

PRINCIPES

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THE PALM SOCIETY

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JOURNAL OF THE PALM SOCIETY

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Leaves and stems of a *Pinanga* species make a delicate tracery against the sky in the Lyons Arboretum, Honolulu, Hawaii. Photo by Frederick B. Essig.

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JOURNAL OF THE PALM SOCIETY

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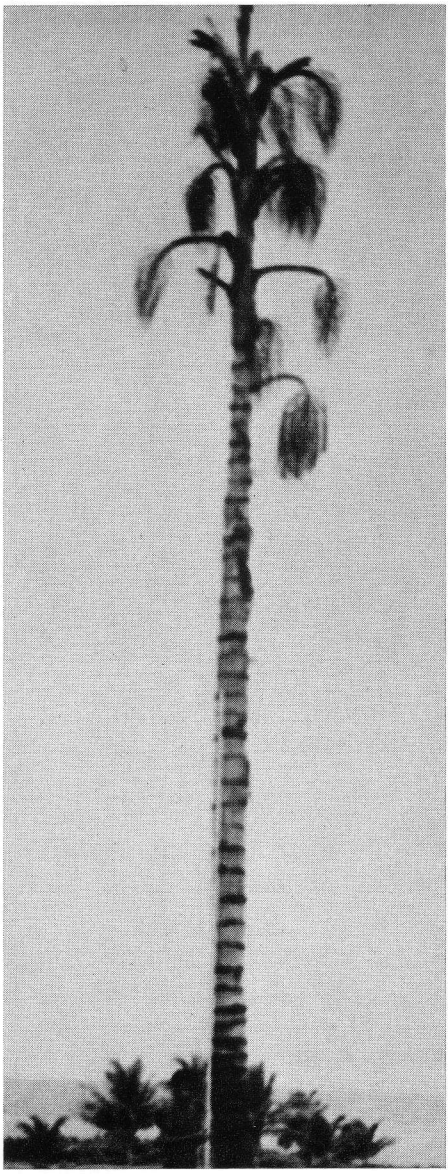
Arenga Listeri (Palmae)

R. B. KURTZ

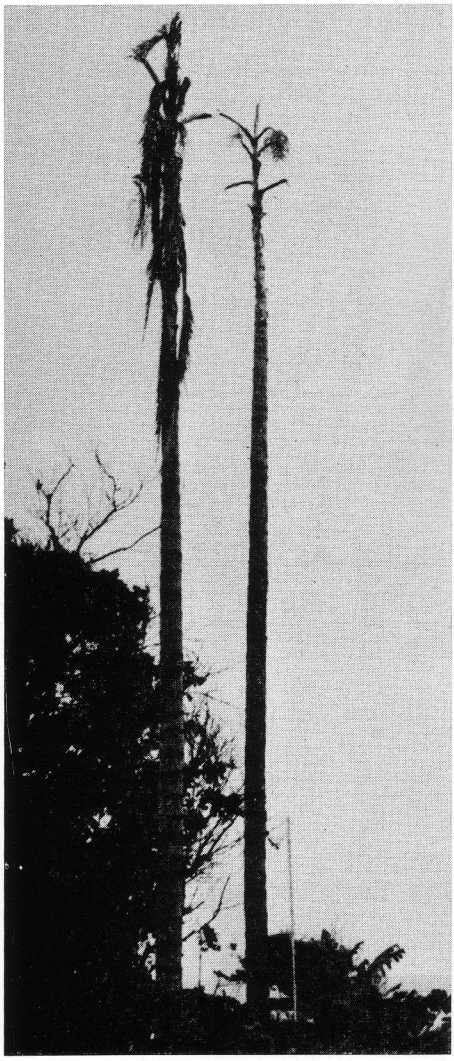
The accompanying photographs of *Arenga Listeri* Beccari were taken by Mr. D. A. Powell of Christmas Island. Christmas Island is an isolated island reaching up to a thousand feet above the Indian Ocean, with inaccessible cliffs all around the edge. It never was inhabited by man, although only 220 miles from the southwestern tip of densely populated Java. It is only 12 miles long and nine miles wide, but when first made accessible in 1886 was covered with gigantic tropical trees 100 to 170 feet high and luxuriant vegetation which has partly disappeared in consequence of phosphate rock mining. Christmas Island belongs to Western Australia and the phosphate is shipped to Australia.

A species of *Arenga* quite distinct from all others is endemic to this small, isolated island. This palm grows on weathered basalt, so that exposures of basalt may be distinguishable at long distances by the great size of the *Arenga Listeri* growing on them. According to Ridley (1906), "It is common all over the island but chiefly on the upper terraces. When the tree has fruited, all the leaves fall off and the dead or dying stem with the inflorescences persisting has a most curious appearance." This habit of fruiting on a tall stem 30 to 70 feet in height, devoid of any but the top leaves, is unique amongst arengas.

Unique also amongst arengas is the small size of the fruit (½ inch) for such a large palm. These small red ellipsoids



1. *Arenga Listeri* at an elevation of 100 ft. on the northeast side of Christmas Island. This individual is bearing fruit and perhaps flowers. A sixteen-foot staff gives scale to the picture. Photo by D. A. Powell



2. Two individuals at an elevation of 85 feet on the northeast side of Christmas Island. Both plants lack foliage; the one on the right bears fruit. A sixteen-foot staff is held for scale. Photo by D. A. Powell.

are smaller than the fruit of *A. microcarpa* which are ⅝ inch red spheres. Unusual also is the solitary trunk, a habit shared only with *A. pinnata*. The other *Arenga* species are cespitose or clustered. The two Javan species, *A. pinnata* and *A. obtusifolia*, have much larger fruit (2–2½ inches). This suggests a closer relationship of *A. Listeri* to the New Guinea or Australian small-fruited types (*A. microcarpa*). Competition with the giant rainforest canopy trees of Christmas Island may have been responsible for the development of a tall trunk up to 70 feet high. The fruit is more like that of a small *Arenga* (*Didymosperma*) *porphyrocarpa*, being elliptic, pink and juicy, with three seeds. Hemsley originally named the species *Didymosperma* sp. in 1890, and it was given its present name by Beccari in 1891.

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Appendix

Extracts from a letter of D. A. Powell to R. B. Kurtz dated April 27, 1970.

"There is not a great deal I can tell you about the palm, my observations are casual and are not backed by any long term research. The palm itself is fairly wide-spread, favouring areas where basaltic flows are weathering down to form a soil profile. In fact twice I have located basalt dykes by using this botanical marker as a guide. Palms that appear to grow in localities other than on basaltic material are isolated and are generally on a drainage pattern or down hill from the parent group. In which case it is reasonable to assume that the seed has been dispersed by rain-water run off or with gravity assistance. In both cases the dispersal has been in such a manner to also assume that the trace elements that the palm requires and obviously finds in weathering volcanics, will no doubt migrate in a similar way. The



3. An individual of *Arenga Listeri* in typical rainforest on the southern plateau of Christmas Island, elevation 500 ft. The vine on the trunk is *Hoya Aldrichii*. Photo by D. A. Powell.

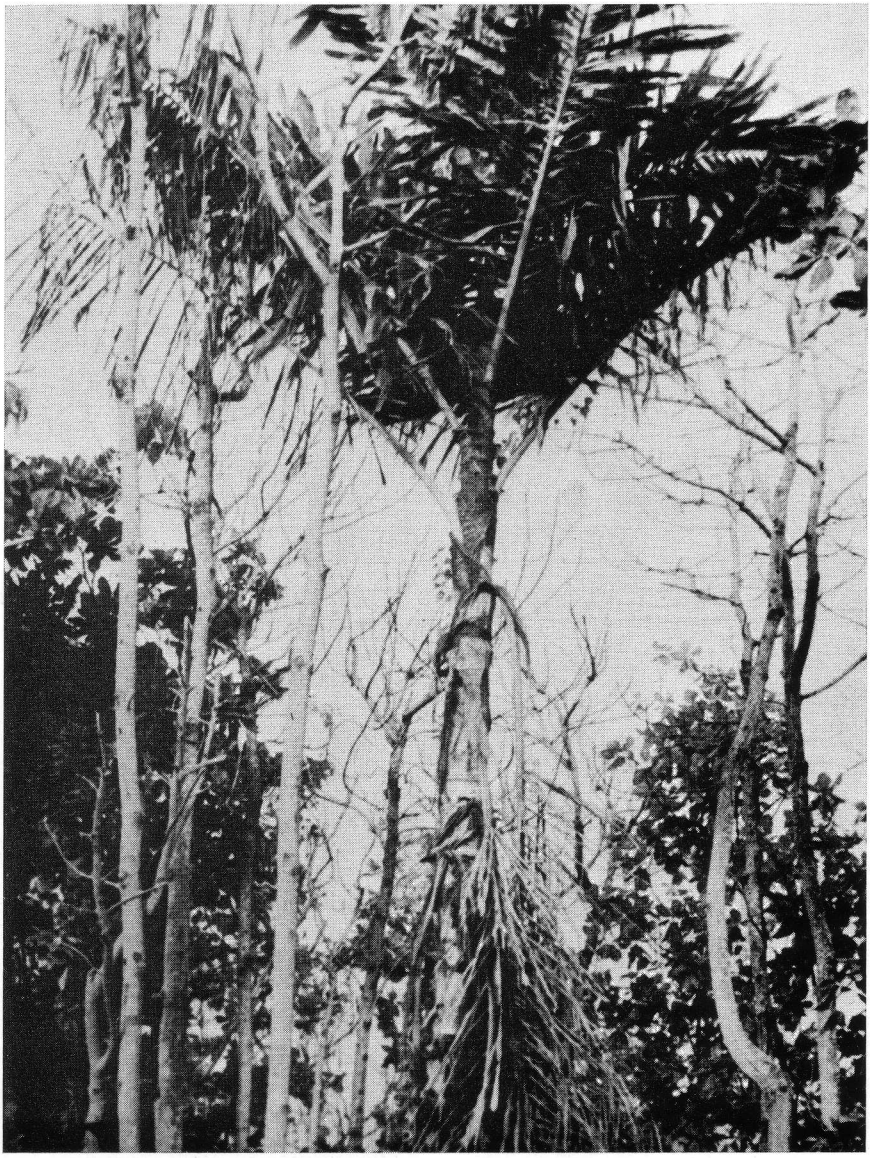
rainfall varies from sixty (60) to a hundred and twenty (120) inches over a year, six (6) to eight (8) inches often occurring in one day. Run-off after one days deluge could carry sufficient minerals to propagate one or two palms but only on a pre-determined geological pattern.

