



PRINCIPES

Journal of The Palm Society

October, 1972
Vol. 16, No. 4

THE PALM SOCIETY

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JOURNAL 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 × 11 bond paper and addressed to the Editor 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.

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Cover Picture

The elaborate fibrous sheaths and distichous arrangement of leaves are a feature of this stem of *Wallichia disticha* in the Fairchild Tropical Garden. Photo by M. V. Parthasarathy.

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JOURNAL OF THE PALM SOCIETY

An illustrated quarterly devoted to information about palms and published in January, April, July and October by The Palm Society, Inc.

Subscription price is \$6.00 per year to libraries and institutions. Membership dues of \$10.00 per year include a subscription to the Journal. Single copies are \$1.50 each. The business office is located at **1320 S. Venetian Way, Miami, Florida 33139**. Changes of address, undeliverable copies, orders for subscriptions, and membership dues are to be sent to the business office.

Second class postage paid at Miami, Florida and at additional mailing offices.

Mailed at Lawrence, Kansas
 November 22, 1972

Palms in the Botanic Garden at Lae, Papua New Guinea

FREDERICK B. ESSIG

L. H. Bailey Hortorium, Cornell University, Ithaca, New York 14850

Any palm enthusiast fortunate enough to visit the South Pacific or Far East will find it well worth his while to stop at Papua New Guinea. Aside from the opportunity to see wild palms in the bush, there is a very fine botanic garden at Lae, which includes an extensive and rapidly growing collection of native and exotic palms. The Botanic Garden of the Department of Forests, Papua New Guinea, was established only two decades ago on a site occupied by swampland, an old coconut plantation, a pineapple farm, and a bit of native rainforest that has been preserved intact. (See J. S. Womersley, Starting from Scratch—the Botanic Garden at Lae, *The Garden Journal, New York Botanical Garden* 12(4):140–143, 1962.)

Lae is situated on the coast of north-eastern New Guinea, at 6°45' S. latitude, and has a truly equatorial climate. The rainfall is abundant year-round, temperatures are constantly warm and day length varies by only 51 minutes through the year. It is a climate suitable for the most sensitive of tropical plants, though many subtropical or temperate plants will do poorly or fail to flower because the lack of seasonal changes in temperature and day length. The active young garden is bound to become an important repository of plants from the equatorial tropics around the world.

The earliest palm plantings appear to date from the mid-fifties, though there are a number of native palms that appear to have been standing on the site prior to the establishment of the garden.

Most notable of these are the many fine old individuals of *Gulubia costata* to be found in the native forest areas and in the area behind the adjacent war cemetery.

The highlights of the garden are the palms native to New Guinea, many of which can be found nowhere else in the world. These include species of *Actinorhytis*, *Areca*, *Calyptrocalyx*, *Drymophloeus*, *Heterospathe*, *Hydriastele*, *Licuala*, *Livistona*, *Nengella*, *Orania*, *Ptychococcus* and *Ptychosperma*.

The main palmetum consists of a large grassy expanse with the palms planted mostly around the edge. A road winds through the area and is lined with *Roystonea regia* palms. A number of old coconut palms have been left standing about the lawn, and in the rainforest border many young *Calamus hollrungii* plants are beginning to climb into the trees. It is a pleasant place, and local inhabitants are often seen strolling among the palms and relaxing on the grass.

The plot which is behind the war cemetery is smaller and more secluded. Here are the best examples of *Gulubia costata*, and the only specimens of *Orania disticha*, which is unusual for its leaves arranged in one plane. A still smaller planting of palms is across from the fire station on Milford Haven Road. Here are the best specimens of *Paralinospadix hollrungii* and *Areca macrocalyx*.

The list that follows was compiled largely from the accession records of the garden, and verified as much as possible through a personal inventory of the



1. The road that winds through the palmetum is lined with royal palms.



2. People return home from market via the botanic garden.



3. Part of the palmetum near the rainforest.

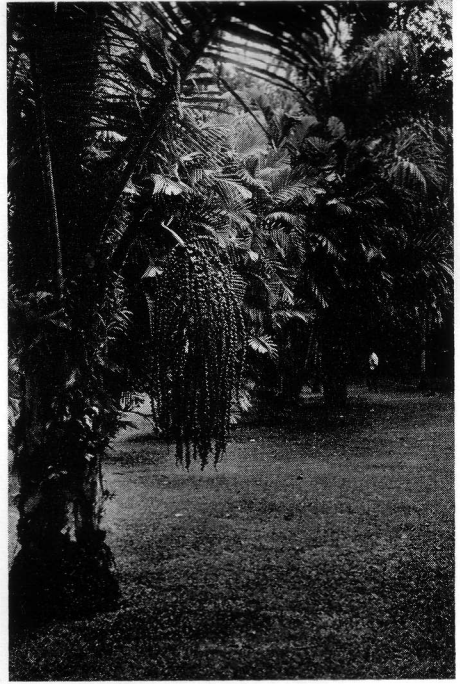
palms in the garden. As in any botanical garden open to the public, many labels have been lost or misplaced over the years. A number of the unlabeled palms are juvenile or currently sterile and



4. Two *Gulubia costata* poke through the rainforest vegetation at the edge of the palmetum.



5. Young plants of *Gulubia costata* come up spontaneously in the native rainforest area.



6. An *Arenga pinnata* in flower with *Ptychosperma* behind.

unidentifiable and cannot be matched with names on the list. In such cases, the names are followed by an X to indicate that the corresponding palms have not been located but may exist among the unidentified specimens. In some cases there are no possible matches, and the palms listed are presumed to have died. These have been removed from the list.

The numbers that follow the name in the list are the garden accession numbers, beginning with E or S. The E numbers represent plants that existed or were planted before regular records were kept. They were inventoried and numbered in 1968. The S numbers, dating back to 1957, are the regular seed accession numbers. Following the accession numbers are the garden location numbers, beginning with P (Palmetum), BWC (Behind War Cemetery), or FS (Fire

Station block), and followed by the numbers by which the palms are marked on the map prepared by myself and Mr. Greg Leach of the garden staff (on file at the garden). For each entry, only a few representative location numbers are listed, though there may be many other individuals located in the garden.

PALMS GROWING IN THE DEPARTMENT
OF FORESTS BOTANIC GARDEN, LAE

Acoelorrhaphe wrightii (Griseb. et H. Wendl. H. Wendl. ex Becc.—S1421: P 11, FS 12

Acrocomia aculeata (Jacq.) Mart.—S2176: P 277–80

Actinorhynchus calapparia (Bl.) H. Wendl. et Drude ex Scheff.—P 184, 260–66
? *Allagoptera* sp.—P 257

Areca catechu L.—scattered locations
A. macrocalyx Zipp. ex Bl.—S1905: FS 1–3



7. *Hydriastele* sp. has an unusual leaf arrangement.



9. *Heterospatha woodfordiana* from the Solomon Islands.

