PRINCIPES

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THE PALM SOCIETY

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

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JOURNAL OF THE PALM SOCIETY

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

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Manuscript for PRINCIPES, including legends for figures and photographs, must be typed double-spaced on one side of 8½ x 11 bond paper and addressed to the Editor at Bailey Hortorium, Mann Library, Cornell University, Ithaca, New York, for receipt not later than 45 days before date of publication. Authors of one page or more of print will receive six copies of the issue in which their article appears. Additional copies or reprints can be furnished only at cost and by advance arrangement.

Contents for October

Cover Picture

A group of thirteen *Washingtonia robusta* in the garden of Dr. Robert N. Smith, Jr. Harlingen, Texas.

Mailed at Miami, Florida
February 6, 1968

NEWS OF THE SOCIETY

Hurricane "Beulah"

Floridians who have lived and suffered through many a hurricane felt the keenest anxiety and sympathy for the members in southern Texas who were pounded by hurricane "Beulah," then marooned by floods. We have had reports from two members, and are relieved to learn that they did not suffer major catastrophes. Dr. Enrique Trapp wrote: "I am happy to report that my family and I survived the hurricane and the flood without any personal injury nor any material loss. I am also happy to report that palm trees withstood the hurricane much better than any other tree. Only very few specimens were broken or uprooted." Mrs. Robert N. Smith, Jr. wrote that they lost a 16-year-old *Washingtonia robusta* and a *Ptychosperma elegans* (severed at the base by a "hurricane U.F.O."), and some other palms were damaged, but "the palm trees took the hurricane better than all other plant life."

We hope all other members in the area were as fortunate.

Meetings

The Western Chapter of the Society held a meeting at the home of Mr. and Mrs. Ralph Velez in Westminster, California, on July 17th. A plant auction was held, proceeds to be used for the expenses of the Chapter. A rousing good time was had by the members who attended.

Another meeting of the Western Chapter was held in Santa Barbara in August. A highlight of the meeting was a visit to the estate of Mme. Ganna Walska whose garden is highlighted in this issue of PRINCIPES.

The Central Florida Chapter was entertained at the Florida Institute of Technology, Melbourne, Fla., on September 13th. Thirty seven members and guests enjoyed a delightful buffet luncheon, with Dr. Jerome P. Keuper, president of the Institute, and his charming wife Natalie, as hosts. Mr. Billings McArthur, chairman pro-tem, organized and conducted the meeting. It was our honor and privilege to have the Society's president, Mr. Otto Martens, as honor guest. Mr. Dent Smith, founder of the Society, was another honored guest. F. I. T., as it is familiarly known, is only nine years old — an institution for graduate studies in science, it is in close touch with the NASA complex at Cape Kennedy, and has some of its scientists on the faculty. Dr. Keuper, youthful and energetic president, is determined to make its 85-acre campus into a botanical garden featuring palms, and in less than a year has made remarkably good progress toward this end.

After lunch and a few short talks, the group toured the campus, braving mud and drizzle, to view several hundred palms in their new home. Following the tour, Mr. McArthur showed his palm slides and gave a comprehensive talk on them.

Richard B. Mayer

Richard B. Mayer, a retired attorney and former resident of Chicago, was the owner of Powder Horn Nursery, Scottsdale, Arizona. He had developed a rather unusual method of growing palms in desert conditions, and had a thriving collection when he died suddenly last April. Elizabeth, his widow, writes: "He was happy and very active in the Nursery and had a challenging and interesting year. Powder Horn is really beautiful now and I feel that it is such a fitting memorial to him that I want to keep it going . . . I feel that with the help of interested and loyal friends I will be able to learn and carry out some of our ambitious plans. Powder Horn is now growing fourteen varieties . . ."

Franklin P. Johnson

Franklin Pitcher Johnson, of Fontana, California, passed away in September after a lingering illness. "Pitch," as he was affectionately called by family and friends, joined the Society in 1963, but had been a palm collector for some time previously. When he attended the biennial meeting in Florida in 1966 he already had intimations that all was not well, but he entered into all the activities with the greatest joy and enthusiasm, and made friends with everyone he met. He left bequests of some of his cherished palms to relatives and friends, a characteristic act of generosity and thoughtfulness in spite of his suffering.

The Society's sympathy goes to the two widows and their families.

Seed Bank

Your secretary wishes to apologize to all who have written to her and have not yet received replies, or who waited for several weeks for answers. The chief reason for this delay in correspondence has been the unusually large crop of palm seeds which was produced this summer. After being thwarted by hurricanes for three years, the palms in Southern Florida took advantage of perfect growing weather to put on really amazing numbers of fruits. The Seed Bank has been extremely active, with thousands of seeds being shipped out to many members in various parts of the world. No one can realize, until they actually do the work, how much time is involved in collecting, cleaning or drying, dividing up among the requests, writing slips, keeping records, putting the seeds in the cloth bags and mailing them. This is work that I enjoy, as I am on friendly terms with most of you, and I can visualize the pleasure with which the seeds are received and planted. Many of you are very kind and thoughtful in expressing your appreciation, which makes the task even more pleasant. I thank every one of you who has taken the time to send thanks and tell me something about what has happened at your end. A sample or two: Mr. and Mrs. Gregg Pamson, new members of Garden Cove, Calif., wrote recently: "Here is a quick rundown on the results we are having with the seeds you have sent: *Chamaedorea Tepejilote* — roots appeared on 16 of 26 seeds within 26 days; *Copernicia glabrescens* — 7 to 9 with 1-inch roots in 16 days; *Drymophloeus Beguinii* — roots appeared on the majority of 22 seeds in 15 days; *Neodypsis Decaryi* — 5 of 10 with 1-inch roots in 22 days; *Opsiandra Maya* — 8 to 10 above surface in 40 days" and so on. Mr. Harrison Yocum, of Tucson, Arizona, writes frequently to tell how his plants are progressing. He has now begun semi-annual "Rambles" through his Botanical Garden, to which the public is invited. Mr. Jack Koebernik, of Key West, regularly reports germination dates which, when tabulated, will produce valuable data.

Mr. R. E. Gauthier, of Mountain View, Calif., wrote: "On September 25, 1967, I planted 60 seeds of *Chrysalidocarpus Cabadae* in 10 containers of 6 seeds each. They first saw light on February 1, 1967, or 129 days after planting. I used small plastic crispers 6″ × 3″ × 2½″ deep. A planting medium of common Black Magic Mix and an orchid mulch of finely ground redwood was wet down well with a pre-mixed water and fungicide and packed well. The fungicide is a product of CHA-KEM-CO of South Gate, Calif., called FUNG-O-CIDE. It has so far prevented mold completely. I covered the seeds to their own depth and kept them at a constant temperature of 78° F. Perhaps a warmer temperature would shorten germination time, but I am afraid to change since I have some suc-

cess. I now have seedlings looking green and strong and about 3 inches tall, sporting full green "rabbit ears."

Most of all, we want to thank those members who have so generously sent, or offered to send, seeds to the Seed Bank, to be distributed to the Society's members. So far this year the following members have donated seeds: Mrs. George F. Adams, Mr. C. L. Barnes, Jr., Mr. David Barry, Jr., Mr. James Benzie, Mrs. T. C. Buhler, Mr. David I. Carroll, Dr. M. E. Darian, Mr. Nat De Leon, Dr. W. F. Dunbar, Mrs. A. W. Erickson, O.B.E., Mr. R. H. Fackelman, Fairchild Tropical Garden, Mr. R. E. Gauthier, Mr. Jerome A. Goodloe, Mrs. Alfred B. Hayes, Dr. R. A. Howard (for the Arnold Arboretum), Instituto Agronomico, Campinas, Brasil, Mr. and Mrs. A. R. Jennings, Mr. Jack Koebernik, Mr. and Mrs. A. C. Langlois, Longwood Gardens, Kennett Square, Pa., Mr. H. F. Loomis, Mr. J. Marnier-Lapostolle, Mr. Otto Martens, Dr. H. E. Moore, Jr., Mr. Robert Norris, Mr. H. J. Oertel, Mr. Barry Osborne, Mr. R. W. Read, Dr. and Mrs. John Robinson, Mr. Dent Smith, Dr. Robert N. Smith, Jr., Mr. Ura Snidvongs, Mr. H. M. Spencer-Lewin, Mr. F. A. Tetley, Jr., Mr. John E. Turner, United States Department of Agriculture Plant Introduction Station, Miami, Fla., Mrs. L. H. Wait, Mr. Robert G. Wilson, Mr. Motohide Yamaka, Dr. U. A. Young.

