

Another specimen also has made a somewhat similar recovery after having been frozen back level with the ground.

This remarkable recuperative recovery would probably not be possible in many of the sub-tropical regions, such as Southern California where the ground remains cold at nights for months during the winter. In Daytona Beach warm weather may follow on the heels of a "norther" and stimulate the functioning of the underground part of the palm to "recover from the roots."

Since the valiant efforts of Europeans to grow *Caryota* palms along the Medi-

terranean coasts, some of the factors involved can now be defined. While it is clear that the genus is primarily tropical in its requirements, some species and some varieties of species that are native to mountain areas will tolerate several degrees below freezing. With this understanding the usefulness of these beautiful palms has been greatly extended to suitable parts of sub-tropical areas where it was not known until recently that the plants would survive. For the future, other species from the highlands of southeast Asia in all probability will be found and tried with similar results.

GARDEN TOUR

Foster Botanical Garden

The mainland visitor to Hawaii who has more than the average awareness of palms is frequently disappointed at the lack of variety being grown in the benign climate of the islands. Coconuts are everywhere, and there is also an occasional *Veitchia Merrillii* or *Pritchardia* or clump of *Chrysalidocarpus*, but few other palms are apparent in this region where so very many species could be grown.

His disappointment can be quickly allayed, however, by a visit to the Foster Botanical Gardens, for here he will find variety in abundance. Located in the heart of Honolulu, adjacent to busy Nuuanu Boulevard and just a few blocks from the center of town, is one of the outstanding collections of tropical palms in the United States. The garden is outstanding not so much because of its size or the extensiveness of its collection, but because of its age and the maturity of the trees.

The garden was begun over one hundred and thirty years ago in 1855 when Hawaiian royalty deeded to William Hillebrand four acres of land which was to become the nucleus of the present garden. A physician by profession, Dr. Hillebrand was an ardent botanist and horticulturist by avocation. He produced the well known botanical treatise, *Flora of the Hawaiian Islands*, and planted many of the tropical trees which have now reached gigantic proportions and give a special character to the entire garden.

In 1867 the land was sold to Captain and Mrs. Thomas Foster who continued to develop the garden, extending it to five and one-half acres. In 1930 they bequeathed it to the city of Honolulu. Since that time, under enthusiastic and able directors such as Mr. Paul Weissich who now heads it, Foster Garden has been enlarged with the introduction of hundreds of new plants.



1. Foster Garden is dominated by huge old trees which give a special character to the garden. Note the very tall *Dictyosperma album* on the left which reaches up through the treetops for light.

The garden is dominated by huge tropical trees of great age such as the banyan, *Ceiba*, *Adansonia* and lesser known trees such as *Cavanillesia*, and *Enterolobium*. These giants create a feeling or mood that only a very old garden can provoke. What were undoubtedly planned as open spaces are now almost covered by great tents of foliage. Palms are found throughout the garden, but three main areal divisions become apparent to the visitor: those

palms growing in the lawn areas among the big trees, those grouped together in the back of the garden around a collection of multiple-trunked palm species, and those planted in a separate rain forest or "jungle" section.

One enters the garden from a spacious parking lot, passing through a small reception center, and is confronted by a great Chinese banyan tree (*Ficus retusa*), its aerial roots fastened firmly to the ground to create a small forest of its



2. Many palms planted among the large trees have developed leaning trunks as the *Livistona* species in the lower left. The slender palm in the center is a *Dictyosperma album* and the palm at the right is *Orbignya Cohune* (formerly known as *Attalea*).

own trunks. On close examination one of these trunks turns out to be that of a royal palm whose identity has been lost in the overwhelming crown of the banyan tree. Ahead and beyond this tree lies the rain forest, a kind of core in the center of the garden that is gradually developed and introduced by a planting of *Pritchardia*. To one's left opens the shady lawn area canopied with the giant trees.

To the far left of the entry, in the front corner of the garden, is the Lyon Orchid Collection comprised of species from the wet tropics. Some are under lath but others are growing naturally in the trees. Many of these plants have only recently been brought in from the wild. And adjacent to the orchid garden is an extensive collection of bromeliads which in themselves would make a visit to Foster Gardens worthwhile. But we are



3. It is surprising to discover that this tall, slender palm is a *Sabal*—*S. mauritiaeformis*. The trunk is attractively ringed and a light grey in color. During a December visit to the garden, the ground beneath this palm was heavily littered with small black seeds, removing any doubt that this was indeed a *Sabal*.



4. At the rear of the garden where the giant trees give way to an area devoted solely to palms, one finds the coco-de-mer, *Lodoicea maldivica*. Note the extensive surface root system of the tree at the left, *Ficus Benjaminia*.

here to see the palms so focus attention on the *Chrysalidocarpus madagascariensis* growing near the bromeliads. As the name implies, the palm comes from Madagascar. It is pinnate with a slender but tall bamboo-like stem. Directly in front of the orchid house grows an old *Pritchardi Hillebrandii*, one of an extensive collection of this genus of tropical fan palms that is found in the garden.

