



PRINCIPES

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THE PALM SOCIETY

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PRINCIPES

JOURNAL OF THE PALM SOCIETY

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Cover Picture

Phoenix reclinata growing on the southern Rhodesia side of the eastern cataract of Victoria Falls, Africa. Photograph by W. H. Hodge.

NEWS OF THE SOCIETY

The untimely death on July 9th of the Society's Vice-President, Dr. R. Bruce Ledin, at the age of forty-four, has shocked and saddened those who knew him.

An attack of rheumatic fever in his early youth left him with a damaged heart which was a constant source of anxiety and curtailed many of his activities. Nevertheless, Bruce was active in a number of fields, contributing greatly to horticulture in Florida and other subtropical areas. At the University of Florida Sub-Tropical Experiment Station, Homestead, Florida, he was in charge of experimental plantings, particularly in the field of fruits. He was a member of the Rare Fruit Council of Miami, giving generously of his knowledge to those engaged in growing unusual tropical fruits.

He was co-author, with Julia Morton, of *400 Plants of South Florida*; he wrote "The Compositae of South Florida" and a number of other works, both scientific and popular. A resumé of his educational and professional background appeared in *Principes* 1:75.1957.

When The Palm Society was formally organized Bruce was elected Vice-President. He set to work at once to help the new organization. He compiled a list of books and other publications dealing with palms which appeared in the mimeographed Bulletin which preceded *PRINCIPES*. And in *Principes* 1:94, 1957, can be found his "Index to Palm Genera in Gentes Herbarum," the official publication of the L. H. Bailey Hortorium of Cornell University. In January 1959 a comprehensive paper on *Pseudophoenix* written by him in collaboration with Stanley C. Kiem and Robert W. Read appeared in *PRINCIPES*.

Bruce's greatest contribution to the Society, however, lay in the editorship

of the forthcoming handbook of palms. We quote Nixon Smiley in *The Miami Herald* of Wednesday, July 15th:

"In his last year he undertook the job of editing [an outstanding handbook] on [the culture of] palms, which [is] to be a joint effort of the American Horticultural Society, the Palm Society and the Fairchild Tropical Garden.

"It was one of those jobs, though, where the editor has to do most of the work. This would have been a tough job even for the most healthy, mentally vigorous person.

"Ledin sought contributors from all over the tropical world, and was able, because of his winning ways, to get both copy and photographs together within a few months.

"He did the palm handbook in addition to his regular job at the University of Florida Sub-Tropical Experiment Station at Homestead, where he was a horticulturist engaged in the improvement of tropical fruit.

"The palm handbook was a work of love, for which he was to receive no money. Nor [are] the contributors to receive any money. It [is] strictly a non-profit venture.

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THE EDITOR'S CORNER

When the editor first arrived at Ithaca in 1948, L. H. Bailey was still actively studying palms in the Caribbean area. Often of an evening at the old Hortorium building, Dr. Bailey would interrupt his work to discuss a specimen and relate the circumstances of its collection. Mrs. Mary Moon, a recent graduate of Cornell University and formerly on the staff of the L. H. Bailey Hortorium, has written an account which gives some of the highlights of his travels in search of palms. The article is reprinted here so that readers of



60. *Sabal Rosei* near Tablon, Sinaloa, Mexico, from *Gentes Herbarum* 6: 444. 1944.

PRINCIPES may share some of Bailey's experiences.

Juan V. Pancho, who writes of an interesting dwarf coconut, has also been associated with the Bailey Hortorium. Following graduation from the Univer-

sity of the Philippines, Mr. Pancho studied at Cornell University on a Rockefeller Foundation fellowship. He is now again associated with the University of the Philippines at Los Baños.

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Diseases of the Coconut Palm*

M. K. CORBETT

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the State Plant Board of Florida, Gainesville, Florida*

IV. — BUD ROT

The fourth disease of coconuts to be considered in this series is bud rot. The disease is common to most coconut growing areas of the world and is caused by the fungus *Phytophthora palmivora* Butl. Butler in 1906 (2) reported the disease in Madras, South East India, affecting three species of palms: palmyra palm (*Borassus flabellifer* L.), coconut palm (*Cocos nucifera* L.), and betel-nut palm (*Areca Catechu* L.). He named the fungus *Pythium palmivorum* and later, after comparative studies with a culture obtained from coconuts by Ashby in Jamaica, renamed it *Phytophthora palmivora* (3). The fungus has since been studied by many workers in several hosts (4, 5, 7, 8, 9).

The symptoms of the disease are quite characteristic and readily distinguished from those of other diseases of the coconut palm. The disease manifests itself in the early stages by a withering or dying of the youngest leaves, which turn greyish-brown and finally break down at the base. The rot may spread to the next youngest leaves, which will turn yellowish-brown. The rot spreads inward, killing the young tissues in the bud. The older leaves remain normal for several months, so the tree appears as if it has lost its top fronds. Well developed fruits may mature in a normal fashion. Figure 61, picturing a diseased tree occurring in Jamaica, illustrates the effects of bud rot on the young fronds of the

coconut palm. The youngest fronds have collapsed, and those next in age have turned yellowish-brown. The older fronds appear normal in color, and some nuts are still present on the tree, which is more or less typical of middle or advanced stages of the disease.

As the disease progresses, the young nuts are shed and the leaves in order of age turn yellowish-brown and drop off or collapse at their bases and hang downward around the trunk. The entire crown eventually dies and the fronds may fall off completely leaving a bare dead trunk. Figure 62 illustrates these late symptoms of the disease. At this stage (or earlier) the fronds may be pulled out easily and the tissues emit a very offensive odor. The rotted bud or heart tissues may contain several species of insects, fungi, and bacteria, which are secondary to the primary infection caused by *P. palmivora*.

The bud is not always killed and recovery may occur (1), but the new leaves are small, giving an appearance termed "little leaf" or "bitten leaf." According to Briton-Jones (1), bitten leaf is an expression of recovery. Several organisms have been obtained from palms exhibiting symptoms of bitten leaf but all thus far isolated are of only secondary importance (1, 6). The type and severity of the bitten leaf symptoms depends upon the extent to which the bud was damaged (1). This recovery aspect and symptom variability, according to Briton-Jones (1), has led to considerable confusion in the literature.

*For previous articles in this series, see PRINCIPES 3:5-12; 49-52; 83-86. 1959
Florida Agricultural Experiment Station Journal Series, No. 847.



61. Coconut palm in Jamaica, exhibiting symptoms of bud rot resulting from infection by the fungus *Phytophthora palmivora*. Note the presence of fruit and collapse of youngest heart fronds.

Figure 63 illustrates a coconut palm in Trinidad exhibiting symptoms of bitten leaf resulting as a recovery stage from the bud rot disease caused by *P. palmivora*. A recovered palm may again become infected with *P. palmivora* and again exhibit symptoms of recovering (1). Recovered palms eventually appear normal if fertilization and moisture are adequate. The rate and extent of recovery depends upon these environmental factors, but usually it would be best to remove the palm and replant (1).

Conditions favorable for spread of the disease occur during periods of rainfall accompanied by high winds or hur-

ricanes because the fungal spores germinate best with high humidity and they are usually disseminated by the wind (8). The exact mode of entrance into the tree is not known, but palms subjected to periods of high winds or hurricanes have many small wounds that could serve as infection courts (6, 8). The fungus may remain dormant during dry weather for long periods because it forms thick-walled spores, termed chlamydospores, that are quite resistant to adverse conditions. Seal (8) found viable chlamydospores on plants nine months after the plants had been killed by the organism.



62. Coconut palm in Miami, Florida, exhibiting final symptoms of the bud rot disease caused by *Phytophthora palmivora*.

Control of this disease may be obtained through exclusion of infected plants, eradication of plants found to be infected, and by protection of exposed plants with effective fungicides. At one time the State of Florida had local quarantines on all properties within a quarter-mile zone of the property on which coconut palms were found infected with bud rot (8). In the British West Indies (1) the recommended control was to spray with Bordeaux mixture coupled with the cutting down and burning of infected palms. The protective application of Bordeaux mix-



63. Coconut palm in Trinidad exhibiting symptoms of bitten leaf attributed to a recovery stage of the bud rot disease.

ture has given inconclusive results, but the eradication program has proved helpful. Seal (8) reported adequate control of the disease by the immediate removal and burning of infected plants, supplemented with spraying of healthy plants in the vicinity with a 5-5-50 (plus sticker) Bordeaux mixture.

Acknowledgments

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making this study possible and to Miss Jean Smith for assistance with illustrations. The author is sincerely grateful for the assistance received in Jamaica and Trinidad.