To all these interested and helpful people, our sincerest thanks. If inadvertently I have failed to mention any donor, please accept my apologies. It was not done intentionally. Any member who is not participating in our seed bank program and desires information about it, should write the executive secretary for details.

Through the work of Palm Society members much information is being gathered: collecting and naming of new species, growth rates, anatomy of palms, methods of germinating and growing them, length of germination periods, suitability of various species to certain localities, etc. One study which apparently has not yet received attention is the *viability of palm seeds*. We know vaguely that some seeds have a very short life span, while others may remain viable for greater lengths of time. A study of this subject, done under controlled conditions, would be of value to seed dealers and other interested persons, particularly to the Society's Seed Bank. We strive to send our members only the freshest seeds, but at times it is imposible to know if the seeds are still living, or should be disposed of. I hope that someone will be interested in doing some experimental work along these lines. LUCITA H. WAIT

PALM LITERATURE

Publications

Mr. Dillwyn W. Paxson, of Winslow, Arkansas, called our attention to "Two New Species of Palms From Nicaragua" and "Preliminary Studies in the Palm Genus *Syagrus* Mart. and Its Allies," both by Dr. S. F. Glassman. (Fieldiana: Botany, Vol. 31, no. 1 and Vol. 31, no. 5).

In the Bulletin of the Texas Ornithological Society, Vol. 1, nos. 3-4, Keith A. Arnold discusses scientific names and their pronunciation. Using scientific names of birds, he gives some pointers on the pronunciation of Greek and Latin names, which are applicable to botanical names as well. He recommends pronouncing the pronunciation which most nearly reflects the meaning of the name. Such a discussion would be a help to those of us who have trouble with palm names. (TOS, Editor, Dept. of Biology, Texas Technological College, Lubbock, Texas 79409). L. H. WAIT

THE EDITOR'S CORNER

With this issue of PRINCIPES we are inaugurating two new features which we hope will become a permanent part of the journal. One of them we are entitling "Garden Tour." This will be a trip to a garden where palms are a conspicuous or dominant part of the landscape theme. We hope to present not only the various species of palms that are growing in the garden, but also a discussion of how they are used and what the companion plants are. In this issue we are taken by Barry Osborne on a tour of Mme. Ganna Walska's garden "Lotusland" set in the hills above Santa Barbara in California. The second regular feature we are introducing with this issue is entitled "Collector's Choice." Here a member of the Society will present a purely subjective picture of his favorite palm, relating his experiences with that particular species and explaining what it means to him as a connoiseur of palms. Lest anyone doubt the appropriateness of selecting a "favorite palm," let him recall that David Fairchild was not above selecting his favorite palm and proclaiming it from the housetops. It was *Pigafetta elata*, or more correctly *Pigafetta filaris*. W.J.D.

The genus Gastrococos (Palmae-Cocoideae)

HAROLD E. MOORE, JR.*

The island of Cuba is the home of a prickly palm sometimes found in cultivation, where it is generally known as *Acrocomia armentalis* or *Acrocomia crispa*. L. H. Bailey included the species in his preliminary study of *Acrocomia*, using the name *A. armentalis* (*Gentes Herbarum* 4: 462. 1941). On the basis of this study, but using an older epithet, the species was listed as *Acrocomia crispa* in a checklist of cultivated palms (*Principes* 7: 124. 1963).

It has become necessary to study this palm more closely to determine whether or not the species properly belongs in *Acrocomia*, whether it is best placed in some other genus of the prickly palms included in the tribe Bactrideae of the subfamily Cocoideae, or whether it should represent a distinct genus for which the name *Gastrococos* Morales is available. The habit and general aspect of the fruit, which appear to have guided Bailey despite the excellent detailed description of flowers given by Morales, prove deceptive when details of the inflorescence and flowers are studied.

There are significant differences which set *Acrocomia crispa* apart from all other species of *Acrocomia*. Examining the rachillae of the inflorescence in *Acrocomia*, one finds that the female flowers are few, restricted to the thicker basal part of the rachilla, generally accompanied by two lateral male flowers more or less reduced in size, and the group of three flowers, or triad, is subtended by a rather prominent bractlet and appears to be slightly sunken in the rachilla. Male flowers are much more numerous and are borne in a specialized terminal portion of the rachilla. Above the triads, except in *A. crispa*, one finds usually a few male flowers borne in pairs, each pair subtended by a rather prominent bractlet, but the majority are borne singly, each subtended by a prominent thin bractlet which is united with bractlets adjacent to it forming a little cup in which the

*From work relating to National Science Foundation Grant GB-3528.

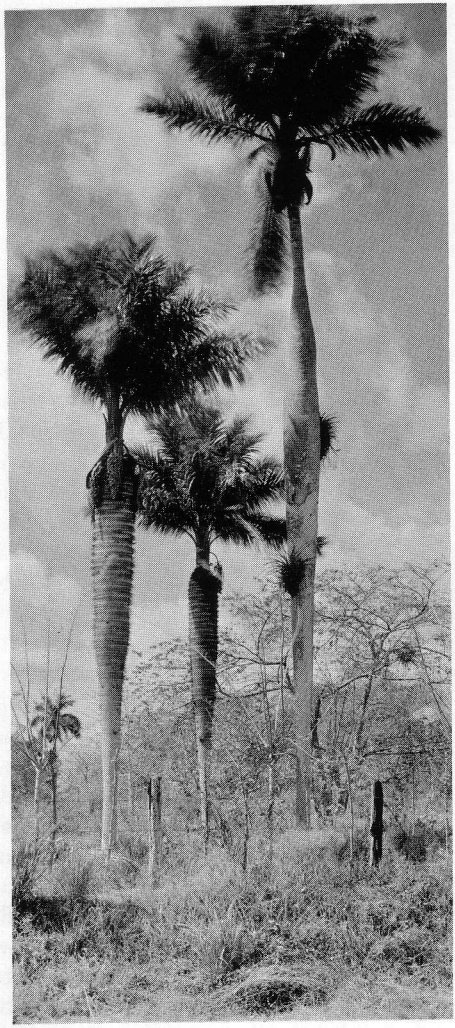
1. A group of *Gastrococos crispa* at Calabazar, Province of Havana, Cuba. Photo by L. H. Bailey.

flower sits. When the flowers are removed, the upper portion of the rachilla looks like a section of honeycomb.

Acrocomia crispa, however, has male flowers borne in pairs throughout or nearly throughout that portion of the rachilla above the basal triads. At the tip of the rachilla one may find male flowers borne singly through the loss of one in a pair. Each pair of flowers, or each flower when single, is subtended by a thin bractlet which is quite free from those adjacent to it, thus there is no appearance of a honeycomb when the flowers are removed.

If we compare flowers, another set of differences becomes evident. The female flowers of *Acrocomia* have a calyx composed of sepals which are distinct and overlapping, a corolla of petals which are free and overlapping or shortly united with each other by their

inner faces but then the margins are free and overlapping at the base. Staminodes (sterile stamens) are united with each other basally in a 6-lobed tube which may be completely free from the petals or united with them basally. The female flowers of *A. crispa*, in contrast, have short sepals united in a 3-lobed cup, thickish petals united with each other for some distance, then distinct with essentially valvate triangular tips.



2. *Gastrococos crispa* (left) with persistent prickles in rings on trunks, a tree of *Roystonea regia* to right, Camaguey Province, Cuba. Photo by J. A. G. Davy.

The six prominent staminodes are united with each other in a tube as long as or longer than the corolla-tube, to which they are united for about three-fourths their length, then distinct and triangular to awl-shaped.

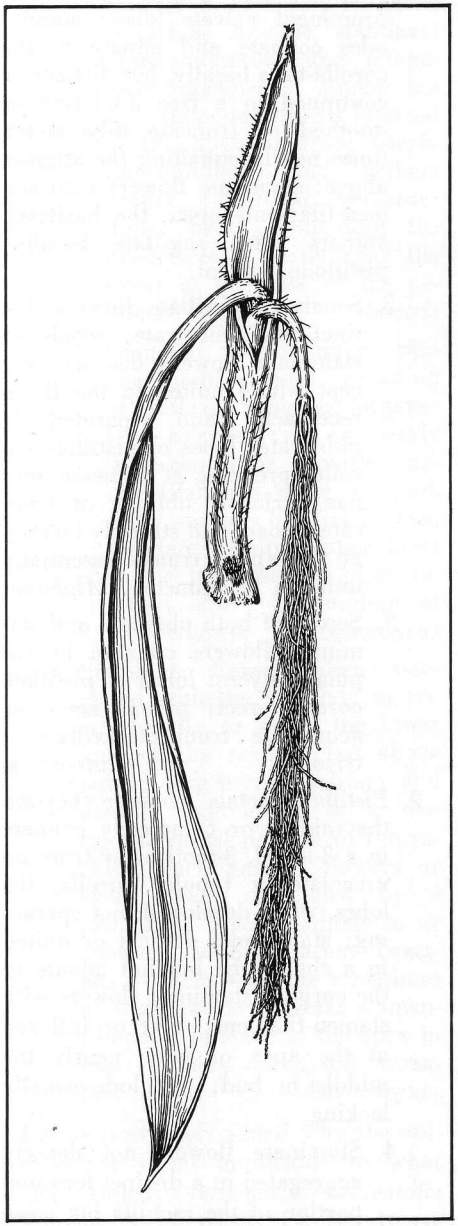
The male flowers also differ. Those of *Acrocomia* have distinct short sepals and a prominent pistillode; those of *A. crispa* have sepals united in a low 3-lobed cup and a short deeply trifid pistillode. The petals are briefly united with the floral receptacle in both. Stamen-filaments in *Acrocomia* are inflexed at the apex in bud and the anthers are dorsifixed and versatile. In *A. crispa*, the stamen-filaments are erect, the anthers basifixed.

