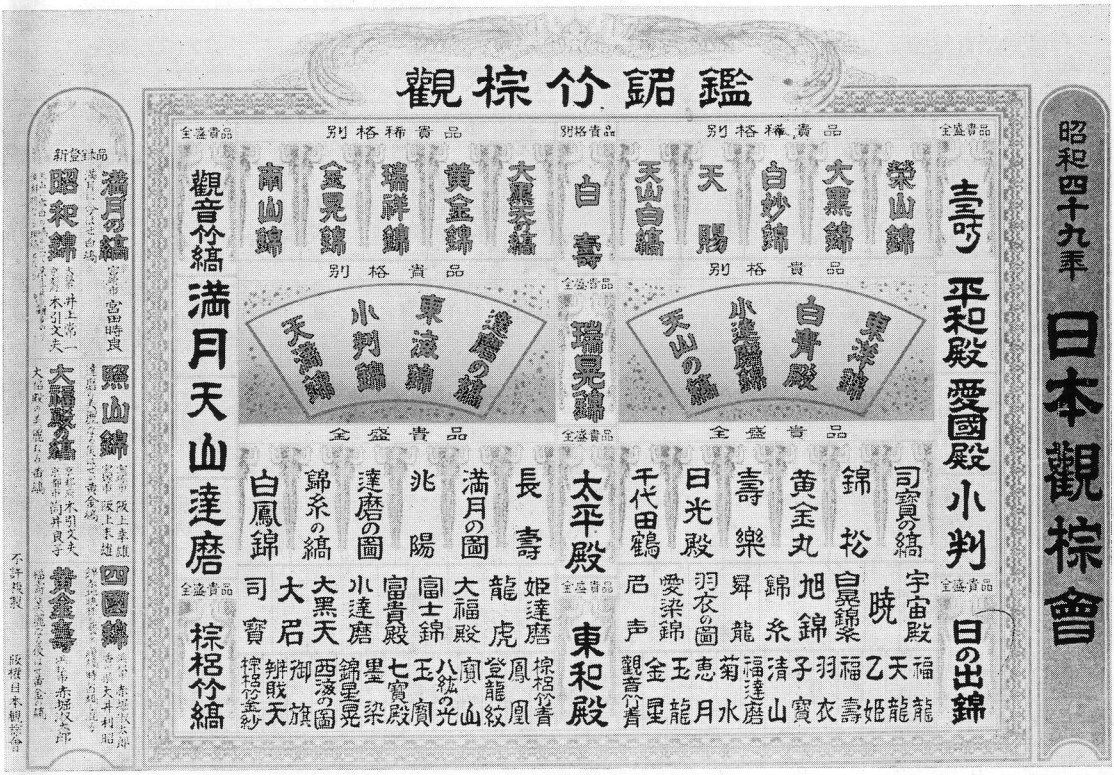


PRINCIPES

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July, 1974
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The Culture of Rhapis in Japan

KIYO-O YAMAGUCHI AND DAVID BARRY, JR.
Kobe, Japan and Los Angeles, California, U. S. A.

Plants belonging to the genus *Rhapis* are not indigenous to Japan. They are native to the southern countries of Asia, such as South China, Vietnam, Laos, Cambodia and Thailand, where some one dozen species have so far been described. The two apparently undescribed species from Thailand mentioned in PRINCIPES, Volume 17, No. 1, can probably be added. Of these fourteen species, only two are commonly cultivated in Japan. *Rhapis excelsa* (Thunberg) Henry in Rehder [*Rhapis flabelliformis* L' Héritier ex Aiton] and *Rhapis humilis* Blume.

Rhapis excelsa in Japanese is called *Kannon-chiku* and *Rhapis humilis* is called *Shyuro-chiku*, with the accent on the "o." *Kannon-chiku* means a bamboolike plant that came from Kannonzan, a temple (or a mountain) in the Ryukyu Islands (Okinawa). *Shyuro-chiku* means a bamboolike *Shyuro*, the name for *Trachycarpus fortunei* (W. J. Hooker) H. Wendland.

The first appearance of these two *Rhapis* in Japan is considered to be some time in an early year of the 17th Century. The name *Shyuro-chiku* appeared in a book dated 1666. In another book printed in 1694, there is a description, "Shyuro-chiku leaves are like Shyuro, stems like Bamboo." The name *Kannon-chiku* is seen in a book printed in 1709. Later, in a book dated 1818, it is stated, "A plant named Kannon-chiku came from Ryukyu. It is a kind of Shyuro." Records of this kind indicate that *Trachycarpus* came to Japan before the *Rhapis* palms. Incidentally, *Rhapis excelsa* was introduced to Europe from Japan in 1774, *Rhapis humilis* in 1837.

The first landing of *Rhapis* in Japan is said to have beeen at the port of Sakai, near Osaka. It was in 1672 that merchants in Sakai were licensed by the central military government (Shogunate) to trade with Chinese merchants and the Dutch. Until that time, contacts with foreigners were allowed only at the port of Nagasaki. The time was the dawn of a new Japan after many hundreds of years of seclusion from the world outside. Naturally there was an intense curiosity for anything new and foreign.

The merchants of Sakai were soon enriched through the legal and illegal importation of the attributes of civilization. They proudly lived in the western mode, sitting in Chinese chairs and drinking port with Portuguese *vidrio*. In the drawing room of such a merchant, on an ebony table, also from China, one would find a *Kannon-chiku* planted in an imported pot. It matched well the exotic mood of the room, and the owner found it an ideal house plant as it would grow in the shade. He presented it to the feudal lord, perhaps also with wine and blankets, in appreciation of the authority to import rifles for his lordship. The lord marvelled at this exotic plant. It was in pleasing harmony with the typical Japanese rooms of his castle. Besides, the plant could be admired equally from all directions, the leaf stems radiating in six directions, spiraling up the trunk clockwise so the sixth leaf would come directly above the first. The feudal lord offered it to the Shogunate in the capital, Yedo, now



1. The President of the Japan Kannon-Shyuro-chiku Association at the awarding ceremony of the 9th All-Japan Concourse, Hamamatsu City, April, 1972.

Tokyo, as a plant of good luck and esteem. The Shogun, in his turn, presented offshoots of his plant to other local lords, who treasured the gifts as symbols of honor.

Thus, *Kannon-chiku* and *Shyuro-chiku* found their way into the gardens and drawing rooms of the aristocrats and the rich. As time went on, and as the plants became more popular, some Samurai of lower classes began to grow them for side income. It afforded also a good means for the Samurai to approach personages of higher rank, and many followers appeared. The restoration of Meiji in 1867 abolished feudalism and the caste of Samurai. This change brought the plant of lords within the reach of the common people. At about this time, the striped or variegated *Kannon-chiku* appeared. It was first mentioned in a book published in 1839. As to the first variegated *Shyuro-chiku* (*Rhapis humilis*), no date for its discovery is recorded, but as tradition says it was known in the early Meiji era, it is assumed that the striped *Shyuro-chiku* was introduced sometime before the Meiji Restoration. (From "Kannon-chiku and Shyuro-chiku" by Y. Okita.)

To sum up, the popularization of *Rhapis* began approximately 100 years ago, after 200 years of cultivation restricted to the privileged class. During this period, propagation was by division, as *Rhapis* is not disposed to produce seed in Japan. The climate is blamed for this lack, but more probably it was due to the dioecious character of the genus. It is remarkable that in the days before thermometers, heaters and glass houses, the subtropical *Kannon-chiku* was kept alive during the Japanese winters.

At that time, *Kannon-chiku* (*Rhapis excelsa*) was considered to be a dwarf variety of *Shyuro-chiku* (*R. humilis*) which had already been introduced and which could be planted out in gardens as it was the hardier. By and by, the difference between the two plants was observed, and in a recent book by T. Yoshida, the following characteristics are described:

	Kannon-chiku *Rhapis excelsa*	*Shyuro-chiku* *Rhapis humilis*
Leaves	Dark green, thick, minutely serrulate margin.	Light green, thin, faintly serrulate margin.
	Leaflets not many (maximum 12)	Leaflets many (maximum 32)
Stem	Height 2 m., diameter 2½–3½ cm.	Height 4–5 m., diameter 1½–2½ cm.
Root	Flexible	Less flexible and likely to break
Temperature	Cannot withstand. minus 3°C. for more than 10 hours.	Withstands minus 8°C.
Varieties	86	9

There are more than 150 horticultural varieties of *Rhapis* now being cultivated in Japan, including seedlings and unregistered plants. Each registered kind is given a Japanese horticultural name, identified by the number, length, type, color and variegation, if any, of the leaves, and by the length and thickness of the petiole. These varieties are grouped into five clones:

Traditional clone—plants multiplied from plants imported in the old days from the Ryukyu Islands.

Formosan clone—plants imported from Formosa, or Chinese plants imported through Formosa.

Chinese clone—plants imported directly from China.

Imported clone—plants imported from countries other than Formosa and China.

Seedling clone—plants raised in Japan from seed.

In the old days any plant that looked like a *Kannon-chiku* was called by that name. There was no regard for names or origins. It is probable that other species besides *Rhapis excelsa* and *Rhapis humilis* were imported and remain in the parentage of cultivated plants.

Between 1933 and 1939 some alert enthusiasts and nurserymen went to Formosa to collect *Rhapis*. At that time Formosa was a territory of Japan and there were no travel restrictions. These collectors probably brought back all of the different kinds of *Rhapis* being grown there at that time. Many of these imports were in a variety of leaf forms, and were sold at high prices as new kinds of *Kannon-chiku*.

The addition of these new kinds spurred to a peak the already intense interest in this plant. In 1938 the Japan Kannon-chiku Union was organized. Its first All-Japan Concourse was held in the next year, and the first Ranking Table was published in 1940. It contained 35 kinds of *Kannon-chiku* and *Shyuro-chiku*. The activity was great, and a real boom in *Rhapis* was under way. This, however, was quickly quenched by the outbreak of World War II in 1941, leaving behind it an episode when a profi-



2. At a contest hall.

teer of the boom donated the cost of an airplane to both army and navy. Many palms were destroyed during the war, but some plants did survive, and after the cease-fire in 1945 cultural activity began again. By 1947 a new *Rhapis* association had been formed and named Nihon Kanso Kai (Japan Kannon, Shyu-



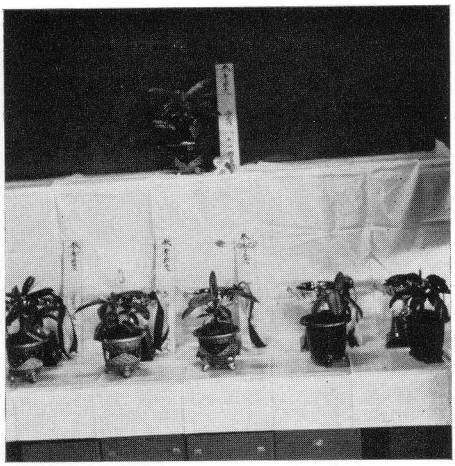
3. A main exhibition table with framed Ranking Tables.

ro-chiku Association). The ranking table was revised with 47 *Kannon-chiku* and 3 *Shyuro-chiku*, and the All-Japan Concourse was held in 1949, showing rapid revival of the feverish interest in *Rhapis*. Thus, the second boom began.

This time, variegated plants played the leading role. With improved techniques many variegated plants were produced from the Formosan clones, and exorbitant prices quoted for such plants inflated the boom until it was considered abnormal. At last, in 1951 a depression began and prices continued to decline until 1961. The reason was over-production of green plants from better heating systems and a large increase in the number of speculators. Some sophisticated collectors bought variegated plants reasonably during this period and carried them along until the third boom began. This one reached a peak in 1967, and then hit bottom in 1970. While it lasted, the fever was frantic and many beautifully variegated plants were developed and exhibited.

At present (July 1973) a fourth boom is getting under way. For the first time a new element is present—the purchase of *Rhapis* as an inflation hedge, as with gold or diamonds.

In 1972 a new star of the variegated *Kannon-chiku* was found among the seedlings raised by a Formosan enthusiast. It was brought into Japan, propagated and registered with the name 'Eizan Nishiki'. There are but a few plants, perhaps ten, of this kind in Japan, and it is the most expensive *Rhapis* of the present with prices quoted from $20,000 to $80,000 per plant. The next plant in rating is 'Nanzan Nishiki', another beautifully variegated plant from Formosa. It is more plentiful, perhaps with as many as fifty plants in the country, and the prices asked are $15,000 to $20,000. Going down the ranking table in descending order of importance, there are about forty kinds of variegated *Rhapis*.



4. Prize winners and trophies.

The retail nursery catalogue prices of less important variegated *Rhapis* range from about Yen 500,000 = $1,850 for a very good plant to Yen 200,000 = $740 for a good one. The lowest-priced variegated plants from nursery catalogues are Yen 10,000 = $37.50, and a large nursery in Tokyo requires a minimum purchase of $1,000. Such is the scale of the *Rhapis* business in Japan.

Value does not depend on size, but on the refinement and elegance of a plant. A low-grown, densely foliaged plant with evenly dispersed variegation on flawless leaves has the highest value. Parti-colored or over-abundantly variegated plants are evaluated only as mother plants for obtaining offshoots of desirable patterns. The way in which a yellow stripe is streaked on a leaf is frequently a matter of several hundred dollars.

As the variegated *Rhapis* are so much appreciated, many attempts have been made to induce variegation on green plants. Exposure to X rays or Gamma



5. An auction of professionals.

rays from Cobalt-60; Isotope bath; treatment with Alchyl compounds known to induce mutation, such as N. mustard dioxibutan, and anti-metabolic substances such as 5-Bromouracil; application of checking substance of nuclear fission such as colchicine, etc., etc. But all these trials were unsuccessful. (From "Kannon-chiku, Shyuro-chiku," by T. Yoshida.) Some scholars are trying to prove that the variegation is a work of a virus, but no conclusion has yet been given, and the cause of this phenomenon is a mystery for the moment.

The outstanding element in the culture of *Rhapis* in Japan is the standard practice of growing small plants only and always in pots. The finest exhibition plants range from 20 to 50 cm. (8 to 20 in.) in height. In semi-tropical and tropical countries when planted in the ground, *Rhapis excelsa* will reach a height of two meters, and *Rhapis humilis* a height of four meters. Japanese do not grow tall plants, which are inconvenient to transport and to caress. When offshoots are wanted they are readily taken from small plants not over 50 cm. (20 in.) in height.