"Where there is a fresh (geological) basalt exposure so that there is rock and



4. A young individual of *Arenga Listeri* in the northern terrace section of Christmas Island at an altitude of 450 feet. Photo by D. A. Powell.

soil together 'in situ' then the palm successfully competes with the secondary growth normally found in rain-forests. In its early stages, due to the spread of foliage it chokes out any minor competitor and will then grow to form the sub or lower canopy at a height of about forty feet. The main canopy standing between a height of eighty to one hundred feet is comprised in the main of *Eugenia gigan-*



5. *Arenga Listeri* approximately 30 feet in height with foliage intact, still protected by light secondary growth on northeastern side of Christmas Island, altitude 85 ft. Photo by D. A. Powell

tea, Planchonella nitida, Hernandia ovigera, Didymocheton amooroides, and *Tristiropsis nativitatis.* In the northeastern section of the island only, to a height of three hundred and fifty feet, two types of tree are competing against the *Arenga*; they are the *Calophyllum inophyllum* and *Ochrocarpos ovalifolius.* Both favour volcanic soil, both rely initially on the sea to disperse their seed. I

would regard them as recent arrivals and would say that there is very little chance of them spreading due to the Miocene limestone present above the four hundred foot contour.

"In areas where the main canopy has been removed, exposing the crown of the *Arenga* to the wind and possibly strong sunlight, it will begin to lose its foliage. To the casual observer it appears dead, but despite its stark appearance it continues to flower and fruit for seven or eight years, possibly longer. I have seen palms, thirty feet in height, denuded of all foliage, produce a series of inflorescences, the lowest being at a height of ten feet from the ground.

"There is no endemic population on the island; our labour force is mainly Chinese recruited from Singapore, consequently any natural lore, botanical or otherwise is lacking. The only use made of the palm is to cut it into sections as a means to attract the robber crab (*Birgus latro*) which they use as bait when fishing.

"When the fruit of the palm is ripe it attracts these large land crabs and they gather beneath the tree scavenging for the berry. After what was on the ground has been eaten, one or two crabs will eventually climb the palm and try to eat the fruit direct from the branch. To what extent they are successful is debatable, for there appears to be a constant stream of falling fruit, which would indicate that the actual crab doing the plucking is not getting much reward for his labour. Beneath, I have on occasions counted over one hundred crabs, so that when the crab eventually climbs down there is very little remaining."

WHAT'S IN A NAME?

Dypsis (díp sis) apparently comes from an inflected form (*dyps-*) of the Greek verb *dyptein* (to dip or dive) though neither Noronha, who first used the name without an accompanying description, nor Martius, who first provided a description, gave an origin for the name. Wittstein (*Etymologisch-botanisches Handwörterbuch*, 1852) suggests a meaning that does not make particular sense and it is perhaps best simply to note the meaning as "obscure."

Iguanura (ig oo a néw ra) was used by Blume for the palm genus based on *Iguanura leucocarpa* because the inflorescence, beset with scales, resembled the tail of some amphibia belonging to the genus *Iguanura* (nomen novii hujusce Generis. . . ob aliquam spadicis squamis obsessi cum cauda quorundam Amphibiorum, quae ad Genus Iguanuram pertinent, similitudinem, ei inditum est—*Rumphia* 2:106. 1843).

Lytocaryum (lie toe ká ree um) was derived from the Greek *lyton* (Latin *solutum*, loosened) and *caryon* (Latin *nucleus*, nut or kernel of a nut) because the fruit coat splits when mature exposing the bony endocarp which contains the seed.

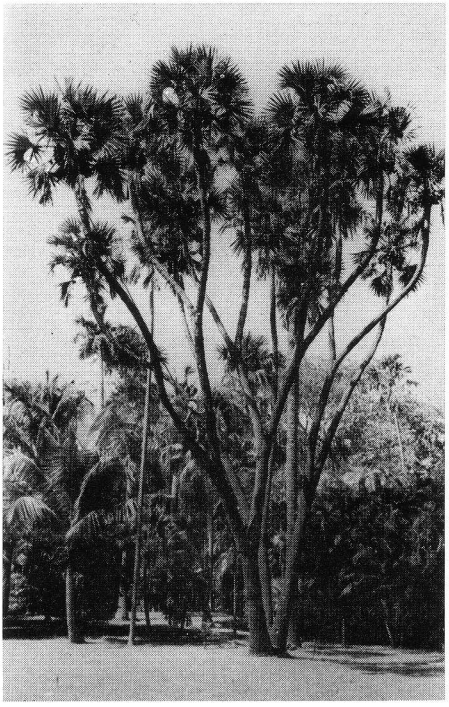
Solfia (sól fee a), a genus described from Samoan palms, honors Wilhelm Solf (1862–1936), onetime governor of German Samoa (1900).

Some Hyphaene Species from the Botanic Gardens, Calcutta

C. X. FURTADO
Singapore

From time to time *Hyphaene thebaica* is mentioned as a palm that has been successfully grown in India. The only Indian species that was commonly mistaken for *H. thebaica* was distinguished by Beccari (1908) under the name of *H. indica* Becc. Nevertheless, Blatter, who in his monographic work *The Palms of British India and Ceylon* (1926) admitted *H. indica* as a good species and re-described it with photographic illustrations to show its habit, stated that *H. thebaica* was "to be seen in many a garden of India and Ceylon," (p. 165), an opinion found reiterated several times by other writers.

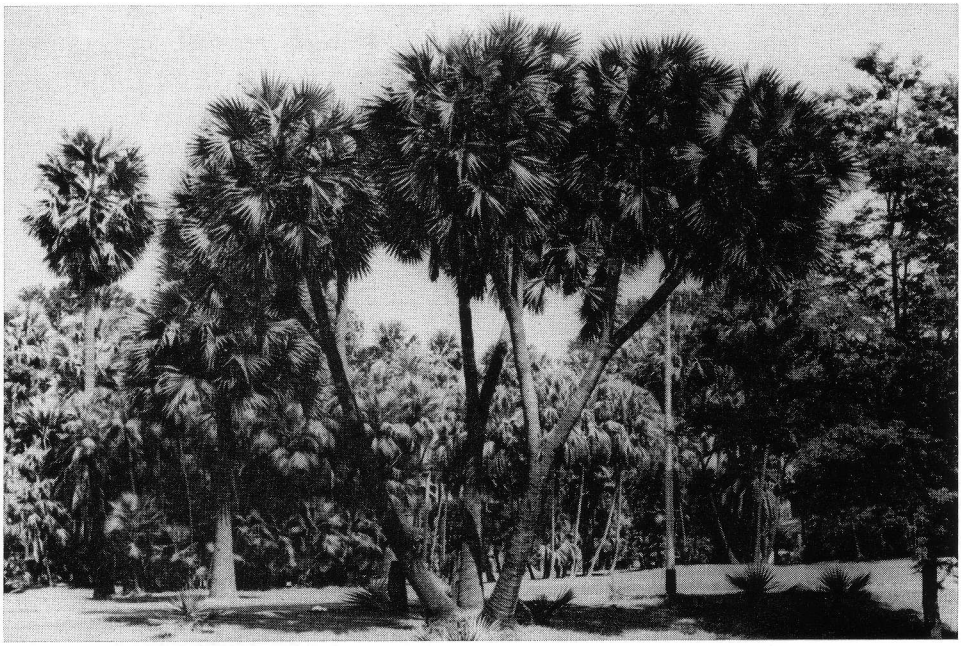
Nevertheless, I was unable to receive a fruit from India or Ceylon of a genuine *H. thebaica* as typified by Martius (1838). However in the region of Thebes there seems to occur also a



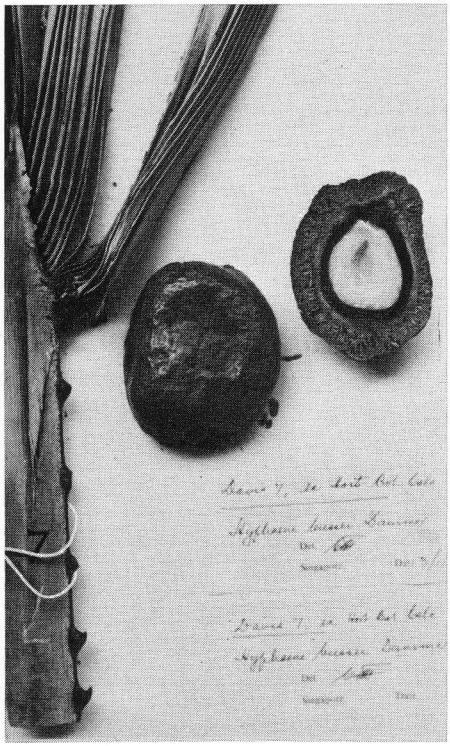
1. *Hyphaene Bussei* growing at the Calcutta Botanic Garden under the name *H. thebaica*. Photo by T. A. Davis.