Though the fruit of *A. crispa* generally resembles that of *Acrocomia* in shape and color, it is smaller than most and has a thin mesocarp which separates easily from a distinctly pitted endocarp. *Acrocomia* proper has fruit with a thick mesocarp of very short dense fibers adherent to an essentially smooth or more rarely shallowly pitted endocarp. These fibers are removed from the endocarp only by considerable scraping with a scalpel.

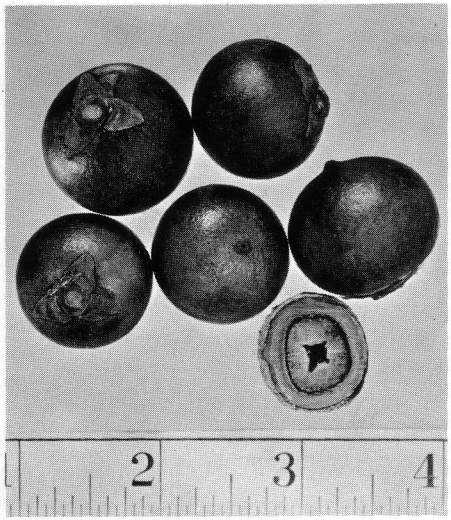
Taking these differences in sum, it appears clear that *Acrocomia crispa* differs from all remaining species of the genus, including others in Cuba, in an assemblage of characteristics despite its general habital resemblance. *Acrocomia* becomes a genus which is readily characterized and recognized even from rachillae lacking flowers when *A. crispa* is removed.

If *A. crispa* cannot be retained in *Acrocomia*, can it be placed in one of the other cocoid genera armed with prickles? *Astrocaryum*, *Bactris* and *Desmoncus* differ markedly in having petals of pistillate flowers united in a tubular 3-lobed, 3-toothed or even truncate corolla as well as in other characteristics so

that *A. crispa* clearly does not belong with them. Comparing with *Aiphanes*, however, one finds many similarities both in inflorescence and flowers. The arrangement of staminate flowers in pairs above the triads, the union of petals with each other and with the staminodial tube in the pistillate flower, the erect stamen-filaments of the staminate flowers are similar in *A. crispa* and *Aiphanes*. Yet there are differences which in sum again suggest that to include *A. crispa* in *Aiphanes* would destroy the homogeneity of that genus: the sepals of both staminate and pistillate flowers are united in *A. crispa*, distinct in *Aiphanes*; the petals of pistillate flowers are united basally and erect above in *A. crispa*, united basally but with spreading triangular valvate lobes in *Aiphanes*; the pinnae of *A. crispa* are acute to acuminate, those of *Aiphanes* are oblique or truncate, broad, and strongly toothed at the apex; the trunk is swollen in *A. crispa*, essentially uniform in *Aiphanes*; and *A. crispa* occurs in geographic isolation from *Aiphanes* which extends northward only to Puerto Rico in the West Indies.



3. An old inflorescence of *Gastrococos crispa* with persistent bracts. Reproduced from *Gentes Herbarum* 4: 426, fig. 258. 1941.



4. Representative fruits of *Gastrococos crispa*. Reproduced from *Gentes Herbarum* 4: 463, fig. 290. 1941.

Both *Aiphanes* and *Acrocomia crispa* appear to have evolved from a common ancestral type yet to different degrees

and in different ways. Thus I prefer to maintain two distinct generic units as the best way of expressing this evolution in a taxonomic scheme: *Aiphanes* for some 40 taxa of Central and South America and the West Indies north to Puerto Rico; *Gastrococos* for the single species of Cuba. The following as yet preliminary key to the six genera which I currently recognize in the Bactrideae may serve to put *Gastrococos* in perspective. *Acrocomia* I consider to include *Acanthococos* as suggested by Wessels Boer (*Flora of Suriname* 5: 122. 1965); *Bactris* includes *Guilielma, Pyrenoglyphis* and *Yuyba.*

Preliminary Key to Genera of Bactrideae

1. Petals of the pistillate flowers distinct and broadly imbricate, or if sometimes partially connate basally and with an adnate staminodial tube, then at least the margins free and imbricate; pistillate sepals distinct: staminate flowers with distinct sepals and the petals distinct and valvate or adnate basally to the short floral receptacle then free and valvate; stamen-filaments inflexed at the apex in bud, the anthers dorsifixed and versatile: fruit with abundant short fibers in the mesocarp, these strongly adherent to the smooth or only very shallowly pitted endocarp: staminate flowers borne in pairs lateral to the pistillate in basal triads on the rachillae, immediately above the triads in pairs, or mostly or entirely singly and subtended by membranous bractlets adnate on all sides to adjacent bractlets forming cells resembling those of a honeycomb. *Acrocomia*

1. Petals of the pistillate flowers connate ⅓-½ their length in a campanulate tube with prominent spreading or erect valvate lobes, or more than ½ their length in an urceolate briefly 3-lobed, 3- toothed or even truncate tube; sepals of the pistillate flowers distinct and imbricate or connate in a shallow to deep cupule: staminate flowers and inflorescences various: fruit lacking abundant short fibers adherent to the endocarp.

2. Pistillate petals connate ⅓-½ their length in a companulate tube with prominent valvate lobes; staminodes connate and adnate to the corolla-tube basally, but distinct or continued in a free 3-6-lobed or -toothed or truncate tube sometimes nearly equalling the stigmas above: staminate flowers with stamen-filaments erect, the basifixed anthers often sagittate basally; pistillode evident.

3. Sepals of pistillate flowers distinct and imbricate; sepals of staminate flowers distinct (except where united to the floral receptacle) and separated or imbricate: lobes of pistillate corolla spreading at anthesis: pinnae variously oblique or truncate, broad, and strongly toothed at the apex: trunks essentially uniform in diameter. *Aiphanes*

3. Sepals of both pistillate and staminate flowers connate in cupular calyces: lobes of pistillate corolla erect: pinnae acute or acuminate: trunk markedly ventricose. *Gastrococos*

2. Pistillate petals connate beyond the middle or completely connate in a 3-lobed, 3-toothed or truncate urceolate or tubular corolla, the lobes, when developed, not spreading; staminodes distinct or united in a short tube but not adnate to the corolla: staminate flowers with stamen-filaments erect or inflexed at the apex or from nearly the middle in bud; pistillode usually lacking.

4. Staminate flowers not densely aggregated in a distinct terminal portion of the rachilla but associated with the pistillate in triads or irregularly interspersed

among the triads and subtended by short distinct bractlets.