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The 'Tambulilid' Dwarf Coconut

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The widespread devastation of coconuts in the Bicol region (Albay, Camarines Norte, Camarines Sur, Sorsogon) of the Philippine Islands due to the mysterious disease called *cadang-cadang* has stirred interest among coconut farmers to plant a dwarf variety of coconut known as 'Tambulilid'. This variety is believed to be resistant to the destructive *cadang-cadang* disease. A number of coconut growers have planted this variety in place of the varieties attacked by the disease.

The dwarf coconut fruits early. Palms about 15 feet high bear many fruits that nearly touch the ground. When planted in good soil, the young palms start to flower in their third to fourth year.

They produce ripe fruits in about ten months time from the appearance of the inflorescence. A fully grown leaf measures up to ten feet long. Nuts are quite large with a sizeable amount of fiber; the shell and white kernel are fairly thick. Trunks measure 18 inches or more in circumference. The meat or endosperm is said to be richer in oil and sweeter than that of the ordinary coconut which makes it very popular.

According to information given by a grower, the original tree from which present plantations originated comes from San Miguel Islands in Tabacco, Albay Province on the island of Luzon. It is now about thirty years old.

From observations and evidence of



64. The 'Tambulid' dwarf coconut growing in the Philippines. Photograph by Juan V. Pancho.

local growers it would appear that this dwarf coconut is a variation from the tall or common palm. This is probably due to some change in hereditary units which takes place perhaps very rarely. No experiments involving the genetics of the dwarf variety have been conducted. However, it is assumed that the

dwarf palm is a recessive mutant with only a single factor involved.

Like all coconuts, the dwarf variety 'Tambulid' appears hardy. It grows well in sandy loam soil. Well-drained alluvial soil also makes palms grow fast and mature early.

Botanical Explorations of Liberty Hyde Bailey*

2. THE CARIBBEAN ISLANDS AND BERMUDA

MARY H. MOON

The story of Liberty Hyde Bailey's travels and collections in the American tropics is basically an account of his studies of the palms. These studies were the result of his dipping into a

plant group new to him merely to satisfy a curiosity, only to find the state of knowledge so incomplete as to be misleading. Student and scholar that he was, he would not turn from it with a shrug of indifference. After all, he had included the palms in his encyclopedias,

*Reprinted with permission from *Baileya* 6:73-82, 1958.

and so he owed it to the users of his works to provide useful accounts of the identification and names of those plants. He lived with the knowledge that the published accounts were in error, that the user would continue to be led astray until they had been corrected. This realization first came to him about 1910, when Bailey was past his mid-century mark, but it was to be another ten years before he commenced serious work on the palms. As soon as the opportunity did present itself, Bailey dug down to the roots of the problem, found the causes of confusion, and then devoted the better part of three decades to properly piecing together the parts of the puzzle.

The underlying cause of the confusion in palm taxonomy and nomenclature was the inadequacy of the preserved material on which were based the species set up by botanists in the past. But why was it true of palms, and not of most other plants? Some kinds of palms are only small shrubs at maturity, and others are tough, spiny, thicket-forming vines, but the majority are trees: trees with tall, slender, unbranched trunks and a crown of leaves that is often well over one hundred feet above the ground; trees with huge, tough, leathery leaves, some weighing fifty pounds and measuring forty feet or more in length; trees with giant clusters of flowers and fruit whose botanically important bracts are trough-shaped woody envelopes up to ten feet long. Plant parts of these dimensions do not lend themselves to being pasted on the conventional herbarium sheet measuring about 12 x 18 inches! Yet it was only such mounted fragments of leaf tips, of flowering branches, or of fruit-shells that Bailey found in the world's museums, where they served as the documentary record of the diagnostic parts of most of these forest giants. It is small wonder that the true char-

acters of the plants were not accurately described in the literature, or that there was no simple way to verify or correct them.

Bailey's first task was to set minimum standards for redocumenting the known palms and for establishing bases for new ones yet to be discovered. His method was to assign a collection number to a particular palm tree; to collect from it a typical leaf and its often sheathing base (no matter how large); to spread it on the ground to photograph it; to cut the leaf into sections, folding each to fit a folder the size of the herbarium sheet, and tagging each part with the same number given the tree. He would cut down a complete flowering or fruiting inflorescence, photograph it if it was large, and preserve the woody boat-shaped bracts or spathes by cutting them into 18-inch sections when necessary. He would retain either the entire inflorescence or major sections of it, often preserving flowers or fruits from it in liquid. Here, too, each item would be tagged with the tree's assigned number. This was time-consuming, often requiring a day or more. When the tree could not be climbed, it had to be felled. This sometimes required authorization from the owner—and more time consumed.

Photographing often was most difficult. Clearings sometimes had to be cut to admit light or to permit a view of the crown of foliage. Very often assistants were hired to do the high climbing or the tree-felling. Frequently Bailey would be wet the day through, unmindful of needing a midday meal, striving to keep his film dry, his field notes legible; and most of these productive years were before the days of modern insect repellents. But he got his specimens and his photographs.

The collection of palm material he

assembled at Ithaca is certainly the world's finest, qualitatively if not quantitatively. It is small wonder that predecessors had failed to get "the stuff," as Bailey would express it. And it is small wonder that Bailey's quests for palms of the Caribbean provided him with anecdotal material wondrous to listen to. However, he was always sensitive lest listeners remember the anecdote only to forget the primary reason for the quest. This was one reason why he would never write memoirs. To him, the experiences were truly incidental to getting the specimens.

All of this palm interest began in his fifty-second year, in 1910, when, according to reports, his wife chided him for not knowing the names of the palms she pointed out to him from a hotel veranda at Kingston, Jamaica. Bailey prided himself on his knowledge of garden plants, and her gentle teasing stimulated him to make the decision to learn about the palms.

It was very much in character that Bailey did not start with those particular planted palms whose names he did not know. He followed his larger plan: his guiding rule, that study of any group of garden plants must be based first on knowing the wild members of the group, and that the identification and naming of the cultivated kinds will then later fall into place. So, Bailey started his journeys to see the wild palms—to the volcanic islands of the Caribbean, to the jungles of Panama and South America, to the hinterland of Mexico, and to the less traveled areas of our southern states. He visited the Caribbean area itself on eighteen different occasions from 1910 to 1949, and collected palms and other plants on at least thirty-one of the islands in the two Antilles chains.

Each of these trips was an adventure

in itself. There is much we do not know about them because Bailey kept no detailed journal, no diary, and did not later write very many anecdotes. Too seldom was much recorded of his informal talks about the trips. What we do know is indeed fascinating. Our knowledge comes from his botanical writings in which he named and described the new species he had found, from his fragmentary notes accompanying the plant specimens, and from the few recordings that were made of his talks in the 1950's.

Among these recordings is his account of his 1935 trip to Andros Island. This was an adventure with all the elements of a movie melodrama: hurricanes, famine and thirst, a shipboard fight, and a cast that included two young Englishmen who were studying diseases of the Caribbean sponges, and an internationally famous swimmer. To the non-botanist, the finding of a new species of palm becomes incidental. Space considerations prevent inclusion of the story in this article, but it will be among those given in full in the forthcoming biography now in preparation.

Sabal is the Latin name of the palmetto palms, a large genus to which Bailey devoted considerable study. He collected its members from many places in the Caribbean: Bermuda in 1922; Dominica in 1922; Cuba in 1929, 1931, and 1938; Puerto Rico in 1932 and 1939; Martinique in 1938, and, of course, many times in Mexico and the southern United States. In addition, he received material from other collectors and studied specimens in the major herbaria. By seeing and photographing the palms in their native haunts, bringing back specimens of their foliage, their flowers, and their fruits, he assembled—often for the first time—an indisputable documentary record of their characteristics. It was

through the subsequent painstaking study of this record that he was able to put the pieces together and produce a true picture of their relationships. In 1940 he wrote, "Several undescribed species of *Sabal* are in my collection awaiting the experience and opportunity to publish a complete revision. The palmettos are so common in cultivation and so abundant in nature that they invite continued attention."

Four years later he penned confidently, in *Gentes Herbarum*, as he monographed the genus, "The genus *Sabal* begins to take cohesive shape in my mind . . . ardent growing collections in many regions have been studied, bundles of sterile and fragmentary material in my herbarium have been burned, and now the way is clear. We should have an encouraging journey."

The journey was more than encouraging, it became satisfying for in addition to recognizing and naming the new species *Sabal bahamensis*, he named and published *Sabal peregrina*, based on material he had collected on Martinique, and *Sabal yucatanica* of Mexico. He also brought together most of the information known about other species, a valuable contribution in itself.