1a. *Hyphaene Bussei*. Portion of rachilla, part of petiole, hastula and base of leaf, fruit in section. Photo by Juraimi.



2. *Hyphaene Bussei* at Calcutta. Photo by T. A. Davis.

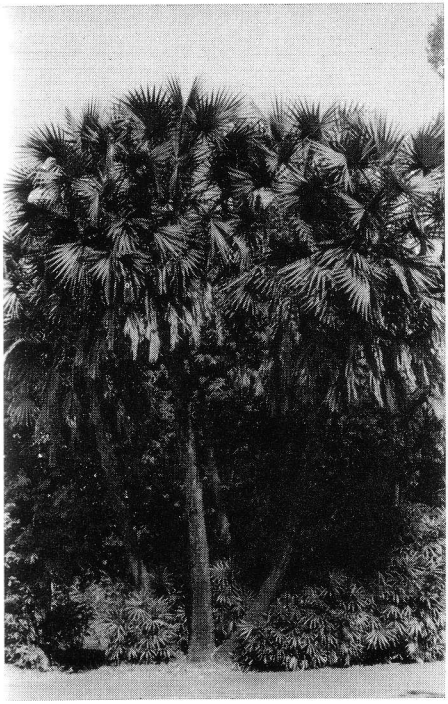


species that is referable to the group named by Beccari (1924, p. 32) as "*H. multiformis*" and Beccari's *H. thebaica* (1924, *Pl. 20*) seems to be referable also to the latter group, many forms of which are known from Kenya. Apparently, Blatter followed Beccari in identifying *H. thebaica* with a form of "*H. multiformis*," and not with *H. thebaica* (L.) Martius; for while he noted that "the young plants are of slow and precarious growth" in India and Ceylon, older plants were "much better developed" there than the trees in Egypt (p. 165). Recently S. K. Basu (1969) reported the species as occurring cultivated in the Botanic Gardens, Calcutta, but the illustration given in the article shows that it has been misidentified.

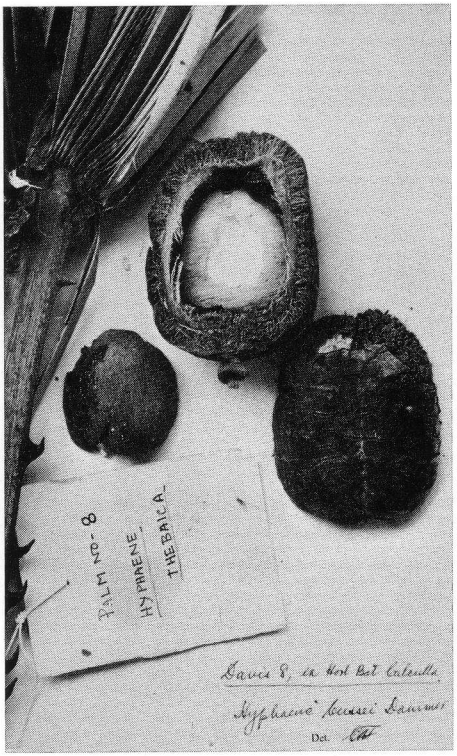
As it is not easy to receive good speci-

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2a. *Hyphaene Bussei*. portion of leaf and fruit of plant in Fig. 2. Photo by Juraimi.



3. *Hyphaene Bussei*, a third specimen at Calcutta. Photo by T. A. Davis.



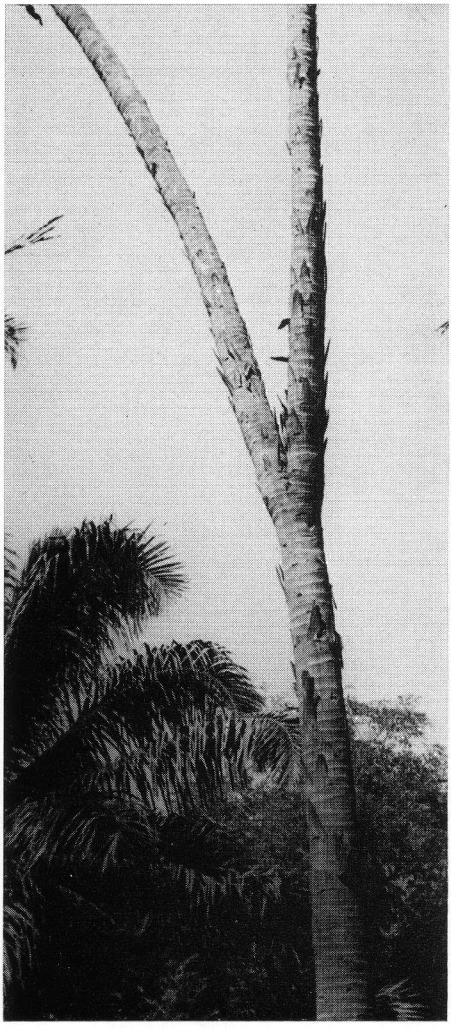
3a. *Hyphaene Bussei*. Portion of leaf and fruit of specimen in Fig. 3. Photo by Juraimi.

mens even of *Hyphaene* species cultivated in gardens, I requested Prof. T. A. Davis of the Indian Statistical Institute, Calcutta, to procure for me fruiting specimens and photographs of the species of *Hyphaene* cultivated in the Botanic Gardens, Calcutta; and as a result of his generous cooperation, I venture to write this note as a supplement to the nomenclature of the *Hyphaene* spp. discussed by Basu in the above-mentioned article.

1. "*Hyphaene thebaica*"

The stem of *H. thebaica* dichotomizes above the ground, but so far only one species is known to dichotomize below the ground—usually dichotomizing twice, rarely once below the ground. The stems that emerge from one seed in the ground are thus four or three (the fourth one is generally suppressed), but rarely two. The species is known as *Hyphaene Bussei* Dammer ex Busse. The type was collected at Bubu in the Ugogo district of Kenya. Busse who collected it stated that it does not branch above ground.

However there is no apparent reason why a palm that has a strong tendency to dichotomize underground should cease to do so above ground unless conditions are not favourable. This might happen in areas which are subject to long dry season alternating with periodic floods, so that after the seed has germinated during a flood its subsequent growth would receive periodic setbacks during droughts or prolonged dry weather. Busse seems to have seen newly established colonies of *Hyphaene* species



4. A *Hyphaene*, perhaps true *H. thebaica*, at the Calcutta Botanic Garden. The only branching is 25 ft. above ground. Photo by T. A. Davis.

in localities subject to such periodic floods and droughts. In the photograph taken by Busse and printed by Beccari (1924, *Pl. 45, Fig. 8*), the three stems arising from the ground are young, having all persistent leaf-bases, and the fourth seems to have arisen by bifurcation aboveground of one of the stems.

Busse reported that the stems are sometimes ventricose in the uppermost portion; apparently because of this character Beccari placed the species *in the Ventricosae*, reducing it as a subspecies of *H. ventricosa* (1924, 46, *Pl. 40, Figs. 3 & 4 & Pl. 45, Fig. 8*). But the species certainly belongs to the group "*H. multiformis*" of Beccari. True dichotomy does not occur in the *Ventricosae*, while its leaf hastula is one-sided and the lamina is waxy not lepidote; whereas the Calcutta specimen shows an obliquely bilateral hastula and a very lepidote lamina. In Calcutta the specimens grow under very favourable conditions and both male and female plants have bifurcated several times above ground. But there are two forms in Calcutta: the one that produces ovate oblong fruits with entire, chestnut coloured skin (Figs. 1 & 1a, 2 & 2a, and Basu's Fig. 1); in the other the fruits are oblong, hardly narrowed above, with the skin dark coffee coloured, suffused with yellow and green, bearing reticulate markings and irregular cracks (Figs. 3 & 3a). The latter character is often found in species that grow in moist conditions near seashores. Figure 3 shows that the ground is moist and therefore covered with many *Rhapis* and other plants around; whereas the ground around other palms (Figs. 1 & 2) is clean.

