues to determine what is meant by Hawkes (1952), Dugand (1941), Standley & Steyermark (1958), Kunth (1841), Moore (1963), Cook & Doyle (1912) and many others. In neither volume is an index or a finding list provided.

It is also disconcerting to note that the epithet *regia* has been used under *Attalea* when this is illegitimate on two counts — as a later homonym and because antedated by the epithet *Maripa* when several species are united as is done by Wessels Boer. The conserved generic name *Orbignya* is consistently misspelled *Orbignia*. The problem of identifying Gaertner's genus *Euterpe* has been dealt with elsewhere (*Gentes Herbarum* 9: 256-262, 1963) as have distinctions between *Euterpe* and *Prestoea* which Wessels Boer considers to have been overestimated. This is a matter of taxonomy in which two workers are apt to differ, but the suggestion that a specimen from Cuba (*Wright 1468*) be accepted as neotype for *Euterpe globosa* (= *Prestoea montana* in the reviewer's taxonomy) in the face of demonstrated disagreement with Gaertner's figures on the fruit (which seemingly should be accepted as type lacking the fruits themselves) does not seem realistic. Moreover, it would change completely the application of the name *Euterpe* by those who do not recognize both *Euterpe* and *Prestoea*.

The flora is well illustrated with half-

tone plates and line drawings. The author has collected most of the species himself and provides more complete descriptions than have heretofore been available for many species. This is the only recent full floristic study of palms for South America based on field experience. Vegetative characteristics are relied upon heavily in keys to genera and species which will make them especially useful in the field, though perhaps less so in the herbarium where so much identification has to be done. However much one may disagree with Wessels Boer's taxonomic concepts, we should be indebted to him for assembling much information from a critical region in a compact volume.

HAROLD E. MOORE, JR.

The Rediscovery of *Carpentaria*

In *Principes* 9: 145, 1965, I erroneously attributed the rediscovery of *Carpentaria acuminata* to Mr. Caulfield and Mrs. Eddy when I should have credited Mr. George Trapnell, who is foreman of the Botanic Gardens at Brisbane and who has done all his field work on his own initiative and in his own time at

his own expense. Mr. Everist has forwarded me the story as follows:

"In July, 1958, Mr. George Trapnell and Mr. Keith Williams were travelling through Northern Territory on a private collecting and photographing trip. When they called at Berry Springs, Mr. Trapnell recognized that the *Carpentaria* was different from *Archontophoenix*, but he could not convince Mrs. Eddy of this. Next day he returned to the grove and brought down some fruits with a shotgun. These specimens were subsequently identified by Dr. Blake as *Carpentaria* and Mrs. Eddy was then convinced that the plant was not *Archontophoenix*.

"The material subsequently sent . . . was collected by Mr. Frank Lewis at some cost to himself. He fell off the roof of his truck whilst collecting the seeds, broke his ankle and spent several months in Darwin hospital as a result."

My apology is extended to Mr. Trapnell and his associates for having provided an erroneous account which I am most happy to be able to correct.

HAROLD E. MOORE, JR.

Palm Hunting Around the World *

HAROLD E. MOORE, JR.

V. New Guinea to the New Hebrides

New Guinea has long seemed to the writer, as to so many others, a "last frontier." Thus to arrive at Lae, the capital of the Territory of New Guinea early on March 1st, 1964, after a night flight from Brisbane was the realization of a long-held ambition. Mr. and Mrs. John Womersley met the plane, shepherded me to the TAA Transit Lodge, and that afternoon drove me to see na-

tural stands of *Metroxylon Sagu* in swamps along the road to Bulolo and Wau. The candelabra-like old inflorescences rising above the green of new stems make a striking effect from a distance but to reach and collect them through the swamp is another matter, and one which was not attempted that afternoon.

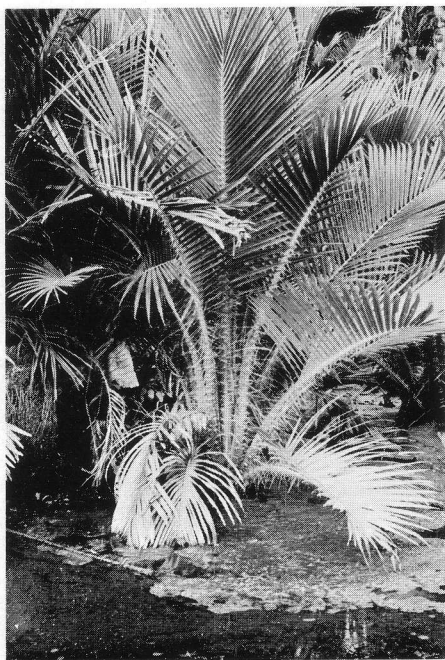
The first full day in New Guinea was spent getting acquainted with personnel and collections at the herbarium, and in a short trip with Curator Ted Henty to collect *Arenga microcarpa* in secondary

*From field work supported by National Science Foundation Grant GB-1354.



1. *Metroxylon Sagu* with its terminal inflorescences near Lae.

woodland opposite the entrance to Nadzab airstrip on the road to Goroka. Meanwhile Mr. Womersley, who is Chief of the Division of Botany, Department of Forests, and Mrs. Andrée Millar, Technical Assistant at the Botanic Garden, had been making final arrangements for a trip to Bupu Village which



2. Suckers of *Metroxylon* show fierce armature.



3. Loading for the trip to Bupu Village.

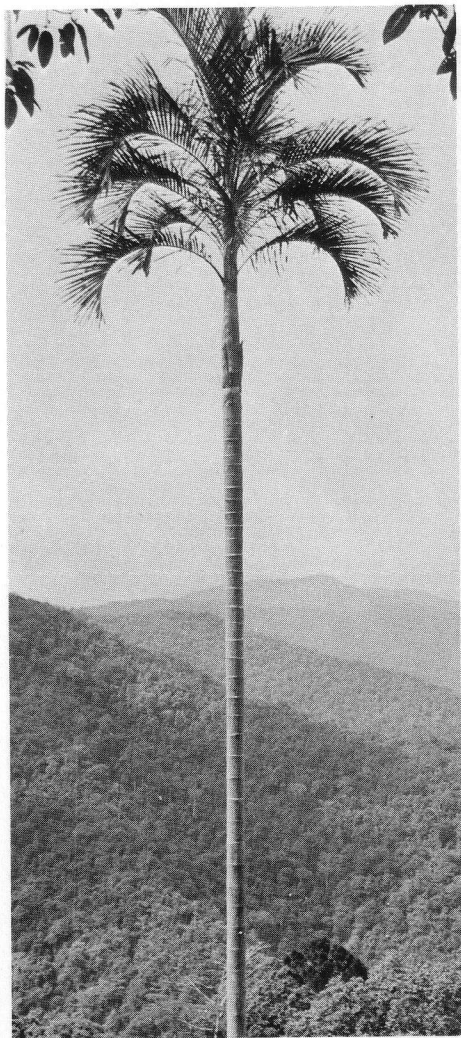


4. Bystanders at Bupu Village. Police house and cook house in background, our quarters at right.

lies some two hours by foot above the Wampit River about 35 miles from Lae on the Bulolo road. Mrs. Millar had arranged for porters—men, women and children—to come down from the village and carry our baggage and provisions upon our arrival by truck the next morning. Much commotion attended the selection and loading of burdens but soon we were all scrambling up the steep and slippery trail which took us from near sea level to an altitude of nearly 2,500 feet and “home” for two days. Camp was established in the thatched huts used by the District Patrol Officer and his assistants when they make their periodic visits, but with the addition of a work area protected by a tarpaulin roof set up between the huts and the important cook house. Here plants were sorted and prepared for specimens and we dined as well.

When camp was set up, I set out with John Koibua, who assisted me with

palm collecting, and followed by several small boys, to survey the trail that runs southwest from the village along a ridge on the track to Engabu. Much of the forest near the village was second growth but palms enough had been left in the cutting to keep us busy. Beside the trail, framed against the seemingly unbroken expanse of forest covering the mountains to the Markham River and beyond to the Finisterre Range, we came first upon a palm called *gumba* locally, a tall, slender, gray-boled tree some 50 feet high and eleven inches in diameter with about 17 leaves arcuately ascending above a brown crownshaft. The shape of the inflorescence suggested that we had come upon a species of *Gronophyllum*, and shortly thereafter we found second and third trees in flower and fruit, one of which John managed to climb for an inflorescence in flower despite the slippery trunk. The flowers certified to the iden-



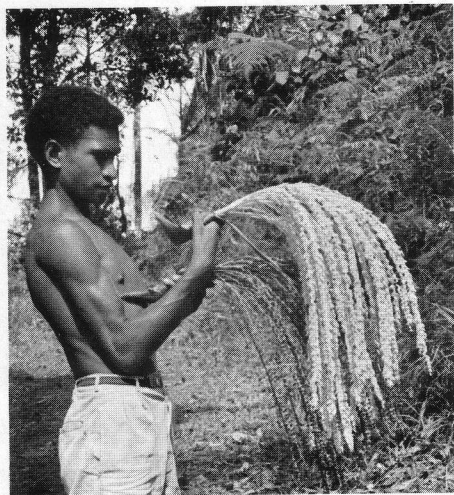
5. *Gronophyllum chaunostachys* stands like a sentinel before the mountains.

tification — the males cream-colored and fragrant, the female buds coral-pink with the elongate petal-tips characteristic of the genus. Months later, after comparison with published descriptions, the tree proved to be *Gronophyllum chaunostachys* described in 1936 by Burret as *Kentia chaunostachys*. But fruit and leaves were needed so the next day we managed to fell an individual which bore dull red-brown immature

and red mature fruit. Only then was it possible to see how beautiful the leaf sheaths composing the crownshaft are, for at close range the protected inner ones are beautiful burgundy-red at the base, the exposed outermost ones nearly black and covered with light brown woolly hairs.

Near the *Gronophyllum* was a small species of *Areca* related to if not identical with *A. macrocalyx*. The solitary green stems, about eight feet high, were topped with four to five spreading leaves below which were inflorescences in bud and in green fruit.

The last palm of the day was a species of *Ptychococcus* called *val* by the boys which has since been described as a new species, *P. lepidotus* (*Principes* 9: 10. 1965). Nine inflorescences in various stages of flower and fruit were densely clustered below the grey crownshaft which, like the *Gronophyllum*, was covered with soft brown hairs. Not only is the habit of this tree attractive, but the large orange-red fruits two inches long are a bold contrast to the green flowers and the large pinnate leaves with blunt pinnae like those of *Ptychosperma*.