Four other palm genera also held particular fascination for Bailey: *Thrinax* (the peaberry palms), *Acrocomia* (the gru-gru palms) *Coccothrinax* (the seam-berry palms), and *Roystonea* (the royal palms). His Caribbean palm collections were coordinated with specimens he collected in other parts of the American tropics, the whole being studied together, and the results published in *Gentes Herbarum*.

Blackberries and their relatives belong to the genus *Rubus*. This was another of Bailey's favorite groups, and for seventy years was the object of his studies. His *Rubus* studies in the Carib-

bean, while not so important in their results as was his palm work, nonetheless helped him gain a perspective on their interrelationships with those of the North American continent.

Travel restrictions imposed by World War II forced Bailey to suspend palm exploration activities. Restive and impatient at this, he conserved allocations of rationed gasoline so that he might fill in broad gaps of knowledge by collecting *Rubus* in hitherto unstudied areas in the United States. In those war years he canvassed southern and eastern parts of the country, collecting the wild blackberries. However, during this period he never abandoned his plan for studying thoroughly the palms of the Caribbean. The war over in 1946, he was back for them once more in that area.

To record the scope and results of each trip is not possible at this time. A list of the new palm species Bailey discovered and named, and of the dates and major stopping places of his Caribbean trips, is appended to this article.

In the course of his studies Bailey kept clearly in mind that, next to adding to man's knowledge through scientific investigation, his most important contribution would be to make these findings available to the plantsman and the gardener. He did this by writing new descriptions in a language that was both meaningful and understandable, and by basing his accounts on his observations of the plants and their structures. He did it, too, by going back to the earliest literature, sifting the reliable from the unreliable, and giving the reader not only the correct name for each plant, but readable explanations of why that name was correct.

Bailey was noted for his singleness of purpose and his energy. These attributes are well exemplified by the way

he planned his trips and went about making the collections. He was always prepared and knew the particulars of each plant he was searching for. On every trip he carried with him a hatchet, machete, and a saw; a plant press and drying papers to preserve the specimens, even wrapping paper and cord for the parcels; storage boxes; a bulky 5x7 camera and tripod, film-developing materials, and photographic accessories.

Bailey would spend a day or more in one locale to get the photographs, fruit, flowers, and leaves essential for an adequate record of a single palm tree. Knowing he might not come that way again, he would develop his negatives on the spot to assure himself that he had good pictures before leaving. (Once, he incurred the wrath of guests and management because he used up the hotel's limited water supply to wash his negatives.)

Seldom did terrain prove insurmountable when the plant he wanted was there. He was "on top of Haiti" (about 6,000 feet above sea level) in 1937, and at the town of Bottom, in Saba, in 1948. He collected in the almost inaccessible Oriente province of southeastern Cuba, and over most of Trinidad, Tobago, and Little Tobago. In *Gentes Herbarum* he wrote, "The llume or *Gaussia* of Puerto Rico is on inaccessible castellated limestone steepes high above the road. All day long I have hunted *Raphia* in water from knees to hips . . ." And he got his specimens.

On most of his later expeditions Bailey traveled alone. In the 1920's, however, Mrs. Bailey and their daughter Ethel accompanied him on several trips to the Caribbean and South America. A trip into Brazil in 1922-23 was the last out of the country for Mrs. Bailey, who later in 1923 suffered a stroke from which she never fully recovered.

Ethel Bailey's last collecting foray with her father was a few months after her mother's death, when, in November 1938, they went to Martinique. It was a rigorous, exhausting trip, associated with landslides, filthy hovels, and food poisoning, and Ethel's laconic field notes read: "Changed packs today, blisters bad . . . climbed up-hill most of day; in awful native hut in rain . . . roads flooded, father has fever . . . both ill but finished packing."

Ethel Bailey's part as his assistant was indeed considerable. It was usually Ethel who pressed the specimens, who spread the hundreds of damp or wet blotters out to dry—on a lawn, a hotel roof, or a veranda—or who scrambled for them when a quick tropical shower came down. It was usually Ethel who wrapped the parcels of specimens for shipment home, who scrounged for precious newspapers in which to press the plants, and who worked by her father's side getting the material to be pressed. Her name, too, is fittingly commemorated in new species they discovered together.

Bailey usually engaged local help, both as guides and porters. The native islander would climb the tall palm to cut carefully an entire leaf, the fruiting cluster, or the bulky flowering branch that Bailey would need, sometimes lowering it with cord or rope to deliver it below, intact. Often the guide located the hut where Bailey could sleep for the night, bought the chicken to be cooked for food, or knew where beer could be bought for drink—it was safer than water.

Bailey would sometimes make arrangements with persons living in areas to which he could not return in the proper season, to send him the palm parts he wanted from trees that he had marked. When Bailey collected in His-

paniola, for example, he had the help of Félix Pierre Louis, of the Botany Department of the Services du Département de l'Agriculture Damien. On Antigua, Bailey met an old resident who had himself "introduced seeds of royals from Trinidad and had grown trees on his place in the hills, and from these trees he had seen the clumps arise in many places down the valleys."

Brother Léon was one of the persons whom Bailey always contacted when he was in Cuba. This French-Canadian priest taught at the Colegio de la Salle, a Catholic college in Havana, and of course spoke fluent Spanish. In 1951 Bailey recounted an adventure they had shared many years earlier when going by train to get some palms he wanted. Both had become thirsty in the tropic heat.

"We stopped at a small station where vendors, as usual, were selling all sorts of things, including beer. He lowered the window and bought two bottles. I didn't have any apparatus for getting the cap off the bottle of beer, so Brother Léon unbuttoned his robe, and drew out a machete. He held the bottle up at arm's length while standing in the aisle, and took a long-armed swipe with the machete and clipped the cap off as slick as a whistle. He had done that before! . . . He was a rare old man. I loved him very much."

When one is confronted with the lists of islands Bailey visited, one is impressed by the number of places where he stopped, by the distances he covered. In fact, his whole life seems one continuous voyage, with longer or shorter stops here and there. The two Antilles chains extend for some 15,000 miles; their islands vary from a few to over one hundred miles apart. Bailey sometimes traveled back and forth between two islands several times during a single tour of

the area. On one of his trips, in 1922 for example, he covered about 1,800 miles in three months. On six successive days his stops were at St. Kitts, Antigua, Montserrat, Dominica, St. Lucia, and Barbados, in that order, and during these short visits he prepared over one hundred specimens.

These figures are the more impressive when one remembers that in those days one could reach the islands only by boat. Often he never knew until he arrived at a dock whether he could hire a small boat or find a skipper to sail him where he wished to go.

Things were very different on his last three trips to the Caribbean, in 1946, 1948, 1949. The airplane had taken over, and its scheduled flights revolutionized Bailey's itinerary-making. He could reach objectives sooner and could plan trips to islands never visited before. These trips seem to have been greater adventures than most of his earlier ones.

Bailey flew down to the Caribbean in January, 1948, and spent three months visiting a dozen islands for palms. He had a penchant for being away from home on his birthday, March 15. In his later years this gave opportunity to recall, for example, that on his seventy-ninth birthday he was in Port-au-Prince, Haiti; on his eighty-second in Oaxaca, Mexico; on his eighty-eighth in Trinidad; on his ninetyieth on Grenada; and on his ninety-first at sea on a small sailboat between St. Eustatius and St. Kitts. The next four birthdays were spent at home.

When he turned ninety, he was collecting palms at the Grand Étang in Grenada. Friends at Cornell University had made other plans for that day—they were to have had a ninetieth birthday party for him—but had to wait on their guest of honor's convenience. The party was held after he returned home

in May. He had wonderful stories to tell, and he told them well.

The Dutch island of Saba was one of his goals that year. He had been told that a certain species of *Coccothrinax* was not to be found there. Bailey was convinced by earlier studies that it was. The fact that an earlier collector had not discovered the palm was unconvincing. To learn for himself, he chartered a sloop to take him there from St. Martin.

The skipper of the sloop, the "Blue Peter," was understandably concerned when the aged white-haired man asked to be taken to Saba that seventh of February. His concern grew when next day they had to "beach" at Saba in choppy water. There was no pier, no harbor. The coast is rocky at the base of this volcanic crater island and one landed by wading ashore. This time the sea was too rough, the breakers too high for any casual wading. Two sailors formed a cradle and, shoulder-deep in the water, carried Bailey—waves breaking over the heads of all three—to the rocky shore. Drenched and shaken, he was nonetheless eager to climb the steep slope to the rim of the volcano cone, to descend to the little town of Bottom nestled deep within its crater. There was no transportation. Everyone climbed up one side and down the other.