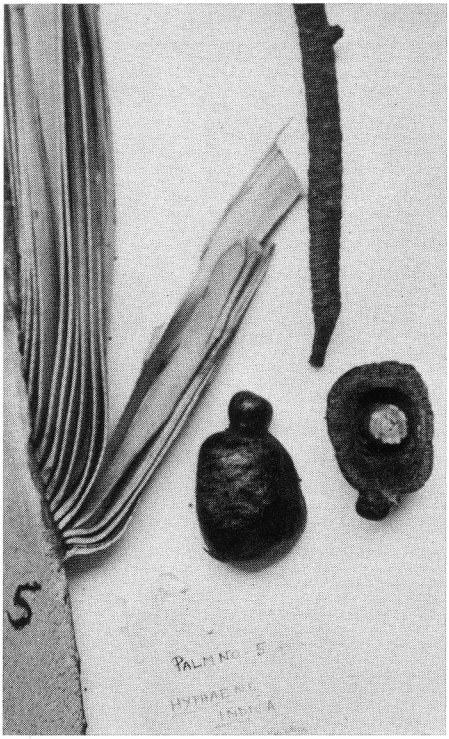
There is another *Hyphaene* (Fig. 4) which in Calcutta has not flowered. It has bifurcated about 25 ft. above ground. This might be true *H. thebaica*, but grows only vegetatively perhaps because the climate is too moist for it.

2. "*Hyphaene indica*"

There are in Calcutta two clumps of *Hyphaene* which are cespitose not dichotomous. Neither of these could be *H. indica* which, as said above, produces dichotomous stems. Two distinct species are involved:



5. *Hyphaene Schatan* at Calcutta Botanic Garden. Photo by T. A. Davis.



(a) *Hyphaene Schatan* Bojer ex Dammer (Figs. 5 & 5a).

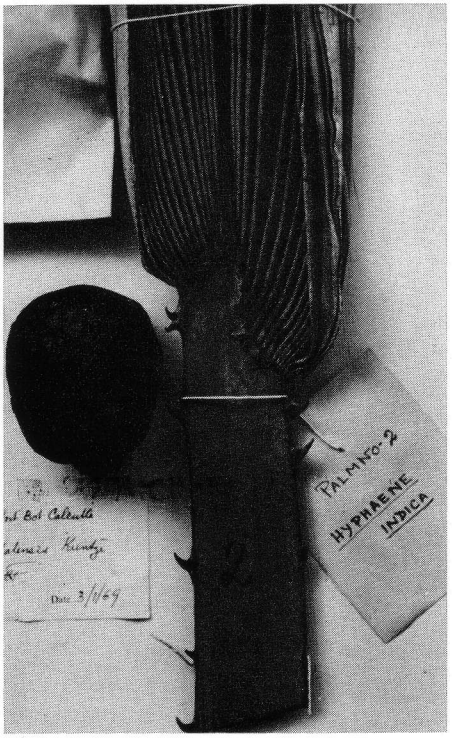
There is a cespitose palm which was first described by Dammer (1900) on a specimen collected in Mauritius by Bojer and listed in his *Hortus Mauritianus* (1837). Some of the forms from Madagascar identified with this might have to be separated as *H. Hildebrandtii* Becc. The Calcutta form certainly agrees with Beccari's *Pl. 36, Fig. 8* (*op. cit.*) which being from Bojer's collection seen by Dammer, might be considered as a holotype or neotopotype of the species; and also with *Pl. 35, Figs. 9 & 10,* which were also from the islands in the Mauritius archipelago. A specimen in the herbarium of the British Museum (Natural History), London, collected by Ro-

←

5a. *Hyphaene Schatan.* Portions of leaf, rachilla, and fruit of plant in Fig. 5. Photo by Juraimi.



6. *Hyphaene natalensis* at Calcutta Botanic Garden. Photo by T. A. Davis.



billard in 1862 on the mountains of the Reunion Island is also the same species.

(b) *Hyphaene natalensis* Kuntze (Figs. 6 & 6a)

This is also a cespitose species but found on the east coast of South Africa and Mozambique; its fruits are different and larger. In cespitose species the lateral buds generally cease to grow above ground, but occasionally one or more dormant lateral buds might become active and then gardeners usually give the species a wrong name. I have received specimens of this species labelled as "*H. thebaica*"; but one can easily distinguish such a branching, because the two "branches" are not equal and the main stem tends to be somewhat constricted below the branching, even when the branching looks dichotomous.

←

6a. *Hyphaene natalensis*. Portion of leaf and fruit of plant in Fig. 6. Photo by Juraimi.

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Taxonomic Notes on Some Malayan Palms

T. C. WHITMORE

Forest Research Institute, Kepong, Malaysia

Palm taxonomy is bedevilled by the small and frequently inadequate fragments gathered by the early collectors, their poor descriptive notes, and the fact that the specimens are now often scattered amongst several herbaria. Malayan palm taxonomy is no exception. Prior to publication of a semi-popular account of the palms of this richly endowed peninsula (Whitmore, *Palms of Malaya*, Oxford University Press, Kuala Lumpur, *in press*), I have had to give some consideration to taxonomy, mainly in the subfamily Arecoideae which Furtado's otherwise extensive researches into Malayan palms have scarcely touched. I have been able to resolve some problems, greatly helped by the background of study in the forest, but others still remain unresolved. It is my experience in Malaya that progress in this family of princes comes after extensive full collection and observation, not least to learn the range of variation within species; I have discovered it to be a myth that palms are difficult to collect. Eventually one can hope to fit the old fragments into a firmly forest-based outline, but progress seldom comes from herbarium study alone.

I am grateful to the Directors of the Calcutta, Kew, and Singapore herbaria for permission to examine material under their care. The abbreviations CAL, K, and SING respectively are used in citations of specimens which follow.

ARENGA

Moore's arguments (*Principes* 7: 102–117, 1960) for reducing *Didymosperma* to *Arenga* are convincing. There is a lot yet to be learned about these palms in the forests where they grow, and little progress will be made until more collections and careful observations are available. Moore demurred from transferring the two Malayan species to *Arenga* because he was not sure how they differ from *Arenga caudata* (Loureiro) H. Wendland et Drude. I have no difficulty in telling the two species apart in the forest, and am sure two taxa must be recognized. Like Moore, I have had no opportunity to study *Arenga caudata* fully; I could find no good material at Kew or Singapore. In the circumstances, and in the hope it will stimulate forest botanists to collect these dainty palmunculi, I propose the following new combinations, although I realise one of these

taxa may eventually be shown to be *A. caudata.*

Arenga hastata (Beccari) Whitmore, *comb. nov.*

Didymosperma hastatum Beccari, Malesia 3: 99. 1886 (*'hastata'*).

Type: *F. Kehding s.n.* (*'Keheding'*).

Arenga Hookeriana (Beccari) Whitmore, *comb. nov.*

Didymosperma Hookerianum Beccari, Malesia 3: 186. 1889 (*'Hookeriana'*).

Lectotype:[1] *Scortechini 136b, 229b*; *King's Collector 2446.*

IGUANURA

I have discovered that *Iguanura* in Malaya contains several polymorphic species. I do not fully comprehend the variation within these complexes; several species have been described within each. I hesitate formally to make reductions, for further observation may show the segregates to be justifiable. Some annotation is essential.

Iguanura polymorpha Beccari, Malesia 3: 189. 1889.

Iguanura brevipes J. D. Hooker, Flora of British India 6: 416. 1892.

Ridley, in *Materials for a Flora of the Malayan Peninsula* 2: 152, 1907, and *Flora of the Malay Peninsula* 5: 15, 1925, was wrong, I consider, to reduce the second of these to synonymy. He ignored the fact, which I have checked, recorded in both descriptions and key in the *Flora of British India,* that the inflorescences are amongst the leaves in *I. brevipes* and below in *I. polymorpha.* Apart from this important difference, and the correlated difference that the latter species has a proper crownshaft, the species do indeed look the same. I have examined material at Kew and Singapore and find the two taxa are represented as follows:

Iguanura polymorpha: PERAK, *Ridley 11405* (SING). KELANTAN, *Gwynne Vaughan 560* (K).

Iguanura brevipes: PERAK, *King's Collector 2029* (type, K). KELANTAN, *Nur 12052* (K, SING).

In addition, *Burkill & Haniff 12715* (K) and *Curtis 2078* (SING), both from Maxwell's Hill, Perak, and *Ridley 8903* (SING) from Bujong Malacca, Perak, have detached inflorescences and I cannot place them.

I have never found palms of a species to vary in presence or absence of a crownshaft, which reflects an important difference in apical organisation, and I consider this character represents a real specific difference. It is odd that both species are known from Kelantan and Perak only, but perhaps this points to no more than paucity of collecting from the high mountains of Kedah and Perlis.