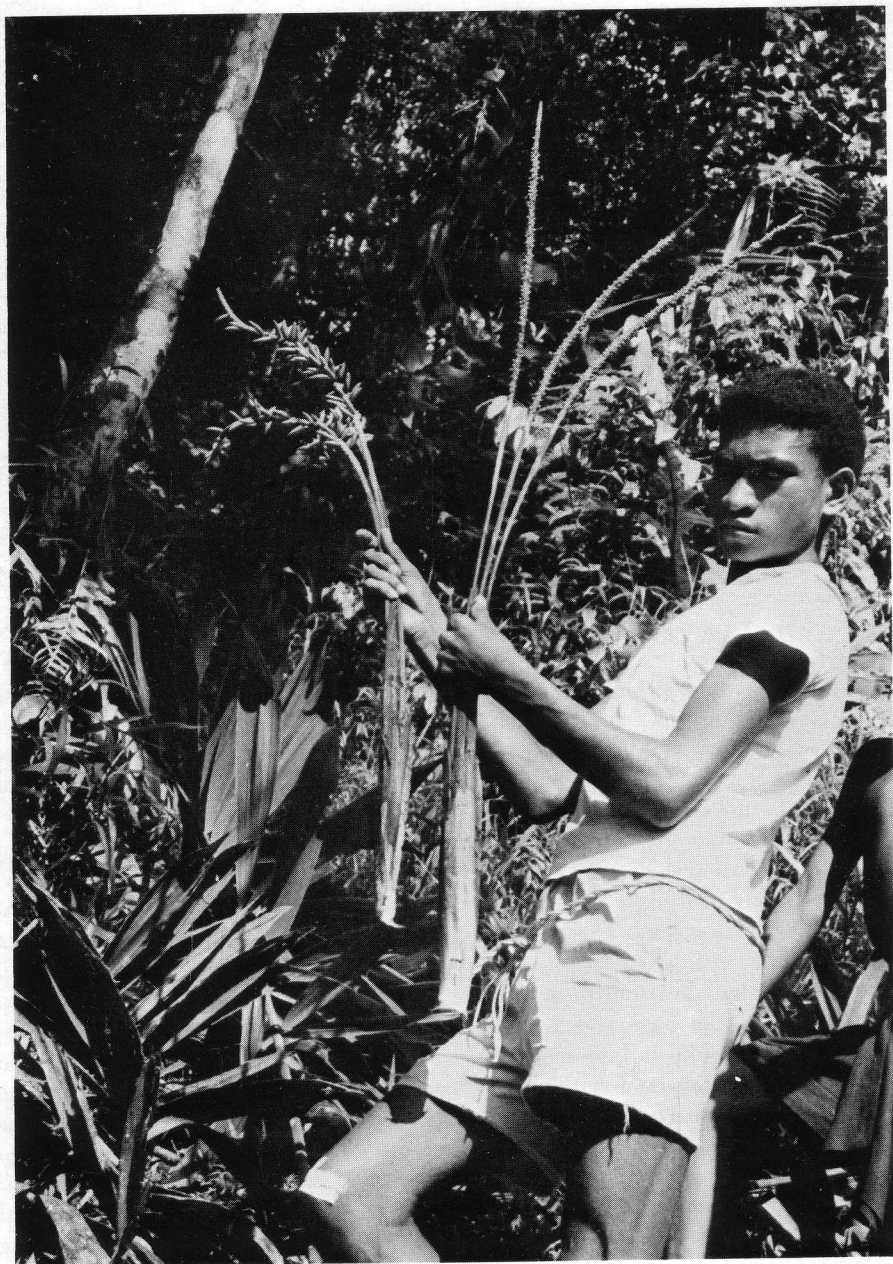
6. John holds inflorescences of *Gronophyllum chaunostachys*.



7. The pinnae of *Calyptrocalyx Lauterbachianus* are borne in several planes.

Preparing specimens required most of the evening and as the village people had brought in quantities of other plants — orchids and gesneriads among them

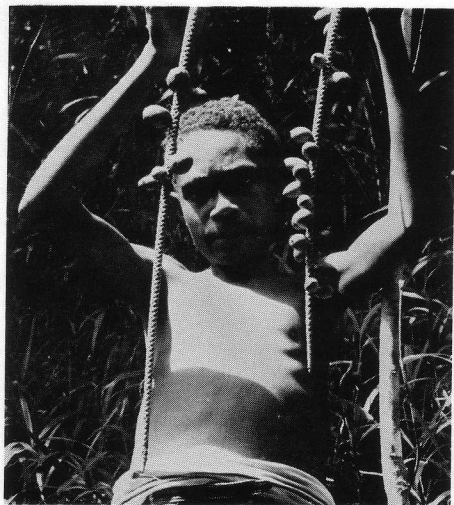
— Mrs. Millar had also been busy from the time camp was set up until we gratefully climbed onto our air mattresses. Here, as in most other places in Borneo



8. John holds the clustered inflorescences of *Calyptrocalyx*, that at left in young fruit.

and the Islands, we cut, trimmed, and fitted specimens into folded newspapers which were tied in bundles, placed in large plastic bags and doused with al-

cohol. So treated, the material would keep until it was transported to a base, the herbarium in this instance, where it could be air-dried at leisure by assist-



9. Fruits of *Calyptrocalyx* vary in size depending on ripeness.

ants. Thus we were able to take full advantage of working hours — always long in the field.

Early the next morning, another procession of myself, John and small boys headed up the ridge again, this time to an elevation between 2,800 and 3,000 feet where two small palms held our attention. One was *Calyptrocalyx Lauterbachianus*, a solitary species with stems about eight feet high and less than two inches in diameter. The green leaf bases flecked with dark scales do not form a crownshaft but split to within a few inches of the base and from their axils long spike-like inflorescences hang down, three to an axil within a single lower bract and each with a long, terete upper bract. Stages from axes in male bud, in pistillate flower, and in immature fruit were found on a single individual. The male buds are cream-colored with purplish bases, the female flowers translucent, pink-tinged, cream-colored, and ripe fruit from another plant was bright crimson, about $1\frac{3}{8}$ inches long with a thick white or pinkish pulp. Leaves of this species have

pinnae grouped and in several planes, and when newly developing are red though at maturity they are deep green.

The second palm, which appears to be *Heterospathes humilis*, is apparently stemless because the short stems are prostrate and root from the base. These stems may be solitary or clustered and bear at their tips seven or more long-petioled pinnate leaves with erect little-branched inflorescences among them. Light yellow male flowers, greenish-yellow female flowers, and small crimson fruits were found among the numerous plants growing on steep slopes.

Returning to camp in the afternoon, we found still a third palm awaiting us, a delicate species of *Linospadix* with clustered stems, undivided leaves, and bright red fruits on erect spike-like inflorescences. These plants had been brought in by the villagers but were not seen by us in the forest. However, time and light did not permit further searching so we had to be content with these collections, some of them fortunately of the whole clump.

March 5th saw us breaking camp and returning to the road with our booty, augmented by specimens of a high-climbing fierce *Calamus* and another cluster palm, *Paralinospadix Hollrungii*, related to *Calyptrocalyx* and *Linospadix*. Once freed of our load, the party divided, Mrs. Millar to return to Lae, I to stay with Mr. Womersley, who had come to meet us, in order to collect in swamps at the foothill forest near Wampit two species of *Calamus*, *Korthalsia Zippelii* with its prickly leaf sheaths and terminal inflorescences loaded with developing scaly fruits, and what appears to be *Orania macropetala*. The last is a stately grey-trunked palm 65 feet high or more with a crown of about twelve ascending pinnate leaves, the pinnae drooping at an angle of about 60° , and



10. Our assistants from the village look at the camera rather than at *Heterospathe humilis*.

large inflorescences among the leaves, some with white flower buds, others bearing fruits the color and size of a small orange. A few seeds of this *Orania* were sent to the Fairchild Tropical Garden where they germinated and where hopefully the species may be established.

From Lae, shorter trips were made in two directions. The first was back along the Bulolo road beyond the Markham River to slopes and wet lowland forest where logging roads permitted access. Here we found good material of *Caryota Rumphiana*, one of the single-stemmed species rather like *Caryota urens* in aspect, a handsome *Hydri-*

astele, as yet unidentified, with clustered slender stems as much as twenty feet high, pinnate leaves and inflorescence with clear currant-red fruits becoming black at maturity, *Gulubia costata*, and what appears to be an undescribed species of *Cyrtostachys*, *C. glauca* (P. 86). The *Gulubia* grows in swampy areas and reaches 50 feet or more in height, 10½ inches in diameter. Handsome crowns of long pinnate leaves with pendulous regularly arranged pinnae stand above the stout crownshaft with silvery grey sheaths (but these almost lilac on the inner leaves) and great inflorescences with drooping branches covered by cream-colored flowers. Un-



11. *Heterospathe humilis* has small red fruits and the upper bract is borne just below the branched portion of the inflorescence.

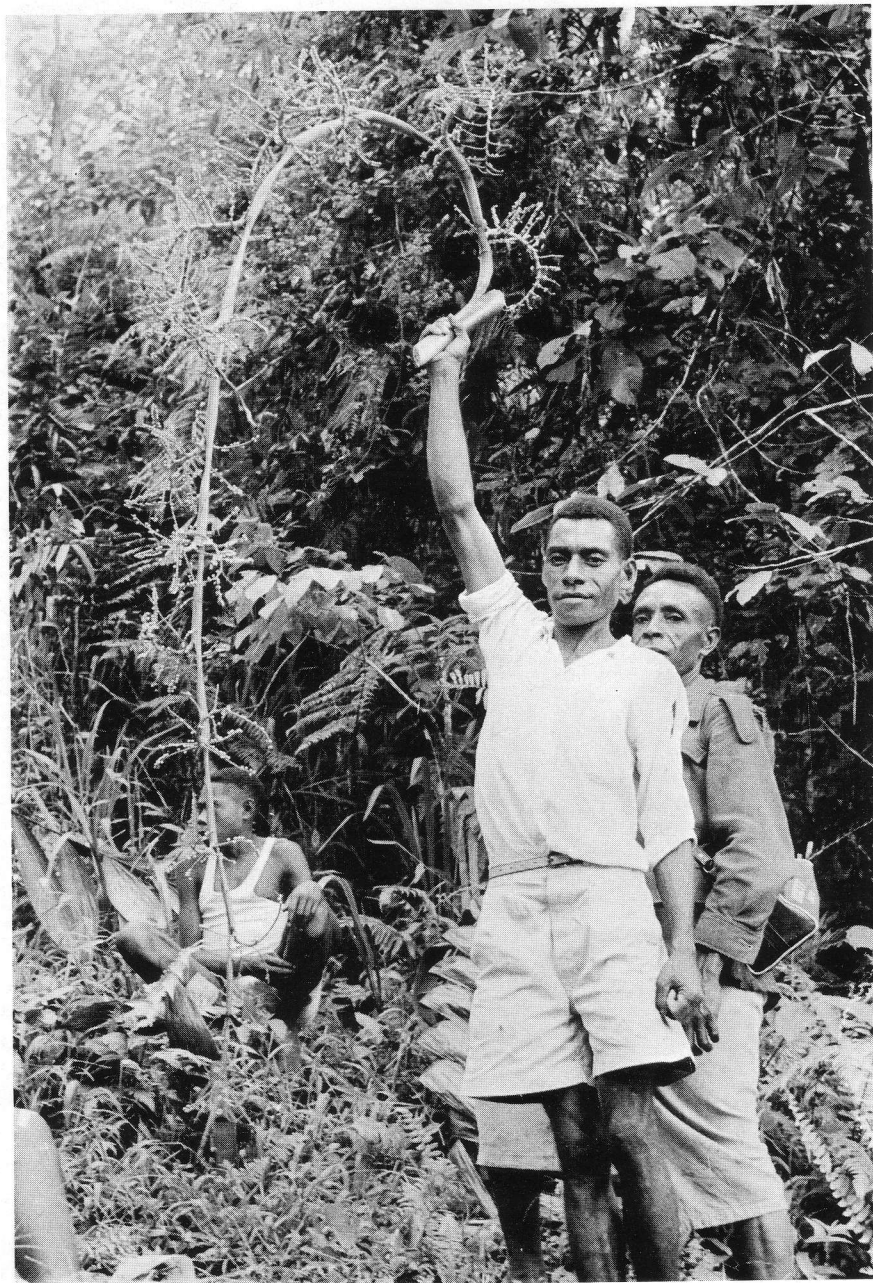
like *Gronophyllum*, to which *Gulubia* is related, this species, at least, seemed to mature slightly unpleasantly scented male and female flowers at the same time. The large bracts, covering the inflorescences in bud are used as vessels, the dry old inflorescences as brooms, and the split trunks for flooring according to our informants.