The pots used for *Rhapis* are so standardized as to be ritualized. They are of clay and are glazed black to gather maximum warmth from the sun. They come in sizes from 9 to 24 cm. (3½ to 9½ in.) inside diameter, and have large drainage holes. The form is urn-like with flat rim and a round bottom supported by three legs. Expensive variegated plants are usually contained in gorgeously decorated pots, with hand-painted, raised patterns, and often with gilt rims and legs. Such a pot will cost more than $100. The beauty of the pot is not considered in the competitions, but naturally a pleasing match between pot and plant makes an elegant presentation.

The potting medium is coarse sand of weathered granite. This rather unusual medium, being without humus, imposes a stress condition on the plants.



6. *Rhapis humilis* or *Shyuro-chiku* grown to mature size.



7. *Rhapis humilis* 'Hakusei-den', a variegated clone.

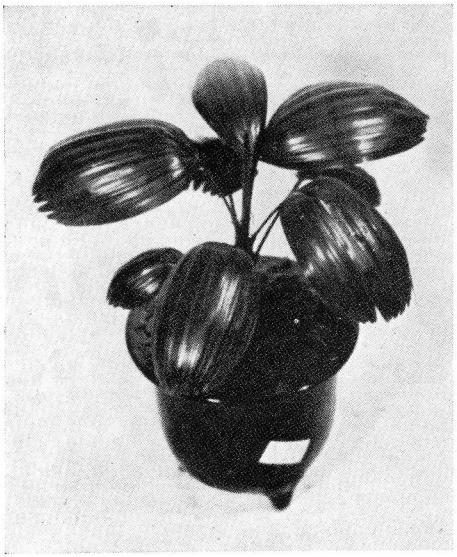
This promotes deviations from the natural and normal foliage forms as well as striped variegations. According to Toshihiko Satake, the leading palm collector in Japan, when *Rhapis* are taken from the pot and freed from, to quote him, "the severe potting condition consisting of the use of coarse sand" and planted in the ground, they will return to their original characteristics, even when their leaves are distinctly different from those of normal plants.

As for food, a liberal amount of manure is given to obtain offshoots from green plants, but it is given sparsely to variegated plants. In either case, because of the coarse medium, the effective elements of the manure are washed away by watering, and do not stay long in the pot. It is a secret of each grower how to give manures and how often to water the plants. In spite of such care, some variegated *Rhapis* will occasionally lose their striping or gradually enlarge the variegated portion until the entire leaf becomes albinized. Such a plant is called a weak plant, as against strong plants with a stable variegation.

All the variegated *Rhapis* registered by the Association are considered to be strong plants. A condition of regis-



8. A clone of *Rhapis excelsa* called 'Nanzan-Nishiki' is also variegated.



9. 'Mangetsu' is a clone of *Rhapis excelsa* from Formosa.

tration for variegated plants is that similar variegation should appear in at least three consecutive propagations —mother plant, offshoot and grand-offshoot.

The association Nihon Kanso Kai, or the Japan Kannon, Shyuro-chiku Association, is conducted by a forty-member board of directors, supported by 1500 direct members and a chapter in almost every prefecture in the country. A general meeting is held every year in November, when a nomination committee is elected to examine the applications filed for registration. The committee also compiles a new Ranking Table for the next year. The newly registered plants are introduced on the left column of the Ranking Table, and the ranking order of other plants is revised. The Association also holds an All-Japan Concourse from time to time, and generous prizes are given to the winners. The 8th Concourse was held at Hamamatsu City in 1972; the 9th will be in Sakai in April 1974.



10. *Rhapis excelsa* 'Zuiko-Nishiki' is grown in quantity.

Apart from this association, scientific study of *Rhapis* is being conducted by a few scholars, of which the foremost is Toshihiko Satake, a director of The Palm Society. He has assembled one of the great collections of palms, with more than 450 species. Among the *Rhapis* are more than 40 kinds when species and varietal clones are counted together. The number of species of *Rhapis* is unique, and most of them do not appear to be in horticulture outside of his collection. Among them are the following:

Species	*Origin*
Rhapis filiformis Burret	Kuangsi, China
R. gracilis Burret	Kuangsi, China
R. laosensis Beccari	Laos
R. micrantha Beccari	West Tonkin
R. multifida Burret	China
R. robusta Burret	China

Rhapis with distinctive stable foliar characteristics designated informally as *R. "elegans," R. "grandifolia," R. "minor,"* and *R. "ptychophylla."*

Mr. Satake considers that the countries of origin given for these palms are correct but that some of the names of the plants are assumptions due to the incomplete taxonomy on the genus.

A recent solicitation of representa-

tive nurseries in Japan showed that these species of *Rhapis* are not available from them. On the other hand, they do offer many kinds of named clones.

In a recent letter Toshihiko Satake stated that when the Ranking Table for *Rhapis* was first published 15 years ago he procured all of these plants listed for observation in cultivation. After growing them for some time, it became impossible to differentiate between most of them. Even the plants that deviated the most in appearance from that of the typical *Rhapis excelsa* form returned to it when planted in soil.

He went on to say that there are, none the less, plants that are stable and hold their variegation even when planted in the ground. In the unstable plants the white or yellow striping will burn and turn brown in bright light. This will happen even with stable plants except for the following three: 'Zuikon Nishiki', 'Nazan Nishiki', 'Eizan Nishiki'. The stability of the first includes hereditary traits. Mr. Satake stated that he set seeds on this kind and obtained seedlings which were variegated white and green.

There are many reasons why *Rhapis* palms are so popular and so widely grown in Japan, and to an extent not found elsewhere. To begin with, these oriental palms in Japan combine very nicely a hobby with a profit. Further, the development of the variegated leaf changed a plain, all-green plant with inconspicuous flowers into one of vivid, decorative value. Of course, the activity of the *Rhapis* Association is an important supporting factor.

The principal reason, however, is that in Japan *Rhapis* are grown in pots and are not planted out. This makes it easy to shelter the plants inside during winter and for people without gardens to grow them. Besides, with the plants close at hand close observation with better care is easy.

A pine tree in the garden will reach ten meters without particular care. This does not satisfy Japanese lovers of plants. They want to bring into their rooms a fifty-year-old pine tree potted in a small container, and to be able to live with it in close proximity. The unique art of "Bonsai" was developed for this purpose. The meaning of "Bonsai" is literally tray-culture, referring to the traylike, shallow containers used. A pot of *Rhapis* is not Bonsai in a strict sense, but it is called that in a wider meaning. This is natural, as many of the techniques of growing Bonsai are used with *Rhapis*.

For these many reasons *Rhapis* is not grown tall in Japan. Very recently, however, with Japanese living more westernized, demand has appeared for full-grown *Rhapis* for the decoration of halls and entrances, and some nurserymen have started production of such plants in large containers. These are all-green plants at present, but some day a big, variegated *Rhapis* with beautiful stripes may win the first prize at the Concourse.

Palms in Southern England

MICHAEL A. F. CARTER

70 Cheviot Road, Durrington, Worthing, Sussex, England

The British climate is notorious throughout the world for its rainy cloudy days and winter mists and fog. This weather pattern, caused by the prevailing westerly winds blowing off the open Atlantic Ocean, may limit continuous high temperatures and endless sunny days in summer, but similarly the influence of the Gulf Stream allows much milder winters than lands lying between 50°N and 60°N have a right to expect normally.

This maritime influence is naturally more marked on the western seaboard than in the east, where winters are cooler, summers hotter, and the weather tends to be sunnier and dryer. However, even here, because of the size and shape of the islands, this variance is merely a matter of degree, for on the sunny southeast coast the annual average of bright sunshine is only 1,830 hours.

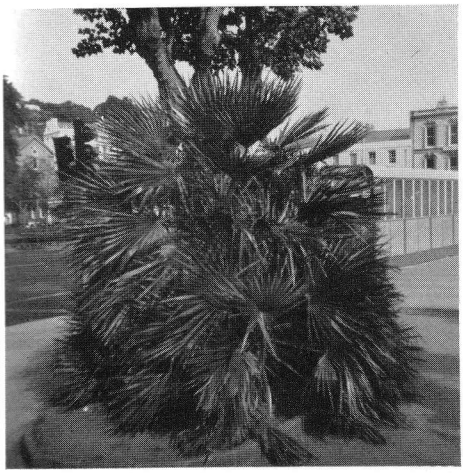
My home at Worthing in Sussex is on this southeast Channel coast, being some 57 miles southwest of London. As happens with many coastal resorts throughout the world, local residents and park authorities in this region like to create a subtropical effect by planting trees and shrubs not normally featured in the area. Here, this effect is attempted by growing *Yucca* varieties, *Cordyline australis*, bamboos, and the palm species *Trachycarpus fortunei* and *Chamaerops humilis*. To my knowledge, however, no pinnate-leaved palms are growing in southeast England.

I recently had the opportunity of spending a short holiday in Devon and Cornwall, the two most southwestern counties of England, and naturally decided to keep an eye open for plants flourishing in these mild areas but not normally seen further east. I planned to visit Torquay, a popular holiday resort on the southeast Devon coast, before proceeding to Penzance in the southwest of Cornwall, where I was to stay. Whilst in Penzance I also hoped to visit the Scilly Isles lying some 30 miles off Lands End, which contain the famous Tresco Abbey Gardens.

The climatic data for these areas with London and my home town for comparison are: London, coldest mean monthly average temperature 39½°F and hottest month 64°F; Worthing, 40½°F and 63°F; Torquay, 43°F and 61½°F; Penzance, 44½°F and 61°F; and Scilly Isles, 46°F and 61°F.

Whilst in Torquay, besides the popular *Trachycarpus* and *Chamaerops*, which can be seen practically everywhere, I noted a fine 30-foot *Phoenix canariensis* growing in a public garden beside the main promenade. This tree, I believe, was planted out about 12 years ago, having presumably previously outgrown some greenhouse. It survived the severe winters of 1961/2 and 1962/3 (the latter being the coldest winter for a hundred years in many areas here) and is growing quite healthily.

Also in this resort, Mr. G. R. Muir kindly allowed me to photograph *Jubaea chilensis* (25 feet) and *Butia capitata* (18 feet) growing in his garden. He informed me that some of the palms in the garden were planted before the turn of the century. These palms, growing as they do at approximately 50°25′N must be some of, if not the most north-



1. *Chamaerops humilis* growing as a street tree, Torquay, Devon.



3. *Jubaea chilensis* in the garden of Mr. G. R. Muir, Torquay, Devon.

erly pinnate-leaved palms growing in the world!

Moving further southwest, I noticed fine eucalyptus trees, *Dicksonia* tree ferns, massive *Cordyline australis*, and Japanese bananas flourishing in the parks of Penzance.

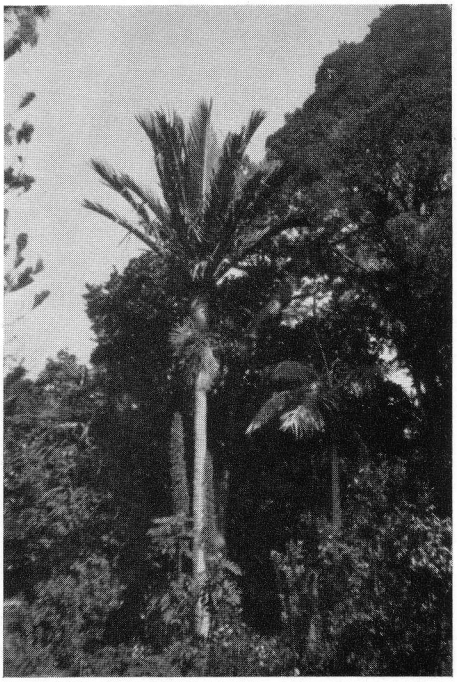
However, the principal feature of this holiday was a trip to the Scilly Isles. These islands, lying about 300 miles from London, are at this latitude (49°, 56′N) the last of Europe and of land generally until Newfoundland's shores are washed by the Atlantic. They consist of approximately 100 islands, islets and rocks, of which five are permanently inhabited. They are a veritable world in miniature, as the largest island, St. Mary's, is only 2¾ miles long and the resident population of the entire group is about 2,000 people only.



2. *Butia capitata* in the garden of Mr. G. R. Muir, Torquay, Devon.



4. *Phoenix canariensis* at Tresco, Scilly Isles.



5. *Rhopalostylis sapida* (center) and *Ptychosperma elegans* (right) flanked by Norfolk Island pines and *Metrosideros*, Tresco, Scilly Isles.

As can be imagined, the area represents an escape from mainland cares and worries and the islands are accordingly popular holiday spots. The other major industry for the islanders is the growing of early-flowering spring plants, which are sent to the mainland markets from about Christmas time to early April. The area, although enjoying mild temperatures (a temperature below 25°F would be very rare) has an annual mean temperature of only 52½°F, which approximates to a southern California winter and the average afternoon temperature in midsummer is a mere 66°F. Annual rainfall is about 32 inches and the soil is a light sandy loam.

I flew by helicopter service to St. Mary's and then travelled by boat about a mile and a half across the sound to Tresco, a low-lying island with unspoilt silver sand beaches. The island of Tresco is leased by the Dorrien-Smith family from the Duchy of Cornwall and the Abbey Gardens, which were started in the 1830's by one of their ancestors, are privately owned, but are open to the public on week days. Before the gardens were commenced, the island was a bare wind-swept spot with nothing larger than a gorse bush! Accordingly when Augustus Smith, the garden founder, started his dream of growing exotic trees, he first had to plant a shelter belt of pine and cypress before the advantages of the climate could be enjoyed.

However, the result of this advantageous climate can now be seen in its full glory, for beyond the shelter belt, eucalyptus, acacias, *Metrosideros*, myrtles and bamboos create a dense jungle in which flourish *Trachycarpus fortunei*, *Chamaerops humilis*, *Phoenix canariensis*, *Jubaea chilensis*, *Butia capitata* (as "*Cocos campestris*") *Washingtonia robusta*, *Livistona australis*, *Rhopalostylis sapida* (to 35 ft.), *Ptychosperma elegans*, and *Cyathea* and *Dicksonia* tree ferns.

Also noted, apart from the above mature species, were juvenile plantings of *Sabal minor*, *Livisona chinensis*, *Arecastrum romanzoffianum*, and *Archontophoenix cunninghamiana*. Surprisingly, I did not notice any howeas which, because of their use as house plants, must be the most easily obtained palms in England. The Canary Island dates and the *Rhopalostylis* palms seemed most at home on their new island habitat and appeared as healthy and vigorous (both seeding freely) as I have personally seen palms growing anywhere, including within the tropics.