A. cf. novo-hibernica Becc.—P 173

A. triandra Roxb.—S1568: P 251

A. spp.—E2008: P 272; E2019: P 221; S2004: P 168–70



8. Young plants of *Orania macropetala* from seed collected by H. E. Moore in 1964.



10. *Caryota urens* in flower and fruit.



11. When *Caryota* flowers, the ground becomes carpeted with the fallen male flowers.

Arecastrum romanzoffianum (Cham.)

Becc.—P 37, 107

Arenga microcarpa Becc.—S1248, S702:
in native rainforest

A. obtusifolia Mart.—S2317: X



13. New Britain is the home of this *Licuala* species.



12. An unidentified species of *Paralinospadix* from the Milne Bay District (accession S 1990).



14. The leaf bases of *Metroxylon salomonense* are zebra-striped and prickly.



15. An undescribed *Dryophloeus* from New Britain.



17. A close-up view of the crown of the *Livistona* in Figure 16.

A. tremula (Blanco) Becc.—S1526: P 179–183

A. westerhoutii W. Griff.—S876: P 59, 120

A. pinnata (Wurmb) Merrill—S1255, S1259: P 88–90, 244

A. porphyrocarpa (Mart.) H. E. Moore—S2321: X



16. A fine stand of *Livistona* species bears bright red fruit (accession E 2022).



18. *Nengella* species grows in the shady border.



19. A typically large clump of a new species of *Ptychosperma* not yet described.

- A. wightii* W. Griff.—S2309: X
Borassus flabellifer L.—S2707: P 40
Butia capitata (Mart.) Becc. var. *odorata* (Barb.-Rodr.) Becc.—S116: P 217
Butia bonnetii Becc.—S1541: P 2
Calamus hollrungii Becc.—rainforest
Calyptrocalyx lauterbachianus Becc.—S1894: X; S1883: P 27, 28, 121
C. sp.—E2029: P 33
Caryota mitis Lour.—S1057: P 116, BWC 15
C. plumosa Hort.—S578: P 81
C. rumphiana Mart.—S368: BWC 15
C. urens L.—E1020: P 252-4
Chamaedorea erumpens H. E. Moore—S1433: BWC 1-4
Chamaedorea seifrizii Burret—E987: P 94-6, 273-5
Chamaerops humilis L.—S28: P 97, 114
Chrysalidocarpus lutescens H. Wendl.—S2157: P 147-51
Cocos nucifera L.—scattered locations
Copernicia holguinensis León—S1651: X
C. macroglossa Wendl. ex Becc.—S2536: X
Cyrtostachys lakka Becc.—S1055: P 85-87, 256
Dictyosperma album (Bory) H. Wendl. et Drude ex Scheff.—S2134: P 160, 100
Drymophloeus sp.—P 195-6
Elaeis guineensis Jacq.—S882: P 44, 45, 218, BWC 16, 30
Gulubia costata (Becc.) Becc.—scattered in native forest areas and BWC
Heterospathe humilis Becc.—S1893: scattered in shady border areas
H. woodfordiana Becc.—S1911: P 153-5, along Memorial Drive
H. sp.—P 14
Hydriastele microspadix (Becc.) Burret—E2013, E2015, E2018: P 3, 6, 8, 219, 220
H. cf. microspadix—E2010: P 24, 41
H. cf. wendlandiana (F. Muell.) H. Wendl. et Drude—E2012: P 104
Hyphaene crinita Gaertn.—S2792: P 203-5
Latania lontaroides (Gaertn.) H. E. Moore—S1071: P 47, 77, 78
L. verschaffeltii Lem.—S1540: P 52-4
Licuala lauterbachii Damm. et K. Schum.—S1904: P 166-7
L. spinosa Thunb.—S2170, S2487: X
L. sp.—S521: P 9, 26, 55, 80
Livistona chinensis var. *subglobosa* (Hassk.) Becc.—S2282, E2014: P 133-7, 62
L. decipiens Becc.—S416: P 118, 42, 66, BWC 24, 25
L. mariae F. Muell.—S19: X
L. melanocarpa Burret—S5093: X
L. sp.—E2022: P 68-76, 43
Mascarena verschaffeltii L. H. Bailey—S1140: P 106
Metroxylon sagu Rottb.—E1060; scattered localities
M. salomonense (Warb.) Becc.—S1766: P 91-93

- Nengella* spp.—P23, 112, and in various border areas
- Neddyopsis decaryi* Jumelle—S648: P 27, 31, 115, 119
- Nephrosperma vanhoutteanum* (H. Wendl. ex van Houtte) I. B. Balf.—S2320: X
- Normanbya normanbyi* (W. Hill) L. H. Bailey—S2545: X
- Oncosperma fasciculatum* Thwaites—S1035: P 268, BWC 8, 9
- O. tigillarum* (Jack) Ridley—S2304: P 144-5
- Orania disticha* Burret—S955: BWC 26-8
- O. macropetala* Laut. et K. Schum.—S1835: P 126-30
- O.* sp.—S2710: P 211-13
- Orbignya cohune* (Mart.) Dahlgren ex Standl.—S2326: P 255; S2386: P 138-40
- Paralinospadix hollrungii* (Becc.) Burret—S1656: FS 9
- P.* sp.—S1990: P 5, 7
- Phoenix reclinata* Jacq.—S25: P19, 228-30
- Pritchardia pacifica* Seem. et H. Wendl.—S783: P 249-50
- P. thurstonii* F. Muell. et Drude—S784: X
- Ptychococcus* cf. *paradoxus* (Scheff.) Becc.—S1240: P 21
- Ptychococcus* sp.—E2024: P 231-6
- Ptychosperma hybrid?*—S2313: P20, 22
- P. hybrid*—S2294: P4, 18
- P. hybrid*—E2013: P 101-3
- P. macarthurii* (H. Wendl.) Nichols.—P 25
- P. microcarpum* (Burret) Burret—E2016: P 188
- P.* sp. nov. ined.—E2021, E2030, E2031, E2040, E2044, E2045: P12, 13, 34, 57, 58, 61, 99, 185-7, BWC 29, 38
- P.* sp.—S1909: P 124-5; S1919: P 141-3
- P.* sp.—P 225-7
- Raphia farinifera* (Gaertn.) Hylander—S918: BWC 5-7
- R. vinifera* Beauv.—S1156: P 105
- Rhopaloblaste elegans* H. E. Moore—S1907: X
- Roystonea oleracea* (Jacq.) O. F. Cook—S2135: Herbarium Drive
- R. regia* (HBK) O. F. Cook—S238: Palmetum Drive
- Sabal causiarum* (O. F. Cook) Becc.—S847: P117, 113, 79, BWC 18, 19
- S. mauritiaeformis* (Karsten) Griseb. et H. Wendl.—S1584: P 174-8; FS 5-8
- S. minor* (Jacq.) Pers.—S2172: P 206-8
- S. palmetto* (Walter) Lodd. ex Schultes—S828: P 48-9, 83
- S.* sp.—S2062: P 16-17
- Syagrus* sp.—P 271, 276
- Thrinax floridana* Sarg.—S786: X
- T.* cf. *microcarpa* Sarg.—S785: X
- T. parviflora* Swartz—S793: P 98, 267, BWC 17, 23, 33
- Veitchia joannis* H. Wendl.—S1139: P 224
- V. merrillii* (Becc.) H. E. Moore—S789: P 56 and along Huon Rd.
- V. montgomeryana* H. E. Moore—S1125: P 108-10
- Verschaffeltia splendida* H. Wendl.—S2165: P 131-2
- Wallichia* sp.—P192-3
- Washingtonia filifera* (Linden) H. Wendl.—S1279: FS 10, 11
- W. robusta* H. Wendl.—S837: P 111

ACKNOWLEDGMENTS

This article was written while based at the Division of Botany, Department of Forests, Lae, Papua New Guinea on a project for the study of *Ptychosperma* supported by National Science Foundation Grant 20348X, H. E. Moore, Jr., principal investigator.