Despite his being ill much of the time while on Saba, and flouting the doctor's orders to remain in bed, Bailey set out to look for his palm. He was not disappointed. The *Coccothrinax* was there, and he got his specimens. Later he named it *Coccothrinax sabana*, after the island. He was not yet satisfied, however. One did not come to an island once in a lifetime without looking it over thoroughly. He had to see what was growing on the rim, high above the spotless Dutch village. So he climbed to

it and walked its four-mile circumference of outcroppings, along narrow ledges often skirting sheer drops of hundreds of feet. And there he found another palm, one he hadn't expected. It, too, proved to be a new species. He named it *Prestoea sabana*. What a triumph that day was for him!

The rest of the month was equally rewarding. The "Blue Peter" returned him to St. Martin, and later took him to St. Eustatius and to St. Kitts. From there he flew to Trinidad, thence to British Guiana, back to Tobago, on to Barbados, and to Grenada, stopping at each island for specimens of particular palms. On Richmond Hill, near St. George's in Grenada, Bailey took a specimen of another palm that later proved to be unnamed. He published an account of it in 1949, naming it *Acrocomia grenadana*.

When Bailey flew to St. Lucia a few days later, he set out for Barre de l'Isle, a nearby spit of land whose rich volcanic soil nurtures a dense rain forest. There, among the understory growth, he found another new palm, a dwarf, which he later named *Aiphanes luciana*.

His ninety-first birthday, in 1949, Bailey spent en route by sloop from St. Eustatius to St. Kitts. He had been in the Caribbean on that trip since the end of January, at Puerto Rico, at St. Thomas and St. Croix in the Virgin Islands, and at Antigua. He made only 23 collections on this trip. His constitution was beginning to deteriorate, was becoming incapable of meeting the demands he would make on it. The one specimen he took on Antigua, on February 25, turned out to be another new palm, *Acrocomia antiguana*. After a short stay at St. Kitts and at St. Eustatius, he came back to Antigua to do some collecting at St. John's. While there, he had an unexpected acute at-

tack of asthma which forced him to rest under medical care, though not for long.

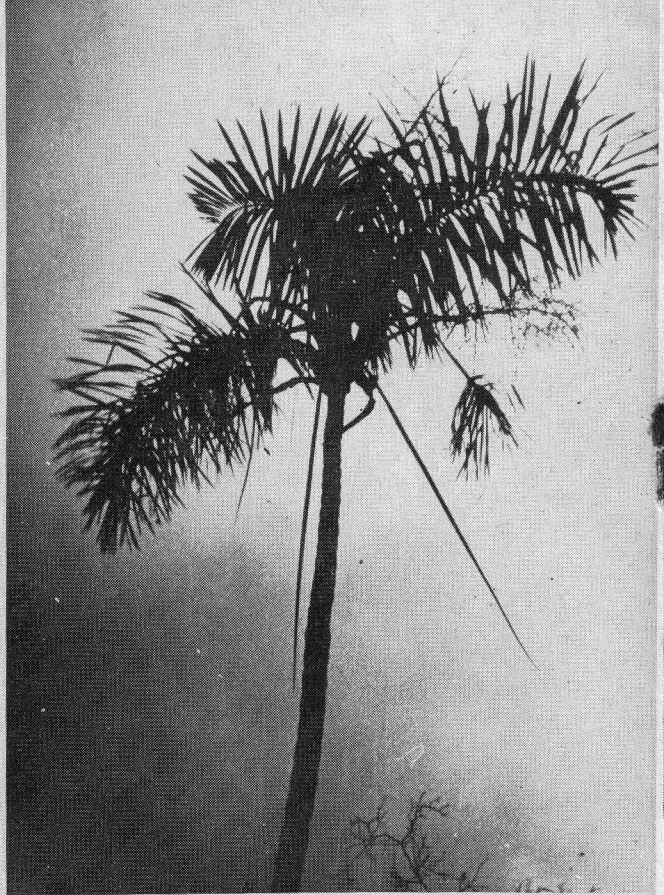
Eight days later he was on the other side of Antigua, taking a few last specimens before flying to Puerto Rico, and thence home. He had a second and more severe asthmatic attack on the plane on the last leg of the return trip, and was hospitalized immediately on landing at Boston. (Bad weather had closed New York airports.) Released the next morning, he went to New York by train, still a sick man. There a Hortorium colleague met him and accompanied him to Ithaca.

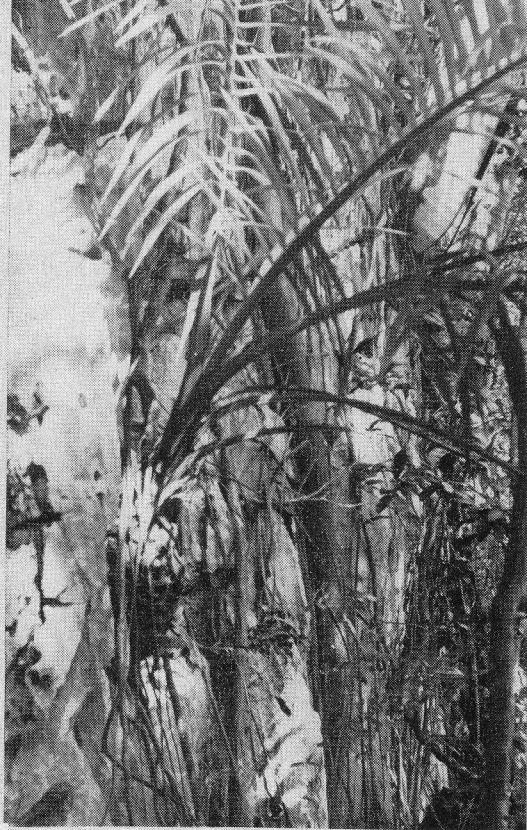
Soon Liberty Hyde Bailey was at work with the new specimens, studying, comparing, and writing about them. In the next few months he wrote accounts for *Gentes Herbarum*, reporting the findings of his two most recent trips. These were his last collecting expeditions, although he was still planning one final trip and even bought the ticket that was to take him to the Belgian Congo to study the oil palms. He never made it. Mind and body revolted against the still-ambitious spirit.

These Caribbean adventures had brought many rewards for Bailey: full herbarium cases, excellent photographic records, valued publications, world renown as a student of the American palms, and countless vivid memories. Nevertheless, he had not yet fulfilled his plans, for the promise of the future and the work he yet would do continued to be foremost in his mind. He wanted to master all the palms, to produce an opus about them that he would title "Genera Palmarum." A manuscript of the first page of the Introduction for it, written after he was denied the trip to Africa, is evidence of his unflagging determination. It is a work that will yet be written and towards which his Caribbean expeditions and studies will contribute much.

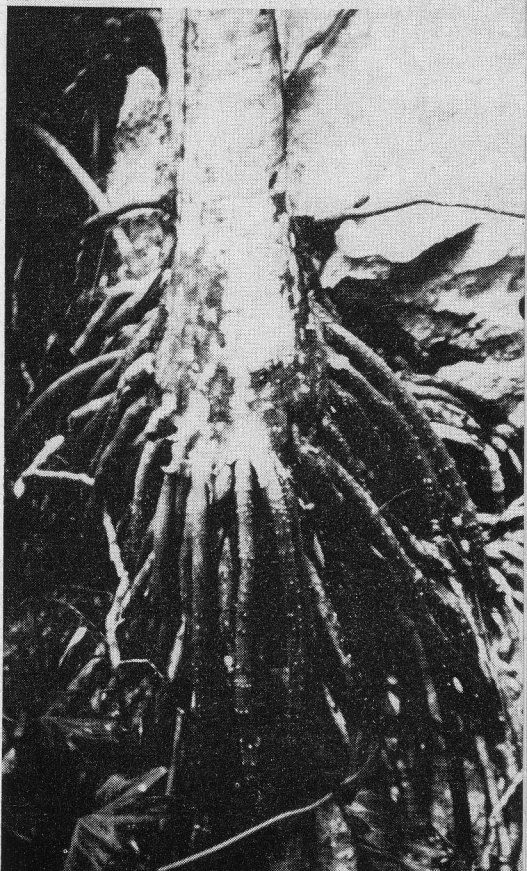
Outline of L. H. Bailey's travels in the Caribbean islands.