Notes on Caryota no Becc. and Other Malesian Caryota Species

JOHN DRANSFIELD

Herbarium Bogoriense, Bogor, Indonesia.

In December 1971 I distributed a large quantity of seed of *Caryota no* Becc. to The Palm Society Seed Bank under the collector's number *Dransfield 2153*. The following preliminary taxonomic note may be of interest to growers who received samples of the seed.

Caryota no is, I believe, when well grown the most massive species of the genus. It was first described in 1871 by Beccari in *Nuovo Giornale Botanico Italiano* (Beccari, 1871), the description being based on Beccari's own collection, *P.B. 3643*—a collection made near Singhi (*sic*), in the First Division of Sarawak, Borneo. The curious specific epithet originates from Beccari's transcription of the local name, *cayu no* (*kayu no*); Beccari also mentions the local Dayak name *onus* as applied to the fibre of the tree—a local name which is used as *unus* to mean the whole tree in South Kalimantan, Indonesian Borneo. It is possible that Beccari was mistaken in the local name *no*, as *enau* (with the "e" hardly pronounced) is one of the most widespread Malay names for *Arenga pinnata*. Beccari distinguished *Caryota no* from other species of the genus by its much greater size, by differences in the shape of the leaflets, and by the presence of two seeds in the fruit. This combination of characters was felt by Beccari in 1871 to be sufficient basis for the separation of *kayu no* as a distinct species. However in 1871 in the first part of Volume One of Beccari's monumental *Malesia*, he had changed his mind concerning the taxonomic status of *Caryota no*. In this work (Beccari, 1877) he recognizes two species of *Caryota* in the Malesian region and numerous varieties, viz:

Caryota rumphiana var. *moluccana* Becc. from the Moluccas
C. rumphiana var. *papuana* Becc. from the Key Islands and New Guinea
C. rumphiana var. *australiensis* Becc. = *C. albertii* F.v.M. from the Cape York Peninsula of Australia
C. rumphiana var. *borneensis* Becc. = *C. no* Becc. from Borneo
C. rumphiana var. *javanica* Becc. = *C. maxima* Bl. from Java
and *C. rumphiana* var. *indica* Becc. = *C. obtusa* Griff from the Malay Peninsula
and *Caryota griffithii* Becc. from Borneo, Malaya, and Java,
and *C. griffithii* var. *selebica* Becc. from the Celebes.

Caryota rumphiana Mart. is thought to refer to the large solitary *Caryota* of the Moluccas.

Unfortunately, of all palms, *Caryota* is one of the most difficult to represent adequately on an herbarium sheet, and, as is well known, types of this genus made in the last century without field notes, are extremely fragmentary, difficult to interpret, and virtually useless for trying to match up with more modern collections. A monograph of *Caryota* will involve, I imagine, tedious work matching up fragments, possibly with

the aid of anatomical characters of the leaflets. In a way, therefore, it is not surprising that Beccari found that the easiest solution to the taxonomic problem within Malesian *Caryota* was to recognize two species only: *Caryota griffithii* was applied to small clustering plants, with two varieties (this is apparently no different from *C. mitis* Lour.), and *Caryota rumphiana* applied to larger solitary species. It is most unfortunate that Beccari did not have material from the Philippines at hand for consideration when he wrote his note. In those days of slow travel, Beccari would not have been able to make comparisons between wild populations, and collections in botanic gardens would have been even more incomplete than now; added to this, all *Caryota* species in the herbarium look very much the same. I feel, therefore, that by the time Beccari came to write his note in *Malesia*, the striking impression of the giant Bornean species may have dimmed sufficiently for resemblances to have won over differences, and for *Caryota no* to be reduced to *C. rumphiana* var. *borneensis*.

The situation within the genus *Caryota* in the Malesian region today has not much changed since Beccari's day. Several species from the Philippines were unknown to Beccari (*C. cumingii* Lodd., *C. majestica* Lind., *C. nana* Lind., and *C. speciosa* Lind.), and Beccari later described *C. merrillii* from the Philippines (Beccari, 1894), Burret described *C. macrantha* from Sumatra, and Ridley decided that Beccari's later combination *C. obtusa* Griff. var. *aequatorialis* Becc. deserved specific rank as *Caryota aequatorialis* (Becc.) Ridl. There are also several epithets first coined by Blume which are not considered by Beccari. There is hence a very real mess in the nomenclature and taxonomy of *Caryota* with a plethora of names.

I have not seen the type specimens of more than three or four of the specific epithets, so the following notes based on field observations and not on herbarium material, must be regarded as very preliminary.

Starting with the island of Java, I recognize here two taxa within the genus:

Taxon 1) is a lowland clustering, small species with spreading leaflets and small one-seeded fruit; this is the taxon widely known as *C. mitis* Lour.; this same palm I have seen with relatively little variation other than in size throughout the lowlands of Sumatra, the Malay Peninsula, and the Minahasa Peninsula of the North Celebes. In South Borneo there is a palm, very similar in all respects, except that the leaflets are somewhat broader, thicker and somewhat concave. I do not know whether this slight difference is constant in cultivation, but, slight though the difference in the leaflets is, it is sufficient to make the whole plant look a bit different from the clustering *Caryota* of Java, Sumatra, the Malay Peninsula, and North Celebes.

Taxon 2) is a giant solitary *Caryota* with drooping primary pinnae, drooping leaf apex, and pendulous leaflets, bright pinky-red fruit containing one seed only (very very rarely does one find two seeds). This palm is no longer common in Java and is found normally above 1,000 m. in the mountains. This palm corresponds, I think, with Blume's *Caryota maxima* and Beccari's *Caryota rumphiana* var. *javanica*. In the *Flora of Java* (Backer and Bakhuizen van den Brink) it is referred to as *Caryota rumphiana* Mart. I have found a palm identical to the Javanese taxon 2) throughout the main range (Bukit Barisan) of Sumatra from Lampung in the south to Aceh in the north. I have been near the type locality of Burret's *C. macrantha*

and I can see only what I regard as the one widespread taxon there. Similarly, I can see no difference at all between the Sumatran/Javanese taxon and the giant mountain *Caryota* in the Malay Peninsula. I therefore do not as yet believe in the existence of the taxon *Caryota rumphiana* var. *indica* Becc. = *C. obtusa* Griff. = *C. obtusa* var. *aequatorialis* Becc. = *C. aequatorialis* (Becc.) Ridl. as distinct from *C. maxima* Bl. = *C. rumphiana* var. *javanica* Becc. = *C. rumphiana* Mart. sensu Backer and Bakhuizen of Java and of Sumatra (sensu Dransfield). The giant *Caryota* from the mountains of South Thailand may well turn out to be this same widespread taxon 2).

Apart from these two taxa mentioned above as found in Java, I know of no other wild species of *Caryota* in Sumatra and the Malay Peninsula. In Borneo as far as I know, taxon 2) is missing. There is however another plant.

Taxon 3), the biggest *Caryota* of all, solitary, with a bulging trunk like that of *Roystonea regia*, vast leaves with stiff main rhachis, stiff primary pinnae and pendulous leaflets, huge inflorescences ultimately bearing large dark purple, almost black fruit, about 98 percent of which contain two hemispherical seeds. This plant is a lowland plant and I have not seen it above 400 m. altitude. This corresponds I believe with *Caryota no* Becc. = *C. rumphiana* var. *borneensis* Becc.

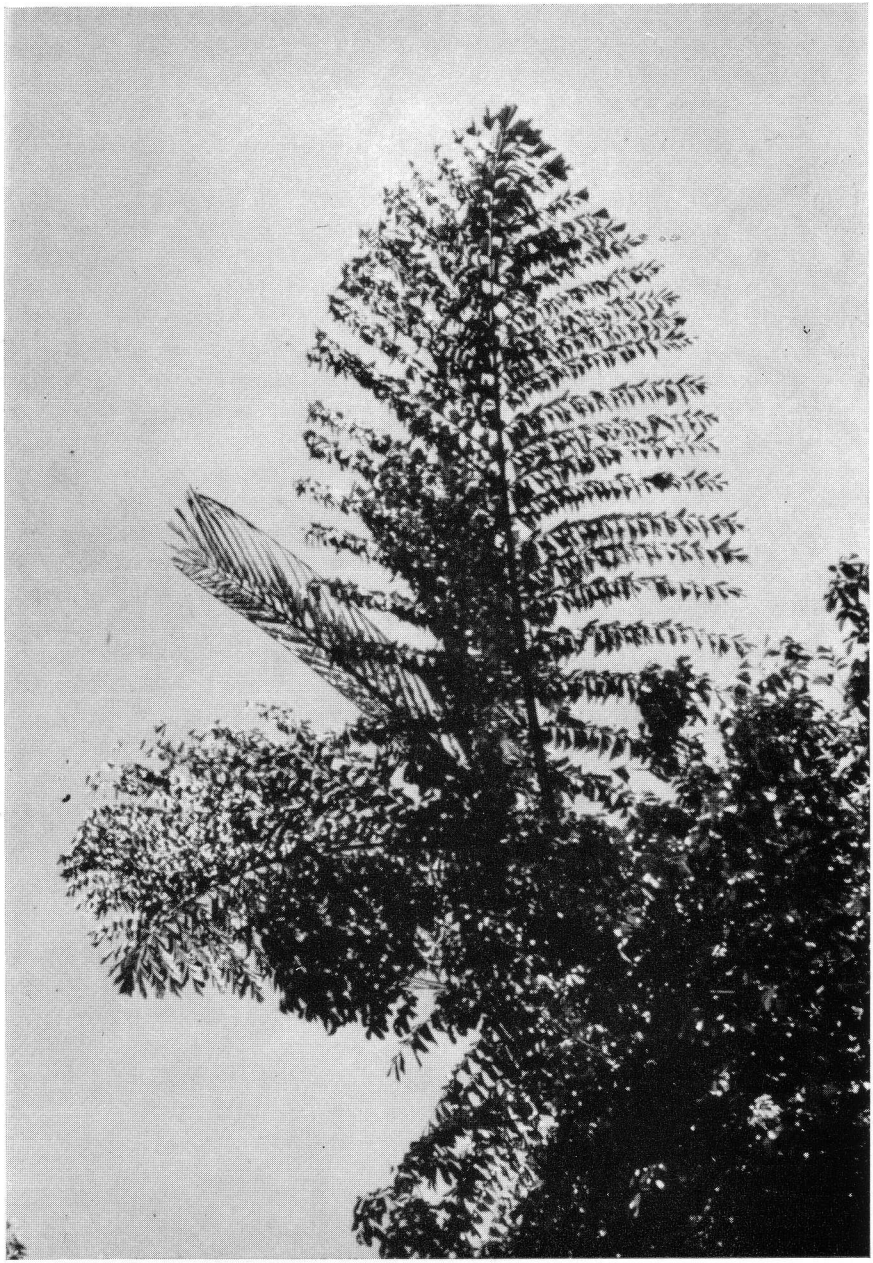
In the Minahassa Peninsula of North Celebes is Taxon 4), a solitary, medium-sized plant rarely exceeding 15 m. with a uniform trunk 15–20 cm. in diameter, the leaves with main rhachis and primary, slightly drooping, pendulous leaflets, and the first two or three primary pinnae on each side highly reduced and spidery, bearing slender, highly serrated leaflets, the whole reminiscent of Pteridophytae aphlebiae, quite different from the other pinnae, and not observed by me in any other *Caryota* taxon; the fruit is pinky-red, and about 95 percent of the time contains two small hemispherical seeds. This palm is widespread and common from about 20 m. to 1,200 m. altitude, a very wide ecological range. (Incidentally in November 1973, I distributed seed of this taxon to the Seed Bank under the collector's number *Dransfield 3732, Caryota* sp.). I have not been able to match this palm with any published epithet.

Photographs of a lowland, solitary, moderate-sized *Caryota* from Ceram in the Moluccas taken by Dr. Charles Lamoureux of the University of Hawaii look somewhat similar to taxon 4) but have stiff primary pinnae and main rhachides. I have no doubt that this is Beccari's *Caryota rumphiana* var. *moluccana* and hence the true *Caryota rumphiana* Mart. Seedlings of this species brought back from Ceram have rounded seeds still attached; though these may represent freak one-seeded fruits of a two-seeded palm, I think it more likely that this is a one-seeded palm.

I know nothing of *Caryota* in New Guinea and Australia and would very much like to receive information on habit, leaf orientation and flowers and fruit, on New Guinea and Australian populations. Beccari does mention that the fruit of *C. rumphiana* var. *papuana* is one-seeded.

When the palms of the Bogor Botanic Gardens are examined however, the situation is much more confused; in many cases records have been lost or are incomplete, and the *Caryota* spp. show confusingly intermediate forms. It is possible that some of these may be of hybrid origin, or may originate from outside the Malesian region.

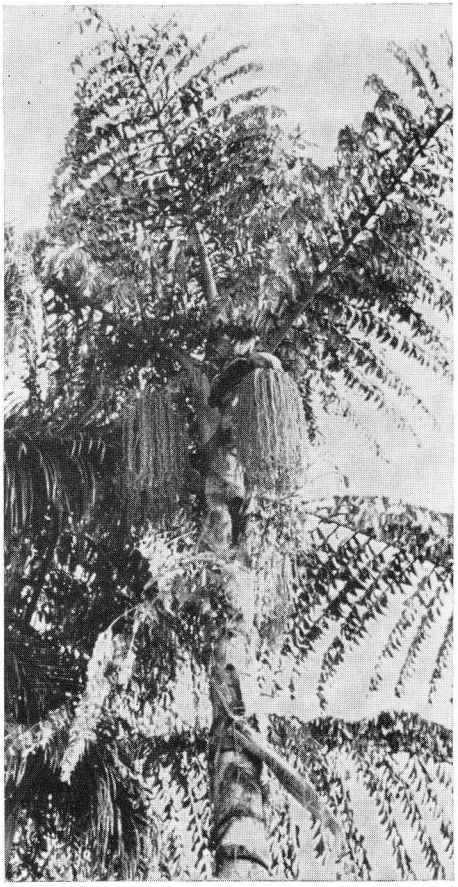
My field observations in Java, Malaya,



1. Looking up at the crown of *Caryota no* near Ranau road, Sabah. From color transparency by H. E. Moore, Jr.



2. *Caryota no* in the Kebun Raya, Bogor, Indonesia, planted in 1957.