The Carnauba Wax Palm (*Copernicia prunifera*).

IV. Economic Uses

DENNIS JOHNSON

Department of Geography, University of California, Los Angeles 90024

The carnauba palm has served as the source of a number of products in north-east Brazil. In fact, it has been used in such a variety of ways that there is a saying that a man can live entirely on its products. It was given the sobriquet "tree of life" by Denis (1837), and while this is descriptive it is a designation used to refer to many palms.

Surprisingly little is known about the economic uses of this palm prior to the description by Marcgravius and Piso (1648). They mentioned that the leaves were used as thatch for huts and for basketmaking, and that the wood of the trunk was used to make corrals for livestock. The latter is clearly a result of the Portuguese colonizers, while the former may be as old as the Indian tribes themselves. Nearly a century and one-half later, in a document dated 1783 quoted by Lins and Andrade (1960), the reported uses of carnauba were about the same. The only additional information included was that the fruit and starch from the tree were used as food by the poor people.

Medicinal Use

The roots of the carnauba, especially those of the white variety, have traditionally been used to make home remedies for the treatment of skin diseases, rheumatism, arthritis, etc. (Braga, 1960). The roots can be harvested in small quantities without destroying the tree,

which is important considering the rarity of the white carnauba.

Food Source

The fruit of the carnauba is utilized as food during times of crop failure, often associated with the recurring periods of drought. When green, the fruit may be cooked with milk to eliminate the tannin; when ripe it may be eaten raw (Valverde, 1964). If it is not used as food, the fruit is commonly used to supplement the diets of hogs, goats, and cattle.

The single seed within the fruit is reported to contain about 14 percent oil (Jamieson, 1943), and can be crushed to produce a satisfactory cooking oil. This oil content, however, is insufficient for oil extraction to be commercially feasible. In addition to providing an edible oil, the seed can be ground and roasted and mixed with coffee.

From the pith of the upper part of the tree, a starchy, floury meal can be prepared. The tree can also be tapped for its sap which can be used in cooking, drunk fresh, or allowed to ferment into a palm toddy.

The terminal shoot or heart of palm is edible and is generally extracted when a tree is felled for some other purpose. Heart of palm is part of the traditional diet of the region and is one of the rare green vegetables eaten.

As a substitute for salt, the roots of the common variety of carnauba are utilized.

Pieces of root are gathered and burned in a clay pot or metal pan and the ashes used directly on food.

Young carnauba plants can be browsed by domestic animals. In times of drought when other animal feed is lacking or in short supply, these plants will often be sacrificed. Leaves of the mature palms can also be harvested and chopped into small pieces for animal feed.

Wood Source

The settlement of the semiarid portions of northeast Brazil by cattle ranchers brought with it a demand for general purpose construction wood which could not be satisfied by the dicotyledonous trees of the thorn forest. The straight trunks of the carnauba, therefore, became important in building corrals, as already mentioned, and for ceiling beams in houses and other structures.

The most desirable qualities of carnauba wood are resistance to termites, of major importance in the tropics, and to dry rot. In salt water it is also rot-resistant and this has prompted its use in bridge construction in tidewater areas and as a piling for docks (Souza Pinto, 1928).

The wood has also been used in cabinet work and for making canes. It is hard, yellowish-red in color, lined with black veins, and is said to take a fine polish. It appears, from a reference by Seeman (1863), that carnauba wood was prized enough to be exported and was occasionally found in the timber yards of London.

Despite increased protection of carnauba stands because of wax harvesting, the tree still serves as a wood source for such things as ceiling beams. Specialized uses such as for cabinet work, however, appear to have completely disappeared.

The petiole of the carnauba leaf serves in a number of ways as a wood substitute. It is used in the building of the

simple mud-and-stick houses, for making lightweight fences to keep animals out of household gardens, and for domestic items such as broom handles and corks for bottles.

Fiber Source

Carnauba leaves have long been used to make hats, baskets, brooms, mats, hammocks, and other similar items. The new leaves yield a fine fiber which is used for quality baskets and hats, while older leaves have a coarser fiber better suited to heavier items. Under the old method of extracting wax from leaves by sun-drying and shaking them to dislodge the wax particles, the spent leaves could be used for fiber.

In the late nineteenth century it is reported that fiber was exported to Europe and used as stuffing in mattresses and furniture, as well as for making hats, baskets, etc. (Howes, 1936). Fiber use in Brazil expanded early in the present century and by the 1920s hat making had increased in Ceará to the extent that hats were being shipped to other parts of the country.

The adoption of the Guarany-Ciclone machine for wax harvesting had major consequences, for by chopping up the leaves to liberate the wax, the raw material for the fiber industries was destroyed. Fortunately some carnauba leaves continue to be harvested by the old manual method, thereby providing fiber for small-scale manufacture of the items mentioned.

Wax

In chronological terms wax is the most recent economic item derived from the carnauba. Its initial use was for making candles in Brazil, first reported about the turn of the nineteenth century (Arruda da Câmara, 1810). A few decades later the wax became known in Europe and the

first exports took place in 1845 from Ceará. In addition to its use in candle-making, there was interest in Europe in using the wax as a protective coating for parquet floors (Macedo, 1867). This application only became important, however, in the 1890s when the S. C. Johnson & Son, Inc., of Racine, Wisconsin adopted it as a prime ingredient in their floor polishes.

The present century has witnessed a slow but steady expansion of markets for carnauba wax. While floor polishes and carbon paper were initially the largest consumers, they have in recent decades reduced sharply their usages. Fortunately at the same time other applications have been developed in a variety of products from lipstick and candy to coating for electric cable, and this has helped maintain demand for the wax.

The future of carnauba wax as an industrial raw material might be termed cautiously favorable. Most detrimental to expanding the international market is the high price of the wax, which has sold for as much as \$2.25 per pound. Variability of wax quality is another factor which complicates its use in carefully controlled product formulas. Ironically, the development of mechanized wax extraction which brought about higher yields per leaf, also added impurities which are difficult to remove.