5. Erect plants: upper pinnae not modified into spreading or reflexed spinose organs: flowers all or nearly all borne in triads or the staminate more numerous and irregularly interspersed among triads: stamen-filaments inflexed at the apex or from nearly the middle in bud; anthers mostly dorsifixed, versatile: upper bract subtending the inflorescence borne near the lower at the base of the peduncle. *Bactris*

5. Scandent plants: upper pinnae modified into spreading or reflexed spinose organs: flowers in triads nearly throughout the rachilla: stamen-filaments erect in bud, short; anthers basifixed, erect, sagittate basally: upper bract of the inflorescence often inserted above the middle of the peduncle *Desmoncus*

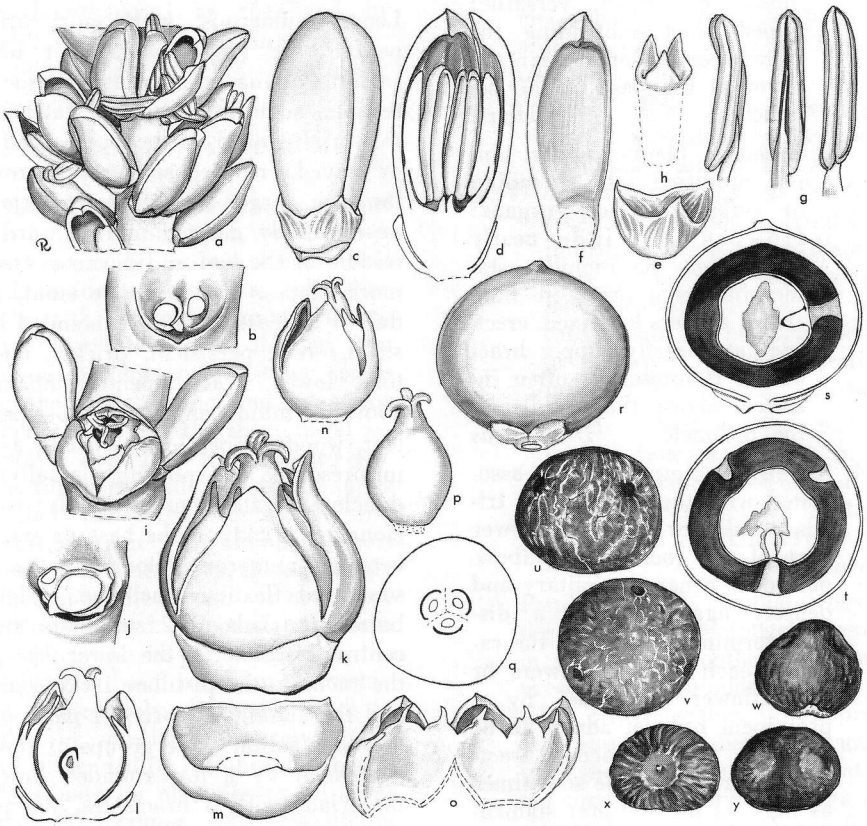
4. Staminate flowers often associated with the pistillate in triads basally or along the lower part of the rachilla but above paired or generally solitary and densely aggregated in a distinct terminal portion of the rachilla, each pair of flowers or each flower subtended by a prominent bractlet adnate to or coherent with adjacent bractlets to form a cupule sometimes as high as the flowers: stamen-filaments inflexed at the apex in bud; anthers dorsifixed, versatile. *Astrocaryum*

I have previously stated why the epithet *crispa* seems applicable to what Bailey called *Acrocomia armentalis* (*Principes* 7: 171-172. 1963). It remains now to transfer the epithet to *Gastrococos*, to provide synonymy superseding that given in the checklist of cultivated palms, and to supply descriptions of genus and species.

GASTROCOCOS S. A. Morales, in Repertorio Físico-Natural de la Isla de Cuba 1: 57, 30 Mai 1865.

Trunk solitary, ventricose and spindle-shaped at maturity, densely armed when young with stout dark prickles in rings, sometimes becoming nearly or quite smooth in age except on new growth. Leaves numerous, with short prickly petiole, the rachis prickly or nearly smooth; pinnae numerous, narrow, attenuate, acute to acuminate but becoming briefly bifid at the apex when old or frayed, crowded and very narrow at the base, larger and regularly arranged or in poorly defined pairs toward the middle of the leaf and borne in two or more planes. Inflorescence stout, pendulous at least in fruit, subtended by a short, erect, persistent, prickly, ancipitous lower bract opening abaxially above the middle and a tomentose persistent, woody upper bract as long as the inflorescence and splitting abaxially; peduncle elongate, densely prickly; rachis elongate, prickly at the base or smooth, bearing numerous elongate unarmed somewhat flexuous rachillae. Flowers borne in triads of 2 staminate and a central pistillate in the lower ⅓-½ of the rachilla, the pistillate lacking above and the staminate borne in pairs or at the apex solitary, the groups of flowers subtended by a low rounded bractlet, the triads with 3 bracteoles, the pairs with 1 bracteole: staminate flowers with a short 3-lobed cupular calyx much exceeded by the 3 valvate petals which are basally adnate to the floral receptacle; stamens 6, the filaments distinct, subulate, erect, the anthers linear, basifixed, erect, sagittate basally, acute or briefly bifid apically; pistillode short, deeply trifid: pistillate flowers with a short 3-

lobed cupular calyx much exceeded by the 3 petals, these connate about ⅓ their length basally, valvate and erect above; staminodes nearly as long as the petals, connate nearly three-fourths their length in a 6-lobed tube adnate basally to the petals, free above; pistil ovoid, very minutely trichomatous, trilocular, triovulate, stigmas 3, recurved at anthesis, ovule attached near the middle of the locule, the micropyle at right angles to the attachment. Fruit globose or depressed-globose, with apical stigmatic residue; exocarp smooth; mesocarp pulpy with flat fibers, readily separated from the pitted endocarp; endocarp thick, bony, with pores slightly above the middle: seed somewhat irregular with homogeneous hollow endosperm and lateral embryo. Chromosome number: n = 15 (R. W. Read, in *Principes* 10: 66. 1966).



5. *Gastrococos crispa.* a, portion of rachilla with staminate flowers × 2; b, portion of rachilla, staminate flowers removed × 4; c, staminate bud × 4; d, staminate bud in vertical section × 4; e, staminate calyx × 4; f, staminate petal, interior view × 4; g, stamens in three views × 4; h, pistillode × 8; i, basal portion of rachilla with triad × 2; j, triad, flowers removed, × 2; k, pistillate flower × 4; l, pistillate flower in vertical section × 2; m, pistillate calyx × 4; n, pistillate flower, calyx removed × 2; o, pistillate corolla and staminodes expanded, interior view × 2; p, pistil × 2; q, ovary in cross-section × 4; r, fruit × 1; s, fruit in vertical section × 1; t, fruit in cross-section × 1; u, v, endocarp in lateral and top views × 1; w, x, y, seed in top, lateral and bottom views × 1. a-q from material of *Read 821* preserved in liquid; r-y from dried material of *Walsingham s. n.*

Endemic to Cuba, where found on calcareous soils in all the provinces according to León, *Flora de Cuba* 1: 245. 1946.

GASTROCOCOS CRISPA (Humboldt, Bonpland & Kunth) H. E. Moore, *tr. nov.*

Cocos crispa Humboldt, Bonpland & Kunth, Nova Genera et Species Plantarum 1: 302 [folio 242]. 1816.

Acrocomia crispa (Humboldt, Bonpland & Kunth) C. F. Baker ex Beccari, in Pomona College Journal of Economic Botany 2: 364. 1912.

Gastrococos armentalis S. A. Morales, in Repertorio Físico-Natural de la Isla de Cuba 1: 58. 1865.

Acrocomia armentalis (S. A. Morales) L. H. Bailey, Hortus Second 22. 1941.

Trunk to 18 m. (60 ft.) high. Leaves large: sheath and petiole 7.5 dm. (2½ ft.) long, the sheath densely covered with upward-pointing slender brown prickles of varying lengths to 3 cm. (1 3/16 in.) long and occasional much longer and stouter prickles, the upper margins fibrous and extending along the petiole nearly to the first pinnae, the free portion of the petiole about 45 cm. (18 in.) long with brown or yellowish prickles, some very stout; rachis more than 2.5 m. (8½ ft.) long, often with short yellowish prickles along the lower margin and on the lower surface near the junction with the petiole; pinnae to 120 or more on each side of the rachis, the lower ones short, narrow, and closely placed, those in the center to 1 m. (3½ ft.) long, 3 cm. (1 3/16 in.) wide, the midnerve green, the lower surface pale. Inflorescence to 1.5 m. (5 ft.) long or more, the upper bract brown tomentose; peduncle about 7.5 dm. (2½ ft.) long, densely brown or yellowish prickly; rachis about as long as peduncle, smooth or with prickles at base; rachillae to 30 cm. (1 ft.) long or more. Flowers yellow to orange, the staminate 8-9 mm. (11/32 in.) long with calyx about 2 mm. (3/32 in.) high, the females about the same height. Fruit smooth, yellow to orange at maturity, 2.5-2.75 cm. (1-1⅛ in.) in diameter.

Hybrids in Chamaedorea

DAVID BARRY, JR.

In June 1923, the *Journal de la Société Nationale d'Horticulture de France* (ser. 4, 24: 223-244, 1923) ran an article on the cultivated *Chamaedorea* by Dr. M. A. Guillaumin of the Jardin des Plantes, Paris. After describing about fifty species the author lists several hybrids. These are referred to as recent hybrids, meaning that they were made after the turn of the century. They would indeed be recent when compared to the dates given for the introduction to horticulture of various species of *Chamaedorea*. The first species was introduced in 1794 to the Imperial Garden of Schoenbrunn, near Vienna. The author adds that the voyager Warscewicz, and especially Linden, the celebrated horticulturist of Ghent, introduced the major part of the species in those early days. Many were introduced between 1840 and 1890.