3. Inflorescences of *Caryota no* at Bogor.

Sumatra, Borneo and the North Celebes do suggest to me that the four taxa I have enumerated above are really very distinct, and also that the differences are sufficient for the taxa to be given equivalent taxonomic categories; that is, if we are going to call the clustering taxon 1) *C. mitis*, then the other three taxa must receive specific rank rather than receiving subspecific rank within *C. rumphiana.* Owing to the extraordinary difficulty of representing *Caryota* in the herbarium and the terrible scraps we have, I am unimpressed by the similarity of the specimens in the Herbarium. I feel field characters are of far more significance in the taxonomy of this genus.

Because of this, I shall continue to use for the giant Bornean *Caryota* the wonderful name *Caryota no* rather than *C. rumphiana* var. *borneensis*, until any monographic treatment of the genus should make it advisable to change the name. Indeed the differences between taxon 2) and taxon 3), for instance, are as great, if not greater, than between taxon 1) and taxon 2), and are greater than the differences between species in many other palm genera.

After this clarification or further confusion of *Caryota* some notes on *Caryota no* as a plant may be of interest.

I first saw wild *Caryota no* in May 1971 near Samarinda in East Kalimantan—here it was growing in an old *ladang* (unit of shifting cultivation), was still young and not yet flowering, and despite growing in a scorched open habitat, was still a grand plant with its swollen trunk and vast leaves. In October 1971, I returned to Borneo, this time to South Kalimantan, and was fortunate enough to see a very well grown individual of *Caryota no* growing in rich riverside alluvium at the edge of a rubber plantation. The palm presented a wide range of stages of flowering and fruiting and particularly welcome were large quantities of ripe fruit. The trunk was to 20 m. tall, ventricose, up to 70 cm. in diameter at the widest point. The leaves measured about 5 m. long, with a spread of 4 m. The inflorescences hung down in great two-meter-long tresses and the fruits seemed to ripen purplish-black without passing through an intermediate pink stage. Beneath the tree were great piles of fruit, in various stages of fermentation and rotting; insect activity was quite considerable within the pile of fruit, and mixed in with the rotting fruit were thousands of seed-

lings almost forming a lawn under the palm. These seedlings probably originated from the first (most distal) infructescence which, when we visited the palm, was shrivelled and dead. To cut down this magnificent tree seemed sacrilegious, yet to climb it was impossible. Collections were finally made after two weeks thought while we were elsewhere in the forest, by making a bridge-ladder of bamboo which our tree-climber used to cross from the top of a nearby rubber tree which he had climbed, into the crown of the *Caryota*. As we finished making the collections, a pied hornbill (*Anthrococerus coronatus convexus*) flew clumsily on to the ripe infructescence and daintily ate about twenty ripe fruit by swallowing them whole—each mouthful being accompanied by a toss of the head—and then flew off. As in all Caryotoideae the mesocarp contains many irritant oxalate crystals. How does the hornbill survive the crystals, where even to the human hand the mesocarp is wildly irritating? This is an unanswered problem. It is also interesting to note that the *musang* and the *dedes* (*Paradoxurus hermaphroditus* and *Viverra malaccensis*, two types of civet cat) in Java are fond of the fruit of *Caryota* taxon 1) and taxon 2)—their dung is often full of the seeds the germination of which is not impaired and is possibly enhanced by passage through the civet cats' guts.

In Bogor in the Kebun Raya are two well grown trees of *Caryota no* planted in 1957; these two trees originate from seeds sown in the Gardens, collected by A. J. G. H. Kostermans under the name *Pinanga* sp. from Samarinda, East Kalimantan. In February 1973 one of the trees produced its first inflorescence. Sixteen years from seed to maturity, and maturity at a great size, suggests a very fast rate of growth. Because of its lowland habit *Caryota no* should prove to be an excellent avenue tree for cities in the lowland tropics; its quick growth and relatively short life cycle of about 20 years from seed to death after flowering should not deter its use—after all, roads in cities nowadays rarely last 10 years without some alteration or widening.

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Some Ecological Notes on Sabal yucatanica in Mexico*

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The ecological information on *Sabal yucatanica* L. H. Bailey reported here derives from an extensive vegetation survey of the northern part of the state of Chiapas, Mexico, in connection with a field program on several wild yams (*Dioscorea*) of pharmaceutical interest (Pérez Jiménez and Sarukhán K., 1970).

Environmental Data

The general area studied is located in the most northern portion of the state of Chiapas; the zone of present interest is between the villages of Huimanguillo, Tabasco, and Reforma, Chiapas, some 40 kilometers from the city of Villahermosa, Tabasco (Fig. 1). This area is part of the southeastern coastal plain and geologically is of Upper Miocene age, while the surrounding coastal plain is of Pleistocene age.

The climate of the study area, based on data from the nearest weather station at Huimanguillo, is "hot humid with rains in summer, Am(i')" according to the system of Koeppen modified by García (1964). The average annual rainfall is 2279.8 mm. (80.9 in.) and the average annual temperature is 25.9°C. (78.6°F.). Winter rains represent 10.7 percent of the year's total.

Figure 2 shows the distribution of rainfall and temperature throughout the year. As seen from this figure, four months have less than 100 mm. (some 40 in.) of rain, including a dry month (March) in the sense of Koeppen (1948), since it has less than 60 mm. (23.5 in.) of rain.

Vegetation and Soils

For the study of vegetation, the methodology proposed by Miranda, Gómez-Pompa and Hernández X. (1967) for tropical regions was followed. It was possible to define two plant associations in the northern part of the study area: a Tropical Rain Forest (*Selva Alta Perennifolia*) of *Dialium guianense* (Aublet) Sandwith (Leguminosae) and a Palm Forest (*Palmar*) of *Sabal yucatanica*. Analysis and comparison of the edaphic characteristics of the two associations disclosed differences, especially in the percentage of clay in the soil (Table 1).

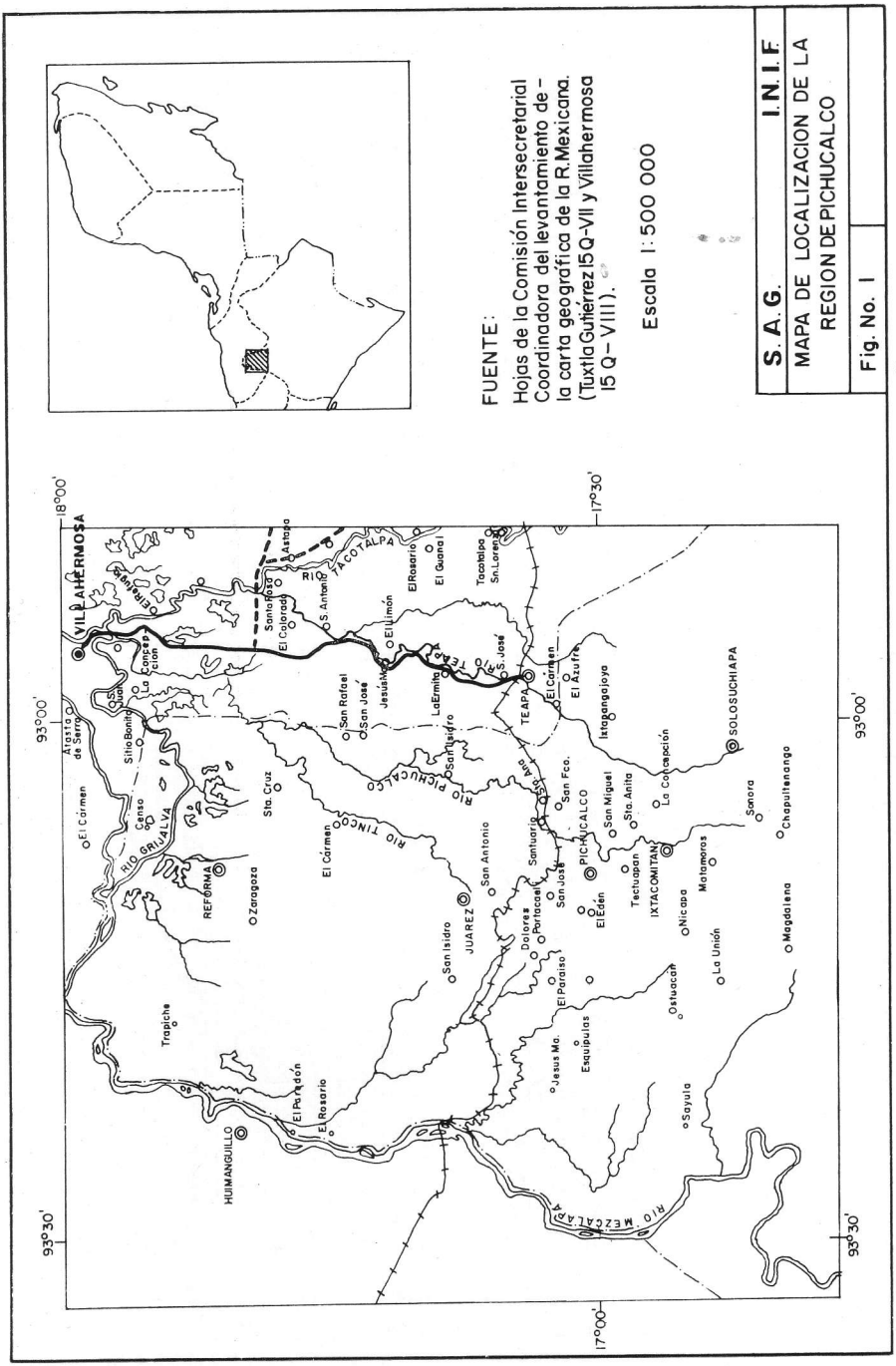
Discussion and Conclusions

Differences in vegetation appear within one climatic condition in the north of Chiapas owing to edaphic and geological differences. One vegetation type is the *Palmar* of *Sabal yucatanica* which grows on soils of special characteristics (Fig. 3). In the area studied, the presence of *Sabal yucatanica* is determined by

* Presented at the biennial meeting of The Palm Society, Mexico, D. F., June, 1972.

→

1. Map showing the region of the zone studied.


FUENTE:
Hojas de la Comisión Intersecretarial Coordinadora del levantamiento de la carta geográfica de la R. Mexicana. (Tuxtla Gutiérrez 15Q-VII y Villahermosa 15 Q – VIII).
Escala 1: 500 000
S. A. G. I. N. I. F.
MAPA DE LOCALIZACION DE LA REGION DE PICHUCALCO
Fig. No. 1
ESCALA GRAFICA EN KILOMETROS
VILLAHERMOSA
PICHUCALCO
TEAPA
JUAREZ
REFORMA
HUIMANGUILLO
TACOTALPA
SOLOSUCHIAPA
IXTACOMITAN
Río Mezcalapa
Río Grijalva
Río Tacotalpa
Río Pichucalco
Río Tinco

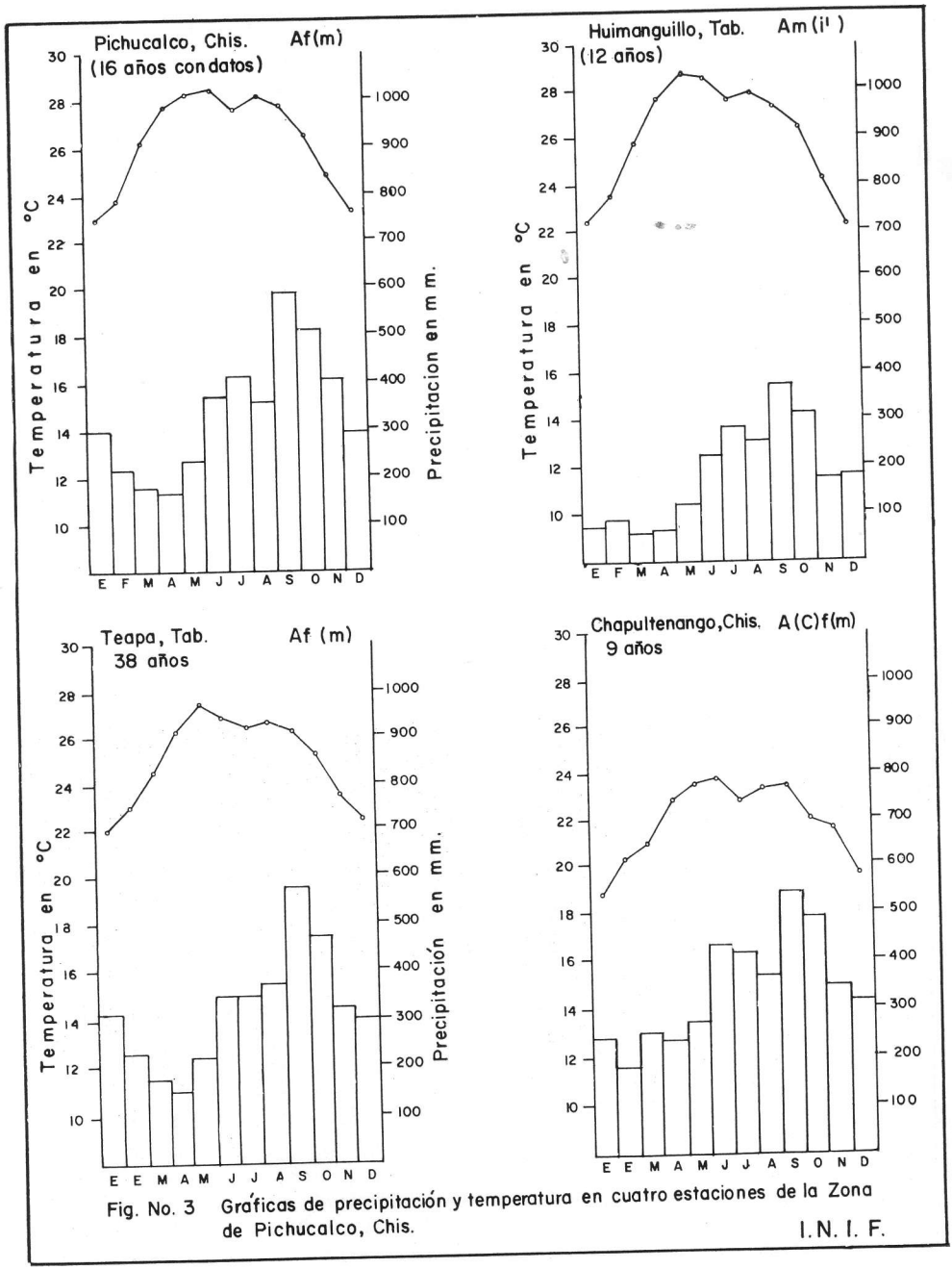


Fig. No. 3 Gráficas de precipitación y temperatura en cuatro estaciones de la Zona de Pichucalco, Chis. I. N. I. F.