Price and variable quality were the two main reasons why carnauba wax users looked for substitutes wherever possible. In a number of instances other vegetable waxes were tried, but they too had similar drawbacks.

The stiffest competition has come from nonvegetable waxes. Montan wax, obtained from lignite, was one early replacement. More recently the synthetically derived polymers have cut deeply into carnauba wax usage for floor polishes. Their advantages are threefold:

one, a reasonable, steady price; two, complete lack of impurities; three, simple composition and qualities which can be varied to suit specific formulas.

The use of carnauba wax as a raw material in Brazil is one of the keys to its continued significance, and recent data are encouraging. In the early 1960s, for example, an average of 1,400 metric tons per year was being used by Brazilian industries. This level of usage represents about 12 percent of the total production (SUDENE, 1967).

Conclusion

This series of papers has dealt briefly with various aspects of the carnauba palm and its utilization by man. The palm has been the source of a number of different products in northeast Brazil, culminating with its exploitation as a wax source. Despite measures and proposals to standardize quality and reduce production costs, the carnauba's future as an international wax supplier is uncertain due to increased competition from substitutes. Whatever its eventual role as a wax producer, secondary uses of this palm will always be of some local importance, and the association between man and the carnauba palm will continue.

LITERATURE CITED

- ARRUDA DA CÂMARA, M. DE. 1810. Discurso sôbre a utilidade da instituição de jardins nas principaes provincias do Brasil. Rio de Janeiro. Quoted in translation in Koster, H. 1816. Travels in Brazil.
- BRAGA, R. 1960. Plantas do nordeste, especialmente do Ceará. 2nd ed., Fortaleza, Brazil.
- DENIS, F. 1837. Brésil. Paris.
- HOWES, F. N. 1936. Sources of vegetable wax. Bulletin of Miscellaneous Information 10. Royal Botanic Gardens, Kew, U.K.
- JAMIESON, G. S. 1943. Vegetable fats and oils. 2nd ed. New York.

LINS, R. C. & G. C. DE ANDRADE. 1960. Os rios-da-carnaúba. Instituto Joaquim Nabuco de Pesquisas Sociais, Recife, Brazil.
 MACEDO, M. A. DE. 1867. Notice sur le palmier carnauba. Paris.
 MARCGRAVIUS, G. & G. PISO. 1648. *História naturalis Brasiliae*. Pt. 2. Amsterdam.
 SEEMAN, B. 1863. *Die Palmen*. Leipzig.

SOUZA PINTO, G. DE. 1928. *A carnaubeira*. Fortaleza, Brazil (pamphlet).
 SUDENE (Superintendência para o Desenvolvimento do Nordeste). 1967. *Estudo dos principais extrativos vegetais do nordeste*. Recife, Brazil.
 VALVERDE, O. 1964. *Geografia agrária do Brasil*. Rio de Janeiro.

Palmologue Letters and Excerpts

One might question the authenticity of "Palmologue." Whence sprang its etymology? This new feature might just as well be called "Palmology," for both "ology" and "logue" are combining forms signifying discourse and either one would fit without too much strain. Straws were drawn to resolve a choice, and there it is up there as a title or sort of buoy to mark the course.

Not long ago I remarked to the editor of this journal that a good many letters about palms, or at least referring to them, come my way and had the temerity to suggest that a fair number of readers of PRINCIPES might welcome a regular feature consisting of such letters or excerpts from them. I said they would go a long way towards mollifying the feelings of honest dirt-gardeners who are dismayed by technical matter and yearn for articles the literary faculty would term of the earth earthy, the phrase

they snitch from I. Corinthians. The editor, Professor Moore, knew that this meant palm culture, and the dirtier the better. He tossed the ball to me with alacrity and told me to run with it.

The matter quoted may be thoroughly unscientific, or learned, or sprightly, or inaccurate, or novel, depending on the propensities, knowledge, whimsy and sphere of interest of each correspondent. But even more than on any of all that, it will have to depend on whatever comes to hand. Some of it may be several months old, for PRINCIPES appears but quarterly and there is a further lag caused by the time that elapses in preparation of the typescript and its travels first to the editor and then to the printer and finally when printed to the readers.

The quoted letters and excerpts are in roman type. My added comments, if any, appear in italics.

—Dent Smith

From Mr. Kyle E. Brown, Raleigh, N. C., May, 1972.

It was with considerable interest that I read your article on *Serenoa repens* in the most recent issue of PRINCIPES. You and I share a love for this most maligned and little appreciated plant.

Since visiting with you last, just before the Society meetings in Melbourne two years ago, I have ranged far and wide in the south Atlantic coastal states doing research on *Sabal Palmetto* for my doctoral thesis at North Carolina State University. On these various trips I have been continually on the look-out

for the other native palms as well. My observations on *Serenoa* last summer verify your suggestion that 1971 was a heavy seed year all over the range of saw palmetto. I saw it fruiting heavily at Hunting Island State Park, South Carolina (near Beaufort, S. C.), in southeastern Georgia and in interior northern Florida. However, in Baker County, Florida, 1970 was also a good seed year, perhaps even better than 1971. It is a mystery to me why this species fruits so sporadically. I have never really followed it closely, but for years had assumed that a crop was set each year. But such is not the case, apparently, according to your observations and mine too in more recent years. Incidentally, I have one of those "rare" saw palmettos you mentioned; a seedling which I germinated from a meager handful of seed collected last August in Baker County, Florida. At the time of this writing the plant has two seedling leaves about three inches long and looks exactly like numerous *Sabal Palmetto* seedlings of approximately the same age.

I have often wondered to what heights the arborescent form of *Serenoa* might grow. I have pictures of one clump in Pasco County, Florida, which contained two 12-foot, one 10-foot, and one 14-foot tall stems (including leaves). Clear trunk on the tallest was about ten feet. I would appreciate hearing from you on the tallest you have found.

Now as for the blue phase, I have seen it commonly, as you have, from Dade County, north to Flagler County, Florida, growing side by side with the green phase. This one fact eliminates, I believe, all of the common environmental factors as controlling agents for color. Perhaps there is a microhabitat difference which we are not keen enough to detect. I really feel there is a genetic difference, but what manner of isolating mechanism must be at work to prevent

the less common blue phase from being absorbed by the dominant green phase? Have you ever seen the blue phase on the central ridge or west coast? I have not. I have located a few plants of blue phase in interior southeast Georgia on State Road 242 about ten miles east of Folkston. Specimens of the blue phase and green phase plants adjacent at this site are in the herbarium at N. C. State University. I believe this to be the farthest north and inland blue phase has ever been found. Correct me if I'm wrong on this. So much for our friend *Serenoa repens*.

I have not seen any very tall serenoas, or at least not with erect stems. A few of the decumbent stems would measure from about 14 to 18 feet in length. Some that answer to these dimensions are growing wild on land adjacent to mine. The height of the tallest is about 12 feet to the top of the foliage. In photographs I have seen erect plants that appear to be taller. No, I have never seen the bluish saw palmettos elsewhere in Florida than Atlantic coastal areas, but then I have not been far afield in this state for many years.