If a broad view is taken of *I. polymorpha,* it includes *I. ferruginea* Ridley and possibly also *I. corniculata* Beccari and *I. arakudensis* Furtado. More observations and collections of this whole group are needed before reductions can be made. If these satellites are included, *I. polymorpha* is a commoner species than *I. brevipes.*

1. Beccari cited three collections when he described *Didymosperma Hookerianum*: *Scortechini 136b* and *229b* and *Dr. King's Collector 2446.* One of these should be chosen as lectotype for the species. In response to a suggestion from Dr. Whitmore, I designate as lectotype that sheet of *Scortechini 229b* in the Beccari Herbarium at Firenze (FI) which bears a staminate specimen and which I photographed under negative 4238 (BH). The remaining sheets of *Scortechini 229b* and *136b* bear specimens in young fruit (negatives 4239–4242) and *King's Collector 2446* is sterile.

H. E. Moore, Jr.

PINANGA

In *Pinanga,* which has about 25 species in Malaya, I feel in a few cases confident in making reductions, and these are formally proposed here. As in *Iguanura,* however, I have in several instances referred a species to its apparent relative without making a reduction to synonymy, as the evidence is still inadequate to be quite sure of the situation. The species I have left alone are mainly based on little material and are very similar in almost all respects, differing in one of the characters which I have come to consider important. One's first reaction is to consider such material atypical and reduce the species based thereon. Thus, *P. acaulis* is very similar to *P. polymorpha* (see below) except in fruit shape, but I dare not reduce it without developmental study of the fruit of the latter.

Pinanga pectinata Beccari in J. D. Hooker, Flora of British India 6: 410. 1892.

Type: *King's Collector 4393* (K), from Gopeng.

Pinanga singaporensis Ridley, Journal of the Royal Asiatic Society, Straits Branch 41: 38. 1903, *syn. nov.*

Type: *Ridley 11267* (K, SING), from Singapore.

Pinanga riparia Ridley, *op. cit.* 44: 201. 1905, *syn. nov.*

Type: *Ridley 11518* (K, SING).

The type sheets of these three species are virtually identical and I have no hesitation in making the reductions following study of them and abundant other material at Singapore, some of which is duplicated at Kew.

There are two points of confusion. Beccari misquotes the collector's notes and instead of 'Gopeng 500–800 ft' puts 'Goping 5800 ft' thereby implying that *P. pectinata* is a species of the upper montane forest. Secondly, Ridley does not cite a type for *P. riparia* but in *Materials for a Flora of the Malayan Peninsula* 2: 143, 1907, he names the collection I quote here as the type.

Martelli, in *Nuovo Giornale Botanico Italiano* 42: 71, 1935, published Beccari's reduction of *P. riparia* as *Pinanga patula* Blume var. *riparia* (Ridley) Beccari. I can find no other reference to this, and as I expound in my book, I consider *P. patula* to be distinct from *P. pectinata* although it can be confused at first glance.

Pinanga perakensis Beccari, Malesia 3: 175. 1889.

Type: *Scortechini s.n.*, Perak, 1200–1500 m.; also cited, *Wray s.n.*, Maxwell's Hill.

Pinanga densifolia Ridley, Journal of the Federated Malay States Museum 4: 85. 1911, *syn. nov.*

Type: *Ridley s.n.*, Pahang Telom.

I have studied *Wray 713* (K) which is apparently from the cited collection of *P. perakensis,* and *Ridley 13917* (K, Sing), which is, by deduction, the type of *P. densifolia* as well as the abundant other material at Singapore, partly duplicated at Kew.

These are both pinangs of the mountain forests quite distinct from any other in Malaya, and from the descriptions and material, I am confident that there is only one species. *Wray 713* has most of the leaflets 15 mm. broad with 2 main nerves, whereas *P. perakensis* characteristically has the leaflets 7 mm. wide with a central main nerve and two lesser marginal ones, but this is not always the case, and a few leaflets of *Wray 713* are similar. The type of *P. perakensis* is not at Calcutta, Kew or Singapore.

Telom is actually, Ridley tells us, the Ulu S. Bertang[2], in the Main Range on the Perak border.

Pinanga densiflora Beccari (*Malesia* 3: 116, 1886) from Sumatra is a quite different species; with close spiralling flowers on stoutish (yet divaricate) spikes, it is not to be confused with *P. densifolia.*

Pinanga polymorpha Beccari, Malesia 3: 173. 1889.

Type: *Scortechini 345a,* Perak.

Pinanga Brewsteriana Ridley, Journal of the Federated Malay States Museums 6: 188. 1915, *syn. nov.*

No collection cited: G. Tahan '. . . occurring on the Padang . . . to nearly 6000 ft. elevation.' See below.

Pinanga glaucescens Ridley, Flora of the Malay Peninsula 5: 6. 1925, *syn. nov.*

Type: *Ridley,* Negri Sembilan Bt. Tangga at 2400 ft.

Pinanga robusta Beccari in J. D. Hooker, Flora of British India 6: 408. 1892.

Type: *King's Collector 7372,* top of G. Bubu 3–5300 ft; synonym published already by Martelli, Nuovo Giornale Botanico Italiano 42: 71, 1935.

Pinanga polymorpha is a very common undergrowth palm of mountain forests. It is aptly named as the leaves are very variable from entire to divided. This palm is rather constant in its gregarious, soboliferous habit, often with small lateral shoots from the nodes, in the stout, few-branched inflorescences with striate axes, at first enclosed in the leaf sheaths, and in the infructescences with red axis and green fruits ripening black. The distinction against *P. Wrayi* Furtado (*Repertorium Specierum Novarum* 35: 275, 1934) needs study in the forest; there is close similarity in the herbarium with slender forms of *P. polymorpha.* I note also that *P. acaulis* Ridley (*Journal of the Royal Asiatic Society, Straits Branch* 44: 202, 1905) also looks very like *P. polymorpha* but has big fusiform fruits 25 mm. long × 4 mm. in diameter on a similar spike, which arises from the sessile rosette; all the material of this species is at Singapore (type: *Machado s.n.,* 18.7.04, Kamuning Woods, S. Siput, Perak; *Haniff & Nur SFN 6986*; a painting by Chas. de Alwis, 16.9.04; plus, possibly, *SFN 33071b,* sterile).

My reasons for the synonymy proposed are as follows, based on examination of all the material at Calcutta, Kepong, Kew, and Singapore.

Pinanga polymorpha: type not at Calcutta, Kew or Singapore, but I have seen at Kew *Ridley 12122,* cited in Ridley, *Materials for a Flora of the Malayan Peninsula* 2: 139, 1907, and annotated by Beccari "var. simplicibus foliis"; Mr. J. Dransfield has examined the type material at Florence for me and notes that *345a, b, c,* all look the same and slightly different from *345d* annotated by H. E. Moore as *P. Wrayi* (see above). There is an abundance of more recent collections, including many by myself at Kepong.

Pinanga Brewsteriana: the only material is at Singapore. Furtado has annotated *Ridley 16041* as the type. Subsequent expeditions to Tahan have added *Holttum SFN 20714, Haniff & Nur SFN 7921.* The Tahan population apparently does not develop the tall trunk found in other stations, but the padang[3] of G.

2. *Ulu* (Malay) = headwaters; S. = *sungei* = river.

3. *Padang* (Malay) = an open place, in this case a low stunted heath forest.

Tahan is a very high bleak place and this is therefore not surprising.

Pinanga glaucescens is represented by a wealth of old material at Singapore, but only a few inter-war SFN numbers at Kew. The only sheet which comes from the type locality is *Napier s.n.*, 1903, no altitude stated, at Singapore.

Pinanga robusta: I have seen the type at Calcutta, and there are other old sheets at Singapore.

Doubtful Records of Pinanga

Pinanga calamifrons Beccari, Malesia 3: 132. 1886 (Borneo).

Ridley cites one of his collections (no number, no date) from the Kedah Peak in *Materials for a Flora of the Malayan Peninsula* 2: 141, 1907, and *Flora of the Malay Peninsula* 5: 9, 1925. I could not find this sheet at Calcutta, Kew, or Singapore.

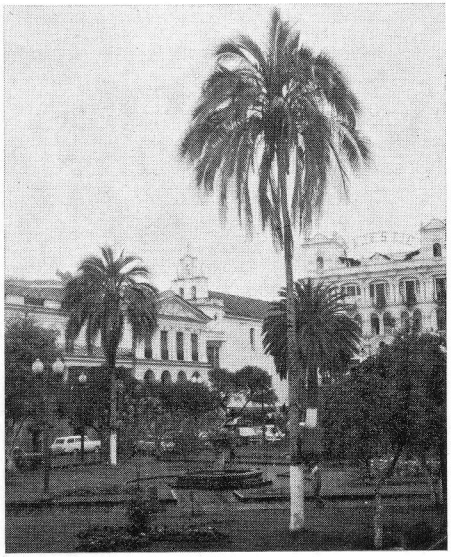
Pinanga canina Beccari, Malesia 3: 135. 1886 (Borneo).

The only Malayan record is *Ridley 7027*, Prov. Wellesley Ara Kudah (*Ridley loc. cit.* above under *P. calamifrons*) and I could not find this sheet either at Calcutta, Kew, or Singapore.