- 1910 (Feb.-Mar.) Jamaica, Cuba (en route from Panama to New Orleans).
- 1912 (Sept. 1-27) Lesser Antilles: St. Kitts, Antigua, Guadeloupe, Dominica, Grenada.
- 1920-1921 (Dec.-May) Puerto Rico (en route to Venezuela and Trinidad).
- 1922 (Jan.-Apr.) Bermuda, Barbados, Dominica, St. Kitts, Antigua, St. Lucia, St. Vincent, Grenada.
- 1923-24 (Dec.-Apr.) Barbados.
- 1929 (Feb.-Mar.) Cuba.
- 1931 (Feb.-Mar.) Jamaica, Cuba.
- 1931 (June-Aug.) Jamaica.
- 1932 (May) Puerto Rico.
- 1935 (Nov.-Dec.) Jamaica.
- 1937 (Mar.-Apr.) Haiti, Santo Domingo.
- 1937 (Nov.) Bahamas, Cuba.
- 1938 (Mar.) Cuba.
- 1938 (Nov.) St. Thomas, Guadeloupe, Martinique.
- 1939 (July-Aug.) Puerto Rico, Haiti, Santo Domingo.
- 1946 (Jan.-Mar.) Trinidad, Jamaica, Tobago.
- 1946-47 (Oct.-Jan.) Haiti, Jamaica, St. Kitts, Nevis, Antigua.
- 1948 (Jan.-Apr.) Lesser Antilles, Jamaica, Barbados.
- 1949 (Jan.-Apr.) Lesser Antilles, Bermuda, Puerto Rico, Virgin Islands, Antigua, Tortola.





66 (left). A view of the mogotes in Pinar del Rio, Cuba, on which *Gaussia princeps* grows (bottom) and habit of the species at San Vicente (top), the crown showing branched inflorescences and persistent denuded leaf rachises. From color transparencies by R. W. Read.



67 (right). The bases of two trees of *Gaussia princeps* growing from cracks in vertical rock faces (top left), a young tree showing the horizontally but not vertically enlarged trunk, trees illustrated at left appearing in upper right corner (top right), and thick roots (bottom), all at San Vicente, Cuba. Photographs by R. W. Read.

Gaussia princeps on the Mogotes of Cuba

ROBERT W. READ

L. H. Bailey Hortorium, Cornell University, Ithaca, N. Y.

Growing on the *mogotes* of Pinar del Rio Province in Cuba, is a very strange palm, the *palma de sierra* or *Gaussia princeps*. This unusual palm rarely grows on a level surface; rather it is almost always found growing on vertical limestone walls with its large rope-like roots dangling far below in a crevasse or over a cliff. *Mogotes* or "hay-stack" mountains are steep hills of very porous limestone, with no actual soil on them, jutting up out of very fertile, flat valleys. So steep and treacherous are some of the *mogotes* that even the local people do not climb them. Royal palms abound on the fertile valley floor but not *Gaussia*; it is never found there, it literally "sticks" to the rocks. Royals are never seen growing on the *mogotes* unless there is a slope with some soil on it.

My first encounter with *Gaussia* in Cuba was in 1956 when I could do nothing but catch a quick glimpse of the palm through the rain. In and around the *mogote* area there is considerable rainfall, a little every day during parts of the year. The effect of the rain is seen and felt everywhere. The rock is eroded badly with pot-holes and caves, while orchids, philodendrons, bromeliads, epiphytic cacti, mosses, ferns, *Ficus* trees, and many other plants, mostly epiphytes, are seen growing on every rocky outcrop. Growing on the rocks like everything else are two species of palms, *Hemithrinax Ekmaniana* and *Gaussia princeps*.

While on a collecting trip during the spring and summer of 1958, a side trip

to the *mogote* region was made specifically to collect and study the habits of *Gaussia*. A little old bus marked "La Palma" took me from the city of Pinar del Rio to the little settlement of San Vicente which is nestled among the *mogotes*.

Collecting specimens turned out to be no easy job due to the peculiar habit of the palm. A rope would have been very helpful but was not available. There is a large cable called *cable* in the area, which is used to ascend the side of one of the *mogotes*. Without the cable it is necessary to scale the sheer cliffs via *Ficus* roots or vines. Once up the side it is difficult to find safe footing because of the many solution holes and crevasses.

Gaussia princeps is a strange palm growing under strange conditions, beginning its life much like the bromeliads and orchids with which it associates. It is on the sides of sheer rock walls in a very small crevice or niche, that the sticky red fruits adhere and the seeds germinate. At first the seedling forms a spherical stem with only a few leaves, appearing much like a turnip. As the trunk enlarges, probably deriving its nutrients from those minerals dissolved from the rocks by the rain, it grows wider rather than longer, increasing to almost a foot in diameter. It is then that the trunk begins to elongate. Usually the base of the trunk becomes one and one-half to two feet through and is very thick up to the point where the top of the palm emerges from the surrounding canopy of trees. When the

Continued on Page 139

LIVISTONA CHINENSIS NATURALIZED IN FLORIDA

EILEEN H. BUTTS

A striking stand of naturalized Chinese fan palms (*Livistona chinensis*) grows along the swampy margin of Lake Crescent in old Hubbard Park at Crescent City, Florida, the former winter home of Bela Hubbard of Detroit. The naturalized palms are represented by a fair number of quite large trees and a great many much younger and smaller ones. Crescent City, the site of this remarkable incidence, is in north central Florida about twenty miles south of Palatka.

The palms were introduced to Florida about eighty years ago when the estate was being developed by my uncle, Henry Guernsey Hubbard, the son of Bela. A celebrated entomologist and naturalist of that era, Henry Hubbard died of tuberculosis while still a young man, before the turn of the century—but not before he had traveled far and wide in search of rare plants for Hubbard Park. These he established in slat houses and protected areas until foreign landscape men designed the extensive gardens which became the eventual source of many of the fine old specimens of palms, camellias, cycads, *etc.*, one finds today in the dooryards of many homes for miles around Crescent City.

There must be now well over a hundred *Livistona chinensis* in the naturalized group, one of which was the original and is perhaps forty feet tall. The moist, very rich black hammock soil of the long and narrow swamp bordering Lake Crescent is lapped at all times at this point by waves that are not always gentle; for, although a large lake twenty-eight miles long by three wide, it is a shallow body of water. Here the *livistonas* have grown happily intermingled

with cypress, southern magnolia, sweetgum, *etc.*, and have also established themselves just beyond the margins of the swamp.

The freeze of 1958 discolored some of the palm foliage but did not appreciably retard growth. Apparently the situation is ideal. The stand would now be very much larger and a veritable jungle of *livistonas* had not so many people gone there for seedlings during the past seventy years. Hubbard Park, however, was never in any way commercialized.

In photographs of Henry Hubbard's slat houses, made about seventy years ago, one can identify a good many kinds of palms in their infancy. How many of them were his own introductions to the United States it is now impossible to state, lacking his notes.

IN AND OUT OF THE PALM GARDEN

No one knows what hash is.

—AMBROSE BIERCE

In the preceding issue of *PRINCIPES* there appeared a few paragraphs under the somber title "Notes of a Palophile." Already this sounds to the paragrapher just a shade snooty for a text not hidebound by the dignity demanded of technical writings, and the new title above represents a closer descent to this terrestrial orb. But whether such a series of notes, under one title or another, will become a regular department in this journal, is first of all up to the editor and is further subject to the exigencies of publication. The notes do skip about somewhat disconcertingly, but that is all one can expect from fragments. Sometimes edible hash is just as disconcerting as the verbal kind, yet there are those who actually manage to eat it and survive. Besides, if taken with a ration of palm oil, these notes should

be less mysterious than most other kinds of hash.

* * *

Imagine our surprise while delving in the Woolworth stacks to find whisk brooms made from the fiber of *Sabal Palmetto*! It appears, however, that this article has been manufactured for years and is no novelty. The Valet Whisk Broom, in the unlikely case that anyone would care, is a product of Empire Brushes, Inc., sells for 61¢ and "outlasts ordinary whisks many times over." One learns that it is made of "genuine palmetto fibre," as if some palmetto fiber were not genuine.

Conservationists occasionally have professed alarm over any attempt to make commercial use of the *Sabal Palmetto* in Florida. Thus far the inroads have been insignificant in relation to the great numbers of this extremely floriferous palmetto. It propagates itself prodigiously far and wide, with the aid of birds and quadrupeds. Undeniably many palmettoes become posts or pilings and some hundreds, or perhaps thousands, are sacrificed annually for the cabbage or heart of palm; but the palmetto population seems able to hold its own against the destruction and even to expand in areas not kept cleared. Tons of unexpanded leaves are cropped each year and shipped out of the state for use in churches on Palm Sunday, without fatal injury to the deep-seated bud. Storms, old age and palm beetles probably take more of a toll than man takes. Despite fires and other hazards any approach to extinction of the palmettoes seems fanciful today, though with the passage of time no one can ascertain what new depredations may be made by man and natural causes. If the palmetto ever becomes of importance to industry, like pine timber and pulpwood, no doubt it would be planted by foresters in huge

stands. In the meantime sentiment about the moderate destruction is pretty but wasted.