From Dr. M. E. Darian, Vista, Calif., May, 1972.

This is one time I could talk for an hour just from the notes I kept on the trip to collect palms, i.e., pritchardias, in Hawaii. So far only one *P. lanigera* survived and it almost cost me my life. I had to jump off a helicopter and onto a canyon wall so steep I could easily see the 5,000' to the floor and afterward saw a 3,000' waterfall at the back end of the canyon. My wife almost fell out trying to pull me back into the 'copter, and at that time, due to our weight shifting the center of gravity, we almost crashed that chopper into the canyon

wall. Five lousy plants and I lost one before I got back to the ground. Had to leave one with Paul Weissich (the inspector found soil on it). Of the 3 I got back home, 1 is growing and the other 2 just sit there. . . .

Never a dull moment when Mardy Darian collects palms. He had more to recount about that April collecting trip to Hawaii, but since then has told his story and illustrated it with slides. The excerpt quoted above, nevertheless, was irresistible.

From Mrs. Lucita H. Wait, Miami, Fla., June, 1972.

Our trip to British Honduras this year was quite different from last year's. Last year we took off from the airport at Belize (after a warm welcome from the officers of the B. H. Audubon Society) over incredibly bad roads, to the Mountain Pine Ridge, at about 3,000 feet. Along the way we saw many, many clumps of *Acoelorrhaphe Wrightii*—in fact, the whole area, until we reached some altitude, was amazingly like southern Florida. Except for some coconuts, I recall no palms until we were up on the Ridge. There we saw palms that were either *Thrinax* or *Coccothrinax*. We were not close enough to be sure of identification.

Last month we flew to Belize and transferred to a tiny ten-passenger plane, flying down to Punta Gorda, about 150 miles south, along the coast. The pink tabebuia trees were scattered through the forest, very attractive. There were thousands of *Orbignya Cohune* palms, also.

From Punta Gorda we drove 25 miles to the Columbia Forest Preserve, where we stayed in cottages usually occupied by forest rangers. The Preserve is surrounded by a large area restricted to the descendants of Maya Indians, who use a

slash-and-burn agriculture in order to raise enough corn to see them through the year. They cut down enough brush and trees for their crop, let it dry, then burn it off. They do not cut the cohune palms, however. Sometimes the palms die in the fire, but other times they sprout again. The Indians use the oil from the palm fruits, and also eat the hearts.

There are five *Chamaedorea* species native to British Honduras: *C. Arenbergiana*, *C. adscendens*, *C. geonomaeformis*, *C. graminifolia* and *C. Schippii*, according to Standley & Steyermark. I saw only one, and it had no flowers or fruit, so I couldn't identify it.

Lucita has not yet been to Comundú, Kathmandu, Novaya Zembya and not even Melkosopohnik, but she has been to a lot of other places. Now that she has retired—correction, semi-retired—it seems unlikely that she will remain permanently earthbound in Miami.

From Mr. and Mrs. Melvin W. Sneed, Montego Bay, Jamaica, July, 1972.

It will be of interest to Palm Society members, especially those who may visit Jamaica, to know that a recent development in the southwest part of the Island offers a "Palm Jungle." This is a section of what is promoted as "Paradise Jungle Park."

The "Palm Jungle" is, indeed, what remains of an original sea-level, virgin, tropical forest. Trails through it have been cut and important specimens tagged with botanical names. Aside from palms, the area is laced with orchids and bromeliads, most of them indigenous, and it's alive with birds, but not without mosquitoes.

As for the palms, the piece de resistance is *Roystonea princeps* (Jamaican morass

royal). It is said that this towering palm is indigenous only in western Jamaica. Many mature specimens are in the "Palm Jungle."

An attractive feather palm is *Calyptrinema occidentalis*, which also occurs in scattered locations on up into the high mountains of Jamaica.

Then, there is the exclusively Jamaican *Sabal jamaicensis* (bull thatch), which has been said to be the most "statuesque" of the Sabals—smooth trunk and huge fronds. The "Jungle" is loaded with this species.

Parts of the "Jungle" offer *Thrinax multiflora* (seaside thatch), which is an attractive fan-palm of some 10–12 feet in height.

Paradise Jungle Park is situated near Savanna-La-Mar, which is approximately two hours driving time southwest of Montego Bay, depending on the driver.

Mr. and Mrs. Sneed have already planted many palms, most of them still quite small, at their new home in Jamaica.

The letter excerpt that follows was in a communication received over two years ago. It suggests something that should have come to light at the time, but somehow the letter was misfiled.

From Mrs. Lillian Ehsanullah, Epsom, Surrey, England.

... I received a letter from your friend Mr. W. D. Manley, Stockbridge, Georgia, in which he suggests that I put to you my idea of a "Palm calendar." As I am a new (Danish) member of The Palm Society, I do not know whether such a calendar is already in existence. I have seen so many good photographs of palms in PRINCIPES and the new Newsletter, so I thought would it not be a grand idea to make use of members' photos of common and rare fine specimens of

palms from all over the world for a calendar to be purchased from The Palm Society by members at about one dollar each. The pictures could be in black/white or colour. It could also be used as a present to non-members who are garden-lovers, and the calendars might then induce more people to become members of The Palm Society. . . . If you like my idea, you could perhaps print part of my letter so we could get other members' reaction to a "palm calendar."

An excellent idea, if it can be carried out at today's inflated costs. A calendar illustrated with color photographs would be very striking, but of course would cost substantially more than one containing no color illustrations. Sometimes a larger expense is self-justifying, and would be in this case if the end result were the accession of valuable new members. Cost would also depend on the size and shape of the calendar, whether for wall or desk, and also on the size of the print order. The smaller the order, the larger the per-copy cost. But to this writer the idea seems quite meritorious, and it ought to be thoroughly explored.

From Kenneth C. Foster, Yorba Linda, Calif., August 18, 1972.

So you think a broken ankle by the new president of The Palm Society is news? Well, if you really want the info, here are a few lines.

I was deep in the eastern Costa Rican jungle at La Selva, the OTS (Organization for Tropical Studies) Experimental Station. U.A. and Ben Young from Tampa, Florida and Lois Rossten from Huntington Beach, California were my companions along with Bob Wilson of San Vito, Costa Rica, who was very kindly showing us all around the country. La Selva is one of the finest palm areas I have ever seen, boasting well over a dozen

different species of palms in a relatively concentrated area. *Welfia Georgii*, *Calyptrogyne sarapiquensis* and *Pholidostachys pulchra* were some of the most outstanding. In the two and a half weeks I was in Central America (including the biennial meeting in Mexico City) the day spent at La Selva was the only day it rained. This is most unusual, as June and July are considered rainy months when one can expect rain almost every afternoon. Well, as I walked along a rain-soaked path looking up at some of the taller palms, the path suddenly dipped down and so did I! I lost my balance, slipping to the ground while hanging on to my cameras and seed-collecting gear. I heard a loud "crack" as I hit the ground. Fortunately for me, U.A. is an orthopedic doctor and after he checked my leg he knew exactly what was broken. He taped me up on the spot and pronounced me OK until I could return to California, resting my leg as much as possible.