PALM BRIEFS

Parajubaea cocoides

Earlier in this volume (p. 50), Professor Cárdenas wrote about *Parajubaea Torallyi* (Martius) Burret which grows at high altitudes in Bolivia. I had an opportunity recently* to see the type-species of the genus, *Parajubaea cocoides* Burret, growing in Quito, Ecuador, late in September. The accompanying photograph of two plants cultivated on the Plaza de la Independencia (with *Phoenix canariensis* in the right rear) does not do them justice but will permit comparison with the Bolivian species figured earlier.



Parajubaea cocoides was originally described from material collected from plants cultivated at Ibarra, Ecuador, but it is commonly seen in and near Quito and is reported to occur wild in the vicinity of Papallacta east of Quito. A handsome planting of these palms may be seen along the road leading from the airport to the city of Quito and another at the Parque Bolivar.

Growing at high elevations as it does, *Parajubaea cocoides* may prove a palm that can be grown to maturity in southern California where it may already be established.

Harold E. Moore, Jr.

* From work relating to National Science Foundation Grant GB 20348X.

Two Palms for Central Florida

In a recent article Smith (1967) discusses two palms, *Copernicia alba* and *Neodypsis Decaryi*, that have proven hardy at his residence located on a peninsula near Daytona Beach, Florida. This writer's palm collection is on the mainland at Vero Beach and, although 120 miles farther south, lacks the protection afforded by a large body of water. Thus there is probably little difference in minimum temperatures at the two sites. Perhaps the best evaluation of the mainland climate at Vero Beach can be made by the palms themselves. *Ptychosperma elegans*, *Veitchia Merrillii* and *Cocos nucifera* cannot be grown, although an occasional mature specimen of the last-named survives as a reminder of a more pleasant past. *Caryota mitis*, *Chrysalidocarpus lutescens*, and *Roystonea* spp. are common, but are damaged nearly every winter, as are the occasional *Archontophoenix Alexandrae*, *Dictyosperma album*, *Mascarena Verschaffeltii*, and *Thrinax floridana*. *Phoenix Roebelenii* and *Archontophoenix Cunninghamiana* are quite hardy—these suffer only minor foliage damage in the colder winters and it is with this group that my specimens of *Copernicia alba* and *Neodypsis Decaryi* are associated.

Growing palms in a marginal area always results in a disproportionately large number of failures. Any successes should be of interest to other growers with similar temperature problems. Two little-used palms are completely successful here and merit wider use in Central Florida.

Allagoptera arenaria has been grown outdoors here for 10 years and, except during the big freeze of 1962 (minimum 24° F.), the plant has been unprotected. During this time, when all the previously named palms suffered more or less damage, it has never shown the slightest injury. Being trunkless, the bud would probably survive if even lower temperatures than those yet experienced destroyed the foliage. Hodge's statement that its hardiness is probably similar to *Arecastrum Romanzoffianum* is supported by its behavior in Vero Beach.

Following the bitter freezes of the winter of 1957–1958, two undamaged *Thrinax* palms were noted in Ft. Pierce, 14 miles south of Vero Beach. One had six feet of trunk and the other was still trunkless. After the 1962 freeze my interest in these palms increased, for both were still unharmed. Inquiries revealed that these were *Thrinax microcarpa*, a native of the Florida Keys, an area where freezing temperatures have never been experienced. The larger palm was the sole survivor of a whole truck load brought from the Keys many years before. The smaller was in a private palm collection.

T. microcarpa is rather slow growing and is not often available in nurseries. As wild palms are firmly rooted in rock, transplanting mature trees is regarded as impossible. Nevertheless, with picks, crowbars and a friend, a trip to Big Pine Key was made in the spring of 1962. An area was found where the trees were abundant and most had trunks from three to five feet tall. There was no soil —only an exposed, eroded, hard limestone with many cracks and solution holes. Heavy blows with a pick had almost no effect and the prospect of getting a tree with sufficient roots seemed negligible. Wandering about and examining trees, we discovered one that when shaken, rocked back and forth. It was found to be growing upon a flat, unfractured, limestone surface several feet in diameter. A mat of palm roots, two to three inches thick, radiated outward from the trunk, across the rock surface, and over the edge. It was the work of

but a few minutes to cut the root mat down to the rock at a distance of about two feet from the base of the trunk and then lift the entire palm. All opened leaves were then removed and the tree set upright in a utility trailer. The roots were covered with wet burlap and the unopened leaves wrapped in plastic film to prevent desiccation while in transit. A total of three trees were taken in this way as, at least at this site, about one tree in 50 was found growing in this manner. Planted in Vero Beach, each palm rapidly recovered, growing a complete new head of foliage in two to three years. None have ever shown any cold damage in the years since their transplanting, although its close relative from the same area, *T. floridana*, is injured almost annually.

References

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W. L. Bidlingmayer

* * *

Palms are Where You Find Them

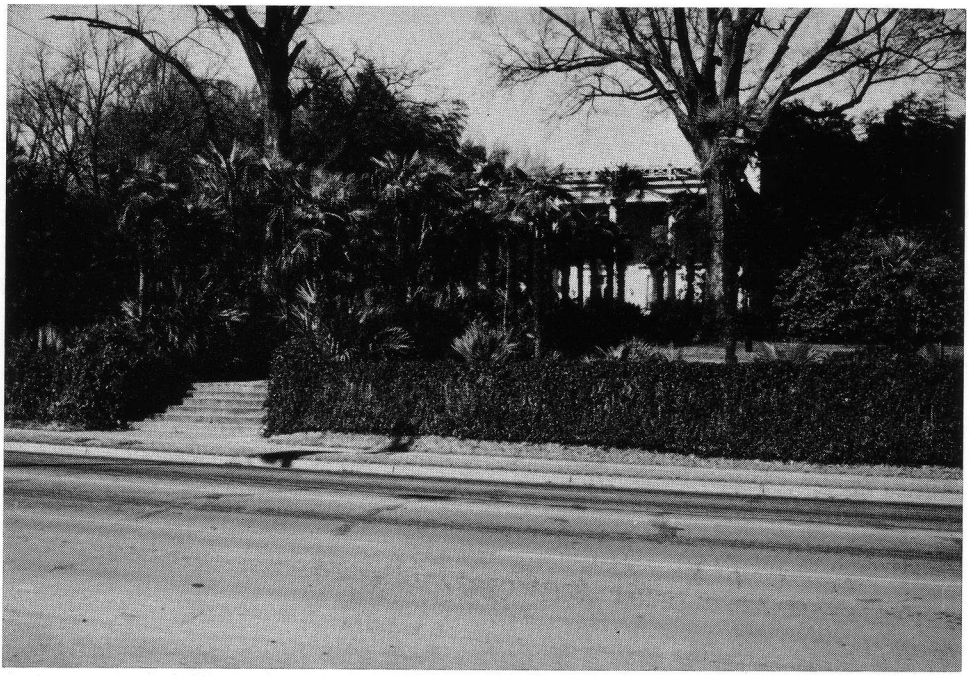
Oil is where you find it. As much may be said for palms. But first—I must have been a radio announcer in a previous incarnation—a word about climate.

Perhaps you know a few people who have delusions about the climate, or if you will, illusions about the weather. They know what the weather is, or has been, or should be, in their own regions, but usually in a vague and general way. Beyond that, millions of honest citizens north of the Mason Dixon line think of the South, and especially the Deep South, not only as a land of magnolias and mint juleps but as having a climate so benign that even the winters are debilitating.

Nothing could be farther from the truth. When the temperature in New York City hovers around 10° F., it is apt to register near zero in Atlanta, no matter what Scarlett O'Hara might think of it. Not infrequently, when Arctic blizzards sweep into Iowa, some of the polar air spills on down into New Orleans and demolishes the myth of a near-tropical paradise. Twice in this century, the powers that be in New Orleans planted arecastrums along Canal Street, perhaps to counteract the presence of streetcars, but twice every last palm was converted to mush by a freeze, and finally it was decreed that no more "royal palms," as the news dispatches called them, would be planted.

All the more astonishing, then, to learn that a planting of numerous palms of three species can and does exist in Anderson, South Carolina. Granted that the three are the most cold-tolerant of all, astonishing is still the right word for such large numbers of palms in such a single planting in such non-palm territory. It's hardly news that Charleston, S.C., can boast of some palms, but proximity to the ocean helps to account for their presence there. Not so with Anderson, which is far inland, over two hundred miles northwest of Charleston. In an average winter, freezing temperatures may occur thirty or more times in Anderson while only ten times or fewer in Charleston.

Thus when a friend, Mr. William D. Manley of Stockbridge, Georgia, near Atlanta, called my attention to an abundance of palms thriving on the private grounds of the old Fant estate in Anderson, S. C., I urged him to obtain as much information as possible about them, and also some photographs, for publication



1. A view of the old Fant estate in Anderson, South Carolina, with tall *Trachycarpus* prominent along the steps and walk.