Cyrtostachys glauca grows principally on well-drained slopes where the bright blue-green leaf-sheaths make it readily discernable. Like its brighter relative, *C. Lakka*, the stems are usually clustered but the ripe fruits are dull black seated in a yellowish or reddish cup formed by

the sepals and petals.

The second short trip was made in the opposite direction to a logging road east of the Bumbu River near Lae where, with Ted Henty, we located *Paralinospadix Hollrungii* in some quantity and two species of *Calamus*, one probably *C. Lauterbachii*. It was helpful to note here that the leaves of the *Paralinospadix* were sometimes undivided, sometimes split into several pinnae, suggesting that leaf division is scarcely a reliable specific characteristic.

On March 10th Mr. Womersley and I with assistants set out by landrover for the last trip in New Guinea with Bulolo



12. Duna holds the inflorescence of a *Calamus* collected on the Bupu trail.

our first objective. Apart from seeing some handsome specimens of *Caryota Rumphiana* and the now familiar *Metroxylon*, the only palms we saw were a

few growing in scrub bush at the edge of a banana patch about five miles beyond Mumeng beside the Snake River. These palms had solitary grey-brown



13. The viciously armed leaves of *Calamus* are not made for easy collecting.

trunks 40-45 feet high and about 10 inches in diameter near the base with a mass of much-branched inflorescences below a green crownshaft and a crown

of about twelve spreading leaves with the tips arched downward. About 100 glossy green pinnae in regular arrangement were borne horizontally in the



14. *Paralinospadix Hollrungii* would make a handsome ornamental. Notice the slender inflorescence across the chest of the man at right.

lower portion of the blade but ascended in the upper portion. Only green fruits were found, these the size and shape of a small hen's egg, but fortunately the

seeds were ripe enough to show ruminate endosperm and this, with the male flowers, helped to determine the genus to be *Actinorhytis* though the species is yet uncertain.



15. Two trees of *Orania macropetala* emerge from the swamp forest near the Bulolo road.

We arrived at Bulolo in good time for the evening meal where we were joined by Mrs. Millar. The next morning Mr. Womersley and I set out for the *Araucaria* forests at about 2,600 feet elevation on the Bulolo-Watut Divide to find, at lower elevations, two species of *Calamus*, more *Hydriastele*, a slender solitary *Ptychosperma* scarcely as high as



16. Inflorescences of *Orania* are borne among the leaves and are covered in season with pale flowers.

a man and, near the summit of the Divide, more *Areca* and a few individuals of *Ptychococcus lepidotus* before returning to Bulolo for the night. On the 12th, in the company of Mrs. Millar, we continued to Wau where the Forestry Department maintains McAdam Memorial Park some five miles south of the town at an elevation of 4,000 feet. The forest in and near the Park, which itself is beautifully landscaped about a pond margined with waterlilies, was extensive enough to keep us busy with collections of *Areca macrocalyx*, *Calypstrocalyx Lauterbachianus* and another species of *Calamus* while Mrs. Millar supervised grass cutting and other work in the landscaped area. Lunch in the thatched pavillion at the park was followed by an afternoon on the road from Wau toward Edie Creek as far as transitable, and by a visit to the very lovely garden



17. An inflorescence of *Orania* stands taller than the assistant.

of Mr. Richard Greatrix in the town. Both Wau and Bulolo were once gold rush towns and one still sees gold dredging activity in the river at Bulolo as well as small family operations on the Edie Creek Road.

At Wau next morning, Mr. Womer-



18. *Caryota Rumphiana* is an imposing tree with its doubly pinnate leaves.

sley, Mrs. Millar, her assistant, and I wedged into a small charter plane which took off from the rather amazingly angled slope of the air strip, over the mission at its base, and upward to clear the rimming mountains for a short air-mile, but long foot-mile flight to a little village called Wagau where an air strip had only recently been established to enable the transport of produce to and from the village. Though Mrs. Millar continued to Lae, Mr. Womersley, Duna and I descended to be met by a procession of villagers who carried our baggage to the new District Officer's hut at the edge of the village. Having set up camp and arranged for fresh vegetables and guides, we set off to check on a cluster of palms noticed on slopes



19. This somewhat worn leaf of *Caryota Rumphiana* is 23 feet high including the four-foot sheath.

near the air strip as we arrived. These turned out to be *Gronophyllum chaunostachys* (here called *gomu*) in excellent fruit. But since the trunks were too wet and slick to climb and the trees were the property of the villagers, we continued to the hills northeast of the air strip where mature *Gronophyllum* yielded to the axe; its forty-foot trunk, waxy grey and slippery, stretched out full length, enabled us to make a second collection of this species in fruit. Also on the slopes we encountered quantities of *Heterospathe humilis*? and an occasional clump of *Calypstrocalyx Lauterbachianus*, here with stems only rarely solitary, while by a stream we found one individual of an *Areca* in which the leaves were very evenly divided into narrow pinnae, though otherwise it seems to be of the *A. macrocalyx* alliance.

Clambering, slipping, cutting, and pressing our way over the mountain slopes filled the day, although the number of palms was limited, and it was with pleasure that we spread air mattresses to sleep on the supple floor of split *Gronophyllum* trunks after our supper of tinned beef and local vegetables.

Morning mists make Wagau cool and damp and delayed access of a plane directed to meet us long enough so that we could pack and transport our gear and make an attempt to collect *Ptychococcus lepidotus* which grew in the bush beside the airstrip. Though only fruits and seedlings were obtained, there seemed no doubt of the identity of the *wakal* which is said to provide sturdy wood for spears. Thus loaded, we returned to Lae in only a few minutes instead of hours on foot over mountain ridges on which trees of *Gronophyllum chaunostachys* stand out like sentinels guarding the wilderness.

Returning to Lae with the knowledge that commitments in the Solomon Islands necessitated continuing onward only made the taste of New Guinea the more sweet, and strengthened not only the desire but the determination to return to this land of unusual palms.

The Solomon Islands

Dr. Timothy Whitmore, Forest Botanist at Honiara in the British Solomon Islands Protectorate, had invited me to visit the Solomons before I left the United States and during the trip arrangements had been worked out to permit a two-week survey of palms there. The plane for Honiara had been scheduled to leave early on the 17th of March, but did not get under way until noon, necessitating an unexpected overnight stop at Rabaul on New Britain where the Forestry representative, alerted by Mr. Womersley, waited to drive me to the Experiment Station at Kerevat. After



20. Even the largest palm can be reduced to size as demonstrated here with *Caryota*.

a brief visit there, we returned to Rabaul via Toma and collected *Licuala Lauterbachii*, a most attractive undergrowth palm, a variety of which was to appear in later collections from the Solomons.

We did get off the next morning in good time and with perfect weather. The smoking volcanos, crater lakes, and forests on Bougainville were closely visible as were the reefs, shallows, and deeps of the sea incredibly blue under the sun and framing islands, islets, and rocks, as we passed by Choiseul, over the New Georgia group and on into Honiara on Guadalcanal where the coral base of Henderson Field, once a familiar name in the news, serves as the airport.

Dr. and Mrs. Whitmore with their little daughter Katie met me and escorted me to their quarters in a modified quonset hut near the center of town.

There we lunched and discussed the full program that lay ahead. Tim had arranged passage to Santa Ysabel on a government boat which was to depart that night, so calls were made at the Forestry Office during the afternoon. By departure time, a heavy rain had started to come down which made for some scurrying in and out of landrovers and into the boat where Wendy, Katie and I filled the single cabin. Tim slept on a cot on deck outside the upper berth at my feet and our assistants — Ramu, Masu'u, Nakisi and Enalo — on the aft deck. Thus loaded we passed a stormy night but arose to find ourselves in quiet waters under a sunny sky approaching Tatamba Bay on the Bogotu Peninsula where we were to make the former District Officer's residence our headquarters. This was luxury indeed — beds in bedrooms, a kitchen, dining room, airy screened



21. Stems of *Cyrtostachys glauca* are left standing by the logging road.

porches, bath house and, toward the bay, one of the most magnificent views I've seen anywhere in the tropics.

Travel in the Solomons is largely by boat, for a majority of the inhabitants now live near the coast and inland trails are nearly nonexistent, at least on Santa Ysabel. Fortunately, we had the use of the launch Tevai, complete with boatswain and helper, for a week. Mornings we would wind out of the bay, past a coconut-fringed village, which in my mind's eye remains the epitomy of the



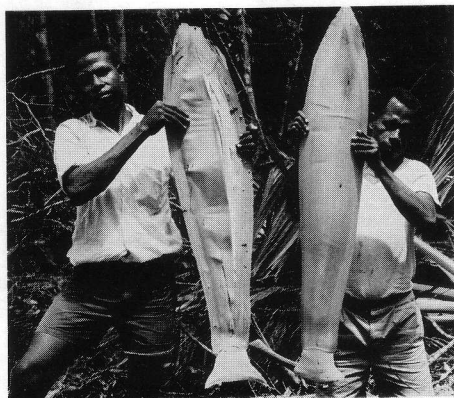
22. *Gulubia costata* grows in swampy areas near the Markham River.

"South Seas" starting back about 4:00 in the afternoon, laden with specimens and munching on a sandwich wet down with a thermos of tea. Morning had passed on our first day, March 19th, so it was after lunch when we boarded the Tevai for the short jaunt to a point one-half mile west of the Tatamba Pier. No sooner had we set foot on shore than we found a patch of *Strongylocaryum latius*, a very near relative of *Ptychosperma*. Nakisi climbed the slender grey-brown trunk to bring down leaves.

inflorescences in flower and fruit. The yellow-green flowers are very similar to those of *Ptychosperma* but the seed inside the orange-red fruit is not permanently grooved though extremely low ridges are present on the fresh seed.