Luckily the accident happened next to the last day of the trip. To get back to San Jose, I had to walk for about an hour back to the OTS boat landing where we again took the powdered dugout to where Bob Wilson's Landrover was parked. I might add that La Selva is actually an island, which is probably one of the reasons the plant life is still intact. This is hard to find in Costa Rica with the tremendous amount of cutting and burning going on in the name of "progress." From where the Landrover was parked it took five and a half hours over rough mountain roads before the hotel was reached in San Jose.

Pan Am let me fly out a day early and I returned to Los Angeles and a meeting with my family doctor, getting a walking

cast and an extended vacation. Several people have since asked me if this problem in the jungles of Costa Rica has dampened my enthusiasm for palm collecting in the wild, and of course the answer is no. How many people have had accidents in their own homes? . . .

On Sunday, August 13th, probably the largest turnout of the Western Chapter occurred at Dr. M. E. Darian's home in Vista, California. The guest book showed 119 names as members came from all over southern California to attend the auction, lunch and slide show, and of course to see Mardy Darian's fine palm collection. Jim Specht was the auctioneer, and it was reported that \$575 was taken in. Theresa Yianilos prepared an excellent lunch enjoyed by all. In the evening Mardy Darian showed slides of his collecting trip to Hawaii where he and his charming wife Cherie collected several species of *Pritchardia* palms.

U.A. and Ben, referred to above, are Dr. U. A. Young and his wife, of Tampa. Bob Wilson is a noted plantsman and former owner of Fantastic Gardens in Miami, now living in Costa Rica. Ken Foster's bad luck with the fracture was almost offset by the good luck of having an orthopedic surgeon as a traveling companion. . . . The size of the gathering at Mardy Darian's place eclipses the same sort of regional meetings held in Florida. Perhaps the zeal of the Californians is at least partly owing to the challenge posed by a climate not so well suited as Florida's to the cultivation of numerous palm species. Or, to put it the other way, any lack of zeal in Florida is probably owing to the fact that palm-growing is too easy and too commonplace, especially in the southern part of the state.

NOTES ON CULTURE

Studies on the germination of palm seeds

The Indian Botanic Garden, Calcutta, has a rich collection of palms growing all over the garden. The majority of the palm species under cultivation are of ornamental interest only, excepting few economic species such as *Cocos nucifera*, *Elaeis guineensis*, *Borassus flabellifer*, *Phoenix sylvestris* etc., which are also included in the collection. An effort has been made to study the germination of palm seeds of different species available in this garden with the idea of furnishing definite information to the palm growers who are sometimes disappointed by the long period required for the palm seeds to germinate. Seeds of about thirty species were studied covering a major portion of the palms which are growing here.

There are many workers who have worked on the germination of economic palm species particularly on the factors controlling the germination. It has also been found from the works of others that palm seeds germinate readily without applying treatment for hastening germination. However, breaking of seed coat, removal of exocarp, or scarification by dilute sulphuric acid sometimes hasten the germination in some palm seeds. The present experiment has been restricted to record the number of days actually required for germination of each species on normal conditions.

The ripe seeds were collected from the trees growing in the garden and the date of collection was recorded. After collection the fleshy pericarp portion, if any, was removed and seeds were thoroughly washed with water, air dried and cleaned. The seeds were sown in test beds constructed in a row with bricks and cement mortar at the Nursery No. 1 (Figure 1).



1. A section of a test bed in the nursery at the Indian Botanic Garden.

The germinating medium consisted of pure sand washed several times with water and completely dried in sun. The seeds were planted within twenty four hours after collection. About 100 seeds of each species were scattered smoothly over the surface, firmed into the medium and covered with an additional amount of sand to a depth of quarter to half inch. The beds were labelled and the record of sowing dates were noted. The seed beds were never allowed to dry out, nor were they allowed to become over watered. Germination was recorded as occurring on the first day a leaf shoot appeared above the surface of the germinating medium. Exact germination data was kept for all palm species for two years and are summarised in the attached table showing the species sown and the number of days taken for germination.

The medium of germination and the methods used in the present study differ slightly from the methods used by other workers. At the United States Plant Introduction Section near Miami, Florida, palm seeds were sown in seed pans or large flat lightly filled with a heat sterilized mixture of 1 part of rubbed peat moss and 3 parts of screened wood ash. Sand medium was chosen for the present study because of its low water



2. Seedlings of *Dictyosperma album* at the Indian Botanic Garden.

holding capacity and for better protection of the seeds and seedlings against fungal infestation. Results: with the exception of *Elaeis guineensis*, *Licuala spinosa*, and *Acoelorrhaphe wrightii*, which took 152, 280 and 180 days respectively for germination, the remaining 27 species may be classed under four heads on the basis of duration of germination.

(i) 18–30 days :- *Caryota urens*, *Corypha elata*, *Dictyosperma album*, *Livistona decipiens*, *Phoenix canariensis*, *Phoenix reclinata*, *Phoenix sylvestris* and *Thrinax "barbadensis."*

(ii) 31–50 days :- *Chrysalidocarpus*



3. Seedlings of *Pritchardia pacifica* (foreground) and *Licuala grandis* (background) at the Indian Botanic Garden.

lutescens, *Areca triandra*, *Howeia belmoreana*, *Livistona chinensis*, *L. rotundifolia*, *Roystonea regia*, *Ptychoraphis singaporensis*.

(iii) 51–80 days :- *Caryota mitis*, *Latania loddigesii*, *Phoenix humilis*, *P. rupicola*, *Ptychosperma macarthurii*, *P. elegans*.

(iv) 81–130 days :- *Areca catechu*, *Chrysalidocarpus madagascariensis*, *Licuala grandis*, *Sabal blackburnia*, *S. mexicana* and *Thrinax parviflora*.