The first hybrid was made by a Russian, F. Katzer, of Pavlosk, about 1899. It was described as *Chamaedorea* × *Katzeri* Loebner, in *Gartenwelt* 13: 159. 1909. The parents were *C. concolor* and *C. Ernesti-Augusti*. The plant was suckering, the terminal leaves simple, like

those of the second parent. The leaves that followed down the petiole were pinnatisect in 3-5-7 segments.

A second hybrid, *Chamaedorea* × *romana*, was named by Guillaumin and had *C. Ernesti-Augusti* and *C. Schiedeana* as parents. It was published in *Bullettino della R. Societá Toscana di Orticultura* 35: 207, 1910, and *Kew Bulletin*, 1911: Appendix III, 93. 1911. This hybrid had a single trunk and much of the general appearance of *C.* × *Katzeri*. It was Italian in origin and was being grown in the botanical garden in Rome in 1910.

Two other hybrids were made about this date and were growing at Kew, according to Guillaumin. They are *C.* × *kewensis* [*C. Wendlandiana* × *C. Lindeniana*] and the unnamed cross *C. corallina* × *C. glaucifolia*. Descriptions are in the Kew *Hand List of Tender Monocotyledons*, 2nd edition, pp. 84 and 85.

The destruction to greenhouses in Europe by World Wars I and II seems to have ended there any activity in hybridizing in *Chamaedorea*. An American cross between *C. costaricana* and *C. Schippii* has been made by one of our society members. Irving Cantor of Los Angeles reports that in 1960 he put some *C. costaricana* pollen on *C. Schippii* flowers and set one dozen seeds from which nine plants were grown. In 1962 he made the cross and harvested 30 seeds. Again, in 1965, he harvested 50 seeds. This hybrid has created a very attractive palm. It is midway in size between the two parents, seems to have the frost tolerance of *C. costaricana*, and has restricted the tendency of *C. Schippi* to run. It seems tolerant to morning sun, a characteristic picked up from the last parent, has great vigor, and is an improvement over either parent.

The only information at hand of hybrids in Florida reached me through the investigative effort of our Secretary, Lucita H. Wait. It seems that the one known instance of hybridization is accidental, and a little uncertain, and took place, or perhaps takes place each year, in a planting of *Chamaedorea* in Fairchild Tropical Garden in South Miami. In a grouping of several species of *Chamaedorea* palms the plants of *C. Seifrizii* are on the lee side of palms of *C. erumpens*. Plants grown from seeds formed on plants of *C. Seifrizii* were at first assumed to be of that species. However, they varied so much in appearance from the plants of *C. Seifrizii* that they are now assumed to be crosses between it and C. *erumpens*. They present a complete range in appearance between the two species. The confusion increases when it is considered that pollen of *C. erumpens*, at least under California conditions, is the sticky type and is never freed to float in the air from plant to plant. Perhaps an insect has been a party to this apparent example of hybridization in Florida.

With about 100 species in the genus the opportunities for producing hybrids are endless. I strongly favor hybridization that aims at improving on nature, and not that done merely for the purpose of creating a hybrid. For example, if the characteristic of branching that is found in *C. elatior* var. *bambusoides* could be bred into some of the single-trunked species, such as *C. corallina*, a new, living, art form would be found. Or, if the "metallic" coloring in the leaves of *C. metallica* could be made to prevail in *C. brachypoda*, while keeping the multiple-trunk character of the last, a most useful horticultural subject would be the reward.

Because of the wide variety of vegetative characteristics within the genus, as now known, it is reasonably evident that all species would not be compatible

with one another in crossing. On the other hand, it is evident that some species should be compatible because of the general similarity of the shape and style of the spadices in both sexes, such as those of *C. metallica* and *C. Ernesti-Augusti.* I assume that this cross could be made, and I recommend it as the kind of hybrid that should produce a significant and interesting result.

In handling the pollen of *Chamaedorea,* plastic bags, or Baggies, are very useful. When the male flowers are ready to shed pollen and will do so when the spadix is tapped, enclose the spadix in the bag, tap and shake the bag vigorously, and the inside of the bag will be whitened with pollen. When the female flowers are sticky, envelop the entire female spadix in the bag, tap and shake the bag, and the flying or falling pollen will find its way to the open flowers.

This method can not be used with species like *C. elegans* that have glutinous pollen that will not be shed by the flowers. In such cases, remove one corolla at a time from the spadix branch, hold it between two fingers, and pluck away the thick petals with tweezers. Put the stripped flowers in a small, open dish for two or three hours to air-dry. Then the pollen may readily be picked up by the bristles of a camel's hair brush by stirring the flowers with it. The pollen will show as white powder on the brush with which the sticky female flowers may be touched, one by one. This is tedious, but it is effective, and will make up for the absence of an insect.

GARDEN TOUR

The Palms at Lotusland

Estate of Madame Ganna Walska

The area of Santa Barbara, California, lying at 34 degrees, 25 minutes North Latitude, enjoys a milder climate than one might expect. The principal reasons for this pleasant situation appear to be two: the close presence of the Pacific to the south (*sic*; consult your atlas) and the fact that immediately to the north of the city is a mountain range which, contrary to the custom of most red-blooded American ranges, runs east-west rather than north-south. The beneficial effect of these rocky slopes, which rise to three or four thousand feet, is often to shut out cold winds from the north, and to absorb and re-radiate heat from the low winter sun.

January and August official average high and low temperatures are given as 64.8°, 40.3° and 78.1°, 56.7° F. by the Department of Commerce Weather Bureau. In recent years, the weather sta-

1. Entrance to Lotusland. Iron gates in filigree are flanked by tall *Jubaea* specimens emerging from a planting of gray-leafed agaves. Barry Osborne photo.

2. Part of a grove of *Howeia* at the Ganna Walska estate. Ivy provides a lush and easily maintained groundcover. Ken Foster photo.

tion has been moved to within two blocks of the beach, and often lies in a chill bank of sea mist, while the rest of the city is warm and clear; thus the nationally published temperatures for the area now give only a foggy idea of the weather here.

Lotusland lies east of the city on gently sloping land between the hotter microclimate of the foothills, where frost may occur only once in, say eight or ten years, and the low-lying regions where the ground is blanketed with white on several mornings each year. Thus, Lotusland serves as a good test spot for the adaptation of a plant for the majority of the land in the Santa Barbara area.

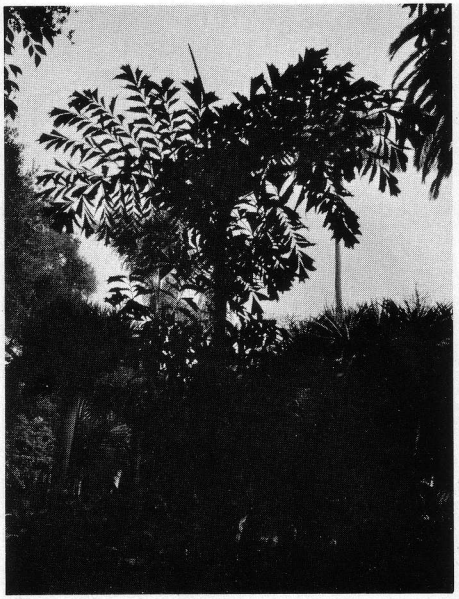
On a tour, one enters the estate through great iron gates which are flanked by two nicely matched huge *Jubaea chilensis* palms. Continuing up the broad entrance drive between clumps and rows of aloes and agaves, one begins to encounter young *Howeia Forsteriana* on the right, planted both singly

3. The sky-blue reflecting pool in the "desert" section of the garden where palms provide a transition between the cacti and succulents and the evergreen trees in the background. Ken Foster photo.

and in groups for a natural efect. On the left soon appears the lotus pond after which the estate is named. If one is fortunate enough to arrive at blooming time (generally July into September) the pond will be a solid sea of round lotus leaves, with the lush pink flowers unfolding above them on swaying stiff stalks. Large plants of *Erythea edulis* and *Phoenix canariensis* form part of the backdrop for this spectacle, along with various dicotyledonous ornamental trees and shrubs.