* * *

As in California a large part of the Florida population is immigrant from other climes, and in both states the newcomers choose a more or less complete set of likes and dislikes of all that is new and different, quite naturally including in it a taste or distaste for the strange plants. One contingent in California is distressed by the washingtonias because of the shag of dead leaves and another is thrilled at the sight of them, as in Florida there are both good haters and great admirers of the tree palmetto (the saw palmetto is reserved for future notice). The standard objection to the palmetto is that it is a scrawny, unkempt and very uninspiring object, all of which it often is in cities and other localities unfavorable for its best development. The variance in form, size and general appearance of the palmetto, however, is so great as to make one suspect specific differences, though none are officially avowed. Some of the wild palmettoes, never glimpsed by the haters and evidently growing under the best conditions, have got magnificence and grandeur enough to stifle many a much-touted and much-desired tropical palm; their clean boles are stout, not yet spindly at all in the young palms of but fifty years as in the centuries-old veterans, and about them they have an air of wildness and loneliness that might well be duplicated in some remote forest of mauritias, or more nearly among the miles of lofty Mexican palmettoes (*Sabal mexicana*) lost in the rolling hills south of Topila in Veracruz. The Florida palmetto attains to eighty feet in some places, which is something less than unverified reports of ninety or more. Even so, this palmetto is grossly misnamed. It is not a "palmetto," in-

dicating diminutive; it is a palm and a very astonishing component of the United States flora.

* * *

Reference was made above to young palmettoes but fifty years old. Advisedly, if the late David Fairchild, botanist with an unashamed and abiding affection for the palms, did not go wide of the mark. He was of the opinion that the very oldest of the palmettoes might have accumulated several centuries of life, basing his observation on the immemorial stands near the banks of the Tomoka River.

* * *

Sabal texana so closely resembles *S. Palmetto* that the young trees, before flowering age, are to be distinguished only with difficulty if at all. On the average, *S. texana* has a heavier trunk when adult, but this is not always so, for some of the eastern palmettoes themselves will erect "outsize" trunks. A dependable character would seem to be the size of the fruits, which are something more than half an inch broad and are commonly larger than those of any other species except one—*S. Dugesii*, a palmetto once known by the single type-tree and now either extinct or alive in complete obscurity. But one large grove of *S. texana* is known, about ten miles from Brownsville, Texas, and elsewhere the wild trees occur more sparingly along both sides of the Rio Grande in the lower Valley. This palmetto has been widely planted in Texas north of its range and may be seen in many cities, as for example in Uvalde where it ornaments the square on all four sides of the city hall.

* * *

The genus *Sabal* presents many difficulties for both layman and scientist, chiefly because some of the published species resemble one another so closely in the flowers, fruits, foliage and stems

that specific differences are not easily distinguished. The difficulties are compounded by much variance among individuals. Bailey expounded upon the lack of uniformity in *S. Palmetto* from one locality to another. Until this day many of the palmettoes in botanic gardens and elsewhere remain of doubtful determination, and even when the beholder is armed with a key he may still find himself baffled. This is partly due, apparently, to a confused use of names, which in turn partly proceeds from the scepticism felt towards the state of scientific knowledge of the palmettoes. Though Bailey's studies were extensive, he did not consider them complete. He believed that further exploration in Mexico and other American countries would be likely to turn up new species to be added to the twenty-six he treated as valid in *Gentes Herbarum* 6 fasc. 7, 1944. In the future, possibly, students may take the reverse tack by uniting some of the species, thus reducing the total number instead of adding to it. This, of course, remains to be seen, and in the meantime we have a *Sabal* puzzle.

* * *

We also have a *Phoenix* puzzle, a *Thrinax* puzzle, a *Coccothrinax* puzzle, a *Chamaedorea* puzzle, to mention only a few that growers and gardeners are likely to be aware of; but the puzzle soonest to be resolved, or in important part resolved, perhaps will be in the large genus *Chamaedorea* with upwards of one hundred species. The promise here is contingent on the studies being made by Dr. H. E. Moore, Jr., who even as this is written is preparing a field trip to Mexico in furtherance of those studies. The *Phoenix* puzzle is less susceptible of any early solution, for in the United States and other countries where many species have long been cultivated the natural hybridization has made conclusive studies of the culti-

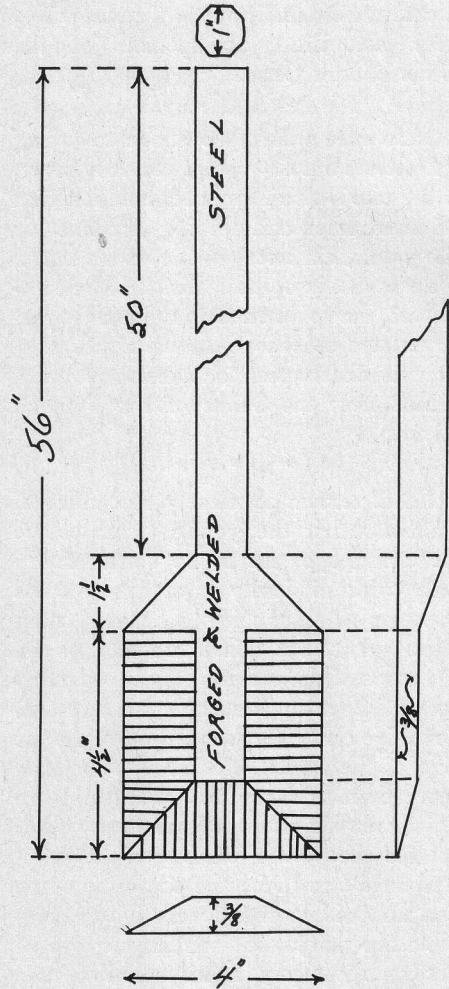
vated kinds impossible or nearly so—excepting of course the date palms of commerce over which there has been more control. The hybrids among the ornamental phoenixes are prolific producers of bloom and viable seed, and it seems probable that we have hybrids from hybrids, or plants of still more complicated ancestry. What we need to know just now is not what the crosses are; we need to know beyond cavil what the species are, and this can be fully determined only by studies made in native ranges and of herbarium specimens taken from such unmixed localities. As for *Thrinax* and *Coccothrinax*, these together with certain other genera await the men supplied with time enough and money enough to accomplish thorough studies and publish definitive treatments.

* * *

“Some persons will think, perhaps, that the study of such conspicuous and valuable plants [the palms] is just a little short of completion; nothing, however, is more untrue.” Substantial progress has been made since the late Brother León wrote that sentence in 1931, and yet despite the long strides forward the essential truth of such a general observation still prevails. To say that ignorance has been diminished and knowledge expanded in the interim is not to say that the end is now in sight. Completion of palm studies, or of any other botanical studies, is not to take place in the sense of finality. Botanical science will have no reason for being when all of its findings become final. So much work remains to be done with the palms that one could wish that the number of palm students were not so pitifully small in relation to the amount, scope, difficulties and importance of that work.

* * *

Anyone wishing to propagate sucker-ing palms by division would find a “date chisel” of immense aid. This tool



68. Chisel for cutting date offshoots.

is indispensable in removing the offshoots from date palms and hence is used in the commercial culture of dates. Certain other cluster-forming and sucker-ing palms are difficult to divide with uniform success unless the right methods can be brought into play. Shovels, spades, axes, wedges and other ordinary tools do not supply that combination of sharp edges, length, strength and accuracy necessary to secure some roots with the offshoot and take it off clean. This is more the case with the larger palms

and would not apply to the intermediate and smaller kinds readily divided with shovel or axe. Often, when a clump of *Phoenix reclinata* is removed from the ground, it is divided with fair success with an axe or chain saw; but when such a clump is to be divided while still in the ground, a date chisel would be just the right tool for the operation. This chisel is not on the market and must be made to order. Its appearance might be likened to a railroad crowbar having a forged blade five inches long by four wide welded to its lower end. Actually a one-inch steel bar fifty inches long is welded to the forged chisel, the beveled edges of which must be precisioned sharp (see accompanying drawing). The tool is pounded down with a sledge when date offshoots are taken.