Sr. no.	Species	No. of days to germinate
1.	<i>Acoelorrhaphe wrightii</i>	180
2.	<i>Areca catechu</i>	90
3.	<i>Areca triandra</i>	50
4.	<i>Caryota urens</i>	30
5.	<i>C. mitis</i>	76
6.	<i>Chrysalidocarpus lutescens</i>	38
7.	<i>C. madagascariensis</i>	84
8.	<i>Corypha elata</i>	20
9.	<i>Dictyosperma album</i>	30
10.	<i>Elaeis guineensis</i>	152
11.	<i>Howeia belmoreana</i>	40
12.	<i>Latania loddigesii</i>	54
13.	<i>Licuala grandis</i>	120
14.	<i>L. spinosa</i>	280
15.	<i>Livistona chinensis</i>	31
16.	<i>L. decipiens</i>	24
17.	<i>L. rotundifolia</i>	45
18.	<i>Phoenix canariensis</i>	18
19.	<i>P. humilis</i>	52
20.	<i>P. reclinata</i>	25
21.	<i>P. rupicola</i>	60
22.	<i>P. sylvestris</i>	20
23.	<i>Ptychosperma elegans</i>	59
24.	<i>P. macarthurii</i>	58
25.	<i>Ptychoraphis singaporensis</i>	41
26.	<i>Roystonea regia</i>	38
27.	<i>Sabal blackburnia</i>	120
28.	<i>S. mexicana</i>	120
29.	<i>Thrinax "barbadensis"</i>	21
30.	<i>T. parviflora</i>	99

S. K. BASU AND D. P. MUKHERJEE
Indian Botanic Garden, Calcutta,
Howrah—3, India.

REPORT OF THE BIENNIAL MEETING

The ninth Biennial Meeting of The Palm Society convened at the Hotel Alameda, Mexico City, Mexico, at 9:30 A. M. on June 22nd, 1972. Fifty four members and guests were present.

Dr. Jerome P. Keuper, outgoing president, welcomed the group and asked each one to stand and introduce himself or herself.

The treasurer's and secretary's reports were read and approved.

The president asked the chairman of the nominating committee, Mr. Otto Martens, to read the slate of officers for the coming biennium. Nominated were:

For President: Mr. Kenneth C. Foster

For Vice-President: Dr. U. A. Young

For Secretary: Mrs. L. H. Wait

For Treasurer: Mr. Wallace E. Manis

The slate was unanimously elected. Mr. Martens then nominated the following directors for 1972-1976:

Mr. David Barry, Jr. California

Mr. Myron Kinnach California

Mr. Billings McArthur Florida

Mr. Dent Smith Florida

Dr. U. A. Young Florida

Mr. Morgan Evans Florida

Mr. Otto Martens California

Dr. Stewart Mathews moved that the directors be unanimously elected. The motion was seconded and passed.

There being no further business, Dr. Keuper introduced the first speaker, Ingeniero Alfredo Perez J., of the Instituto de Biología, Universidad Nacional de México, and head of the Biological Station of Chamela, Jalisco. Sr. Perez spoke on the difference in two types of terrain adjacent to each other, one of which sustained a palm forest of *Sabal yucatanica* palms, the other containing almost 100% *Dialium guianense*, a leguminous forest tree. The conclusion was that the *Sabal* grows on poorly drained clayey soils.

Dr. H. E. Moore, Jr., of the L. H. Bailey Hortorium, Cornell University, Ithaca, N. Y. was introduced. He spoke on the ecology of palms: the environment which they require in their native lands, whether hot and dry, or swampy, whether high on a mountain-top or at the ocean's edge, or in the deep, shady forests. He described the various pollinating media, such as wind, insects, or small animals, and the destructive elements which are influencing their decline and possible disappearance. His talk was illustrated by color slides taken in the palms' native habitats.

Dr. U. A. Young, of Tampa, Fla., newly elected vice-president, told about a recent trip to South America made by himself, his wife and two sons. Starting at Belem, Brasil, at the mouth of the Amazon, they proceeded upriver, stopping at Manaus, Brasil, Iquitos, Peru and Leticia, Colombia. They collected seeds and took pictures of many palms as yet almost unknown to North Americans.

Mr. Otto Martens, of Goleta, California, spoke on his recent visit to Lord Howe Island, source of the commercially valuable *Howeas* (*Kentias*), so popular in the florist trade. Seeds of these palms no longer meet the demand of commercial growers. Mr. Martens made a special trip to the islands to find out the cause of the diminished supply. He found that many of the palms have been destroyed in favor of other crops, others have grown old and have not been replaced, and the islanders seem to have lost interest in harvesting the seeds. He wrote a strong letter to the Lord Howe Island Board of Control (see *Principes*, January 1972), recommending methods for the increase of production, and said that he has received assurances that something will be done.

Following the four speakers there was

a panel discussion, led by Mr. Kenneth Foster, newly elected president. The panelists were: Mr. Martin Wittbold, Dr. H. E. Moore, Jr., Mr. Dent Smith, Mrs. L. H. Wait, Dr. U. A. Young, and Mr. Otto Martens.

Mr. Wittbold spoke briefly about commercial palm growing in northeastern Florida. Dr. Moore spoke on palm classification, Mr. Smith on cold hardiness, Mrs. Wait on the organization and operation of the Society, Dr. Young on introduction and growing of seeds and plants, Mr. Martens on commercial palm growing in California. After these brief remarks the meeting was thrown open to questions from the audience, and an animated question and answer period followed. The meeting was then adjourned.

The banquet was held that evening at the same location. Sixty three persons attended. During the social hour we were entertained by a *mariachi* band, courtesy of Mr. Dent Smith, founder and first president of the Society. Mr. Foster, the new president, presided at the banquet. He expressed the warm thanks of the Society to Dr. Keuper for his two-year term as president. He also thanked Dr. Keuper and Mr. Smith for their efforts in making the arrangements for the meeting in Mexico City. Dr. Keuper presented a plaque to Mrs. Wait, in appreciation of her work as executive secretary for fifteen years. Mr. Foster presented her with a gold pin in the shape of a palm tree, crowned with a pearl "seed," gift of the California members.

The crowning event of the evening was Mr. Smith's amusing reminiscences of his years in Mexico as a young and impecunious adventurer.

* * *

Thursday, Friday and Saturday were given over to sight-seeing in and around

Mexico City, with trips to Chapultepec Castle, the Anthropological Museum, the Pyramids, the Ballet Folklorico, as well as an all-day expedition to Cuernavaca and Taxco.

On Sunday we flew to Guatemala City, Guatemala, and the following day to Tikal, to visit the famous Maya ruins and to search the jungle for palm seeds. The ruins are impressive, but the seeds were few. On returning to Guatemala City the group separated, four members going on to Costa Rica for more seed collecting, others to visit the famous sights of Guatemala or to return home.

LUCITA H. WAIT

REPORT OF THE SECRETARY

1970-1972

The two years since the last Biennial Meeting, held at Florida Institute of Technology, Melbourne, Florida on August 1, 1970, have been relatively uneventful ones. The meeting itself was well attended. We were invited to use the dormitories of the Institute at very reasonable rates, so several members brought their families to enjoy the beaches and outdoor activities.

You have read, in *PALMS*, the account of the post-convention trip by twelve members to Guyana and Venezuela.

Members

At the 1970 meeting we reported a total of 520 paid-up members, and a loss of 46 members who did not renew their memberships. Some of these did renew at a later date. As of today we have 502 paid-up members. This is a much greater loss than it seems, as new members have been enrolling constantly. Actually, more than 100 members are in arrears, among them some of our oldest and most loyal. In part, I believe, this has been due to the change-over in the beginning

of our fiscal year from May 1st to January 1st. This has caused quite a lot of confusion, which we hope will soon be cleared up. Mrs. Buhler has sent out a *third* and *final* notice, and when we get home we hope to find a lot of renewals waiting. We will start readying a new roster of members as soon as we return, and we do not want to leave out anyone who wishes to continue in the Society. (Mrs. Buhler is the new Executive Secretary. I am using the "we" because I am serving as her unpaid assistant until she becomes used to the routine).