2. Precipitation and temperatures for the zone studied.

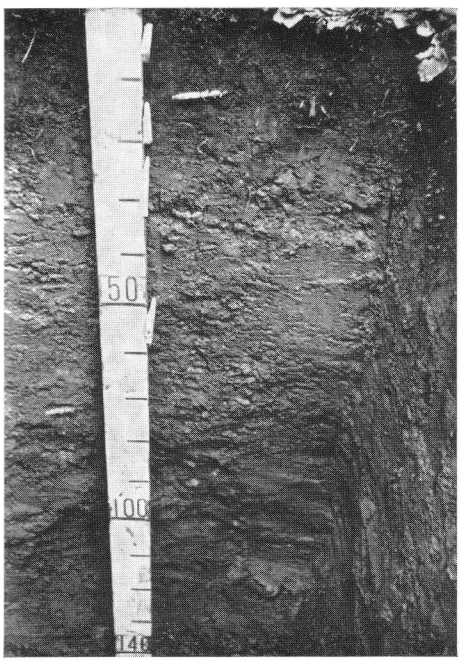
Table 1. Soils of the forest of Dialium guianense *and the palmar of* Sabal yucatanica.

Horizon	Depth in cm.	% Sand	% Silt	% Clay	% O.M.	C/N	
A_1	0–5	62.7	24.0	13.3	7.11	10.23	Forest of
A_2	5–25	63.7	24.3	12.0	4.64	9.61	*Dialium*
A_3	25–38	60.7	24.7	14.6	2.92	9.10	*guianense*
B_1	38–75	42.0	20.7	37.3	1.03	8.78	
B_2	75–150	41.0	22.4	36.6	0.00	0.00	
A_1	0–6	38.0	25.4	36.6	13.24	15.51	Palmar of
A_2	6–31	35.4	20.0	44.6	4.64	14.54	*Sabal*
A_3	31–59	31.4	17.0	51.6	2.54	15.34	*yucatanica*
B_1	59–110	20.7	22.0	57.3	0.73	10.35	
B_g	110–140	7.8	14.0	78.2	0.06	1.16	

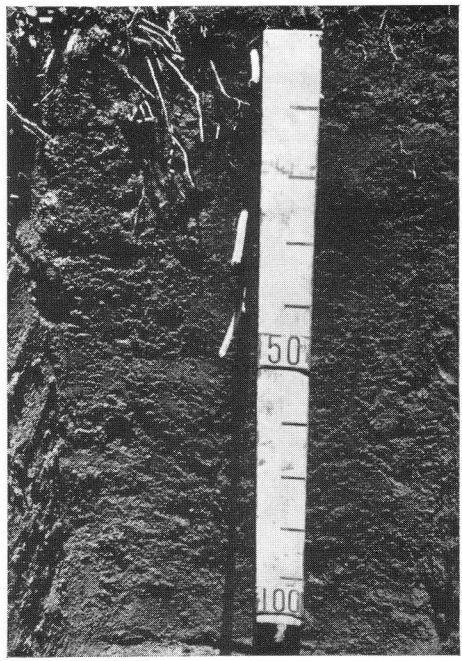
O.M. = Organic Matter.
C/N = Carbon/Nitrogen relation.

clayey soils of poor drainage due to a pseudogley horizon (Bg) in the soil profile at 1.10 m. (3.6 ft.) from the surface.

It is noteworthy that within the *Palmar* there are individuals of *Dialium guianense*, a leguminous species that characterizes the adjacent association of tropical rain forest, while *Sabal yucatanica* is never present within the forest



3. A soil profile from the Palm Forest of *Sabal yucatanica.*



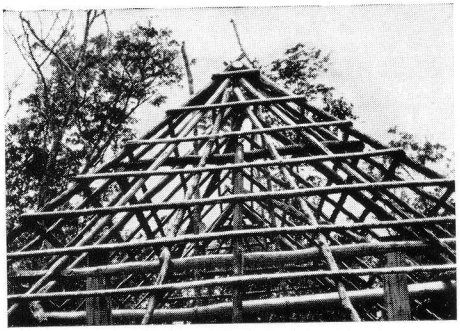
4. A soil profile from the Tropical Rain Forest of *Dialium guianense.*



5. A corn field in which individuals of *Sabal yucatanica* have been left; at the center, one individual of *Dialium guianense* may be seen.



6. A house thatched with the leaves of *Sabal*.



7. The framework of a roof to be thatched with leaves of *Sabal*.



8. Detail showing the manner in which the leaves of *Sabal* are attached in thatching a roof.

of *Dialium guianense*. We also found that the abundance of a yam, *Dioscorea composita* Hemsley, is very low in the *Palmar* and very high in the surrounding rain forest or in its successional phases due to the fact that *D. composita* has a better development in deep, well-drained soils (Fig. 4). We are led to conclude that this population of *Sabal yucatanica* is very well adapted to a condition of poor drainage.

At present, the *Palmar* of *Sabal yucatanica* in this region is in the process of disappearing due to the transformation of the area into one devoted to agriculture and livestock; nevertheless, individuals of *S. yucatanica* remain in many places (Fig. 5) because the palm is fire-resistant and because its stems and leaves are used in the building of rural houses (Figs. 6–8).

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General Roy Stone: Portrait of a Gentleman

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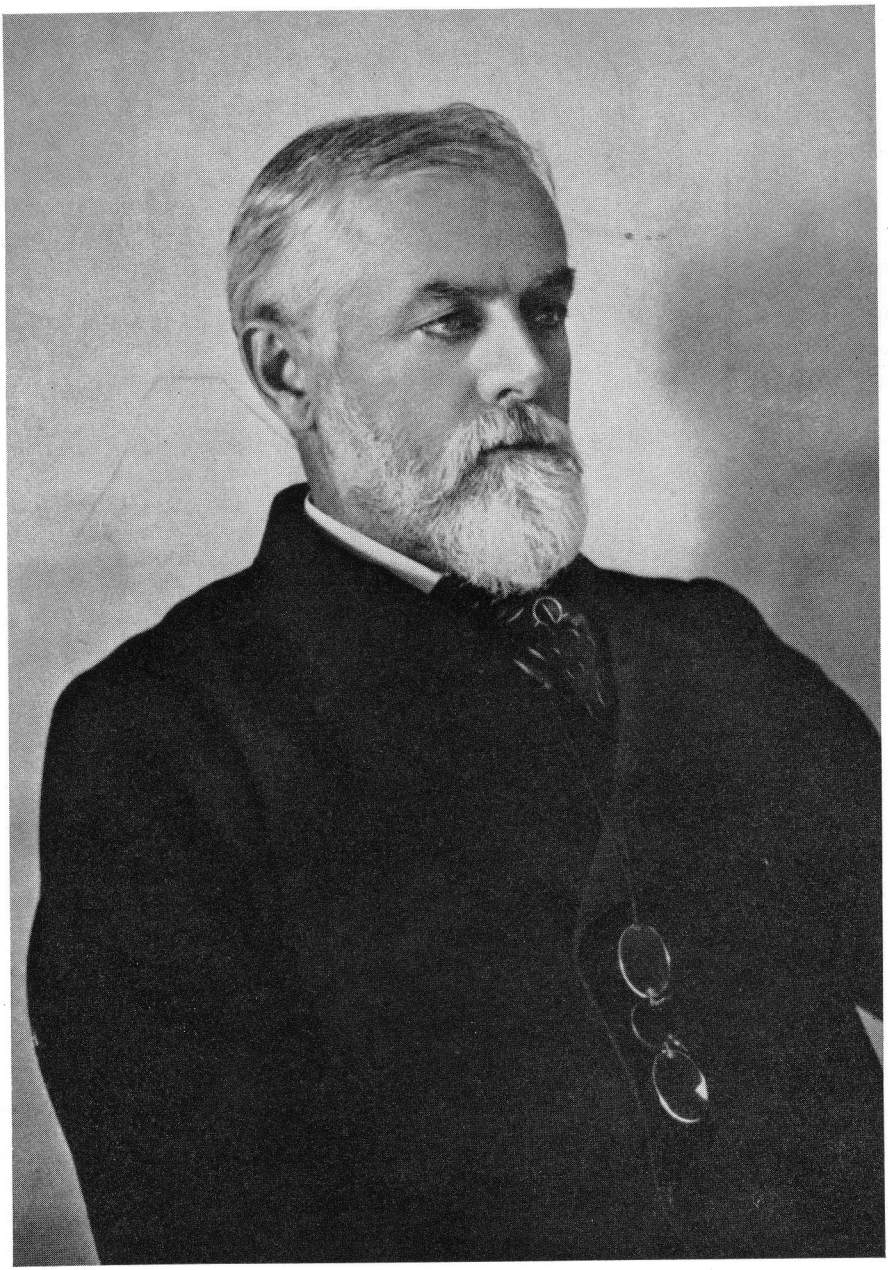
Almost two years ago, while trying to improve my scant knowledge of that great family of plants, the palms, I came across the interesting fact that the very beautiful royal palm was named *Roystonea*, and that "the generic name honors General Roy Stone (1836–1905), United States Army Engineer, who rendered outstanding service to Puerto Rico at the time of the Spanish-American War." Later, I found that the name *Roystonea* was given the royal palm in 1900 by O. F. Cook. This led to speculation: was there no generic name for the royal palm before 1900? What sort of a man was General Roy Stone who deserved to have this beautiful palm named in his honor?

In order to find out more about these questions, I wrote to Mr. Stanley Kiem, Superintendent of the Fairchild Tropical Garden asking for his help. He replied promptly, quoting from various authorities to the effect that the generic name *Oreodoxa* had been mistakenly used for royal palms in the nineteenth century and that it was not until 1900 that O. F. Cook rectified the error by proposing the generic name *Roystonea* for the royal palms "as a respectful compliment to General Roy Stone, the American engineer officer who secured the admiration of the people of Puerto Rico by his fearlessness and conspicuous energy in the Adjuntas road-building campaign which flanked the line of Spanish defenses, and whose subseqent interest in the improvement of the Island will undoubtedly affect its future history." (*Bulletin of the Torrey Botanical Club* 28:552, 1901).

My question about General Stone, however, remained unanswered. I therefore started a quest that took me most of a year and revealed some very interesting facets in the life of that gentleman.

Not knowing exactly where to begin, I wrote to Senator Lawton Chiles, asking his help in obtaining the army records of General Stone. In about a month a large envelope was received containing the entire record of his army life and also some records of his service in the Department of Agriculture, where he served in later years. From these records I was able to contact his granddaughter in Surrey, England, who furnished me with many pertinent facts as well as a photo of the General when he was in his sixties (Fig. 1). Correspondence with historians in Cuba, N. Y., and a three-part article that ran in the *Journal of the Historical Society of Western Pennsylvania* brought out more interesting facts. Information that follows was drawn from these sources.

Roy Stone was born October 17, 1836, in Prattsburg, New York, a small village of about 50 houses. His father was Ithiel V. Stone, a wealthy land owner, who kept moving west and finally became mayor of Cuba, New York, where he had large lumbering interests. His mother was a Gurnee, whose brother had made a fortune in railroading and was later mayor of Chicago (1851–53). Roy had three sisters, Ella, Cornelia



1. General Roy Stone, about 1900. Photo courtesy of Mrs. T. R. Bevan.

and Ida. The 1855 census in Cuba lists Ithiel as being 52, his wife Sarah as 52, Ella 22, Cornelia 21, Roy 18 and Ida 14. The house in Cuba was listed as valued at $2,000.00, *pretty high for those days.* (The house is still standing in Cuba, minus the hitching post.) Roy's sister Cornelia later married Albert Gallitin Porter, Governor of Indiana.

After high school, Roy was sent to Union College in Schenectady, New York, which had been chartered in 1795 and was noted for its pioneer work in the teaching of engineering. He graduated at the age of 22 and worked for his father from 1858 to 1861 in the sawmill, and then the War Between the States began. And so, we find that on April 28, 1861, he enrolled in the army at Warren, Pa. as a volunteer and was made a Captain at the age of 25. In June, 1861, he was promoted to Major. His army records show him wounded slightly in the "7 days battle" on June 30, 1862, and while recuperating from this wound he was sent to Pittsburgh to recruit men for the Bucktail Brigade. August 15, 1862, he married Mary Elizabeth Marker, and upon his return to duty was made a Colonel, 149th Penn. Infantry (volunteers). Early in 1863 his father died and he obtained a 7-day leave to go home to Cuba for the funeral.

His army records show him to have been near Belle Plain, Va. early in 1863; also near Pollock's Mills, Va. On July 1st, 1863, his brigade had retreated to Gettysburg, and about noon on that fateful day at the Battle of Gettysburg, he was seriously wounded. When in later years he applied for a pension, his sworn statement reads as follows: "Colonel Roy Stone of the 149th Penn. Vol. while in command of the Bucktail Brigade, Third Division, First Corps, at Gettysburg, on July 1st, was severely wounded, while in the line of duty, probably about 1 p.m. and was carried into the McPherson barn, where he lay, totally disabled, from which injury we believe he has never fully recovered, although, some months later on, he resumed the command of his Brigade.—we believe a minnie ball went through his pelvis bone dangerously causing trouble with his hip, and a general disorder of his system."

In September of 1863, he was sufficiently recovered from the Gettysburg wound to serve as President, Court Martial Board in Washington, D.C. and he served in this capacity until March 1864, when he resumed command of his beloved Bucktail Brigade, and was on active duty with the Army of the Potomac, under Grant, in the sweep through Virginia. Many of the 149th Pennsylvania Volunteers were counting the days until their enlistment period was at an end, and they could return home, little knowing that they would be involved in one of the most crucial and bloody battles of the war—the Battle of the Wilderness. For a powerful and moving account of this battle, read *A Stillness at Appomattox* by Bruce Catton. During all the confusion and killing of this battle, with the forest on fire and many wounded men being roasted alive, General Stone was thrown from his horse, aggravating the hip wound received at Gettysburg less than a year before.