Proceeding farther into the garden, the visitor is struck by the curious curve of many palm trunks as they reach upward for light. Many palms originally planted at a comfortable distance from competition and in full sunlight now find themselves in the shade. *Livistona*, *Dictyosperma*, *Howeia* seem determined to emulate the coconut. Several old *Dictyosperma album* have reached much



5. Adjacent to the *Lodoicea* grows this interesting stilt-rooted palm, *Verschaffeltia splendida*. In the background is a new planting of young palms. The collection of suckering or clumping palms is to the right of the picture.

greater heights than the limits usually accorded this palm. They, along with *Archontophoenix Alexandrae*, are encountered mainly as trunks with crowns lost high in the treetops. A surprise in this part of the garden is the discovery that one of these tall slender trunks is that of a *Sabal*, *S. mauritiaeformis*, a palm with none of the gross characteristics so frequently associated with the sabals.

As one walks deeper into the garden, the palm planting increases in interest. A large and rather messy *Orbignya Cohune* contrasts with a beautiful hedge of *Chrysalidocarpus madagascariensis* screening the garden from the adjacent side street. And then, staged on the grass is the legendary coco-de-mer, *Lodoicea maldivica*, the so-called "double coconut" from the Seychelles in the Indian Ocean. It is still a young plant, but its



6. *Ptychoraphis augusta* from Nicobar Island at first glance looks like a *Howeia*. This palm fruits heavily in Hawaii.

robust aspect is already befitting the tree that will bear the fifty-pound seed, the largest and heaviest seed of any plant, said to require ten years to ripen. The garden is proud of this palm and keeps a double coconut seed on the registration desk at the entrance.

The visitor is now near the rear of the left side of the rectangular garden and in an area where the large forest trees have been left behind and where

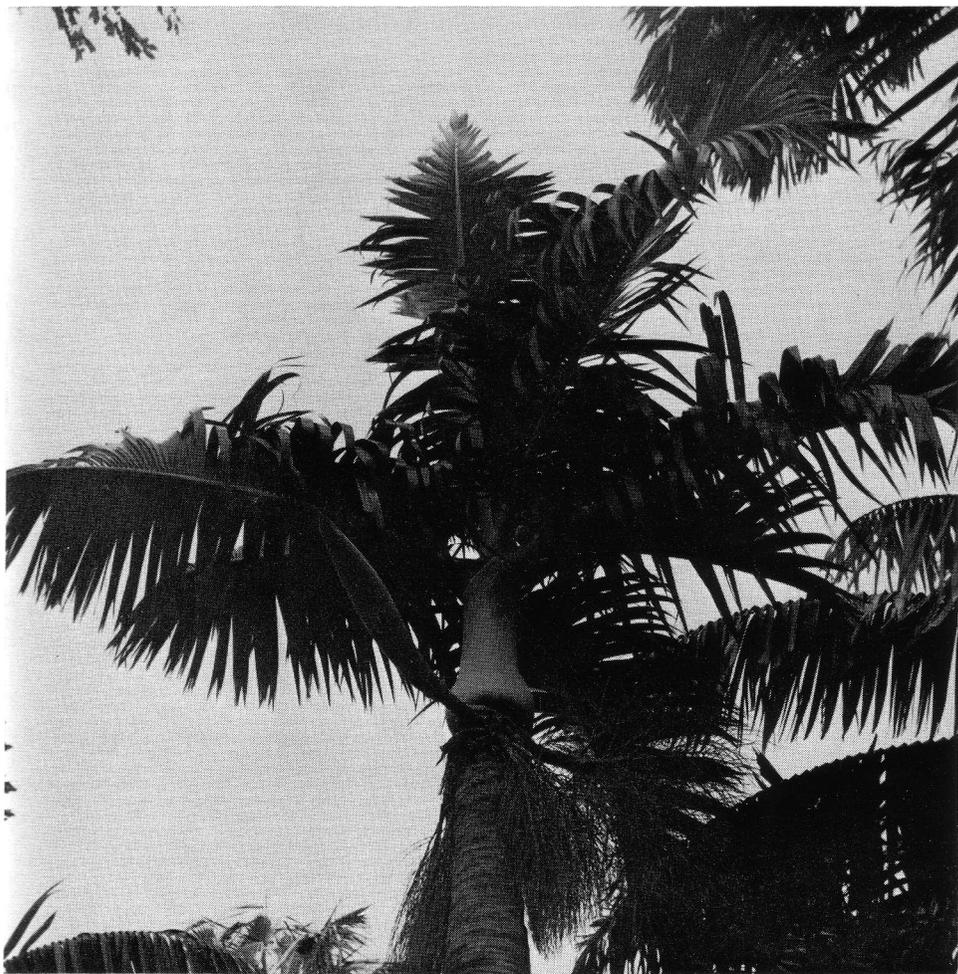
palms predominate. Here is located the type specimen of *Pritchardia macrocarpa*, protected by a fence. It is over one hundred years old and is the plant from which this species was first described. This is a dwarf species which originally grew in the upper end of the Nuuanu Valley and is now probably extinct in the wild. This *Pritchardia* is one of over twenty species of palms that are native to the Hawaiian Islands and are