Subscribers

Our list of institutional subscribers has increased very little. We now have 129 libraries, universities and botanical institutions subscribing to *Principes*. These are organizations which do not wish to have the privileges of membership, but simply to have our publication on their shelves. This is a very small number of subscribing institutions, and we would like to find a way to increase the circulation. Any suggestions will be most welcome.

Plant Sales

On October 2nd, 1971, the southern Florida group of the Society conducted their first sale of plants to the public. The originator and chairman was Mr. Chauncey Barnes. Members were generous with donations of palms and other plants. Although there was not enough time for thorough preparation, the public's response was excellent, and the plants were soon gone. We took in \$500.00. Of this amount, the group voted to donate \$200.00 to Fairchild Tropical Garden for the purchase of another herbarium case to contain palm specimens. It was much needed, as palm herbarium specimens are large, and take up much room. Another \$200.00 went into the Society's general fund, and

\$100.00 was retained by the group for special events or needs. The group is planning future sales, as the demand seems great.

The western group has been holding auctions at occasional meetings, and has earned quite considerable funds among its own members. These funds have also been used for worthwhile purposes.

Seed Bank

This has been a banner year for the Seed Bank. There are 200 names on the Seed Bank want list, and this number increases steadily. Of these 61 are also on the list for "any rare seed." The regular list which we send to new members has 94 palms on it. These are palms whose seeds are usually readily available to the Seed Bank. We also suggest that persons wanting seeds of palms not on the regular list send us their requests. About 300 genera and species in this category have been requested, many of them so rare and unusual that one wonders if they could ever reach the Seed Bank. Amazingly, quite a number of them have been received, thanks to generous friends.

One contributor of many new and rare species is Mr. John Dransfield. This young Englishman studied at The Botany School at Cambridge University. He then spent some time in Malaya, where our group met him four summers ago. He now is spending some time in Indonesia, including Sumatra and Java. From there he has sent the Society many treasures, including several which are still unidentified.

Mr. Fred Essig (whom we met in Hawaii), after working there and at Cornell, has spent a year in New Guinea. He has been generous with seeds collected there, among them several new or unknown species of *Ptychosperma*, in which he has a special interest. While he studies and identifies them the "rare

palm" devotees will be growing them while looking forward to learning their correct names.

The personnel at Cairns Botanic Gardens, in North Queensland, Australia, has sent valuable material, some of it quite out of the ordinary.

Our friends in Thailand, particularly Capt. Ura Snidvongs and Cmdr. Watana Sumawong, have supplied the Society with rare seeds, including Pinangas and Licualas from their native forests.

And, of course, our endless gratitude to Dr. H. E. Moore, who not only produces our fine journal, *Principes*, but in his extensive travels throughout the world has sent many otherwise practically unobtainable seeds. From Gabon, Africa, in March, 1971 he sent seeds of the rare *Podococcus garteri*, which were immediately distributed to those who had requested them. There was no germination until May, 1972, when three members reported germination. A wait of fourteen months! Other species have taken even longer to appear.

We have received gifts of seeds from many other members, also. All money over and above the expenses of distribution go into the general fund of the Society. All Seed Bank activities are voluntary—no one is paid. Last year the cost of printing *Principes* increased by about \$600.00. Revenue from the Seed Bank covered most of this extra expense. The Society is most grateful to all those who have been so helpful.

New Executive Secretary

On January 1st I retired from the job of Executive Secretary. Mrs. T. C. Buhler has taken over most efficiently, and I am sure all of you wish her well and will do all you can to make her work enjoyable.

Respectfully submitted,
LUCITA H. WAIT
Secretary

NEWS OF THE SOCIETY

On August 13, 1972, the Western (California) Chapter of The Palm Society held a day-long meeting at the home of member Mardy Darian to see the unbelievable palm collection he has assembled on his three acres. The meeting started at noon with a well-stocked smorgasbord prepared by the cook-book author and member Theresa Yianilos aided by the hostess. The cost was \$1.50 per person (children under 12 free) which included not only the delicious food but all the beer you could drink.

At the auction held after lunch, thanks to generous donations from numerous members and tremendous enthusiasm, a total of \$562 was netted. Donated plants are the sole sustenance of the Western Chapter.

By 8 p.m. all but 20 guests had left so those remaining were treated to a slide presentation by the host. It was indeed a memorable meeting and one that will long remain in the memories of the 120 "Palm Nuts" who attended it.

On Sunday, August 20, 1972, a group of the Miami Area members gathered at the home of Lucita Wait to do her honor for having had a palm named for her. After a pleasant cocktail hour the group proceeded to a Japanese restaurant for a delicious meal. As a fitting climax, member John Turner, who had conceived the idea originally, presented Lucita with a handsome framed picture in which he had mounted the striking frond from his own plant of *Ptychosperma waitianum*. Under this were mounted the three pages from PRINCIPES describing the palm, and a fourth page stating that this picture was presented to Lucita Wait by the Miami Area members in recognition of her great contributions of time, enthusiasm and knowledge to The Palm Society.

PALM SOCIETY FINANCIAL STATEMENT

December 31, 1970–December 31, 1971

Income:

Contributions	\$6232.58	
Subscriptions	1076.26	
Seeds	1176.17	
Convention misc. 1970	1060.00	
Plant Sale	<u>156.80</u>	\$9701.81
Interest earned, savings account		<u>101.45</u>
Earned income		9803.26
Transferred from savings account		500.00
Income, less interest		<u>9701.81</u>
Total deposits in checking account		10201.81
Expenses		9859.22
Transferred to savings account		<u>1000.00</u>
Total amount of checks disbursed		10859.22
Net expenses		9803.26
Net earned income		<u>9803.26</u>
Net loss		<u>55.96</u>

Balance, 1st Nat. Bank of S. Miami, 12/31/71	\$1684.56	
Balance, Security Fed. Savings Bank	<u>2542.06</u>	
Total net worth		4226.62

Expenses:

Printing <i>Principes</i>		\$5441.31
<i>Salaries:</i>		
L. Wait	\$1680.00	
W. Everngam	900.00	2580.00
Social Security tax		131.58
Office rent		240.00
Petty cash		240.00
Postage		128.00
Computer service		212.80
Bank charges		7.94
Seed expenses		91.43
Printing and typing		67.52
Convention expense (food, 1970)		543.54
Publication refund		5.40
Publications (H. Loomis)		100.00
Repairs, typewriter		25.40
Misc.		<u>46.30</u>
		9859.22
Transferred to savings account		<u>1000.00</u>
		<u>10859.22</u>

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