* * *

When palms in containers are to be moved from heavy shade into direct sunlight, it is prudent to transfer them at intervals of several days, advancing them at each remove to less shade and more light. This gradual shifting conditions them to the unaccustomed rays and prevents scorching of the foliage. When shaded palms bought from nurseries are to be planted at once in a sunny location, some kind of temporary shade should be provided. One method of introducing a shade palm to full sunlight is to preplant two or three castor beans to overtop the palm and, after planting it, very gradually reduce the protection by pruning away a little of the castor-bean foliage every four or five days till none of it remains. This method has been used successfully to avoid eyesores and the risk of fatalities. Even a sun-loving palm will be burned severely when suddenly removed from deep shade into strong, daylong sunlight, especially in the summertime.

* * *

Wooded yards adjacent to woodlands

are often so heavily infested with ground moles that traps and poison are ineffective in controlling them. Certainly the moles do not eat roots, but just as certainly they damage small planted palms by burrowing directly under them and creating an artificial drought about the upper roots. There are localities where they make it impractical to set out very small palms, because of heaving and drying action, unless their incursions can be prevented. The burrowings seldom occur under plants watered only infrequently, for the moles evidently find better pickings of earthworms in the manured, moist soil about regularly irrigated plants. Wherever traps and poison cannot stop the depredations, a ring of half-inch mesh hardware cloth eighteen inches wide, stood on its edge, will positively prevent the entrance of moles but will allow new roots to penetrate the soil outside the wired ring. The hole is best wired before the young palm is planted, and though the wire of hardware cloth is galvanized it will have rusted through long before the palm reaches adult proportions. Mole runs about the soil of large palms probably do little damage and to some extent may be beneficial in aerating the soil.

* * *

A similar method may be used to exclude widely-ranging tree roots from the feeding area of small palms newly planted, at least for the time it would take the palms to establish enough of a root system to compete on better terms with any of the gross feeders standing near them. A two- or three-foot section of metal conduit six feet in diameter, which would be impenetrable by roots except at the bottom, may be used. Lacking the conduit, asphalted roofing paper may be set on edge in the hole where the palm is to be planted, in a ring of any desired diameter and depth. The paper must be securely overlapped and

held rigidly upright by stakes at regular intervals to prevent the pressure of the earth from bulging it either inwards or outwards. Either paper or metal should be removed when the palm roots threaten to become too confined, but by that time the palm should be able to compete with any aggressive plants surrounding it.

* * *

When does a collection of live palms cease to be merely a garden and get itself promoted to the high-sounding rank of palmetum? When the area is large, the palms many and no other plants are interspersed among them. So defined, one may doubt that two dozen palmetsa might be found anywhere in the universe.

* * *

A new addition to the list of tropical palms showing marked tolerance of cold weather was found in a short-statured but adult specimen of *Thrinax microcarpa* tested in the open ground at Daytona Beach, far north of where it had been previously tried in Florida. Five hours of below-freezing weather, on January 17, 1959, reaching a morning minimum of 27° F., had no visible effect whatsoever upon this palm. It has subsequently developed seven normal inflorescences and has retained all the leaves subjected to the freeze without the slightest blemish on any of them. These lower and older leaves, by the way, were fledged in 1958, and are so long that the blades now rest on the ground. The newer leaves are normally ascending, and quite up to standard. It is only fair to say, however, that the palm besides being tropical is also a subtropical one, for it occurs in the Florida Keys and in the Bahamas north of Cancer as well as elsewhere south of it. Nonetheless the climate and flora of those islands are largely tropical. No such cold tolerance can be claimed,

more's the pity, for *Thrinax parviflora*, which also is native both in the Keys and in the Antilles. Adult specimens of the latter suffered extensive damage to their foliage from the same freeze at the same location, though none of three planted the preceding summer was fatally injured.

* * *

Coccothrinax argentata, the silver palm of far southern Florida, should be a very promising candidate for culture much north of its range. According to our condisciple Stanley Kiem this Florida native endures unscathed the rigors of the low twenties, at times, in the pinelands west and southwest of Miami. The occasional sharp cold that invades the inland parts of Dade County is usually of much shorter duration than that of equivalent cold in central Florida, and without taking extremes into account, the winter weather is characterized by a much higher mean temperature. Nevertheless the implications are clear, from the fact that the silver palms withstand violent outbreaks of cold without a tremor, that this outlander could be cultivated with success elsewhere. Two drawbacks are responsible, very likely, for the paucity of this palm under cultivation: growth from the seed is exasperatingly slow, requiring ten years or more for the development of a plant scarcely four feet tall, and thus the nurserymen understandably shun them; and, though the wild palms are abundant near Miami, they are among the most difficult of palms to transplant from the wild. Nonetheless, culture of this attractive *Coccothrinax* is possible and only awaits enthusiasts endowed with more patience than enthusiasm, plus the urge to wade through a certain amount of trouble.

* * *

Had it not been for certain wild palms the history of the conquests made by

Cortés might have been materially altered, at least in relation to the expedition he led in 1524-5 for the purpose of punishing his rebellious captain Cristóbal de Olid. During the course of his overland march from the City of Mexico to northern Honduras he and his soldiers and Indians were several times threatened with death from starvation, and apparently were saved from it only by eating palm buds, kernels of palm seed and also inflorescences at different points along the route taken.

That part of the journey from Coatzacoalcos, Veracruz, to the Río Dulce in Guatemala just south of what is now British Honduras, was so extremely arduous that it alone took six months. In his Fifth Letter of "Relación" to the Emperor Carlos V, written in 1526, Cortés says that his men were so weak from starvation that it took two of them the whole day to cut down one of the huge palms for the bud or cabbage though they could devour all of it in half an hour. In this northeast part of Guatemala the tall palms might have been orbignyas, but prior to that time Cortés writes of eating "cooked little palms" (doubtless the inflorescences of chamaedoreas) and "nuts of palms" in the total absence of any other food. Also Bernal Díaz del Castillo, who fought under Cortés in all the campaigns of the Conquest and in his old age wrote his history of it, records that the soldiers of the same ill-starred expedition, when near the province of Acala in what is now the Mexican state of Tabasco, were "dying of hunger, although some of the old soldiers remedied matters for themselves by felling some very tall trees that look like palms, having as fruit some things that are apparently nuts but with extremely hard shells, and these they roasted, broke open and ate." [. . . *morian de hambre, y aunque algunos soldados de los viejos se remedia-*

ban con cortar unos árboles muy altos, que parecen palmas, que tienen por fruta unas al parecer nueces muy encarcadas y aquellas asaban y quebraban y comían].

Victims of almost constant famine, later on in the year 1525 the depleted forces ill and starving reached the vicinity of Lake Yzabal in Guatemala, of which occasion Bernal Díaz remarks with feeling, "As for food, why, not even in dreams had it not been for some 'pacayas' which spring from some very small palms, and some other things like nuts which we roasted and split open, and we ate the kernels." Whence it appears that the vernacular term "pacaya" has been in common use for well over four centuries, but both Cortés and Bernal Díaz applied it to the inflorescence rather than to the palm itself.

Gaussia Princeps

Continued from Page 132

crown has emerged, the first inflorescence usually appears and from then on the trunk abruptly tapers to a long slender neck. Several much-branched inflorescences may appear at the same time, blooming in late June.

Many seedlings were found on the rocks and ledges and in some of the tiny solution holes on the vertical walls, so we are assured that the palm is perpetuating itself very well. The number of mature specimens is also great, many of them reaching heights of 30 feet or more. *Gaussia*, however, has proved to be a difficult palm to grow under cultivation, since conditions such as those on the *mogotes* are difficult to reproduce. But someone willing to experiment may find a way to cultivate it successfully.

Weeping Coconuts

IN FIJI, by W. H. HODGE

In late August of 1958 I had the pleasure of making a short visit to the Botanic Gardens at Suva (Viti Levu) in the Fiji Islands. Besides seeing the Gardens, one of the primary purposes of the visit was to locate, if possible, viable seed from the one remaining specimen of the rarely cultivated Marquesan *Pelagodoxa Henryana* which is still growing in this Garden. Though that latter mission failed, my hospitable guide, Mr. John Parham of the Department of Agriculture at Suva, pointed out a very interesting "weeping" form of the common coconut palm, *Cocos nucifera* (see illustration). The plant has been growing in the Botanic Garden at Suva for some years.