7. An amazingly tall and dense stand of *Acoelorrhaphe Wrightii* creates its own little forest.

found nowhere else in the world. They are found from sea level to over 4,000 feet elevation, and some may be confined to a single island or even to a single valley. The Foster collection contains all but a few of the described species. A visitor to Hawaii cannot help but wonder as he surveys the acres and acres of sugar cane and pineapple how many unique plant species were lost forever in the wanton clearing of native vegetation for commercial agriculture.

Ahead and to the right is an extensive planting of palms including the tall and slender *Gaussia attenuata*, a collection of *Caryota* species, more species of *Pritchardia*, *Copernicia*, a curious putative *Mascarena* hybrid, *Latania*, *Ptychosperma*, *Aiphanes corallina* in fruit and many more. Outstanding, however, is the collection of suckering palms. There is a clump of *Acoelorrhaphe Wrightii* that is unbelievably (to a Californian at least) a full twenty feet across—a small



8. The Foster Garden Bulletin says that this strong-featured palm is a hybrid between *Mascarena Verschaffeltii* and *M. lagenicaulis*. In the opinion of the author this palm is more attractive than either of its putative parents.

forest in itself. Magnificent groves of *Rhapis* grow nearby. There is a beautiful specimen of *Ptychosperma Sanderianum* with slender bamboo-like stems and a well-proportioned stand of *Ptychosperma Macarthurii* consisting of ten tall trunks, all in fruit. One is struck by the great variety of clumping palms, from the dense growth of the *Acoelorrhaphe*, to the open airiness of the *Ptychosperma*, to the robust and larger trunks of *Oncos-*

sperma tigillarum from the East Indies. This is a beautifully proportioned group of several six-inch trunks growing closely together, terminating in soft pinnate crowns arranged at various heights. The trunks, heavily set with black spines, are vicious to touch but delightful to behold.

A pleasant discovery for the palm enthusiast comes after leaving this palm area and continuing to the right into a



9. These ten soaring trunks of *Ptychosperma Macarthurii* are loaded with ripening fruit, held in pendulous clusters below the crownshaft.

section apparently devoid of palms, but containing many flowering trees. There he encounters what at first appears to be just one more tree with a main trunk dividing into four ascending secondary trunks and branches. It appears to be an ordinary tree, that is, until the eye reaches the top and finds a crown composed of seventeen beautiful separate heads of grey-green palm leaves. The tree is the branching palm from Egypt

and the Sudan—*Hyphaene thebaica*—growing enthusiastically in this Honolulu garden.

The rainforest section in the center of the garden is an entirely different experience. One follows a path and is enclosed by a lush, almost overpowering growth of philodendrons, gingers and heliconias, dieffenbachias, red ti, anthuriums and aloccasias. The visitor feels alone here although others may be only