So his army records show his absent, wounded, for May, June, July and August, 1864. From September, 1864 until January 1865, he was at Camp Curtin, and in January, 1865, he was at Alton, Illinois, where on the 27th of that month he tendered his resignation. This was accepted and he was given an honorable discharge. After the battle of Gettysburg he was made a Brevet General.

After receiving his discharge from the army, Stone returned to Cattaraugus

County, New York, to begin his civilian life with his wife, "Dearest Mary." Since his father's death he was the owner of extensive holdings along the Allegany River near Vandalia, and operated the sawmill that furnished a living for several families. In later years, when he applied for a pension, he lists his occupation as a "manufacturer" in Vandalia and Cuba, New York, so it may have been that he turned out in his sawmill wooden articles such as barrels, wooden buckets, clothespins and many more.

The house that the General built reflected the woodland that they were part of. The siding and roof were wooden slabs with the bark left on. The large veranda had a railing of roots and tree limbs. The woodland theme was carried into the interior of the house; the walnut dining table top being supported by a tree trunk with the limbs extended; the furniture was made from various woods that grew in the forest. In every respect, General and Mrs. Stone were affluent people in their county.

Now begins one of the most interesting episodes in the life of Roy Stone: he was, for all practical purposes, *the inventor and first builder of the monorail.* Of course, the name *monorail* had not yet been coined at that time. He called his invention "General Stone's Elevated Railroad." When he first conceived the idea is unknown; in fact, very little in the way of diaries or letters or other written records is available to the seeker of details of the life of Roy Stone; it is necessary to assume many facets of his life. The idea may have been triggered by the fact that New York City was in the process of determining the best possible rapid-transit system for its growing population and a Commission was examining every possible elevated system; the financial rewards to the successful designer would be liberal. At any rate his patent application read as follows: "To whom it may concern, be it known that I, Roy Stone, of Vandalia, Cattaraugus County, New York, have invented an improvement in locomotives for one-rail railroads"—his patent numbers are 162,323 and 162,501.

Sometime in 1875 Stone had contacted the management of the Phoenix Iron Works of Phoenixville, Pennsylvania, to get help in the construction of a working model of his Elevated Railroad, including his patented "A"-shaped truss. The management must have seen some possibilities in his idea and helped him make up his working model because in early October, 1875, a group of prominent New Yorkers made the trip to Phoenixville to witness a demonstration of the new system. Here is what they saw: "A single-rail track, raised on columns an average of twenty feet off the ground, with steep inclines and a sharp curve, rambling across the deserted factory ground for a fifth of a mile. Properly speaking, it was not a single rail at all. It was three rails mounted on an "A" shaped truss. At the apex was the heavy, bearing rail on which the equipment rolls; at the crossbar of the "A," spaced about 3½ feet apart, were two parallel guide rails. Jauntily perched on center bearing wheels a weird little locomotive and coach straddled the top rail—horizontal guard wheels with rubber rims were pressed against the guide rails."

The engine had been manufactured by the La France Co. of Elmira, New York, and was really two engines, one to propel the coach in one direction and the other to reverse. The single coach was two-tiered, about twenty feet long. In the upper tier, the riders faced each other while in the lower tier the passen-

gers faced outward with their backs to the bearing wheels. The demonstration given by Stone seems to have been a success.

However, the Commission from New York failed to recommend any particular type of elevated system and when construction was begun the standard rail system with two tracks was used, much to the consternation of Stone and the Phoenix Iron Co.

Undaunted, however, by this setback, Roy Stone was determined to sell his "Elevated Railroad" to the nation. A World's Fair was to be opened in Philadelphia in May of 1876; the theme would be "Progress in the Arts and Sciences." Stone was successful in selling his railroad system to the Fair management to operate across a ravine called Belmont Dell. The line extended in a straight line for about 500 feet, with an elevated passenger platform at each end. The engineer was Adelbert Underwood, of Cuba, N.Y. The fare was three cents each way.

For six months the Roy Stone Elevated Railroad operated at the fair without any accidents but failed to meet expenses and, what was even worse, no other city or company had shown any interest in this transportation system. Now, in late 1876, Roy Stone was forced to acknowledge the fact that he was practically bankrupt. He was heavily in debt, and in addition, was having a health problem, due to the serious wounds received in the War Between the States. So, in March, 1877, he applied for an army pension, since he was almost penniless. He was awarded the princely sum of $22.50 monthly.

Later in 1877, a company was formed to make use of the General's patent in building an elevated railroad between some of the oil towns then being opened by the oil boom in Pennsylvania. Roy Stone was voted some stock for the use of his patent but he had no part in its operation; it soon went broke after an engine blew up killing several passengers; the details of this operation has no part in our narrative.

The next place we find Roy Stone is in New York City where he had taken a job with the Army Engineers under General John Newton, who had charge of clearing navigational hazards from New York Harbor. This work had been going on for twelve years. In a short time Roy Stone had patented a hydraulic excavator (patent # 224,309), which was used extensively in the clearing work. We must assume that he worked for the Army Engineers for many years; there is a space that is blank in his life.

1898 he again volunteered for service in the Spanish-American War—June 7, 1898. At that time he had served for at least five years in the Department of Agriculture, connected with the Good Roads Board and on February 1, 1899 was made Director of the Roads Inquiry Board. So we may say quite truthfully that General Roy Stone is also the "Father" of the good roads movement in the United States. Sometime in 1900 he again retired with a pension, amount unknown.

The final record reads as follows: Telegram sent to the Secretary of War reading: "General Roy Stone died here last night, burial at Arlington Wednesday or Thursday"—signed John Gilmer Speed, dated August 6, 1905.

His widow, Mary Elizabeth Stone, then applied for a pension, amount unknown, which she received until her death on October 5, 1925. She died while visiting her daughter and son-in-law, Lady and Lord Monson, Burton Hall, Lincoln, England. The body was

transported home on the S. S. "Majestic," and she was buried beside her husband in Arlington Cemetery.

The elevated railroad episode in General Stone's life is written about in much detail by Mark Reinsberg in a series of three articles which appeared in the *Journal of the Historical Society of Western Pennsylvania* (January 1967, July 1966 and October 1966) under the heading "General Stone's Elevated Railroad. Portrait of an Inventor." I have borrowed from these articles quite heavily and wish to thank Mr. Reinsberg for all the information he uncovered that I had been unable to find. I owe a great debt to Mrs. T. R. Bevan, Barmoor Cottage, Bletchingley, Surrey, England, who is the granddaughter of General Stone; also the historians in Cattaraugus and Allegany Counties, who were of great help. It is unfortunate that more information concerning General Stone's activities in Puerto Rico which led Cook to honor him has not turned up.

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The following articles by Peter H. Brown and Theresa Yianilos are reprinted from *California Garden*, January-February, 1974, with permission. Mr. Brown's article first appeared in the *San Diego Union* on October 14, 1973, and is reprinted with permission of the *San Diego Union*. Mrs. Yianilos is a member of The Palm Society as is Bill Gunther, Associate Editor of *California Garden*.

Palm Popularity Wavers in City

Builders and landscapers have raised their growth hemlines, and the tropical palm tree is passing out of fashion.

The swaying symbol of a balmy city for six decades is an oddity in the fast-growing suburbs and the distinctive trees hugging the coast may be dinosaurs of fading tastes.

The trend away from the southern California favorite is happening so fast, according to city planners and landscape experts, that San Diegans themselves may have to become "tree tourists" to regularly see palm trees.

"The parks, the coast and around the historic sections of town; that's where suburbanites will have to go to find palm trees," said Karl Schnizler, assistant parks superintendent.

The official of the city once called "a paradise of palm trees" says the plant that gave a distinctive touch has been abandoned for olives, pines and full-leafed trees that grow fast.

Richard Nadeau, immediate past president of the local California Landscape Contractor's Association agrees. "If you are talking in terms of symbols, the olive is replacing the palm in new developments—both commercial and residential," Nadeau said. "Developers and homeowners are planting 100 olive trees to one palm," Nadeau estimates.

When it comes to the complete tree-planting picture, architects and city planters estimate there may be less than two palms in every 500 trees sunk into local soil.

What's causing this sad ending for the tree that Spanish cargo ships brought by the hundreds from the Canary Islands? The experts say there are two basic reasons:

—The palm tree has gotten a bad press because of disease that has raged through trees at Mission Bay, on Shelter Island and in beach areas.

—"Both landscape architects and thousands of new residents come from northern California, the Midwest or the East

and are simply unfamiliar with the palm tree and its heritage," Schnizler said.

The disease epidemic is real enough, but may be controlled within the next 12 months. A blight—called pink bud rot by agriculturists—has killed 41 Canary Island palm trees on Shelter and Harbor Islands and has affected hundreds in the lush tropical landscape of Mission Bay.

"We are working to stop the march of the blight," said John Wehbring of the San Diego Port District. "But 47 more of the trees are sick enough that they might die within 24 months."

Schnizler is more optimistic. "We are using fertilizer, good care and attention to help pull our trees out of it," said the parks official. "We plan to keep the palms predominant." There are 30,000 palm trees in city parks and on right-of-way land here. "And the thinking is to increase that number," Schnizler said.

Spokesmen for Garden Valley Wholesale Nursery and Moennig's Nursery—both major bulk tree suppliers, say the demand for palms is almost non-existent. Moennig's salesmen feel the palm began dropping out of style as early as ten years ago. One expert in tree sales said the palm's poor image has been the major factor. Others say it simply does not provide the shade now in demand.

Landscape architect Kenneth Hayashi, who has directed massive plantings in areas such as Mira Mesa and Mesa Village, says San Diego suburbs are fast getting an "Eastern look."

"The park atmosphere has become important. The palm tree does not fit in," Hayashi said. "It is correct to say that the palm is on the way out." The designer says "99 per cent of the trees going in are broad-leafed. The housing developers want trees that are large when they go in or trees that will become large quickly."

This type of planting, Schnizler feels, could engulf the palm and leave it a bizarre reminder. This is a shame because many visitors to San Diego comment to parks officials about the palm trees clustered in Balboa Park and near the old coastal sections,'" Schnizler said. "In fact, palm trees seem to be as big an attraction as anything we have going outside of our weather."

And palms are a symbol of that weather, he believes. He considers Hotel Circle to be a major exception. "This is because hotel and motel builders and owners know from experience about the palm," he said. They know, says the official, about the lure of swaying palm trees on a San Diego August night. "There is one area where you find the palms going in regularly and aesthetically," Schnizler said.

The palm may need a protector much like Victorian houses or Spanish architecture. "Palms have gotten a bad name because people have often planted them wrong—too close to houses and failed to realize the nature of the tree," Schnizler said.

PETER H. BROWN

No! The Palm Isn't Falling

The predictions that the palm tree is disappearing from the San Diego scene as stated recently in our local papers has opened up a red-hot, angry ant hill. The Western Chapter of the Palm Society, which has hundreds of members here in southern California, has been called upon for some truthful facts.

It is not true that palms are highly susceptible to diseases. The infestation of pink bud rot which attacked the palms on Shelter Island has been stopped in its tracks. The virus lethal yellowing, which has killed so many of the coco-

nut trees in Florida, has not yet been conquered, but scientists are closing in on this disease. Florida is spending thousands of dollars to control lethal yellowing in its palm population; they are aware of the beauty that palms lend to their state and are doing everything to save them. We in San Diego should not allow any group to attack and discourage the planting of palms in our area.

San Diego and the coastal areas all the way to Santa Barbara have a rare palm microclimate. Only in this belt can many rare palms grow out of doors and thrive. Along this belt from San Ysidro, Chula Vista, past La Jolla, Cardiff, Vista, Oceanside, and up the coast, palms of many varieties can and are grown. The list numbers in the 50's. Does this surprise you? It's true!

The best part of growing palm trees is the fact that once established, they will be relatively free of pests and will require little care. Palms, as all plants, do better and are more beautiful when given lots and lots of water, good drainage, an all-purpose liquid fertilizer occasionally, and vitamin B to encourage root growth. The most important factor is the soil. The planting hole should be five times the size of the tree and the soil should have plenty of humus such as planter's mix or manure.

Is it true that fewer and fewer palm trees are being planted nowadays? Yes, unfortunately, it is true. But not for the reasons stated in the newspapers. Where are the prejudicial attacks coming from? I must first blame those landscape architects and builders who have not taken the time to learn about palms and are hiding their ignorance and imposing their prejudices by eliminating palms from their plans. Even if an owner insists, these architects will often discourage planting palms and will point out the disadvantages of a few particular palms such as the spiny Date Palm (*Phoenix canariensis*) or the Mexican Fan Palm (*Washingtonia robusta*) which can grow very tall. "No shade!" they say. Or "dirty flagpoles" they are called.

Profit minded developers with hit-and-run subdivisions will not plant beautiful rare palms. An olive tree is so much cheaper and fills up a landscape faster. It doesn't matter to them that the olive tree will need yearly pruning and that it will get very messy, shedding its leaves every day of the year and dropping its olives to stain walks and terraces. Good palms of a respectable size such as *Livistonia chinensis* or a clump of King Palms (*Archontophoenix*) or Queen Palms (*Arecastrums*), or Butias, will all cost more; its simple arithmetic. You've got copper plumbing and a dishwasher with your mortgage. You should expect palms too!

Pity the poor palm lover who goes to a nursery to buy a palm. Chances are he'll be sold the cheapest and biggest palms, such as the *Washingtonia*, which will soon overpower his house, or a *Phoenix canariensis* which will stab him as he comes out of his door. The average nursery is often quite ignorant about palms and therefore is often responsible for inhibiting the spreading of the culture of palms. They will, for reasons of expediency and profit, plant young palms in pots and sell them at an astronomical figure as "patio" or "house" palms, thereby making a hefty profit. Take your typical potted palm—it will either be a *Howeia* (kentia) or *Chamaedorea* of some kind. When kept in pots, these varieties will stay small and rootbound. The nursery often ignores the fact that all of these palms grow in the ground outdoors here in our southern California San Diego palm belt. All too often the average customer doesn't

realize this fact himself, so the palm fancier looks at the small palm with a high price tag and goes home with an olive or eucalyptus tree for his money, not knowing he has been cheated out of the opportunity to grow a beautiful tree that will become more valuable as the years go by.