3. A closer view of plantings in front of the Fant estate.

in PRINCIPES. He fully realized that, in having stumbled upon such an imposing number of palms in such an unlikely region, he had something unique to report—something almost as extraordinary as turning up a glacier in Florida—and accordingly he made several long trips to Anderson to photograph the palms and learn what he could of their history. I have not seen the palms myself, but after viewing Mr. Manley's photographs it seems to me the simile about a glacier in Florida is not quite so far-fetched after all, for there they are—hundreds upon hundreds of palms in a locality where one would hardly expect to find any. But now I confine myself to the information which Mr. Manley has so painstakingly obtained so that it may be transmitted to anyone interested. I shall not try to improve on his succinct notes by altering their sequence or by marshaling them in narrative form, for they are more telling as they appear below in his own words.

"The original home was built about 1906 in Anderson, S.C., by Rufus Fant.

"Bamboo was smuggled in with a few joints in his pockets along about this time.

"Palm plantings were begun about 1910 and went on for a number of years.

"Mr. Fant was the founder of the Fant Book Store in Anderson, and at present the third generation is running this store.

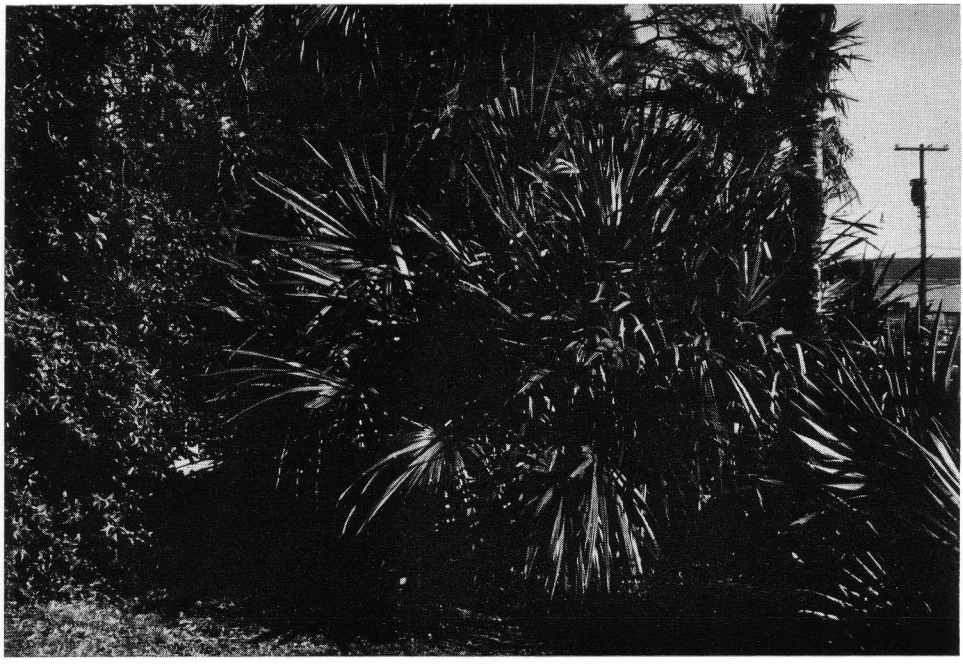
"Marshall A. Fant lives next door to this old home where dozens of palms are also planted—most from seeds taken

←

2. A front view of the old Fant estate.



4. *Sabal minor* is prominent in the foreground.



5. One of the hundreds of needle palm, *Rhapidophyllum*.



6. *Trachycarpus Fortunei* bears abundant fruit.

from the original palms. He is now seventy-five years old and remembers when his father started the plantings.

"Following is a rough number of palms on this estate.

"*Trachycarpus Fortunei.* In and around the front yard there are perhaps one hundred of these palms from about ten to twenty-five feet in height. In the rear area there are about fifty taller ones, measuring about twenty-five to thirty feet in height. In both front and back there is just no way to count the number of these palms in all sizes, which include seedlings and five-footers numbering possibly in the thousands.

"*Rhapidophyllum hystrix.* There are twenty-five large ones in the front area. These are some of the largest I have ever seen, and many hundreds of small ones are scattered all around, from little seedlings up to heights of about two feet.

"*Sabal minor.* There are about one hundred palms, large for this species, in and around the home. And then, there are many thousands of smaller ones. It would be reasonable to suppose that all these smaller ones have come of course from seeds dropped over a period of many years.

"Actually all around the dwelling and far back in the rear (about five acres), with the countless palms and the large growth of timber bamboo, it looks like a rain forest.

"I have not mentioned the many hundreds of other plants in and around the home area.

"I might mention the bamboo. Some of the canes or trunks are as large as six inches in diameter.

"I believe that the *Trachycarpus Fortunei* came from the Fruitland Nursery in Augusta, Ga., for they are the only ones I know of who have been growing



7. Hundreds of seedling *Trachycarpus* grow under mature palms from seeds dropped in mass.



8. *Sabal minor* grows in a line.

these palms for a great many years, possibly seventy-five.

"On the back of the hundreds of acres owned and operated by Fruitland Nursery, I saw some years ago a growth of *Sabal minor* covering a large area. This was a wild growth and the nursery made no attempt to sell the palms. Even until this day I have not seen *Sabal minor* offered for sale in any nursery. So I incline to believe that Mr. Fant had Fruitland to dig dozens of their wild palms and ship to Anderson. It is also possible that he had these same people dig the *Rhapidophyllum hystrix* from its native place and ship to him. It is just here recently that this palm has been offered for sale in a few nurseries."

So much for Mr. Manley's factual notes, but I can't take leave of him and those hardy palms without also quoting the final paragraph from his letter of last January that accompanied the notes, for it seems to me a felicitous ending for this account. "I have stopped this letter," he writes, "long enough to build a good log fire and it sure feels good. The *Trachycarpus* palms on the patio are just about as beautiful and lush as any palms could get. I have spotlights on them, so will just sit by the fire tonight and look through the window at the cold rain glistening on their foliage."

DENT SMITH

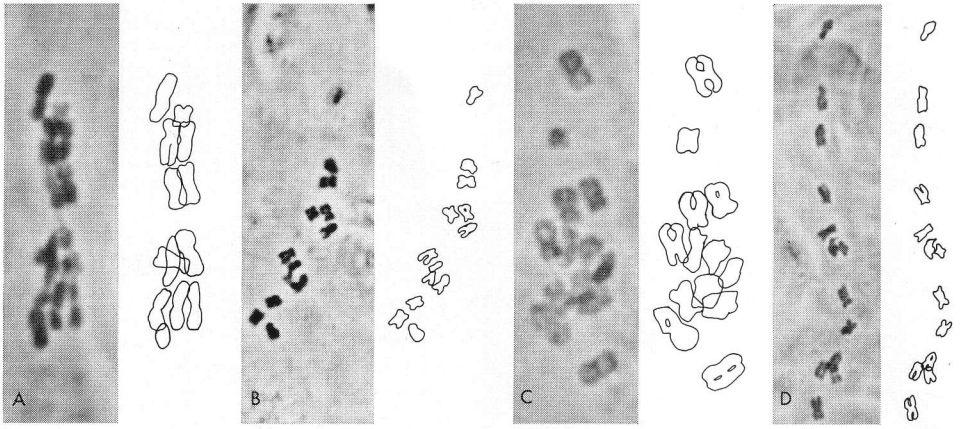


New officers of The Palm Society. From left to right, Mr. Wallace E. Manis, Treasurer, Mrs. Lucita H. Wait, Secretary, Dr. Jerome P. Keuper, President, Mr. Kenneth C. Foster, Vice President. Photo by Ralph Velez.

New Chromosome Counts in Chamaedorea (Palmae)

FREDERICK B. ESSIG
L. H. Bailey Hortorium, Cornell University, Ithaca, New York

Previous counts for *Chamaedorea* were reported by Read (1963, 1966). Counts have now been made for four more species from specimens cultivated in the conservatory at L. H. Bailey Hortorium under the several BH numbers listed. The method used was that described by Read (1964) involving the culture of pollen tubes on nutrient medium and observation of generative cell mitosis suspended at metaphase with colchicine. Chromosome number for all four species was found to be n=13, suggesting affinity with *Chamaedorea elegans* and others sharing this number, rather than with



1. Photographs and drawings of *Chamaedorea* chromosomes. A, *C. brachypoda* × 4200; B, *C. pochutlensis* × 2300; C, *C. pulchra* × 4200; D, *C. tenella* × 3300.

C. alternans, C. cataractarum and others for which n=16 (Read, 1966). The four species counted are as follows:

Name	Number	Voucher
Chamaedorea brachypoda Standley & Steyermark	n=13	BH 60–800 *Moore 8221* (BH)
Chamaedorea pochutlensis Liebmann	n=13	BH 60–819 *Moore 8173* (BH)
Chamaedorea pulchra Burret	n=13	BH 60–821 *Moore 8224* (BH)
Chamaedorea tenella H. Wendland	n=13	BH 67–635 *Moore 9599* (BH)

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NEWS OF THE SOCIETY

Biennial Meeting

A very congenial group began to gather at Melbourne, Florida, on Thursday, July 30th, 1970, for the eighth Biennial Meeting, or Convention, if you prefer, of The Palm Society.