Climbing up the ridge to the top where ultrabasic soils are present, we came upon *Gulubia Hombronii*, a solitary tree over 50 feet high with an expanded base, olive-green crownshaft tinged orange at the apex, and crown of leaves with light green pinnae directly upward from the main axis. Our first encounter with this species produced only trees in bud, the staminate flowers a beautiful rose against white inflorescence branches. Later we obtained open male flowers which are rose-pink with paler tips and fragrant with a suggestion of the May-flower of New England (*Epigaea repens*). Inflorescences in fruit were also obtained, the dull red fruits arranged in four precise rows along the branches. Our assistants, who came from the Island of Malaita, called this tree *Bulatari* in the Kwara'ae language and said that the trunks were split to make floor boards. This species is common and characteristic of ultra basic soils.

Our first full day took us again down the bay to Nangalao village where we scrambled through thick second growth to collect *Caryota Rumphiana*, known as *fufuri* or, on the Bogotu Peninsula, as *badha*. Higher on the ridge back of the village, we obtained *Licuala Lauterbachii* var. *bougainvillensis* in full fruit, the orange-red berries half an inch in diameter, more *Strongylocaryum latius*, *Heterospathe minor*, a solitary brown-trunked tree 15 feet high, and most exciting, what has proved to be a new species of the endemic genus *Rehero-phoenix* which is described elsewhere (page 93) as *R. subdisticha*. This tree



23. Inflorescences of *Gulubia* are swathed in bracts which drop to the ground when the inflorescence expands. The dried ones are sometimes used as containers.

was not abundant and we were fortunate in obtaining enough material to describe the species with flower and fruit.

On the 21st of March we landed in Tanagoba Harbor where the Longuhutu River enters the sea at the southeast corner of the Bogotu Peninsula. Here we had to use the launch's small boat to get up river to swamps where *Metroxylon salomonense* grows in some abundance. Some of the trees were in fruit which on maturity drops into the stinking mud, adding an unexpected ease to the search for material. The green to brownish-green fruits resemble baseballs with scales, being three inches high and a

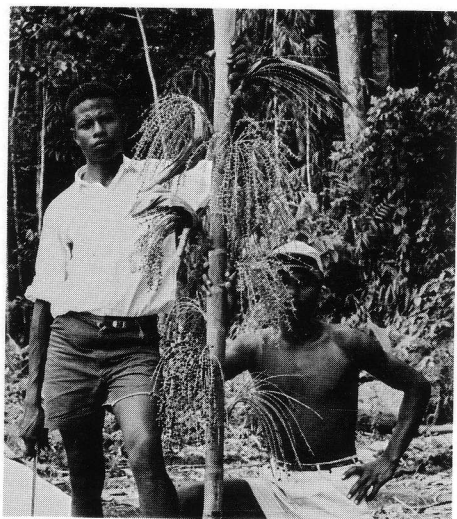


24. Male flowers of *Gulubia costata* form a distinctive overlapping pattern.



25. *Hydriastele* sp. forms clumps of slender stems in swampy forest.

little broader. Trunks of the species are armed with whorls and clusters of flat yellowish spines up to twenty inches long



26. Mature fruits of *Hydriastele* are clear currant-red to black; nearly all stages are present here.

on the older leaves. Also on the margins of the swamps we collected *Areca macrocalyx* and *Licuala Lauterbachii* var. *bou-*



27. An *Areca* near Wagau had leaves much more dissected than most. The fruit is a handsome orange.



28. The Noula, which took us to Santa Ysabel (left) and the Tevai (right) which served as transport about the Bogotu Peninsula.

gainvillensis again, the latter with straw-colored flowers.

Working near Tatamba on the 22nd, we walked from the shore to the first ridge on the mainland, opposite Horara village, where we were rewarded with a second species of *Gulubia*, *G. macrospadix* (p. 88), which is called *niniu* and which never grows on ultrabasic soils. Here we also saw stilt-rooted palms, never in flower or fruit, which belonged to the Tribe Clinostigmatheae and probably to an undescribed genus if they are like those from Guadalcanal or Kolombangara. In fact, there appear to be two kinds, one called *manisilae* on Santa Ysabel and Kolombangara, the other called *garagara* on Guadalcanal.*

Ridges back of Koloajoa village at the head of the bay west of Tatamba

were our objective on the 23rd, a wet-tish day but rewarded by seeing *Licuala*, *Areca*, *Gulubia macrospadix*, and collecting a fine series of *Heterospathes Woodfordiana* which is known as *araramai*. This was especially satisfying, for the species appears to have been known heretofore only from some fruiting branches in the herbarium at Kew. It is a solitary slender brown-stemmed palm to twelve feet high with about ten spreading leaves. The new leaves are deep red, in handsome contrast to the very deep green mature leaves and brown or black-splotted sheaths. Erect inflorescences bear waxy or pinkish staminate flowers and at length bright red ellipsoid fruits half an inch long. If introduced seed survives, the species should make a fine addition to our ornamental palms.

Returning to Guadalcanal, after a nearly fruitless foray on the 24th, we posted seeds and did the innumerable

*This palm (*garagara*) has just been identified as a species of the genus *Physokentia* hitherto known only from the Fiji Islands and Vanua Lava in the New Hebrides. H.E.M.



29. Flowering trees of *Metroxylon salomonense* differ strikingly in appearance from *M. Sagu* (see Fig. 1).

necessary chores that follow on days in the field while planning for trips in the vicinity of Honiara. Geoffrey Dennis, Tim Whitmore and I with helpers set

out on the 27th to collect palms in gully forest a mile from the coast and a mile east of the White River headwaters. Here, not far from the Forest De-

partment Headquarters, we collected a *Strongylocaryum*, *Areca macrocalyx*, *Caryota Rumphiana*, a *Calamus*, and one of the most elegant palms I have seen, appropriately described as *Rhopaloblaste elegans* (page 94). As though an unknown species were not enough, this collection extends the range of the genus *Rhopaloblaste* from the Moluccas and New Guinea well into the Solomon Islands chain and we were later to see it in abundance in the forests at the headwaters of the Matinikau River where it grows with still another palm, the *garagara* (*Physokentia*) mentioned above.

Elsewhere near Honiara we collected another *Heterospatha* very much like *H. minor* from Santa Ysabel in disturbed forest at Mambulu (Mount Austen), *Metroxylon salomonense* in flower along the Matinikau River and in a swamp in grassland near Konga Road, *Metoxylon Sagu* apparently native. Sometimes planted, the species here is used for thatch, not sago and is said not to grow well except in very wet ground.

Departure for New Caledonia had been planned and materials packed when a typhoon disrupted air service between Honiara and Vila in the New Hebrides where one transfers for Noumea. Though the delay caused loss of time both in the Solomons and in New Caledonia, it did provide an opportunity for an afternoon and a morning of collecting on Efate where I had to spend a

night. A hired taxicab took me to the Blidiniere Estate near the airport where, coming in, I had seen *Veitchia* in abundance (as one also sees it near the airport at Santos on Espiritu Santo). With the help of a local boy, a tree was cut and complete specimens obtained which, on study, suggest that the species is very close to *V. Montgomeryana*, if, indeed, it is not that species which has been known only from cultivated plants. What is probably the same species is cultivated in parts of New Caledonia near Noumea where it would be accessible to travelers and might have been sent elsewhere on the assumption that it was *V. Joannis* with which *V. Montgomeryana* has been confused. More collecting is necessary in the New Hebrides, however, before the identity can be more than suggested.

A second palm on Efate, collected near Mele village where both planted and native, proves to be *Metroxylon Warburgii*, noteworthy for its stiff terminal inflorescence more like that of *M. Sagu* than that of *M. salomonense* but with pear-shaped brown scaly fruits several inches long and very bright yellow-green flowers with orange-yellow stamens which, in mass, attract attention from a distance. Also seen was a *Calamus* but always sterile so left for a future visit when hopefully two odd palms on Aneityum may also be obtained. On this trip, time in New Caledonia had been closely planned and that fascinating Island was the next goal.

New Palms from the Pacific

HAROLD E. MOORE, JR.

Several species of palms were collected during my visit in the Pacific Islands early in 1964 which appear to be undescribed. Not all have been

studied as yet but those of which I feel certain are described here. One is from New Guinea, two are from the Solomon Islands and one is from the Fiji Islands.

In addition, I have transferred the sole species of *Paragulubia* to *Gulubia* and provided an amplified description.*

CYRTOSTACHYS GLAUCA H. E. Moore,
sp. nov.

Caudices caespitosi. Folia longe petiolata, regulariter pinnata, vaginis glaucis. Inflorescentiae paniculatae, rachillis scabridulis, floribus in foveis non profundis nec densis 5-seriatis. Flores masculi 3 mm. alti, staminibus 9. Fructus 11 mm. longus, 5 mm. in diam., ellipsoideus.

Caespitose with usually 1-2 trunks to 9 m. high, 10 cm. diam., and 2-4 or more less well developed trunks at the base, the trunks bright green becoming gray in age, with prominent nodes, and internodes ca. 7.5 cm. long. Leaves 7-8, spreading, with spreading or at length somewhat pendulous pinnae; sheaths forming a bright glaucous crownshaft ca. 1.3 m. long, sparsely and minutely lepidote with membranous brown scales; petiole green, elongate, ca. 75 cm. long, rounded and rather densely and minutely brown lepidote below, concave and similarly lepidote or punctulate above; rachis ca. 2.7 m. long, lepidote or becoming punctulate below, punctulate above, with 59-60 regularly arranged pinnae on each side; pinnae green, acuminate, the midnerve prominent above but scarcely punctulate at the base, clothed below with brown membranous scales to 3 mm. long, the surface very minutely punctulate, secondary nerves 5-6 on each side, tertiary nerves very fine, numerous, cross-veinlets evident when dry, the basal pinnae ca. 96 cm. long, 2.8 cm. wide, median pinnae ca. 98 cm. long, 5 cm. wide,

apical pinnae ca. 25 cm. long, 9 mm. wide. Inflorescence green in bud, becoming yellow in fruit, paniculate, subtended by 2 bracts, the lower bract ancipitous, ca. 42 cm. long, 10-11 cm. wide in bud, the upper briefly rostrate, ca. 42 cm. long, 9 cm. wide; peduncle very short, ca. 5 cm. long, glabrous; rachis ca. 54 cm. long, minutely scabridulous to glabrescent; basal branches borne at about a 90° angle with the rachis, twice-branched, to 75 cm. long including naked base ca. 19 cm. long, middle branches once-branched, upper branches undivided; rachillae minutely scabridulous especially on the angles, to 37 cm. long, 5-6 mm. in diam. when fresh, drying to 3-4 mm. in diam., not enlarged in fruit, bearing triads of two staminate and a pistillate flower throughout, these arranged in 5 spiralled series at mid-axis, each subtended by a low rounded lip and separated by intervals of ca. 5 mm., the pits shallow, not congested. Staminate flowers pale yellow in bud, ca. 3 mm. high; sepals 2 mm. high, keeled and ciliolate dorsally, rounded and ciliolate apically; petals symmetric, 2 mm. high above a solid receptacular base; stamens 9, the subulate filaments inflexed at the apex in bud; pistillode tapered from a broadened base (when fresh) to a minutely trifid obtuse apex, about as long as stamens: pistillate flowers in bud 2 mm. long, the pistillate perianth 3-3.5 mm. high in fruit, subtended by 2 pale brown bracteoles ca. 0.6 mm. high. Fruit black in a yellowish or reddish perianth, 11 mm. long, 5-6 mm. in diam. when fresh, drying 11 mm. long, 5 mm. in diam., ellipsoid with a prominent excentrically apical rostrum when dry; exocarp smooth; mesocarp thin with flat longitudinal fibers; endocarp thin and adherent to seed; seed 7-8 mm. long, 5 mm. in diam., ellipsoid; endosperm homogeneous; embryo basal.