Another falsehood spread about palms is that they grow slowly—NOT TRUE! They really will grow very fast, as fast as any other tree, provided of course that they are given food, water and good planting mix. The Fishtail Palm (*Caryota urens*), will amaze you in the amount of growth it can achieve in one year.

Another little known fact is that the best size of palm to plant is the smaller size. True, a large palm is easily transplanted and the ball needn't be too large, but a small palm will easily catch up in its growth and they are cheaper. If you would like a larger specimen palm in the lawn or front or back yard, try any one of the following: *Butia*, *Caryota*, *Chamaerops*, *Livistona*, or *Jubaea spectabilis*. For street trees to line a driveway with, plant any of the following: *Archontophoenix*, *Arecastrum*, *Howeia* or *Roystonea* (tender).

One suggestion when buying palms—explain that you are going to plant it in the ground and you want the least expensive one of the kind you are buying, otherwise you may be paying for an expensive decorative pot.

If you've grown anything from seed, be assured that you can grow palms from seed. When you see a palm tree with ripe seeds (the color will tell you when they are ready and viable because the seeds will be a deep, dry brown or a bright red or rich orange-brown), pick them and plant them in a pot with wet vermiculite. Put the pot in a protected place or in a plastic bag. Set it aside and wait for 2 to 36 months until the seeds sprout. Keep them warm and moist. You cannot be impatient! Transplant the seedling to another pot with planter's mix with 10 per cent sand and pearlite, and watch them grow. You can do this with any palm that grows in this area. In three years, you will have hundreds of palms that are rare and look expensive growing in your yard.

If the landscape architects, the plant lovers, the garden enthusiasts and those who love the silhouette of swaying palms in the San Diego sunset don't make the effort to find out about palms and then pressure nurseries to sell them at reasonable prices for area landscaping purposes, the chances of San Diego becoming the rare palm center of the United States—surpassing even southern Florida—will never come true.

THERESA YIANILOS

PALM BRIEFS

The Elegant Ptychosperma in South Florida

There are well over 300 species of palms growing in South Florida. Most have been introduced from the world's tropics. The majority are thriving; few are unhappy with our soil or climatic conditions; some will only thrive if given special care. *Ptychosperma elegans* is alive, well, and very happy, and has naturalized in South Florida. It is one of our fastest-growing and most adaptable palms. In full sun or full shade, on limestone rock or deep rich soil this beauty is healthy and grows aggressively.

In its native Queensland, Australia, this palm grows as single, scattered specimens along the coast around Cairns. In this same area, *Archontophoenix alexandrae* occurs in great stands, sometimes so thick that it appears to be clustering. This is probably the reason why

Ptychosperma elegans got to be called the solitary palm in contrast.

In South Florida, one of the most striking areas to view *Ptychosperma elegans* in its naturalized state is the central area of Matheson Hammock Park immediately north of the Fairchild Tropical Garden. It was in this location that some of the original introductions of *P. elegans* were planted years ago in the rich soil of the "sink-holes" of the hammock. (Note: a hammock is defined as a dense natural growth of broad-leaved tropical trees; hence a jungle or woods. A sink-hole is a low pocket where the rocky surface has collapsed and deep soil has accumulated.)

There are now hundreds of "wild" *Ptychosperma elegans* growing throughout sections of Matheson Hammock Park. They seem to be able to adapt to all conditions from rich pockets of soil to hard pans of limestone rock. Their growth is relatively fast and some show internodal gaps of up to ten inches. They add a beautiful dimension to the patterns of the junglelike growth. (Here we also find some native *Roystonea*, and some naturalized caryotas, *Phoenix*, and *Elaeis guineensis* as well as many sabals and serenoas.) Cardinals, mockingbirds, bluejays, and others vie for the great amount of scarlet, pea-sized fruits produced by the mature palms. This is probably the reason for the ever-increasing propagation of *P. elegans* in the area.

Ptychosperma elegans is not a cold tolerant palm. In Florida it will grow just about as far north as the coconut and *Veitchia merrillii*. It is also a palm that seems to thrive in an area or grow not at all—by that I mean in marginal areas it is sick and unsightly.

As a landscape object it is one of the most popular in South Florida. It has a relatively thin trunk—three to four inches in diameter—and is self-cleaning. The small fruit causes little clean up problem. Several palms in a group planting are used with striking results.

One of the few drawbacks of *Ptychosperma elegans* in South Florida is that it is occasionally attacked by sooty mold and aphis. An infrequent spray with malathion, cygon, or a similar insecticide will control this problem. (Note: be sure to remove *all* fruit from the palm before spraying or birds will eat them and die.)

Ptychosperma elegans is apparently resistant or immune to the lethal yellowing disease that is presently destroying thousands of 'Jamaica Tall' coconut palms, *Veitchia merrillii*, *Pritchardia pacifica*, *P. thurstonii*, and perhaps others in South Florida. In badly blighted areas, in many cases this is the only palm left that gives a touch of the tropics to the landscape. As time goes by, the demand for it will certainly increase for this reason alone.

PAUL A. DRUMMOND

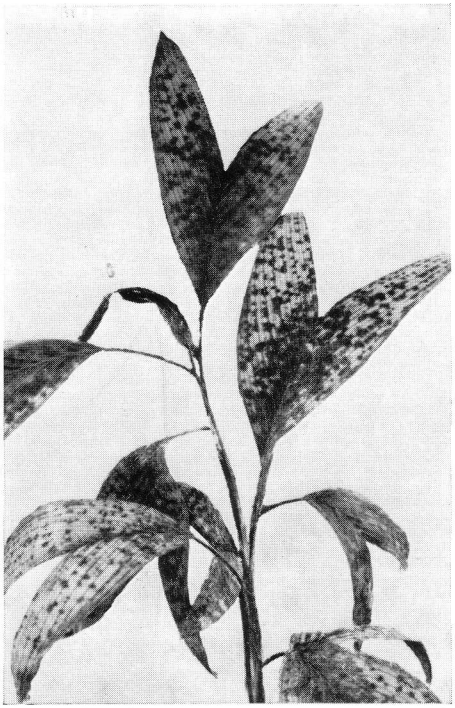
Some Malaysian Palm Notes

Malaysia's palms are legend. The brilliant red leaf sheaths and petioles of *Cyrtostachys renda*, the sealing-wax palm, catch the eye of even the most casual observer. The vertical lines of 70-foot-tall multiple-stemmed clumps of *nibong* palm, (*Oncosperma*) topped by narrow pinnate leaves shimmering in the tropical breeze are a most characteristic feature of the Malaysian landscape. Coconut and betelnut palms are everywhere. For the palm enthusiast, the shady, sun-fleck-dappled jungle floors hold a cornucopia of little-known palm treasures. In the effort to gather as much light as possible and to shade out competing neighbors, these palms have developed broad, little-divided fronds.

Iguanura wallichiana is a spectacular

example, forming clumps 6 to 10 feet tall of simple fronds with cleft tips and exotic clusters of snow-white fruits which gradually turn to navy blue before falling. Specimens in the fern house at the Penang Botanical Garden present a memorable sight and no shade palm could be more exotically beautiful. On the forest edges, especially along the beach where light conditions are more intense or on rock outcrops as seen from the cable car on Penang Hill, *Caryota mitis* is a common weed, seeding freely and forming thickets in the shade of taller forest trees. When through some accident they are exposed to the full sun (*C. mitis* is never found there naturally), the fronds soon yellow and sunburn. Its clustered ropes of many small black fruits are a scourge to the unknowing person who ventures to gather them, the effect being that of an extremely potent itching powder. Collecting the seeds is a task made easy by a small animal which feeds upon the fruits and conveniently excretes the seeds in neat small heaps along forest trails.

For some unknown reason, variegation is a common characteristic displayed by all plant families which have adapted to life on tropical jungle floors. Among palms, this characteristic is probably most pronounced and most beautifully displayed by *Pinanga disticha*. My first contact with this exotic palm was on a collecting trip to Penang Hill with members of Penang Botanical Garden staff. In a ravine at about 2,000 feet elevation, with the virgin jungle cover still partially intact, *Pinanga disticha* grew in 2- to 4-foot-high clumps along the trail in association with a variety of gingers, ferns, gesneriads and two other palm species, one of them *Pinanga malaiana* of much larger stature with new fronds of a delicate bronzy green color. The thick yellow clay of the mountain had nearly perfect drainage because of the steep slope of the terrain.



1. *Pinanga disticha* at Kedah, Malaysia. Photograph adapted from a color transparency by the author.

Shooting up pencil-size stems from runners and branching from near the base, *Pinanga disticha* tended to form small thickets. In most cases the fronds consist of one broad roundish blade with a deeply cleft tip. Sometimes fronds developed one or two pairs of back pinnae on older, stronger plants. The small blue-black fruits were born sparsely on short, closely branched stalks near the crown of mature stems. The trees immediately surrounding the ravine had been cut letting in more light than this species desires. Under such conditions the fronds were a blotchy yellow-green but attractive in their exotic form.

Some months later on a trip to Kedda Peak we met with *Pinanga disticha* for the second time. After seemingly end-

less letter writing to secure the necessary permits to visit the guarded mountain, we found ourselves spending the night, quite unexpectedly, in an enormous old mansion on top, its veranda decked with pots of plump begonias and of cheerful dahlias in full bloom. In the tropics these plants are a rare sight as they cannot be grown in the heat of the lowlands. The "rest house" was none other than the mountain retreat of the Sultan of Kedah and was at our disposal complete with a bevy of Tamil servants. We spent the following day exploring the fantastic cloud forest flora of the 4,000-foot-high mountain top.

The cool, usually cloud-enshrouded peak with its leached-out, mineral-poor soil is the habitat of rare *Nepenthes* and *Utricularia* species which catch their own food and of strange *Dischidia rafflesiana* with ant-inhabited pouch-shaped leaves and *Hydnophytum formicarum*, an epiphytic member of the coffee family with huge swollen, ant-inhabited bases. Epiphytic rhododendrons and a host of orchid and fern species encrusted rocks and tree bark everywhere. On one stony, moss-covered slope beneath a forest of dwarfed trees grew lady slipper orchid, *Paphiopedilum barbatum* in association with a miniature pinnately fronded palm species. Its waxy 4-inch-long fronds were borne on wiry stems 2 inches to 18 inches tall.

After lunch we began our descent on foot. The road, full of hairpin curves, winds 14 miles down the steep mountainside but foot trails cutting straight through reduce the distance to perhaps five miles. As we made our descent into the warmer temperatures of lower elevations, the trees become taller and the herbaceous growth of the forest floor became more rampant, taller in stature and broader in leaf. *Musa* and ginger species became most prominent.

At about 2,000 feet, on a steep slope, a most exotic foliage plant caught my attention. The simple 10-inch-broad leaves with deeply cleft tips were of sparkling silver color dappled with thumb-sized blotches of deep green, the whole having the rich velvety sheen of a rex begonia leaf. Never had I seen a more exotically beautiful foliage plant. I called to my Malay friend, Hassan, for identification. His answer: *Pinanga disticha.* I replied that I was going straight home and throw out all of my plants from Penang Hill. He told me not to do that because they were the same. The Penang Hill plants were smaller-leaved and did not have high color simply because they had been grown in partial sun. In deep shade the species always takes on exotic color and large size. Among small palm species, *Pinanga disticha* is surely one of the most desirable.

All of the plants which I have seen grown in pots, even those in Penang Botanic Garden, have had blotchy yellowish-green leaves from too much sun, but most of them seemed vigorous enough under cultivation. The species tends to have plump roots which are few in number and far-spreading. When collected plants are potted, they always die back partially and then sulk for two or three months before suddenly responding with vigorous new shoots from the base of the plant. It dislikes poor drainage with a passion and the new shoots will suddenly rot away if the soil is too heavy and waterlogs during the monsoon season. The drainage capacity of stiff soil on a steep mountain slope and the same soil in a pot is not equivalent. At 2,000 feet altitude in Malaysia, the soil of the forest floor is covered with a two- to three-inch layer

of leaves and fallen litter. Such is the activity of soil bacteria in tropical climates that there is little humus in the underlying soil.

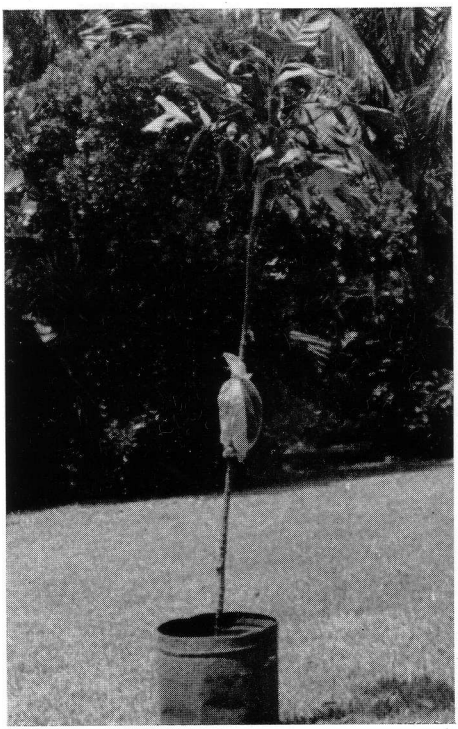
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NOTES ON CULTURE

Notes on Marcottage of Certain Palms

Some of us with older gardens occasionally have a palm that has become so tall or ungainly that we would like to bring its crown down closer to the ground as it was when younger. This can be achieved with palms of the genus *Chamaedorea*, possibly with a few others also.

The accompanying photos (Figs. 1, 2) show what large and healthy roots developed on a very leggy old plant of *Chamaedorea metallica* (the form with the somewhat divided leaf), and also on *C. ernesti-augusti* (Figs. 3, 4). Both palms had root initials along their stems. The stems were wrapped with a fair-sized ball of damp sphagnum moss and the moss covered and held in place with a sheet of plastic, all secured with twistems. In an amazingly short time (this was in midsummer), big fat white root tips showed through the plastic. The stem was then cut below the roots and the entire ball put into a pot large enough to permit quite a bit of soil to be placed on all sides of the ball. The plants kept right on growing; the *C. ernesti-augusti* did not even lose any of its developing seeds. The same treatment was accorded a plant grown for many years under the name of *C. humilis* which much resembles *C. elegans* only is not as large. This plant had sent out root initials at nearly every internode. It was in a place where it got too much sun in summer. Instead of moving it, therefore, it was mossed off. Now it is



1. *Chamaedorea metallica* with marcot in place. Photo by T. C. Buhler.