Florida Institute of Technology and its president, Dr. Jerome P. Keuper, were our hosts. Ably assisting were Mr. Perry F. Clendenin, treasurer of the Institute, and Dr. William Rose, dean of housing, as well as Mrs. Anna Galvin, Dr. Keuper's secretary.

Although the weather was at its usual summer hottest, we were very fortunate in having no rain, so the out-of-doors activities could proceed as planned. The first item for most members was a walk through the Dent Smith Trail, a bit of Florida woodland which has been carefully preserved and developed as a home for many species of palms. A brook curves its way through the area; it is spanned by small bridges where the trails cross it, and here and there amid the trees are found rustic shelters where one can rest protected from sun or rain. Mr. Jack Thompson, landscape foreman, and Mr. Jim Joyner, botanist, under the direction of Dr. Jerome Keuper, have produced a charming combination of Florida native growth and exotic palms.

On Friday the group went by bus to Cape Kennedy, and were given an intensive tour of the NASA Space Center—a truly awesome complex. In the afternoon there was swimming on the beach, followed by a "cook-out" on the grounds of one of the Institute's buildings.

A meeting of the Board of Directors was held on Saturday morning at 9:00 A. M. The following Directors were present: Mr. Kenneth Foster, Dr. Jerome P. Keuper, Mr. Otto Martens, Dr. H. E. Moore, Jr., Dr. John Popenoe, Mr. Dent Smith, Dr. Robert N. Smith, Jr., Mrs. L. H. Wait, Mr. Harrison G. Yocum and Dr. U. A. Young. Mr. Billings McArthur, chairman of the Central Florida Chapter, was present, also.

The business meeting began at 10:00 A. M. in the auditorium of the Institute. While registration was going on, members had an opportunity to examine and purchase some rare books donated by the estate of the late Dr. Lawrence Simonson, a large collection of petrified palm specimens donated by one of our board members, Dr. Robert N. Smith, Jr., and some *Trachycarpus Fortunei* seedlings donated by Mr. W. J. Brudy.

The meeting was called to order and the minutes of the previous meeting were read and approved. The President, Secretary and Treasurer read their reports of the activities of the Society during the previous two years. The Treasurer reported that the Society ended the biennium with a balance of $16.95.

Mr. Dent Smith, Chairman of the Nominating Committee, read the proposed slate of officers and directors for the coming two- and four-year periods as follows:

Officers, 1970–1972

President: Dr. Jerome P. Keuper
Vice-President: Mr. Kenneth C. Foster
Treasurer: Mr. Wallace E. Manis
Secretary: Mrs. Lucita H. Wait

Directors, 1970–1974

Mr. Wallace E. Manis	Florida
Mrs. Lucita Wait	Florida
Dr. Harold E. Moore, Jr.	New York
Mr. Kenneth C. Foster	California
Mr. Toshihiko Satake	Japan
Dr. John Popenoe	Florida
Dr. Jerome P. Keuper	Florida
Madame Ganna Walska	California

There being no nominations from the floor, the slate was unanimously elected.

After a delicious buffet lunch, at which our founder and first president, Mr. Dent Smith, made a charming short talk, the meeting reconvened for the program.

The first speaker was Mr. Harrison G. Yocum, research assistant at the Environmental Research Laboratory, University of Arizona, and founder of the Tucson Botanical Gardens, who presented an illustrated talk on the work of the Environmental Research Laboratory, where experiments on the conversion of salt water to fresh water for growing of plants in high humidity greenhouses are carried on. The slides of the inflated plastic greenhouses filled with thriving plants, in contrast to the desert conditions outside, were most impressive.

Mr. Morgan Evans, landscape architect for Disney World and our next speaker, told us of the gigantic project now taking shape in central Florida, and the vast amount of planning and experimentation which must precede the actual work.

The program concluded with an all-too-short talk by Mr. Arthur C. Langlois, of Nassau, Bahamas, co-owner of "The Retreat," a world-famous palm collection. He told about the three years he has spent working on a supplement to "Palms of the World," which encompasses about 100 new genera, and with humor about his efforts to get it published.

A social hour, followed by the banquet, was held in the main dining room of the Student Center, on the campus. After dinner our speaker was Dr. Robert W. Read, of the Smithsonian Institution, who told us about his recent three-month stay in Ceylon, and showed interesting slides of the flora and fauna to be found there.

On Sunday the group split up. Some flew away to northern South America on a palm-hunting expedition, others drove to Miami to visit the Fairchild Tropical Garden, and others remained in Melbourne to enjoy the beaches and other amenities, while some members had to return home.

Your secretary wishes to give heartfelt thanks to every one of you who helped to make this meeting a success.

LUCITA H. WAIT

* * *

President's Report

This has been a very successful biennium for the Palm Society. The two major achievements have been an increase in membership and publication of our newsletter "Palms." Major credit for the Newsletter goes to V.P. Dr. Jerome Keuper but Ken Foster and the many contributors and workers also should share the credit.

The Palm Society has continued to keep its members up to date with the latest information, both botanical and horticultural, on palms through the medium of its journal PRINCIPES. The Society owes a debt of gratitude to our Editor, Dr. Harold E. Moore, Jr., for his continued effort on our behalf.

Last but not least, the chair recognizes the work of our Executive Secretary, Lucita Wait, who actually runs the Society. We look forward to having her continue in this capacity into the indefinite future and we wish to thank her

for all she has done, is doing, and will continue to do for this Society.

We have every reason to believe that the Palm Society will continue to grow in importance and value to its members in the years ahead. We know that the palm family is the second most important family of plants in the world as far as economic value to man is concerned. Aside from their importance for food, fiber, and shelter, they are among the most valuable plants for landscaping in a tropical or subtropical climate. Their value as house plants in the north is ever increasing.

There is so much we can do with palms and so much to learn about them that palms will be a great challenge and a great satisfaction to us as far into the future as we can foresee. There are still many palms to introduce for trial in our gardens wherever they may be. There are hybrids to be made and there are new ways to protect palms against winter cold to be found. I am sure that members of The Palm Society are going to take the lead in these adventures and that information about them will be printed in our journal and newsletter.

Finally, I want to thank the President, staff and trustees of the Florida Institute of Technology for inviting us to this lovely campus and providing so well for all the needs of this meeting.

JOHN POPENOE

Treasurer's Biennial Report—April 30, 1968 to April 30, 1970

Income:			
Contributions	$12,555.35		
Subscriptions	2,034.28		
Seeds	929.47		
Photos	1.65		
Biennial Income 1968	195.00		
Biennial Registration 1970	132.00		
			$15,847.75
Interest Earned, Savings Account			113.49
Total Earned Income			15,961.24
Total Net Expenses			15,944.29
Net Gain			$ 16.95
Balance, First National Bank of So. Miami 4/30/70	$ 1227.45		
Balance, So. Miami Savings Bank	850.22		
Total Net Worth	$ 2077.67		
Expenses:			
Printing Principes		$7,645.75	
Postage		372.33	
Salaries		4,430.68	
S.S. Tax 1969–70		115.20	
Taxes to IRS 1968–69		329.05	
Petty Cash		500.00	

Office Rent	460.00
File Cabinets	42.13
Seed Bags	96.64
Seed Bank Exp.	74.50
Typewriter Repair	15.08
Membership Cards & Envelopes	195.33
Postage	99.00
Membership Refunds	100.93
Dues	65.00
Entertainment	50.00
Travel Expenses	599.69
Computer Service	92.00
Freight	8.00
Roster	286.82
Books	41.40
Binding Principes	7.72
Telephone	34.34
Bank Charges	6.72
Folders	60.00
Biennial Expenses	215.98
	$15,944.29

WALLACE E. MANIS

CLASSIFIED SECTION

THE INDIGENOUS PALMS OF SOUTHERN AFRICA, by Hein Wicht. Descriptive and well illustrated, this attractive little book should be on the shelf of all palm lovers. Available from Fairchild Tropical Garden Bookshop, 10901 Old Cutler Rd., Miami, Fla. 33156 or from Edwin A. Menninger, P.O. Drawer 45, Stuart, Fla. 33494, USA

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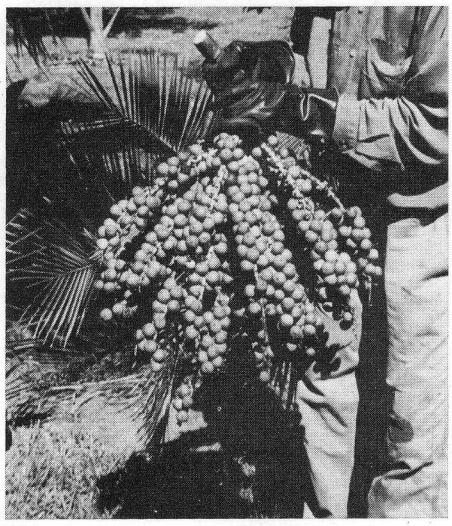
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PHOTO GALLERY



A handsome plant of *Arenga Engleri* with a leaf-spread of over 22 feet in the garden of Dent Smith, Daytona Beach, Florida. Photo by Dent Smith.



A fruit cluster of *Arenga Engleri* from Dent Smith's garden. Photo by Dent Smith.