Further along the drive, the howeias on the right become larger, and gradually other species, such as *H. Belmoreana, Hedyscepe Canterburyana,* and *Archontophoenix Cunninghamiana* are worked into the grove. It is here, too, that two other specimens are seen which invariably cause comment when the tour members are palm enthusiasts: *Jubaeopsis caffra* and *Parajubaea cocoides.* The *Parajubaea* is particularly striking, as the leaves have a special sheen similar to that of *Cocos nucifera,* as well as the contrasting yellow midrib. It seems a shame this plant is not more widely distributed in California, as it appears to be hardy as far north as Richmond (San Francisco Bay area), yet there is only one mature, bearing tree of the species in the state, to my knowledge.

Soon a decision must be made in our



4. *Caryota ochlandra* in silhouette. Barry Osborne photo.

5. *Ptychosperma elegans* growing in the Santa Barbara garden of Madame Ganna Walska. The small plant behind it is *Chambeyronia macrocarpa*. Barry Osborne photo.

walk, as paths begin to extend in several directions. Generally, the decision is already suggested by the presence of chains made of rattan, or the presence of a wooden animal, such as those seen on carousels, blocking the way. The route has been planned, however, so that you will not miss the sights behind the wood unicorn or gnu, but will circle about for them later.

Generally, one turns here to the left, and goes down a little path past a *Rhopalostylis sapida*, a large *Trithrinax acanthocoma*, and several butias, thence into an area where the lotus pond is viewed from a different angle, and where many young palms are gathered under the trees. There are, for example, *Arenga Engleri*, *Livistona Mariae*, and — most interesting to me — three *Roystonea regia*, the tallest about ten feet now, and just getting ready to form trunk. Records at the Santa Barbara Botanic Garden indicate that roystoneas have been grown in California, but so far as I know there are only two of any considerable size in the state now: one in San Diego and one said to be in the vicinity of Palm Springs. However, the history of palms once grown here but now scarce or nonexistent would be another article, so let us continue up one of Madame Walska's secluded paths.

Shortly we come upon an interesting situation of similarity and contrast: large clumps of *Rhapis excelsa*, *Rhapis humilis* and *Chamaedorea costaricana* are planted right next to a grove of black-stemmed bamboo. As one's eyes travel up these various jointed stems, there is always the slight feeling of surprise as the greatly differing leaves are seen.

Beyond these groves, the land begins to become more open and sun-drenched. It is here that the majority of aloes and many beaucarneas are gathered. Along the sides of this desert-like area appear *Erythea Brandegeei*, two spiny-trunk *Acrocomia Totai*, and several groupings of *Phoenix reclinata*. Here, too, are four majestic *Jubaea* in a row, with *Trachy-*

6. Cacti and palms make a pleasant garden setting. Ken Foster photo.

carpus Fortunei filling in the foreground. In the center of this "desert" there appears a mirage-like sky-blue reflecting pool, free-form and edged with iridescent shells. Water cascades into this pool from several giant clamshells, producing a shimmering effect on the whole area when the sun is at the right angle.

From the aloe section, the tour then continues by several more formal pools, past specimens of *Acoelorrhaphe Wrightii* and *Jubaeopsis caffra* to the deeply shaded *Caryota* section. The largest and most impressive of this genus seen here are *C. ochlandra,* which has been found to be not only hardy here, but rather fast-growing as well. Beneath and around these ochlandras are seen the other more familiar species such as *C. mitis* and *C. urens,* creating a dense exotic effect difficult to describe and, I understand, even more difficult to photograph.

Nearby, for those impressed with size, are several of the tallest *Washingtonia filifera* in this region, and an extremely tall *Arecastrum Romanzoffianum.*

After passing a tree-fern "forest" and

7. Sunshine gleams on the leaves of *Parajubaea cocoides*, its delicately pinnate leaves contrasting sharply with *Agave attenuata* below. Barry Osborne photo.

a display of truly magnificent large specimens of staghorn ferns, we enter an area which is filled with many species of young palms, many of them considered to be either unusual or experimental for this area. Here are *Pritchardia Beccariana, Chambeyronia macrocarpa, Chrysalidocarpus lutescens* and *C. madagascariensis, Neodypsis Decaryi* and many kinds of *Chamaedorea.* My own favorite species in this area is *Linospadix monostachya;* its unusual leaf shape and dark green gloss make it especially attractive, and the relatively rapid growth of the specimens here is most encouraging.

Just around the corner begins a grove of *Phoenix Roebelenii* of all sizes and shapes, including one multi-headed specimen which, while not so graceful as many of the others, always draws comments as a curiosity.

The most curious and interesting spectacle at Lotusland, however, is, in the minds of many, the "blue and silver" area to the east of the main drive Here, gathered in one spot are plants from all over the world, combined on the basis of one requirement: the predominent color of the plant must be blue or silver. The South African silver tree (*Leucadendron argenteum*) can be seen here, as well as many specimens of *Erythea armata,* which vary from silvery-white to bluish in their fronds. Various blue evergreens are planted next to agaves, over a groundcover of *Festuca glauca* and *Kleinia repens.* The overall effect is rather Alice in Wonderlandish because for the moment the whole world seems to have turned blue and silver.

Since this is an article on the palms at Lotusland, we must regretfully pass over the collections of succulents and cacti, the bromeliad collection, which has been vastly expanded in the past year, and only mention the outstanding collection of cycads, which is scheduled for further extension into a new area next spring. I know little about many of these plants, but suspect that there are some true rarities here, for I have seen cycad collectors touching their foreheads to the ground before certain specimens, just as Mohammedans prostrate themselves toward Mecca.

The tour of Lotusland traditionally ends on the broad, meadow-like lawn, where Madame Ganna Walska often serves refreshments beneath wide varicolored umbrellas, near the topiary collection and the giant clock decorated with semi-precious stones and minerals. Here, beside large multi-stemmed *Phoenix reclinata,* one may discuss with the hostess her plans for further developments of her gardens.

8. A young specimen of *Pritchardia Beccariana.* Barry Osborne photo.

In the palm category, these include two new areas scheduled for planting in the spring of 1968. Many palm species, either out of the ordinary or as yet untried in this region, are now being gathered in the greenhouses, to be put into the ground as soon as the soil temperature rises. In the process of making new plantings, a great deal of forethought and judgment must be involved to form a harmonious overall landscape. Despite the tremendous variety of plants and collections, somehow one is never aware of a transitional shock, so cleverly are the plantings arranged.

One of the most important lessons to be learned from a visit to Lotusland is that a plant should not be passed off as "impossible" or "inappropriate" simply because it has not been traditional in a region. Were it not for people who seek new plants, plus a few adventuresome landscape gardeners, Santa Barbara might still be an area of only live oaks and chaparral.

Otto Martens and I were able to make a survey of the palms present at Lotusland in the spring of 1967. Herewith follows a list derived from that study. Most of the heights are estimated, with the exception of a few of the tallest specimens, where an instrument operating on a triangular principle was employed. In a few cases where groves were particularly dense, estimates were also made of the number of plants. The list does not, of course, contain the many species added since the survey was made. After the name appears the quantity and the height of the tallest specimen:

9. *Acrocomia Totai* at Lotusland is shown in the center of the picture. Dark fronds at the right and rear are *Jubaea chilensis*. Barry Osborne photo.

10. Four *Jubaea chilensis* at Lotusland. Barry Osborne photo.

Acrocomia Totai 2, (15′); *Aiphanes acanthophylla* 1, (1½′); *Archontophoenix Cunninghamiana* 9, (28′); *Areca triandra** 3, (2′); *Arecastrum Romanzoffianum* 11, (80′); *Arenga Engleri* 4, (5′); *Butia capitata* 34, (18′); *Caryota Cumingii* 1, (1½′); *C. mitis* 15, (4′); *C. ochlandra* 5, (15′); *Chamaedorea cataractarum* 2, (4′); *C. costaricana* 6, (12′); *C. elatior* 2, (10′); *C. Ernesti-Augusti* 4, (3′); *C. erumpens* 1, (7′); *C. glaucifolia* 1, (10′); *C. metallica* 16, (2½′); *C. microspadix* 1, (4′); *C. radicalis* 4, (3′); *C. Seifrizii* 1, (7½′); *C. sp.* 1, (6′); *C. stolonifera* 1, (3′); *C. Tepejilote*, 4, (5′); *C. Woodsoniana* 1, (8′); *Chamaerops humilis* 14, (14′); *C. humilis* 'Nana Compacta' 1, (2′); *Chrysalidocarpus lutescens* 4, (5′); *C. madagascariensis* 1, (2½′); *Dictyosperma album** 1, (3′); *Erythea aculeata* 3, (3′); *E. armata* 51, (25′); *E. Brandegeei* 2, (21); *E. edulis* 81, (28′); *E. elegans** 1, (11′); *Hedyscepe Canterburyana* 2, (3′); *Heterospathe*