To my own mind, this weeping form of the coconut is of interest simply as a botanical curiosity. Certainly unlike many other weeping forms of plants this is nowhere near as attractive as the normal type of coconut palm. The weeping habit is exhibited by the leaves themselves, but particularly by the lateral pinnae. The individual fruits of this weeping form are considerably smaller in size than in the regular coconut variety. In general, the overall appearance of the plant was to me unthrifty, almost as though the palm was ailing. As a matter of fact, apparently little is known about this weeping type and its habit might conceivably be the result of some unknown physiological disturbance.

In recent correspondence (dated November, 1958) Mr. Parham has written further about the Suva Garden example. He states

"I know very little about the weeping coconut, but I think that it does breed

true as, a few weeks ago, I came across a group of five weeping palms in a coconut plantation. It seemed fairly obvious to me that the nuts must have been all collected from one parent palm and planted together when the plantation was established. The nuts are much smaller than those of the ordinary coconut palm. Mr. Leslie Wishard of Kamuela, Hawaii has made it his hobby to collect coconut varieties and he was greatly intrigued by the weeping coconut. He has succeeded in growing some from nuts I sent him in 1956.

"These palms are known from a number of different places in the Fiji Group. The man in charge of the gardens (at Suva) told me that they always collected the nuts from the palm and that they always produced weeping coconuts. I must say, though, that I don't know what he does with them as the one in the Garden is the only one I've seen in Suva."

IN FLORIDA, by STANLEY KIEM

There are several examples of the "weeping" form of the coconut in South Florida. In Key West, one may be seen on White St. and Petronia Ave., another in front of a housing development at Peary Ct. just off White St. Fronds of these palms do not seem to be smaller than those of normal coconuts but the several fruits opened did have a smaller nut inside. I removed the small nuts from their husks and planted them in the greenhouse in January. They sprouted nicely and have developed into healthy plants even though the nut was a bit less than one-half the size of a normal one. A few nuts from Key West germinated several years ago. They have not yet begun to divide their leaves though I somehow doubt that this would be a pure strain.



69. Weeping coconut, Botanic Garden, Suva, Fiji Islands. Photo by W. H. Hodge.

One palm at Southwest 25th St. and Southwest 3rd Ave. in Miami has leaves that are only partially affected. A

much better example is in the back yard of a home at 81 Northeast 53rd St., Miami. So far as I know, the last has



70. Weeping coconut at White Street and Petronia Avenue, Key West, Florida. Photograph by Stanley Kiem.

not yet produced any coconuts. It is my impression that the ends of the pinnæ are stiffer in the plant at 53rd St. than in those at Key West.

I have also seen these "weeping" coconuts in Haiti and again last March in Yucatan, although the Yucatan plant was not as characteristic as the others.

WHAT'S IN A NAME?

Hermann Wendland and Otto Drude erected a number of new palm genera, many of them familiar horticulturally, in *Linnaea* 39:153-238. 1875. The origin and pronunciation of their names follow:

Actinorhysis (ak tin oh rye tiss) was derived from two Greek words, *aktis* (a ray or beam) and *rhytis* (wrinkle or fold), because of the way in which the ruminations of the endosperm radiate.

Archontophoenix (are kon toe fée nix), so named because of the regal stature and beautiful foliage of the palm, comes from the Greek *archon* (chief, ruler) and *phoenix* (date palm, or by extension a palm). The common name king palm is derived directly from the generic name.

Carpoxyton (car póx i lon) from the Greek *karpos* (fruit) and *xylon* (wood) was suggested by the woody endocarp of the fruit.

Ceolococcus (see lo cók kus), a genus now considered synonymous with *Metroxylon*, takes its name from the Greek words *koilos* (hollow) and *kokkos* (grain, seed). The endosperm of the species originally described in the genus has a deep excavation on one side.

Dictyosperma (dik tee oh spér mah) is derived from the Greek *diktyon* (a net) and *sperma* (seed) because of the laxly reticulate or netted branches of the raphe on the seed coat.

Grisebachia (greek eh báh kee ah), an illegitimate synonym for *Howeia*, commemorates a German botanist, August Heinrich Rudolf Grisebach (1814-1879).

Hedyscepe (heh diss sée pee) is called umbrella palm by inhabitants of Lord Howe Island. The generic name, taken from the Greek *hedys* (pleasant, delight-

ful) and *skepe* (shade), carries the idea of umbrella into botanical language.

Hydriastele (high dree ah stée lee) is derived from the Greek words for a water nymph (*Hydrias*) and a pillar or column (*stele*). The appellation was given because the trunks reach lofty heights near springs.

Laccospadix (lak ko spáy dix) is a genus in which the flowers are borne within pits on the inflorescence. The name, therefore, was taken from the Greek words *lakkos* (pond, cistern, reservoir) and *spadix* (frond, branch of a palm, and botanically the palm inflorescence). The generic name was treated as masculine by Wendland and Drude but is feminine in derivation and should be so treated.

Lepidorrhachis (leh pid oh ráy kiss) has an indument of scales along the costa and nerves of the leaf which caused Wendland and Drude to coin the name from the Greek *lepis* (a scale) and *rhachis* (spine, backbone). The name was spelled *Lepidorhachis* by O. F. Cook who raised it to generic status but the double r is classically correct since r at the beginning of a word is doubled when by inflection or composition a simple vowel is brought before it.

Linospadix (lie no spáy dix) from the Greek *linon* (flax or anything made from it, thread) and *spadix* (frond, branch of a palm, and botanically the inflorescence) was so named because of the slender elongate simple inflorescence of *L. monostachya*. Wendland and Drude considered this name masculine as they did *Laccospadix* but it is correctly feminine in gender.

Loxococcus (lox oh cók kus) was derived from the Greek *loxos* (slanting) and *kokkos* (grain, seed) because of the oblique development of seed and fruit.

Nenga (néng ga) was modified from a Javanese vernacular name, *Nenge*, and used by Blume as a specific epithet for *Pinanga Nenga*. When this species was set apart as a distinct genus, Wendland and Drude simply used the epithet as a generic name. Because the generic and specific terms cannot be duplicated the correct name for the original species is now *Nenga pumila*.

Rhopalostylis (roe pal oh sty liss) from the Greek *rhopalon* (club) and *stylis* (pillar or column, and botanically the style) was chosen because the rudimentary female organ in the male flower is club-shaped.

News of The Society

Continued from Page 115

"Ledin sent the manuscript to the publisher, the American Horticultural Society, just before his death.

"Publication date has been set tentatively for this coming winter. It will be the most complete work on palms so far turned out in the Western Hemisphere.

"Although Ledin was born in Minnesota, no other botanist was more familiar with native Florida plants.

"He knew the names of the smallest things that grew at our feet, and recalled them as easily as a socialite introducing her dinner guests.

"Ledin was a great deal more aware of the things around him than the average individual. His trained eyes caught detail never seen by untrained eyes. For to him nothing in nature was insignificant.

"His association with Florida tied him ever closer to its wonders. He knew the 'glades, the hammocks, the pinelands, the swamps and the sand dunes.

"How much Ledin loved the wilds of Florida is shown in his will, in which he requested that his ashes be scattered over the Everglades."

Editor's Corner

Continued from Page 116

Mrs. Eileen H. Butts of 253 John Anderson Highway, Ormond Beach, Florida, writes of the naturalization of *Livistona chinensis* in Florida from plants introduced by her uncle, Henry Hubbard. Mrs. Butts adds the following paragraphs concerning the association of her uncle and David Fairchild:

"As a lad of nineteen, David Fairchild knew and loved Henry Hubbard. They both served in the Department of Agriculture in Washington, D.C., under Sterling Morton, Henry's cousin.

"In 1942, when I first mentioned my uncle Henry to Dr. Fairchild, his pleasure and enthusiasm knew no bounds, and it was then I learned of their early association. David Fairchild declared that my uncle had been an inspiration to him and one of the greatest naturalists who ever lived. He then proceeded to write in my copy of *Garden Islands of the Great East* the following inscription:

'To Eileen Hubbard Butts

When I was a boy of 19 I met your uncle Henry Hubbard. He was in Washington and thrilled a group of young scientists with his stories of caves and ambrosia beetles.

Affectionately yours,

DAVID FAIRCHILD'"

The plates borrowed for reprinting illustrations of *Sabal* were somehow switched so that *Sabal wresana* rather than *S. Rosei* actually appears in Figure 58 of this volume (July). When proof was read, the switch eluded this now apologetic editor. The real *Sabal Rosei* appears as Figure 60 of this issue.

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Erratum: For legend to Figure 58, page 109, read:
 58. *Sabal uresana* in northwestern Mexico. The foliage is glaucous-blue. Reprinted from
Gentes Herbarum 6: 441. 1944.