*From work supported by National Science Foundation Grant GB-1354. I should like also to express thanks to my colleague Dr. W. J. Dress for correcting Latin descriptions and to the John Simon Guggenheim Memorial Foundation which supported the study of palm specimens in European herbaria during 1955-1956.

TERRITORY OF NEW GUINEA. MO-ROBE DISTRICT: forested slopes along logging road just beyond bridge over Markham River on road from Lae to Bulolo, 7 March 1964, H. E. Moore, Jr. 9272 (BH, holotype; LAE, isotype)

Cyrtostachys glauca stands out in the forest because of the glaucous leaf-sheaths which prompt the epithet chosen. Normally, it appears to be caespitose with one or two of the several stems larger than the others. In this caespitose habit, it resembles *C. Lakka* and *C. Renda* which (if distinct from each other) are readily distinguished by the bright red or orange-red leaf-sheaths as well as by the presence of 12 (-15?) stamens in the staminate flower. *Cyrtostachys elegans*, also caespitose and de-



1. The crown of *Cyrtostachys glauca*.

scribed from cultivation but thought to have come from southern New Guinea, differs as follows:



2. Duna holds an inflorescence of *Cyrtostachys glauca* loaded with ripe fruit.

C. glauca

Leaf sheath glaucous.

Pinnæ spreading, or drooping only in age.

Petiole elongate, ca. 75 cm. long.

Ultimate rachillae slender even in fruit, ca. 4 mm. in diam. when dry, minutely scabridulous, especially on ridges between pits, these shallow, ca. 5 mm. apart in each series; bracteoles subtending pistillate flowers light brown, low, ca. 0.6 mm. high in fruit.

Fruit 11 mm. high, 5 mm. in diam. when dry, in perianth 3-3.5 mm. high.

The remaining species thus far described appear to have solitary stems and, except for *C. compsoclada*, have stouter rachillae 5 mm. in diam. or more when dry with congested and deeper pits mostly in seven or nine spiral series. *Cyrtostachys Brassii*, *C. microcarpa* and probably *C. Loriae*, from which the first two may not be distinct, as well as *C. Kisu* (and perhaps *C. Peekeliana*) have 12 stamens. *Cyrtostachys phanerolepis*, also from the Morobe District of New Guinea, has 6 stamens according to Burret, pits in nine series, and larger fruit.

Cyrtostachys Ledermanniana and *C. compsoclada* have 8-9 stamens like *C. glauca* but the first differs from *C. glauca* in having the pinnæ prominently paler below than above, in thicker flowering axes with congested pits, and a fruiting perianth larger in proportion to the fruit. It is difficult to contrast *C. glauca* and *C. compsoclada* since the latter was described from very inadequate material. From what we know, it differs from *C. glauca* in having the laxly arranged pits in three series, in solitary, short, thick stem and in purple flower buds. Until more adequate

C. elegans

Leaf-sheath green.

Pinnæ drooping.

Petiole short, 22.5-30 cm. long.

Ultimate rachillae thick even in bud, 6-7 mm. in diam. when dry, glabrous, pits prominent, densely arranged; bracteoles subtending pistillate flowers dark brown, prominent, the larger to 1.5 mm. high in fruit.

Fruit (immature) ca. 11-13 mm. long, 4-5 mm. in diam. in perianth ca. 6 mm. high.

collections of *C. compsoclada* are made in Papua (Boridi), the somewhat remote possibility of identity cannot be ruled out, but certainly *C. glauca* does not correspond in the particulars noted.

Cyrtotachys glauca should make an attractive foil to the more brilliant *C. Lakka* and *C. Renda* in cultivation if plants mature from seed sent to the Fairchild Tropical Garden, Miami, Florida, in 1964 and accessioned as FG 64-139.

GULUBIA MACROSPADIX (Burret) H. E. Moore, tr. nov.

Paragulubia macrospadix Burret, Notizblatt des Botanischen Gartens und Museums zu Berlin-Dahlem 13: 84. 1936.

Gulubia Niniu H. E. Moore ex T. C. Whitmore, Guide to the Forests of the Solomon Islands, 1966, name only.

Burret distinguished the genus *Paragulubia* from *Gulubia* on the basis of ruminant endosperm and pinnæ praemorse at the apex. Ruminant endosperm, at least in the Arecoideae, is not a useful generic characteristic when taken alone, witness numerous genera with both ruminant and homogeneous endo-

sperm. The newly expanded pinnae of some species of *Gulubia* (*G. costata* and *G. Hombronii*, for example) are basically praemorse at the apex, though the upper margin may be so extended as to give the appearance of a merely acuminate apex. Morphologically, however, there is no real difference. I do not find it possible to maintain the genus, hence transfer its only species to *Gulubia*.

In so doing, it may be worth providing some notes on the species as I interpret it on the basis of the type and of collections made more recently on Santa Ysabel in the Solomon Islands, the more so since at one time I had thought these last to represent an undescribed species. Thus the invalid name *Gulubia Niniu* will be found in the literature as noted in synonymy. I have compared an isotype collection of *G. macrospadix* with specimens from Santa Ysabel and find quantitative rather than qualitative differences. The inflorescence of the type is more massive, longer (9 dm.), with more (20-24) and thicker (5 mm.) branches while those of specimens from Santa Ysabel are slender, ca. 5 dm. long, with 7-8 branches only 3 mm. thick. Fruits from the type measure 14-16 mm. long, are strongly lined when dry and are narrowed to a prominent apex while mature fruits of *Moore & Whitmore 9305* are 12-13 mm. long, essentially smooth when dry (though underlying fibers may be seen through the exocarp), and rather abruptly rounded to a less pronounced stigmatic point. But when fruits of this last collection having well formed but not completely mature seeds are examined, they, though smaller, exhibit the same tendency toward a lineolate exocarp and more prominent apical point as is seen in the type where the seeds also suggest that the fruit was not perfectly mature when collected.

Dr. Whitmore writes that this species is common throughout the British Solomon Islands Protectorate where it is never found on ultrabasic soils (there replaced by the common and characteristic *G. Hombronii*) but in the lowlands and up to altitudes of 3000 ft. on mountain ridges. Though our Santa Ysabel collections are constant in their small inflorescences, one would anticipate this much size variation either as a result of environmental factors or as a result of population differences from locality to locality.

Because the species yet remains inadequately described, I append a fuller account of it based on collections which include fruits and staminate flowers inserting in brackets measurements from the isotype studied—*Kajewski 1787* (A).

Solitary trees to ca. 17 [-20] m. high, with enlarged base above superficial root mass and tapered gray-brown bole from 11.5 cm. in diam. near the base to 7 cm. in diam. at the crown. Leaves 20-25, ascending with arcuate tips; sheaths forming a crownshaft, ca 70 [-90] cm. long bright yellow-green becoming glaucescent at the apex and blackish or olive-green at margins; petiole elongate, 35-37.5 [-50] cm. long, rounded below, slightly ridged above, minutely brown punctulate with centers of deciduous peltate scales; rachis 1.5 [-1.95] m. long, marked with yellowish line towards apex below, minutely lepidote with brown-centered membranous pale peltate scales, especially on upper surface, or only minutely brown punctulate; pinnae about 30 on each side, directed forward and upward at an angle of about 45° with the rachis but with tips recurved and drooping, green above, glaucous below at least when first expanded, very minutely punctulate on the nerves below and with a few inconspicuous larger membranous pale brown scales on mid-

nerve, secondary nerves 3-5 on each side and inconspicuous, margins thickened, basal pinnae ca. 50 cm. long, 1.2 cm. wide, obliquely acuminate at tip, median pinnae ca. 82 [-100] cm. long, 2.5 [-3.5] cm. wide with obliquely toothed apex, apical pinnae ca. 25 cm. long, 1.4 cm. wide with blunt, toothed apex. Inflorescences glabrous, 5 [-9] dm. long, 4-6 below the leaves, subtended by 2 bracts (not collected), the base very thick; peduncle 5-8 [-11] cm. long; rachis 4.5-6 cm. long with ca. 7 [-11] primary branches to ca. 36 [-40] cm. long, the lower often furcate, the upper simple; rachillae totalling 11-13 [-24] in number; flowers borne in triads in 4 vertical series throughout or nearly throughout the rachillae. Staminate flowers (from *BSIP* 2325) red or rose, ca. 8 mm. long; sepals acute, ca. 1 mm. long, the margins sometimes ciliolate; petals asymmetric, acute, ca. 8 mm. long; stamens 7-9; pistillode minute, trifid; pistillate flowers ca. 3-5 mm. high; sepals 2 mm. high, sometimes ciliolate along the lower margins; petals 3.5 mm. high, ciliolate along the lower margins; staminodes 3. Fruit 4-ranked, maturing bright crimson in a green perianth, ellipsoid, 1.2-1.3 [-1.6] cm. long, 7-8 mm. wide, rather abruptly rounded to a mammillate broad excentric stigmatic residue and rounded to a short base, not markedly lineolate when dry though separated longitudinal fibers are visible in the mesocarp; seed broadly ellipsoid, 8 mm. long, [5-] 6 mm. in diam. with 3-4 [-5] lateral branches from the raphe; endosperm ruminate.

Vernacular name: *niniu* (Kwara'ae language); *kuritu* (Bougainville). BRITISH SOLOMON ISLANDS PROTECTORATE: SANTA YSABEL: Bogotu Peninsula, slopes of ridge on mainland opposite Horara Village near Tatamba, alt. 0-500 ft., 22 March, 1964, *H. E.*

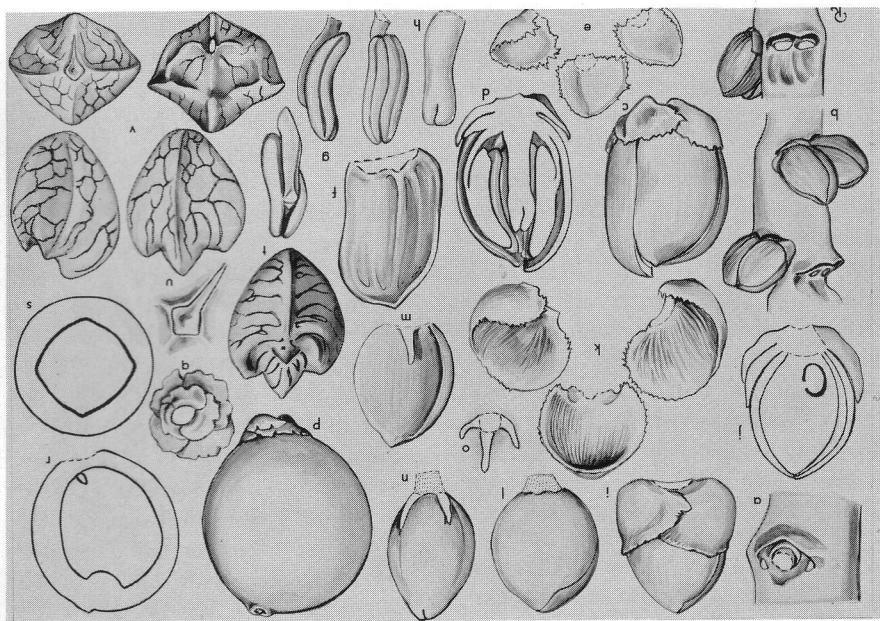
Moore, Jr. & T. C. Whitmore 9305 (BH, BSIP). Maringe Lagoon, near Tiratona Village, on broad ridge at 1,600 ft. alt., 23 October 1963, *T. C. Whitmore* BSIP 2325 (BSIP).