elata 1, (3′); *Howeia Belmoreana* 4, (8′); *H. Forsteriana* 73, (26′); *Jubaea chilensis* 45, (45′); *Jubaeopsis caffra* 2, (7½′); *Linospadix monostachya* 3, (2½′); *Livistona australis* 21, (45′); *L. chinensis* 7, (10′); *L. Mariae* 2, (1′); *Mascarena Verschaffeltii* 1, (5′); *Microcoelum Weddellianum* 2, (2′); *Parajubaea cocoides* 1, (9′); *Phoenix canariensis* 85, (55′); *P. dactylifera* 6, (40′); *P. humilis** 1, (1½′); *P. reclinata* 3, (38′) *P. Roebelenii* 50, (10′); *P.* sp. 1, (1½′); *P. tomentosa* 1, (4′); *Pritchardia Beccariana* 1, (1½′); *Ptychosperma Macarthurii* 1, (1½′); *Rhapidophyllum hystrix* 2, (6′); *Rhapis excelsa* 1, (12′); *R. humilis* 2, (11′); *R. sp.* 1, (3′); *Rhopalostylis Baueri* 1, (5′); *R. sapida* 1, (11′); *Roystonea regia* 3, (9′); *Sabal Blackburnia** 2. (5½′); *S.* sp. 1, (17′); *Trachycarpus Fortunei* 12, (29′); *T. Martianus** 1, (24′); *T. Takil* 4, (2½′); *Trithrinax acanthocoma* 3, (16′); *Washingtonia filifera* 6, (80′); *W. robusta* 1, (18′).

*Identity has been questioned.

BARRY L. OSBORNE

11. Madame Ganna Walska and Palm Society President, Otto Martens. Ken Foster photo.

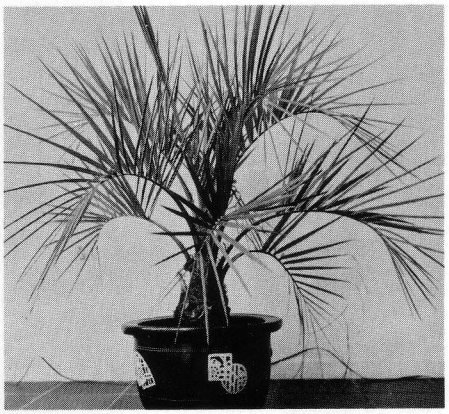
COLLECTOR'S CHOICE

Butia Capitata

Selecting a favorite palm is somewhat like selecting a favorite child: we love them all, each for its own particular characteristics and idiosyncracies. And yet when I ask myself which of all my palms would I keep if I were allowed to retain only one, I do come up with a favorite, and for me it must be the *Butia capitata,* especially the gray-leafed varieties. Although this palm certainly would not be a favorite in all regions where palms are grown, in the San Francisco Bay Area where I garden — and I grow more than forty-five species of palms out-of-doors — the Butia has much to recommend it.

First of all, I admire this palm because of the way it always manages to be an interesting feature of the garden no matter what size it may be. So many young palms, with their simple leaves and juvenile characteristics, need several seasons of growth before they begin to contribute to the total garden picture. Not so the *Butia.* As a small plant barely a foot in diameter, it is unmistakenly a little *Butia,* with its gray-green, feathered leaves already assuming the characteristics of the adult palm with a six or eight foot spread. Thus even a small plant can play an important role, masquerading as a gray-leafed *Phoenix Roebelinii* among smaller plants that it will soon shoulder out as expendable items in a continually changing garden. Later, as an adult, it is never too big even for the smallest garden, accepting both the role of specimen in a lawn or an enlivening part of a mass of shrubbery.

For one who enjoys a daily tour through the garden to observe the subtle change of growing things, the *Butia* ranks near the top of the interest scale. In my area the *Butia* is considered one



1. Butias can live for years in containers and play an important role on the deck or patio, taking more abuse and neglect than most potted plants. Photo by Warren Dolby.

of the faster growing palms. I do not know if it grows faster here than in other places where it is grown, but relatively at least it is a fast grower. Perhaps this is because most of my other palms put on little or no growth at all during the cooler part of the year, while the *Butias* along with the *Chamaerops, Trachycarpus* and a few others, continue to push out new growth no matter what the season. As the young *Butia* gains in breadth and height, the very growth itself becames a delight. The new leaf bud thrusts itself up from the heart of the plant with a determination unequalled in any other palm in my garden. The heavy bud stands hard and resolute, and then in a day — I have seen it happen in an afternoon — it begins to fray at the tip, expand into leaflets farther down from the top, and then of its own weight fall fully open into a great arching frond that takes its place in the fountain of foliage that is a *Butia.*

Equally dramatic to me is the development of the inflorescence. Like a flat bean it beings to emerge from deep among the leaf stalks. And almost as fast as a bean it grows into a great protruding bud, as round as my arm

2. In an architectural setting, the *Butia* can be as dramatic as a piece of sculpture. Photo by Warren Dolby.

and fully two or three feet long. Then one day a crack appears, the huge bud splits, and sometimes before the day is over the inflorescence has burst out and cascaded into a fully open bloom. The *Butia* is one of the few plants in my garden that is never without buds, flowers, and fruit in various stages of development.

Although I seldom go into the garden and find that the *Butias* are not putting on some kind of performance, this alone is not sufficient to warrant my placing the plant in my favorite-palm category. The *Butia* also ranks high with me because of its unusual color and form. The foliage seems to vary among individuals, from a light green to a frosty gray. I prefer the gray-leaved *Butias* and find them providing a refreshing and useful color in the landscape. Not all leaves on an individual *Butia*, however, are of one shade of gray. The newly opened leaf is sometimes of a creaminess that resembles the bleached heart of an artichoke that only gradually assumes the shades of the older leaves, but which enlivens the total aspect of a healthy *Butia*. Against the gray-green leaves, the inflorescence takes on a heightened interest. The colors of lavender or rose or orange might be lost among leaves of any other shade, but are displayed to their fullest among the misty-gray fronds of the *Butia*. Surpassing the flowers, of course, are the great clusters of orange fruit, often weighing twenty or thirty pounds, that are suspended below the leaves on older specimens. The fact that these are the only edible palm-fruit in my garden also endears the tree to me.

As a landscaping element the *Butia* contributes a softness to the garden. This is due not only to its finely pinnate leaflets, but also to the graceful curvature of the entire frond itself. With its great central spike of leaf buds, the

3. The new leaflets of a *Butia* break apart as a creamy green, providing added interest to the mass of foliage. In a short time they assume the deeper shade of the older leaves and of their own weight bend down in the arc that characterizes most butias. Note cluster of orange fruit in foreground. Photo by Warren Dolby.

breaking young leaves, and the recurving older foliage, the *Butia* presents nothing less than a fountain aspect in the landscape, especially if it is a young specimen that has not yet developed much of a trunk. These char-

4. The total effect of a well grown *Butia* has been likened to that of a garden fountain — a central spike of new foliage rising stiffly from the heart of the palm, new leaves spilling out their leaflets, and recurving leaves reaching outward and downward in a great explosion of foliage. Photo by Warren Dolby.

acteristics are further heightened when the palm is planted with glossy-leafed evergreens such as dwarf citrus or camellias as a background (or foreground in the case of older specimens.)

There are few plants that are so picturesque that they can almost assume the role of sculpture in the garden. But Desmond Muirhead, writing in PRINCIPES in January 1960, had this to say which I feel applies especially to the *Butias*:

> "Palms can also be used as an integral garden decoration, much in the same way that sculpture should be used. This is especially true of the smaller palms like *Chamaerops humilis* and slower growing palms like *Butia capitata*. In an architectural setting the last two, and species of *Sabal* and *Erythea* are pure garden sculpture."

Finally, of course, a major reason

5. Although the *Butia* can be a prima donna in the garden, it also lends itself to mass plantings. Those shown above are part of a small grove that drifts into a canyon in Balboa Park, San Diego, California. Photo by Ken Foster.

for my liking the *Butia* is its adaptability and willingness to perform. It is the least demanding palm I grow. I never have to "worry it through" a cold night as I do some of my marginal palms. If it misses an irrigation during our dry California summer, it adapts to the drought. It is tolerant of a wide range of soils and does not demand the proverbial $10.00 hole required by so many palms. Strong winds may tatter the leaves of my fan palms and kink the fronds on the *Arecastrums*, but the strongest winds have never affected the *Butias*. In fact they seem to like the wind, be it a gale that furiously blasts in from the Pacific, through the Golden Gate and across my East Bay Hills, or a slight breeze that stirs the *Butia* into undulating motion when all else in the garden is still. The leaves on the *Butia* are, I believe, more durable than those of any palm I grow (with the possible exception of certain *Phoenix* species). They remain on the plant for years and seem always presentable. An annual pruning is more than sufficient, whereas some of my palms demand attention several times a year to be maintained as an attractive and acceptable element in the landscape.