2. New roots formed in marcot enable plant in Figure 1 to be reduced in size. Photo by T. C. Buhler.



3. *Chamaedorea ernesti-augusti* with marcot. Photo by T. C. Buhler.

well established in a pot and waiting to be replanted where it will be happier. The palm probably suffered less than had the entire plant been moved.



4. Top of *C. ernesti-augusti* with roots after removal from old stem at right. Photo by T. C. Buhler

Two large *Chamaedorea elegans* that had no root initials along their stems were a bit stubborn. After they showed no signs of producing roots in about a month, the moss ball was moved up to where the oldest leaves were still on the plant as a few roots seemed to be starting in that area more or less protected by the bases of the flower stalks and leaf bases. Perhaps these roots had formed because the entire plants were well watered to keep the moss wet and this watering may have kept the area protected by the leaf bases moist. By the time the moss was moved upwards it was already September, rather late in the year for such an experiment, but both plants developed adequate new root systems and are now flourishing.

TEDDIE BUHLER

NEWS OF THE SOCIETY

Hawaii

Member Norman Bezona, County Extension Agent at the University of Hawaii, College of Tropical Agriculture, writes the following about the new local group organized by him. "The chapter was organized on the Island of Hawaii and officers elected in December 1973 with Donn Carlsmith, President. Vice President is Bunichi Usagawa, Recording Secretary is Jane Robinson, Correspondence Secretary is Frances Schobel, with Bill Hansen, Treasurer and Norman Bezona as Adviser. State Directors are Herbert Shipman, Dr. Yoneo Sagawa, University of Hawaii, Paul Weissich, Foster Gardens and Bill Stewart, Pacific Botanical Gardens on Kauai.

"We have 24 members as of May 1974. Monthly meetings alternate a field trip with a business-program meeting. Our objectives are to grow and distribute native and exotic palms throughout the islands, to interest and educate others in the use of palms in the landscape and to

encourage planting and preservation of palms on private and public lands. We hope to get other chapters started on all islands, with the help of our State Directors.

"We meet at the Hawaii Community Agricultural Building. We have plant exchanges at each program-business meeting. We are working with the State Forestry Service for a mass distribution of palm seedlings on Arbor Day this November and also planning for a plant sale as well as setting up a sponsorship of the 4-H Community Pride Project. This is based on "subsidizing" each club 25¢ per palm that is planted by them in their Community Projects. Thus far, the 4-H has planted only coconuts but we want to expand it to all palm species."

Congratulations to you palm enthusiasts in Hawaii, we think you are setting a wonderful example for other local groups.

Florida

Paul Drummond, Chairman of the South Florida group, invited only out of town members to his place at the time of the Biennial Meeting because he felt he could not accommodate too large a group. So, on February 23 he gave the South Florida members a chance to see it. His property consists of hammock, or native Florida growth, and in it he has planted a surprising number of palms. Many are so happy they are naturalizing themselves, particularly *Ptychosperma elegans* and chamaedoreas. Among the outstanding specimens are *Cyrtostachys lakka*—9–10′, *Pigafetta filaris* starting to form a trunk, *Phoenicophorium borsigianum*, *Verschaffeltia*, *Areca catechu*, fruiting Malayan coconuts and many others too numerous to mention. Everyone brought his own picnic lunch and quenched his thirst with a delightful punch furnished by our host. Afterwards Nat DeLeon and De Hull brought us some interesting inside facts on palm culture, particularly of seedlings.

On April 20 Nat DeLeon arranged for the South Florida group to see the beautiful plantings at the Parrot Jungle, one of Miami's outstanding tourist attractions. Among the lush natives and exotics such as anthuriums, bromeliads, gingers, bamboos, etc. there is a tremendous *Raphia* and a fruiting single-trunked *Areca vestiaria* (*A. langloisiana*) as well as other beautiful palms. Colorful parrots flying free add to the exotic effect. After the escorted tour most members enjoyed a pleasant lunch at the restaurant located on the premises.

Palm Society members from outside Dade County are invited to be guests at a Cocktail-Reception on Saturday, June 22, as the first event of the 1974 Biennial Meeting. Hosts for this party are the South Florida group, so to defray the expenses of the party a plant sale was held on May 11. Because of the immaturity of most of the palms donated by the members, the sale was restricted to members. The sale was a financial success. One of the items that brought in the most money were 84 egg cans of *Rhapis excelsa* that had been dug from the hedge of one of the members. The sale was held under two spreading bombax trees at Peg Gorman's place and after the sale those who had brought lunches enjoyed a social hour. Chairman Drummond reported that *Phoenix reclinata* had been added to the list of palms in which lethal yellowing disease had been identified. He also stated that at a meeting held in Miami in April, Florida Commissioner of Agriculture Doyle Connor had announced that the E.T.A. had given emergency permission to release Terramycin for general distribution for home use and that it should be available about the end of July, at a nominal cost.

On the advice of experts, a sale of

rare palms that had been planned at the time of the Biennial Meeting has been cancelled for fear of transporting this dread disease outside the affected counties of Dade (Miami), Broward (Ft. Lauderdale), and Palm Beach in Florida.

Seed Bank

On the advice of consultants, the Seed Bank has stopped shipment of palm seeds collected in Florida for the time being but will continue to distribute seed collected in the wild or from areas free of lethal yellowing disease. Members who may be able to provide alternate sources of seed are requested to advise Mrs. Lucita H. Wait, 7229 S.W. 54th Ave., Miami, Florida 33143 or Mr. DeArmand Hull, 531 N. Military Trail, West Palm Beach, Florida 33406.

Palmologue

Palmologue does not appear in this issue, but Dent Smith, who was visiting Spain during May and June, will continue the feature in succeeding issues. Correspondents should continue to write him.

TEDDIE BUHLER

PALM LITERATURE

GLASSMAN, S. F. A Revision of B. E. Dahlgren's Index of American Palms. vi + 294 pp. Phanerogamarum Monographiae Tomus VI. Published by J. Cramer, Germany. Softbound (cloth) DM 120 (ca. $43.00).

There are so many possible uses for an authoritative index to palms, and the desire for one is so great, that the publication of a revision of Dahlgren's *Index of American Palms* is most welcome. In a revision of such a book, based on the high reputation of the earlier edition, the author must either improve on the earlier work or simply reprint it with annotations in order to bring it up to date taxonomically and statistically. Both improvement and taxonomic updating were undertaken in this revision. However, the less-than-careful editing and proofing will limit its value, much as the price will restrict its distribution, in spite of the great amount of valuable, useful, and interesting information contained within the present 294 pages.

This new index, like its predecessor, is an alphabetical listing, by genera (species are arranged alphabetically under each genus), with authorities, bibliographic references, synonymies (cross-referenced), distribution, and type specimens. In a typical citation such as:

> ACANTHOCOCOS Barbosa Rodrigues, Palm. Hassler. Nov. 1, 1900; 1903; Drude, 1908; Lemée, 1929; Burret, 1940c; Toledo, 1952.

the authority—Barbosa Rodrigues—follows immediately on the generic name, then follows the abbreviated title of the reference to the original publication of the genus—*Palmae Hasslerianae Novae* . . . page 1. 1900;—. The second date cited—1903—refers to the list of references under Barbosa Rodrigues (1903, Sertum Palmarum Brasiliensium, ...). Further references are in chronological order. Full titles are found in a list of references.

Next are the species, each with its authority and the original place of publication. Additional author's names and dates (of works wherein the species was treated) follow that of the original publication and these in turn are followed by the geographical distribution, and in parentheses the "type specimen." The word "Type" apparently only occurs when a "substitution" (p. v) is made by an illustration.

It has been brought to my attention that the specimen numbers for ACANTHOCOCOS are incorrectly cited. Upon referring to the original publication, one finds that the type collection(s) of *A. emensis* is *M. Rachid s.n.*, that collections

were made at two different times, and that the "collecting number"—52.941—is apparently the accession number for the collection in the Instituto de Botânica at São Paulo. Similarly the type of var. *pubifolia* is *L. Labouriau 717* which Toledo notes as bearing the institutional number 53.727. There is a substantial difference between a collector's own number and an institutional accession (or other) number. Under the species *Acanthococos hassleri* it would seem preferable to leave both of the specimens cited by Barbosa Rodrigues (*Hassler 4957* & *5224*) as did Dahlgren in the original edition, unless Glassman has studied material and is able to select a type on some basis other than that of listing the first number cited. If Glassman has studied material, then the selected specimen should be clearly designated as lectotype. As the revised entry now stands (*Hassler 4957*—G), one does not realize that Barbosa Rodrigues originally cited more than one collection and that Glassman has presumably attempted to select a type. Lectotypification should be done with great care in a work of this sort and it should be based on actual study of materials, or else typification should be left to the monographer who may otherwise have to devote time and print to remedying an "automatically" selected type. If someone else has selected *Hassler 4957* as type, then this should be noted as lectotype with a reference to the person who selected it. Often lectotypification is so obscure that only a monographer familiar with the entire literature can determine its occurrence.

When Dr. Glassman states (p. v) that "Type specimens are sometimes based on the first specimen cited by the author in his original article, if the author did not specify a type.", the obvious assumption here is that he is lectotypifying the species ("sometimes"?) if the original author did not cite a type specimen. Dr. Glassman states in the introduction (p. v) that the specimens which he cites in parentheses, following the citation of distribution, are types. Article 8 of the *International Code of Botanical Nomenclature* (1972) clearly states that, "The author who first designates a lectotype or neotype must be followed, but his choice is superseded . . . . if it can be shown that the choice was . . . . made arbitrarily." Any choice actually made by Glassman such as that mentioned above is certainly arbitrary. On further checking I also find that the citation of types is not only arbitrary but inconsistent. For example, although only one of the two original specimens of *Acanthococos hassleri* was cited, two specimens are cited for *Thrinax harrisiana* (*Harris 9273*, *10264*-US?) and others. The citations of "US" (indicating a deposit in the U. S. Natl. Mus.) for this and especially *T. tessellata* are in error, as a check in the original description will show. The types, said by Beccari to be in Berlin, may in fact have been destroyed, but this necessitates the selection of a neotype, not a new location.

Since it is nowhere explained, it should be pointed out that when a genus such as ACANTHORRHIZA is indicated in the present work as equalling "= CHELYOCARPUS Dammer, COCCOTHRINAX Sargent, CRYOSOPHILA Blume, TESSMANNIODOXA Burret." it means that species which were at one time placed in the genus ACANTHORRHIZA may now be found in one of the genera indicated. It does not mean that ACANTHORRHIZA equals all four of the genera listed following the = sign. "ACANTHORRHIZA Wendland" (the proper author citation should have been ex Regel, and shortened to Regel, not Wendland) in fact = CRYOSOPHILA Blume for that is where its type species is placed.

According to the *International Code of Botanical Nomenclature*, the earliest available validly published epithet is the "correct" one when synonymies are involved. However, it is not clear, in an entry such as that for *Bactris augustinea* Bailey, why that particular epithet was used when *Augustinea ovata* Oersted (an earlier epithet) is included in synonymy. It would have been much clearer in such an Index as this to indicate that the combination *Bactris ovata* (Oersted) Wendland would be a later homonym of *Bactris ovata* Stokes, 1812, and therefore cannot be used. I don't understand why *B. ovata* of Stokes does not appear in the alphabetical sequence. That would have cleared up the problem.

It should also be noted that although Dr. Glassman states in the Introduction (p. vi) that Table I follows the alphabetical treatment and that "Following Table II" is a list of countries with the names of the native species in each, and "The last major category in the *Index* is a list of references. . . .", it will be found that the opposite is true. Table I mentioned above appears on page 288, Table II appears on pages 289 and 290, but both tables are preceded by the geographical list on pages 265–287, which in turn is preceded by the list of References on pages 229–264 immediately following the alphabetical treatment.

On first scanning the pages of this revision I found rampant misspelling such as the following sample: p. iv "Calytrogyne" (*Calyptrogyne*); p. 14 "Asterogyne romosa" (*A. ramosa*); p. 15 "Astrocoryum" (*Astrocaryum*); p. 65 & 66 "Cerocylon" (*Ceroxylon*); p. 95 "Collina" twice (*Collinia*); p. 104 "Cyclospathe northropi" (*C. northropii*); p. 183 "Parajabaea" (*Parajubaea*); p. 208 "Rhytococos" (*Rhyticocos*); p. 265 "Aceolorrhaphe" (*Acoelorrhaphe*); p. 267 "Rheinhardtia" (*Reinhardtia*) and "Roystoynea" (*Roystonea*); p. 269, twice "Neonicholsonia watsoni" (*N. watsonii*); p. 270 "Acoelorraphe" (also spelled a third but correct way on the same page); p. 272, twice "Thrinax morrissii" (*T. morrisii*).

The number of inaccurate author citations seems equally rampant such as: ACANTHORRHIZA "Wendland" should read, Wendland ex Regel; BARCELLA "Drude" should be (Trail) Trail ex Drude; CHAMAEPHOENIX "A. H. Curtiss" should read, H. Wendland ex A. H. Curtiss (in keeping with the format); DIGLOSSOPHYLLUM "Wendland ex Drude, Engl. & Prantl.." should read, Wendland ex Salomon, Die Palmen 155. 1887; LEPIDOCOCCUS "Wendland & Drude ex Wendland in Kerchove, should read Wendland & Drude ex Hawkes, since the Kerchove publication is not valid; OROPHOMA "Drude, Mart. Fl. Bras." would more properly read, in Martius, but should correctly read, Spruce, 1869 ('1871'); PLECTIS Cook . . . . = Euterpe "Gaertner" should read, *Euterpe* Martius (see p. 117); PRESTOEA "Hooker ex Bentham & Hooker" should read, Hooker in Bentham & Hooker; RHAPIDOPHYLLUM "Wendland & Drude ex Drude" should omit, ex Drude; YUYBA "Bailey" should read, (Barbosa Rodrigues) Bailey. For an example of a totally misleading reference see p. 169 under "MAXIMILIANEA Martius *in* Schrank, Flora Bras. 2: 452. 1819." Then see p. 251, "Flora Brasiliensis" should read simply "Flora", a journal.

Thus, the present publication is replete with misspellings, incorrect or incomplete author and reference citations and dubious typifications. However, it must be emphasized that it is a very handy reference although its usefulness is considerably restricted by the plethora of careless oversights.

R. W. READ