TERRITORY OF NEW GUINEA. BOUGAINVILLE: Kugumara, Buin, 28 May 1930, *S. F. Kajewski* 1787 (A, isotype).

PHYSOKENTIA ROSEA sp. nov.

Palma solitaria quoad radices epigeas *Physokentiae* Tete et *P. Thurstonii* similis sed ab eis differt inflorescentia et floribus roseis, pinnis acutis, fructibus minoribus in sicco 1.6-1.7 cm. altis, 1.4-1.6 cm. in diam., semine 1.2 cm. alto, 1.3-1.4 cm. in diam.

Solitary palm ca. 4 m. high from a cone of stout, prickly, basally branched, stilt roots ca. 1' m. long, the trunk green, ca. 10 cm. in diam. above roots, 7.5 cm. in diam. below crown, with prominent nodes. Leaves ca. 9, stiffly spreading to ascending; sheaths forming a crownshaft, 47.5 cm. long, thickened below the petiole, olive-green outside, rose-pink inside, with grayish scales; petiole ca. 22.5 cm. long, densely and minutely lepidote at least when young, with brown-centered pale-margined membranous or even fimbriate peltate scales; rachis lepidote as petiole, ca. 1.22 m. long with ca. 35 pinnae on each side at regular intervals, with the margins curved downward when living, basal pinnae 27 cm. long, 9 mm. wide, median pinnae 67 cm. long, 4 cm. wide, apical 16 cm. long, 6 mm. wide, the midnerve minutely lepidote or becoming brown punctulate above, minutely lepidote and clothed with larger brown membranous basifixed to medifixed scales to 5 mm. long, the 4-5 secondary nerves and thickened submarginal nerves brown-punctulate below. Inflorescences glabrous, rose-red in bud, becoming green in fruit, to 6 below the crownshaft, in pairs at successive nodes



3. *Physokentia Thurstonii* (a-h, p-v) and *P. rosea* (i-o). a, portion of rachilla and triad with flower removed x 2; b, portion of rachilla with paired staminate flowers x 2; c, staminate bud x 4; d, staminate bud in vertical section x 4; e, staminate sepals x 4; f, staminate petal x 4; g, stamens in 3 views x 4; h, pistillode x 4; i, pistillate bud x 4; j, pistillate bud in vertical section x 4; k, pistillate sepals x 4; l, pistillate bud with sepals removed x 4; m, pistillate petal and staminode x 4; n, pistil and staminodes x 4; o, staminodes x 4; p, fruit x 1; q, fruiting perianth x 1; r, fruit in vertical section x 1; s, fruit in cross section x 1; t, endocarp x 1; u, operculum x 2; v, seed in 4 views x 1. From material of Moore & Koroiveibau 9347 (b-h), 9353 (p-v), 9363 (i-o) preserved in liquid.

(in the type tree) separated by several sterile nodes, the upper in flower, lower in fruit, horizontal, stiffly branched, the lower branches again branched, the whole subtended by and enclosed in bud by 2 papery bracts, the lower open on abaxial side and incompletely encircling the peduncle, the upper not split in bud and completely encircling the peduncle, both rose-pink shading to white basally; peduncle 6-8.5 cm. long, rachis to 16.5 cm. long, lower branches divided into 4-6 simple or rarely furcate rachillae to 24 cm. long, upper branches less divided or undivided; rachillae to 19 cm. long, angled and somewhat flexuous to markedly flexuous apically; flowers in triads of a pistillate and 2 staminate to about the middle of the rachillae, paired or solitary

staminate above the triads and staminate clusters subtended by an acute bractlet. Staminate flowers 4-5 mm. long, briefly pedicellate with flat pedicels, one subtended by a low flat bracteole; sepals to 2 mm. long, deep red-black, imbricate, rounded to acutish with membranous, often ciliate margins; petals 4-5 mm. long, rose-red, somewhat asymmetric, valvate; stamens 6 with subulate filaments inflexed at the apex and at anthesis exceeding the petals, those opposite petals with base wider than those opposite sepals, anthers linear, bifid basally, entire apically; pistillode elongate-ovoid with rounded briefly trifid apex; pistillate flowers 5 mm. long, in bud, subtended by 2 low bracteoles; sepals 3 mm. long, strongly imbricate, red-black, rounded with membranous

often ciliate margin; petals deep vinous red, ca. 5 mm. long; staminodes 3, subulate; pistil ovoid, ovule pendulous. Fruit reddish-green probably becoming blackish, globose, 1.9 cm. in diam. when fresh, drying ca. 1.6-1.7 cm. high, 1.4-1.6 cm. in diam., in a perianth 5 mm. long, endocarp 4-angled and keeled, depressed apically, ca. 1.5 cm. high, 1.4 cm. wide, 1.3 cm. thick, with basal operculum; seed 1.2 cm. high, 1.1 cm. wide, 1.0 cm. thick (from preserved, well-formed but apparently not completely mature material), 4-angled with obliquely depressed and angled apex; endosperm homogeneous, embryo basal. Seedling leaves bifid.

FIJI ISLANDS. VITI LEVU: Province Ra; vicinity of Nadarivatu, mossy cloud forest on upper slopes and ridges from Mt. Lomalangi beyond second peak in easterly direction, 2 May 1964, *H. E. Moore, Jr. & D. Koroiveibau* 9363 (BH holotype; SUVA isotype).

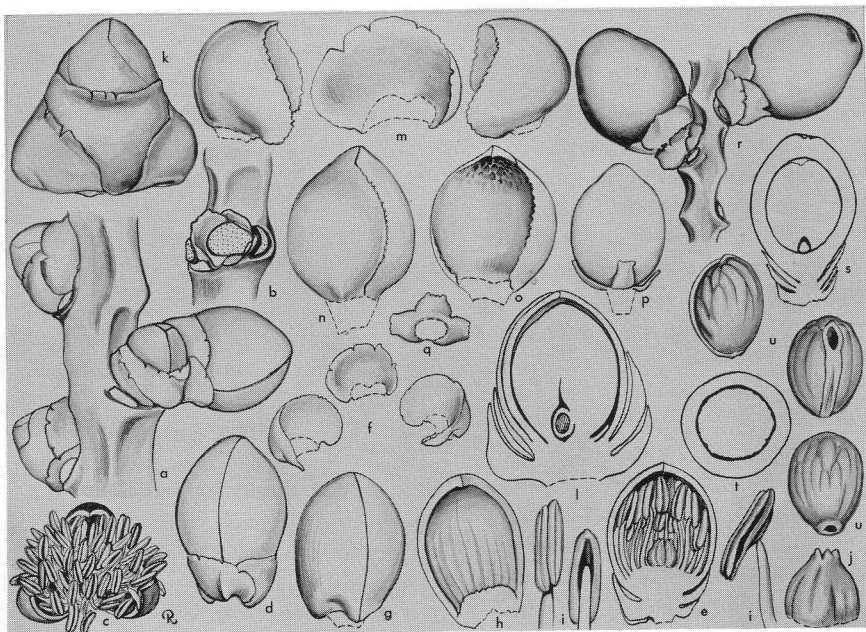
Physokentia rosea differs from the two other species in the genus, *P. Tete* from the New Hebrides and *P. Thurstonii* from Vanua Levu in the Fiji Islands, in its smaller fruit. Though not completely mature, the endocarp appears to have reached its mature size and is filled, in preserved material, with a well-formed seed which shrinks on drying. In both *P. Tete* and *P. Thurstonii*, the mature fruit is 2 cm. in diameter or more when dry and the seed correspondingly larger. Pinnae of *P. Tete* are praemorse at the apex in the fragmentary material described by Becari and seen by me while those of *P. Thurstonii* and *P. rosea* are acute when first expanded. There is great resemblance in habit between *P. Thurstonii* and *P. rosea*, both having prominent stilt roots, irregularly ringed trunks, and similar leaves. The inflorescences, as I

have seen them, differ strikingly, those of *P. Thurstonii* being white or creamy-white while those of *P. rosea* are deep rose-red; flowers similarly differ in color, being white with sometimes a pinkish cast in the former, deep rose-red with red-black sepals in the latter.

These differences, considered with our poor understanding of infraspecific relationships in palms, lead me to describe the material at hand as a species. In Fiji, each species of *Physokentia* is also accompanied by different species of *Balaka*, *Veitchia*, and *Taveunia*, though on Viti Levu, *Clinostigma exorrhiza* — always seen with *P. Thurstonii* in Vanua Levu and Taveuni — is lacking. Interestingly enough, there is a different species of *Clinostigma*, *C. Harlandii* Becc., on Vanua Lava in the New Hebrides where *Physokentia Tete* is native, though there the genus *Taveunia* appears to be lacking.

When Burret described the genus *Goniosperma* he noted the resemblance to *Physokentia* and also noted that his *Goniosperma vitiense* was possibly identical with *G. Thurstonii*. After seeing plants on Mount Mariko and on Taveuni, there is no question in my mind but that they are the same. I have also seen the type of *Physokentia Tete* at Florence and despite the praemorse pinnae, (which may be so only because of wind or other damage), think there can be little questions of its generic identity with *Goniosperma*. I have, therefore, taken up the earlier generic name in describing *Physokentia rosea* and accept for the second Fijian species the name *Physokentia Thurstonii*.

Three other collections from the same region identified as *Goniocladus petiolatus* (Degener 14792, Degener 14893, A. C. Smith 5700) surely belong here but are not explicitly cited as I have not restudied the specimens. Degener



4. *Rehderophoenix subdisticha*. a, portion of rachilla with triads x 2; b, triad with flowers removed x 2; c, staminate flower at anthesis x 1; d, staminate bud x 2; e, staminate bud in vertical section x 2; f, staminate sepals x 2; g, staminate bud with sepals removed x 2; h, staminate petal x 2; i, stamens in 3 views x 2; j, pistillode x 6; k, pistillate bud x 4; l, pistillate bud in vertical section x 4; m, pistillate sepals x 4; n, pistillate bud with sepals removed x 4; o, pistillate petal x 4; p, pistil and staminodes x 4; q, staminodes x 4; r, portion of rachille in fruit x 1; s, fruit in vertical section x 1; t, fruit in cross-section x 1; u, seed in lateral, adaxial and abaxial views x 1. From material of *Moore & Whitmore 9300* preserved in liquid.

gives the vernacular name as *tangan-danu* in the Sabatu dialect.