Here, then, is a palm small enough for the average garden, dramatic enough to dominate the scene or complement the most modern architecture, subtle enough to assume a balanced role in a tropical planting, always presentable and interesting as an individual, and above all easy to grow.

WARREN J. DOLBY

PALM BRIEFS

Palms Observed While Traveling Through Western Europe

A few years ago my wife and I took a tour of Europe, and from England to Spain we were constantly on the lookout for palms. I had heard of the *Trachycarpus* at Kew Gardens in London, but could not manage to get by to see them. I could understand, however, how this palm could grow or survive there, as the foliage all around London was very lush, due I am sure to the constant bath of fog and moisture from the ocean. In Paris, which is much less under marine influence, I did discover three *Trachycarpus* in a city park. I had seen large and beautifully formed *Trachycarpus* on travel folders picturing the shores of Lake Lucerne in Switzerland, but I searched in vain for these palms, never finding them.

On the train trip from Venice to Florence in Italy, I saw hundreds of *Trachycarpus* but no *Chamaerops*. In the city of Florence, however, we finally did see several nice *Chamaerops*. I was amazed in Rome when in a small park in front of a bus station I came upon several beautiful *Chamaerops* with trunks that reached heights of at least twenty to twenty-five feet. Around the historical ruins in Rome there were many tall *Washingtonia* as well as *Phoenix canariensis*, *Butia capitata*, and *Sabal Palmetto*. The presence of these palms in Rome seemed astounding to me for I well remember seeing a newsreel many years ago of a snowstorm in Rome, and a year or so ago I saw pictures of a fifteen-inch snowfall there.

In Madrid, Spain, we saw a few *Trachycarpus* in a park which were in good condition, but we saw only one *Chamaerops* and it looked forlorn and beat. Madrid is hot and dry in the summer and about a mile above sea level. In Seville, however, at lower elevation and far to the south we saw many palms and drove down a boulevard several miles in length that was lined with tall and stately *Phoenix canariensis*.

Upon our arrival in the Mediterranean area I became constantly on the lookout for *Chamaerops*. Inasmuch as this is the only palm native to this area I was interested in seeing it and examining it in its natural state. I first saw a few small clumps in Italy, one standing on a high cliff in Capri, and a large single-stemmed specimen at the entrance to the ruins of Pompei. It was only some miles south of Seville in Spain, however, that the palm began to appear in any appreciable numbers. We first saw them as small clumps, and as we gained in miles toward Rota, the clumps increased in size. Actually they looked very much like the well-known saw palmetto or *Serenoa repens* found in south Georgia and the Florida piney woods.

From Rota south to Gibraltar, the *Chamaerops* were especially beautiful. Many clumps were in wheat fields, and in one area near the ocean just about as far as we could see were olive trees, oleanders and large clumps of *Chamaerops*. We stopped many times and I was in my seventh heaven walking all around and examining the palms. It appeared that this palm does not "trunk out" in its natural state, but will remain in clumps of short stems unless it is pruned. I visited a large nursery near Rota where they had a number of varieties of palms for sale. The salesman could not speak English and I only a little Spanish. All he could tell me was that they were "just palms."

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1. The mazari palm, *Nannorrhops Ritchiana*, at Fairchild Tropical Garden.

On Nannorrhops

Three or so species of the palm genus *Nannorrhops* are known to science. These occur over a considerable region in south-central Asia, the best known being the Mazari Palm, *Nannorrhops*

Ritchiana (often misspelled *Nannorhops Ritchieana*, according to Moore), a native of dry mountainous areas of Afghanistan, Baluchistan, and parts of adjacent India. There it occurs at elevations up to 5000 feet, where during the winter it is frequently covered by snow for months at a time.

This fan palm is a cluster-forming species, the stem typically being subterranean and more or less branching, or prostrate on top of the ground. Under exceptional, optimum cultural conditions, the stems become erect and can attain heights of approximately twenty feet. The general aspect of this *Nannorrhops* can be deduced from the accompanying photograph, made of a clump at Fairchild Tropical Garden a number of years ago — the specimen is much larger today.

The palmate, short-stalked leaves attain a maximum diameter of some four feet, and are typically powdery whitish- or greyish-green, a characteristic of many plants of diverse families occurring in arid spots at reasonably high elevations. The normally erect spadix is a sizeable structure, as can well be seen in our illustration. Pyramidal in basic outline, it supports a number of slender, recurved rachillae, these set with small cream-white flowers. In fertile specimens, a copious supply of half-inch, brown or orange-brown, rather wrinkled fruits is produced. The flesh of these is consumed by the natives in its mountainous habitat in time of want, the young vegetative shoots are eaten as a vegetable, and the leaves are used as thatch and in the manufacture of baskets and coarse sandals.

In his valued book, *Palms of the World* (Harper & Brothers, New York, 1960), the lamented James C. McCurrach notes that "On a trunk that is about to flower, the last few leaves produced are progressively reduced in size and length, the final leaf being very small. Although most descriptions ignore the subject, it is probable that each trunk dies after fruiting, as does the talipot palm, *Corypha*, to which *Nannorrhops* is related." (Ed. note: see *Principes* 10:25, 1966)

This is accompanied by a footnote, reading: "Loomis reports that in plants at Chapman Field, Florida, the stems that have flowered have several dead leaves at the top, but that the lower leaves are green. These stems are still alive two years after flowering. However, although they flowered, they have never borne fruit and perhaps this makes a difference."

Despite the obvious cold-resistance of the species, *Nannorrhops Ritchiana* is a singularly uncommon palm in collections in this country. It would seem that, together with the other members of the genus, *N. Naudiniana*, from northwestern India, and *N. Stocksiana*, of Baluchistan, attention could profitably be paid it by connoisseur palm enthusiasts.

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To the Editor
Principes

It was my good fortune to be able to spend August following the highways in Mexico that lead around the Gulf from Monterrey to Tampico to Veracruz to Villahermosa to Campeche and on out to Yucatan. I came away so enthused that I want to recommend this route to all those palm lovers who like to see the trees in the wild.

At Monterrey, Huasteca Canyon has specimens of *Brahea Berlandieri* but they grow high on the tops of precipitous 1500 ft. canyon walls. South of the city about ten to twenty miles are stands of *Sabal texana*. Between Tampi-

PHOTO GALLERY

Mrs. Langlois beside a specimen of *Areca Langloisiana* at the Retreat in the Bahamas. Photo by Dent Smith.

Mr. Arthur Langlois beneath foliage of their *Phoenicophorium* (*Stevensonia*) at the Retreat, Nassau, Bahamas. Photo by Dent Smith.

co and Veracruz are literally miles and miles of *S. mexicana* and many beautiful stands of *Scheelea Liebmannii* with stands of *Acrocomia mexicana* scattered among them.

Eastward from Veracruz to Villahermosa and beyond, the countryside varies from swamp to grassland to rolling hills, dominated by the old volcanic cones of the Tuxtlas. Here the palms occur more frequently and in addition to the ones mentioned above are *Roystonea*, *Astrocaryum mexicanum*, *Acoelorrhaphe Wrightii*, and bactrids.

Between Villahermosa and Campeche there are two paved routes, one along the beach and a second newly paved route that traverses the inland back country behind Laguna Terminada across the Usumacinta River basin. This area is a veritable paradise for palms as civilization and agriculture have not yet left their marks in the back country. After seeing the roystoneas scattered across these miles of jungle, swamp, and grassland, there can be no doubt as to whether or not the royal palm is native to Mexico — it is!

Near the boundary between the states of Tabasco and Campeche (inland route), literally miles of *Acoelorrhaphe* can be seen, and literally miles of clusters of bactrids can be seen — but rarely are the two mixed together. Also in this region are thousands of specimens of the tall, slim, graceful botans, *Sabal nematoclada* (*mayarum?*) mixed in with *Scheelea* and roystoneas. In the ravines of the hilly country can be found many kinds of *Chamaedorea.*

A pleasant surprise along the route was to encounter in the city of Villahermosa a main boulevard with its center divider planted with what seems

Arenga Engleri growing in the Court House gardens at Santa Barbara, California. Ken Foster photo.

to be *Elaeis guineensis.*

As one enters the state of Campeche, dramatic soil changes occur and the palms give out almost entirely except for *Sabal mexicana* here and there. Of course all along the beach and lowlands adjacent to the Gulf, thousands of acres of commercial plantings of coconuts can be seen.

I am certain that any Palm Society member would travel this route with nothing but enthusiasm supreme. Try it!

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