REHDEROPHOENIX SUBDISTICHA H. E. Moore, sp. nov.

Rehderophoenici pachycladae similis sed fructibus in rachilla subdistiche vel distiche dispositis, minoribus et ad apicem rotundatis, florum masculorum staminibus ca. 190, bracteis inflorescentiarum inter se 2.5 cm. disparatis differt.

Solitary; trunk to 12 m. high, 10.6 cm. D.B.H., brown and closely ringed, somewhat enlarged at base with emergent adventitious roots to 20 cm. long. Leaves 10-15, spreading; sheaths forming a crownshaft, ca. 6 dm. long, dark green with white indument of floccose scales and dark margin; petiole short, ca. 7.5 cm. long, rounded and floccose-scaly or brown-punctulate below,

slightly concave and punctulate above; rachis 2.4 m. long, pale-floccose scaly when young becoming punctulate in age; pinnae ca. 25 on each side, deep glossy green above, dull green below in age but prominently glaucous when young, the apices obliquely to bluntly praemorse, basal pinnae ca. 50 cm. long, 4.1 cm. wide with praemorse-acuminate apices, median pinnae ca. 50 cm. long, 7.5 cm. wide, apical pinnae ca. 20 cm. long, to 3.9 cm. wide, midnerve and margins thick, secondary nerves to 8 on each side, glabrous above, with scattered small white branched trichomes on some of the nerves below when young but not becoming prominently punctulate. Inflorescences 2-3 below the leaves, to ca. 50 cm. long, light green in flower, dark green in fruit, white-floccose scaly, especially on peduncle and rachis, when

young but glabrescent in age, stiffly branched into 12-14 branches, the lower branches once-branched, the upper unbranched, rachillae to 23 cm. long, 4 mm. wide, angled and flexuous especially toward the apex; bracts subtending the inflorescence 2, not seen but scars of insertion ca. 2.5 cm. apart with the scar of a third and probably incomplete bract above; flowers in triads of 2 staminate and a pistillate for the most part, these slightly impressed and subtended by a very narrow bractlet when fresh, superficial and the bractlet not obvious when dry, arranged subdistichously to distichously in a slight spiral nearly throughout the axes. Staminate flowers light green, ca. 10 mm. long when dry, symmetric; sepals 3-4 mm. high, 5-6 mm. broad, gibbous basally, the margins more or less crenulate and sometimes minutely ciliate; petals ca. 9 mm. high, 6 mm. broad, navicular; stamens ca. 190 with white filaments and light brown anthers; pistillode broadly ovoid, lobed apically; pistillate flowers in bud 6 mm. high; sepals 3.5-4 mm. high, ca. 5 mm. wide, rounded and sometimes crenulate; petals ca. 5 mm. high with brief valvate apex; staminodes 3, dentiform; pistil ovoid, the ovule pendulous. Fruit orange-red when mature, ellipsoid, ca. 1.9-2.0 cm. long, 1.4 cm. in diam. when fresh, becoming 1.1-1.2 cm. in diam. when dry; exocarp densely and minutely roughened over included sclerosomes when dry; mesocarp thin with several layers of longitudinal fibers over the fragile yellowish endocarp; seed oblong-ellipsoid, ca. 1.1 mm. high, 9 mm. in diam. essentially terete in cross-section, with impressed anastomosed raphe-branches, the raphe extending along one side of the seed; endosperm homogeneous; embryo basal.

Vernacular names: *basibasi* (Kwara'ae language); *ori* (Bogotu language).

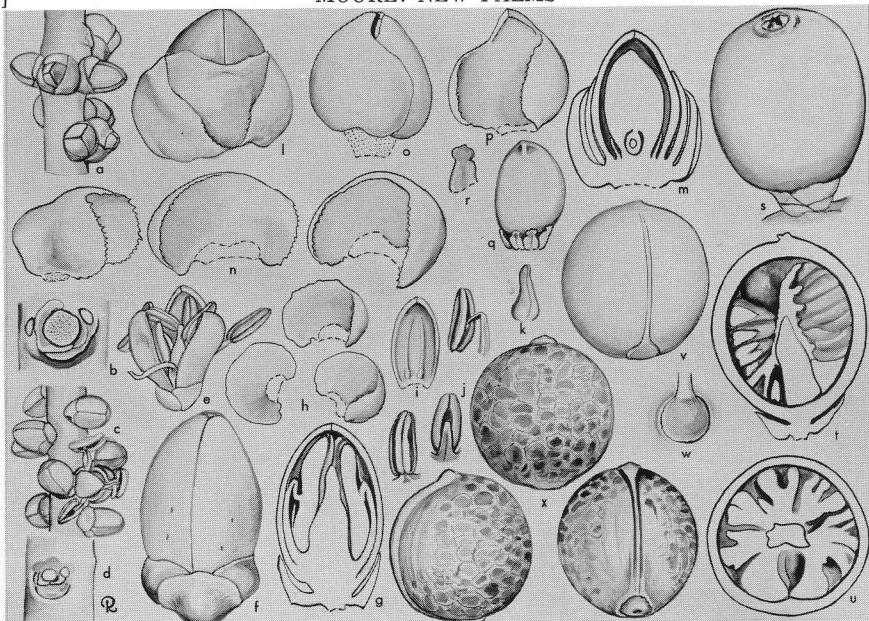
BRITISH SOLOMON ISLANDS PROTECTORATE. SANTA YSABEL: Bogotu Peninsula, occasional on slopes of ridges behind Nangalao Village near Tatamba, 0-500 ft. alt., 20 March 1964, *H. E. Moore, Jr. & T. C. Whitmore* 9300 [=BSIP 2588] (BH, holotype; BSIP, isotype).

Rehderophoenix subdisticha is the second species to be described for the genus. It differs from *R. pachyclada* of San Cristoval Island in the much smaller inflorescence (5 dm. vs. 1 m.) with slender rachillae (4 mm. vs. 8 mm.) on which the triads are arranged in essentially distichous fashion through a low spiral on the axis, the fruits appearing two-ranked rather than in a distinct spiral with fruits several-ranked. The fruits, themselves, are smaller (1.9-2.0 cm. vs. 2.5 cm.) and abruptly rounded rather than tapered at the apex, with a smaller perianth in fruit (6 mm. vs. 9 mm.) the seeds oblong-ellipsoid rather than ellipsoid. Staminate flowers have ca. 190 stamens as opposed to ca. 290 stamens in *R. pachyclada*.

Bracts subtending the inflorescence of *R. subdisticha* were not seen but are inserted only ca. 2.5 cm. apart with a probably incomplete third bract above them. In *R. pachyclada*, the cylindrical rostrate upper bract is inserted ca. 13 cm. above the ancipitous obtuse lower bract and according to Burret exceeds it in length by 17 cm.

RHOPALBLASTE ELEGANS, *H. E. Moore*, sp. nov.

Caudex solitarius ad 12 m. altus vel altior. Folia regulariter pinnata ad 3.4 m. longa. Inflorescentia breviter pedunculata, ramosa, rachillis pendulis ad 40 cm. longis. Flores masculi 6-7 mm. longi, virescentes. Fructus globoso-obovatus, in vivo ca. 2.6-2.7 cm. altus, 2.3 cm. in diam., in sicco ca. 2.5-2.7 cm. altus, 1.9-2.1 cm. in diam., semine glo-



5. *Rhopaloblaste elegans*. a, portion of rachilla with triads x 1; b, triad with flowers removed x 2; c, portion of rachilla with paired and solitary staminate flowers x 1; d, scars and bracteoles of paired staminate flowers x 2; e, staminate flower at anthesis x 2; f, staminate bud x 4; g, staminate bud in vertical section x 4; h, staminate sepals x 4; i, staminate petal x 2; j, stamens in 3 views x 2; k, pistillode x 2; l, pistillate bud x 4; m, pistillate bud in vertical section x 4; n, pistillate sepals x 4; o, pistillate bud with sepals removed x 4; p, pistillate petal x 4; q, pistil and staminodes x 4; r, staminode x 8; s, fruit x 1; t, fruit in vertical section x 1; u, fruit in cross-section x 1; v, endocarp x 1; w, operculum x 2; x, seed in lateral, abaxial and adaxial views x 1. From material of Moore & Whitmore 9310 preserved in liquid.

boso, 1.7-1.8 cm. in diam., albumine profunde ruminato.

Solitary tall palms tapered from a somewhat enlarged base with a mass of short, stout adventitious roots, ca. 12 m. high or more, 15 cm. in diam. near base, 7.5 cm. in diam. below crown, the bole gray-brown to rather light gray upward with chocolate-brown scales on new internodes. Leaves rather numerous in a handsome spreading crown; sheaths ca. 8.5 dm. long, forming a slender crownshaft, light green with a dense indument of brown scales and appearing brown, pinkish inside, tightly appressed and sticky inside; petiole short, 5-7.5 cm. long, green, concave above, rounded below; rachis straight, covered with dense indument of shining brown fimbriate peltate scales in-

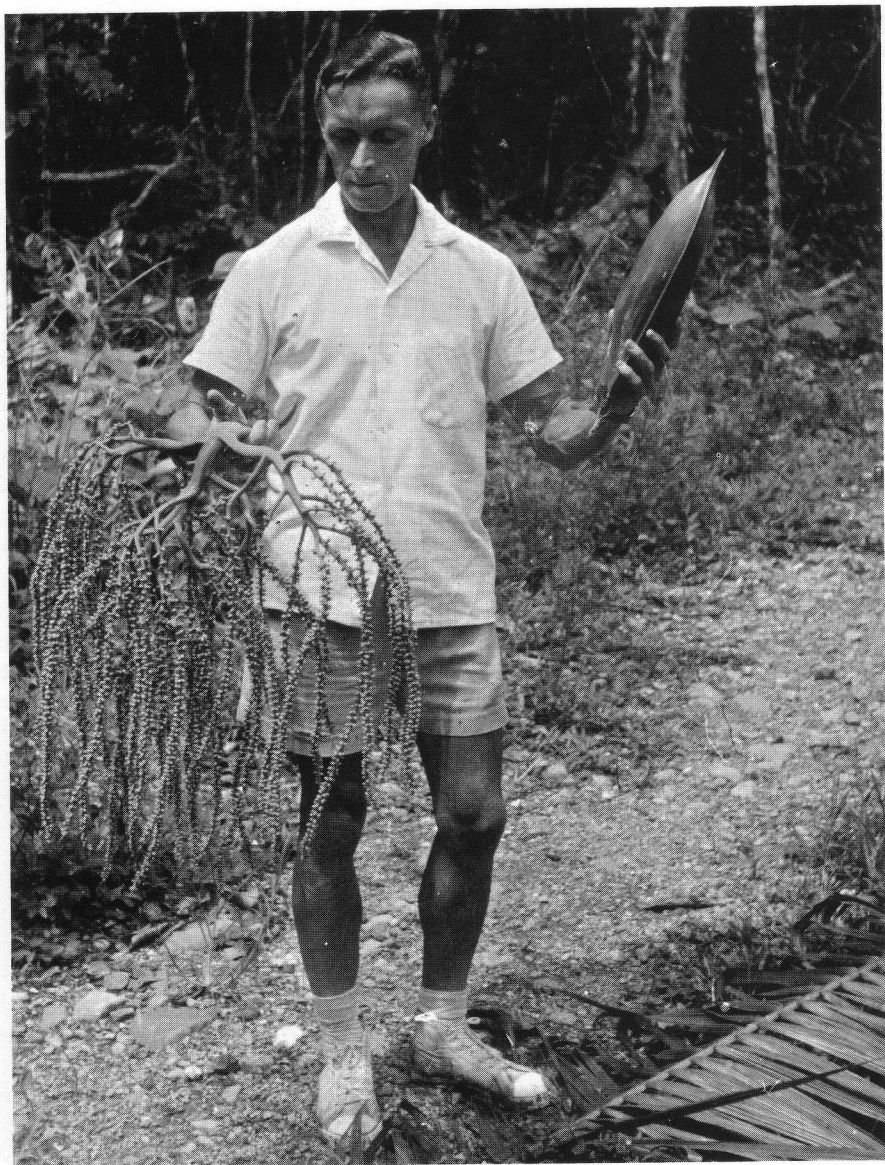
terspersed with deciduous white tomentum below, densely covered with shining fimbriate scales above when young, ca. 3.4 m. long with ca. 76 straight pinnae on each side, these regularly arranged and bent downward at an angle up to 45° with the rachis, light green, stiff, papery, with prominent pale nerves and appearing sub-plicate above, green below, the midnerve elevated and clothed with dark brown or grayish dull twisted basifixed scales above as are also the margins, below clothed with short and moderate shining brown twisted basifixed scales, the secondary nerves ca. 3 on each side, prominent below and scaly or brown punctulate; lower pinnae ca. 30 cm. long, 1.1 cm. wide, pinnae at mid-leaf 64-68 cm. long, 2.7-3.4 cm. wide, upper pinnae 41-26 cm. long, 19-8



6. Light breaking through the forest glints on fronds of *Rhopaloblaste elegans* at the headwaters of the Matanikau River near Honiara on Guadalcanal.

mm. wide, the apex acuminate and obliquely praemorse. Inflorescences 1.3 below the leaves, enclosed in bud in caducous sub-terete green bracts with brown lepidote-tomentose indument, the lower ca. 36 cm. long, laterally keeled,

the keels extending into a flat rostrum ca. 2 cm. long, the upper bract enclosed within the lower, slightly keeled and rostrate, more densely lepidote-tomentose; expanded inflorescence with a short peduncle 6-8 cm. long, orange-green at



7. Mr. Dennis holds inflorescences of *Rhopaloblaste elegans* in bud and expanded. Photograph by T. C. Whitmore.

base, then green, the rachis ca. 30 cm. long, the branches 15-16, the first two divaricate at about a 90° angle with the rachis and with a main axis ca. 23 cm. long, again branched into simple or furcate pendulous flowering axes to ca. 40 cm. long, tipped with a brief sterile

spinose apex, middle branches once-branched, the apical unbranched and to ca. 25 cm. long, triads borne on lower half of the axes, paired or solitary staminate flowers above, the axes somewhat flattened at least basally, the triads scarcely sunken and subtended by a

prominent rounded lip. Staminate flowers glabrous, 6-7 mm. long, greenish, leaving an orange scar on the green axis when fresh, very slightly asymmetric and acutish at apex, the sepals 2 mm. long, 3 mm. wide, slightly keeled basally; petals 5-6 mm. long, 3 mm. wide; stamens 6, the flat white filaments ca. 2.5 mm. long, inflexed at the apex in bud, the yellow anthers 3 mm. long, dorsifixed, briefly bifid at base and apex; dull yellowish pistillode about as high as the filaments, narrowed from an ovate base to a trigonous 3-lobed apex. Pistillate flowers glabrous, subtended by 2 low imbricate bracteoles ca. 1 mm. high, rounded in bud, ca. 4 mm. high; sepals 3 mm. high, 5 mm. wide; petals 4 mm. high, 3 mm. wide; staminodes 4, more or less united basally; pistil ovoid with 3 short erect stigmas; ovule attached laterally. Fruiting axes dull green, the fruit successively green, yellow to orange then crimson with a copious glaucescence when ripe, globose-obovate in a perianth 6-7 mm. high, ca. 26 mm. high, 23 mm. wide when fresh, 2.5 cm. high, 1.9-2.1 cm. wide when dry, the exocarp smooth, mesocarp with longitudinal flattish fibers and thin flesh, endocarp thin, crustaceous, shining, not adherent to seed with a basal operculum; seed globose or depressed globose, 1.7 cm. high, 1.8 cm. in diam., raphe impressed, as long as the seed, branches numerous and reticulate dorsally; endosperm deeply ruminate; embryo large, basal.

Vernacular names: *da'e* (Kwara'ae language Kwai dialect): *angiriri* (Akui dialect). BRITISH SOLOMON ISLANDS PROTECTORATE. GUADALCANAL: north coast, vicinity of Honiara; gully forest 1 mile from coast and 1 mile east of White river headwaters, alt. ca. 500 ft., 27 March 1964, *H. E. Moore, Jr., G. F. C. Dennis & T. C. Whitmore*

9310 [= *BSIP* 4085] (BH, holotype; BSIP, isotype).

Rhopaloblaste elegans is surely one of the most elegant palms of the Solomon Islands and represents an extension of range for the genus eastward from New Guinea. Near Honiara on Guadalcanal, it forms extensive open stands in disturbed rain forest over coralliferous raised beach sediments on Mt. Austen which give the forest a distinctive appearance, and when brought into cultivation, as in the garden of Mr. G. F. C. Dennis at Honiara, it shows distinct promise as an ornamental palm, being more delicate than *R. ceramica*. Seed was sent to the Fairchild Tropical Garden, Miami, Florida, and accessioned as FG 64-173. *Rhopaloblaste* also occurs on Choiseul Island where collected three miles inland from Liulu Village in *Pometia*-dominated forest over a dissected limestone plateau (*T. C. Whitmore, BSIP* 4097) but the collection lacks fruit and the specimen available (US) differs slightly in other particulars so that assignment to species must be left until further material is collected. Dr. Whitmore writes that this locality is over a substratum similar to that of Mt. Austen and the species composition of the forest is also similar.

The exact number of species truly assignable to *Rhopaloblaste* is not quite certain but among those described with fruits exceeding 2.5 cm. in length, *R. elegans* differs from both *R. micrantha* Burret* of New Guinea and the type-

**Rhopaloblaste micrantha* Burret, Notizblatt Berlin 15: 10, 1940, not *R. micrantha* (Becari) Benth. et J. Hooker ex B. D. Jackson, Index Kewensis 2: 713, 1895. Burret noted that stamens had been destroyed in the material seen by him. Since I have not seen authentic material nor more recent collections agreeing with the description, and since the spreading pinnae and only slightly dissected staminoid ring are not in accord with *Rhopaloblaste* as I know it, it seems premature to provide a new name to replace Burret's later homonym.

species, *R. ceramica*, in having globose-ovoid fresh fruits (ca. 2.6 cm. long, 2.3 dm. diam.) which dry with an abruptly rounded rather than gradually tapered apex and seeds globose and rounded at the apex rather than ovoid and acutish. From *R. ceramica*, *R. elegans* differs further in having a much

less robust inflorescence, in having ovoid pistillate buds 4 mm. across subtended by bracteoles 1 mm. high or less as opposed to depressed trigonous-globose buds 6 mm. across subtended by bracteoles to 2.5 mm. high in *R. ceramica*, and in having the triads subtended by a prominent lip-like bractlet.

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EXPECTING FRESH RIPE *LODOICEA MALDIVICA* nuts in Sept. 1966. Hope to have a few extra, which I will TRADE for other rare palms; do not wish to sell — exchange preferred. Dr. M. E. Darian, 2615 So. Santa Fe Ave., Vista, Calif., U.S.A.



Mr. and Mrs. Satake and daughter

Satakes Visit U. S.

Mr. Toshihiko Satake, prominent manufacturer of rice-milling machinery at Hiroshima, Japan and long an expert on palms, visited Miami from May 28th to 31st. He was accompanied by his charming wife and daughter, Mrs. Fumiko Satake and Mrs. Robert Satake.

Although the two ladies had been here before, this was Mr. Satake's first visit. An expert photographer, he was interested in taking pictures of palms, also in meeting various people with whom he had corresponded, and in trying to find one or more palms not already in his very extensive collection. He was hampered by the fact that the weather was very showery, and that it was the Memorial Day week-end when many persons were out of town. Eventually all aims were achieved, including a one-day trip to Nassau, Bahamas, to see the Langlois and Ericson collections.

Mr. Satake said that he was very much impressed by what he saw, and hinted that he might return before too long. The family had spent a month making a thorough tour of the United States, including a short stay in Ithaca, N. Y. to meet Dr. H. E. Moore, Jr., Director of the L. H. Bailey Hortorium at Cornell University as well as editor of *PRINCIPES*. Dr. Moore is now spend-

ing a month in Japan, where no doubt the friendship will be renewed.

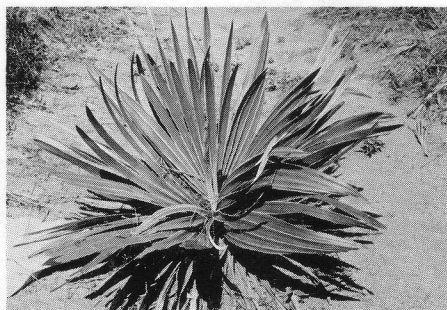
An incident which took place during the Satakes' stay in Miami illustrates the value of knowing botanical names. We were at the Cutler Nursery, Mr. Cleveland, the new owner, showed us two very unusual-looking palms in large tubs. He asked me what they might be. While I was cudgelling my brain to identify them, Mr. Satake, who does not speak English, stepped up and quietly said: "*Gaussia princeps*". Then, as his daughter interpreted, he told us about a very similar one growing in his greenhouse.

All of us who met this delightful family hope that they will soon come back to see us.

L. H. W.



1. *Copernicia alba*, the caranday wax palm of Paraguay. This species reached this height from seed in five years. Mr. Kitzke is 5 ft. 8 inches tall.



2. *Copernicia Cowellii*, a Cuban wax palm and slowest growing species in the genus. The plant figured is eight years old.



3. *Copernicia alba*. Another view. Mr. Gerardo Maciel is 6 ft 2 inches tall.

Growth in *Copernicia alba*

Apropos of his letter to Dr. Hodge concerning the cabbage of *Copernicia alba* printed on page 36 of the last issue of PRINCIPES, Mr. Kitzke has forwarded some photographs which give a better idea than words how fast this palm grows at the S. C. Johnson & Son, Inc. Raposa plantation in Ceara, Brazil.



4. *Copernicia alba*. These five-year-old specimens were planted directly as seed. Note *C. hospita*, another Cuban wax palm, on the left. The taller palms are *C. prunifera* (*C. cerifera*), the native Brazilian wax palm.