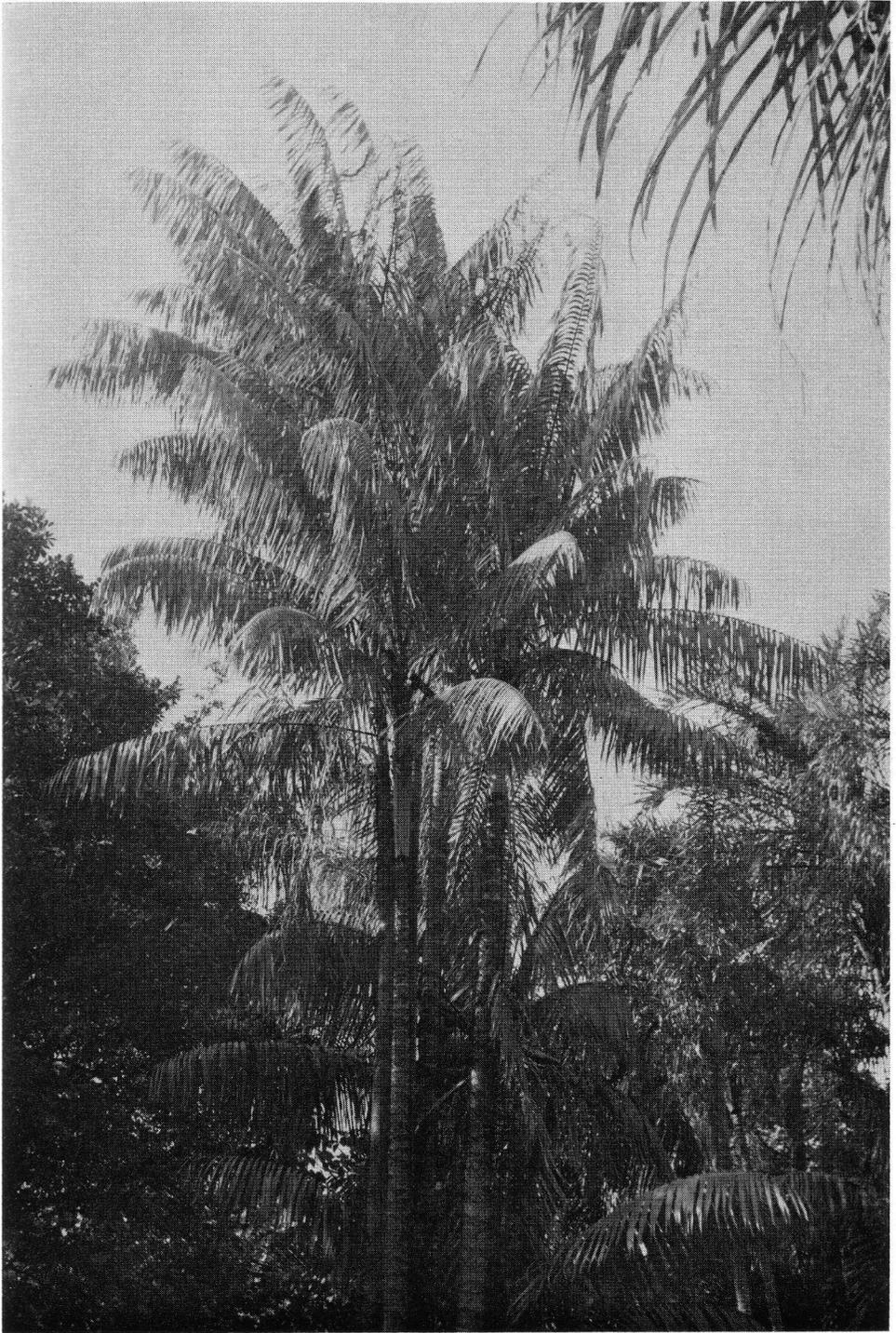


10. The fruit of *Latania Loddigesii* is interesting, looking deceptively like large bunches of green grapes.



11. A *Chrysalidocarpus* from Madagascar, probably *C. madagascariensis* or its variety *lucubensis* but called *Dypsis pinnatifrons* in the garden, raises crowns that look very similar to the much more familiar *Arecastrum Romanzoffianum*.

12. A multiple-trunked palm of most pleasing proportions is *Oncosperma tigillarum*. Closer inspection reveals a trunk densely set with black spines. →







14. The curious branching palm from Africa, *Hyphaene thebaïca*, is planted apart from the other palms, among the dicotyledonous trees. It is a startling discovery to look up and find a crown composed of palm leaves. Photo by E. Charles Cornell.

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13. Detail of the trunk of *Oncosperma tigillarum*.



15. This young specimen of *Hyphaene thebaica* shows the costapalmate leaf, similar to that of many of the *Sabal* species. Photo by E. Charles Cornell.

a short distance away. Most of this part of the garden is very informally planted, although in some sections there appropriately are concentrated plantings of related species, for example, a ginger terrace. Of particular interest is the collection of *Chamaedorea* species and other understory palms which thrive in this section of the garden. Probably the most breathtaking palm planting of all is in this area, consisting of a group of perhaps a dozen *Licuala grandis*, their great

many-folded, uncut, palmate leaves held ten or twelve feet high, appearing almost translucent in the filtered light. Across the path from the *Licuala* is a splendid palm, *Rhopaloblaste ceramica*, with a grey trunk, prominently ringed like giant bamboo, and enlarging into a beautiful crownshaft that blends delicately into the trunk.

In this part of the garden is also found the vine-like rattan palm, *Daemonorops mollis*, which clammers through the trees



16. This group of *Licuala grandis* in the rainforest section is one of the loveliest plantings in the entire garden. Photo by E. Charles Cornell.

by its spines and thorns and projections at the end of its leaves. Contrasting sharply to these smaller species—almost as a shock—is a massive specimen of *Metroxylon amicarum* from the Caroline Islands. It dwarfs all else around it with a spread equal to that of the largest *Phoenix canariensis*, yet with an open crown like an *Arecastrum* and with a relatively smooth trunk proportionate to the crown. This rainforest section of the

garden abounds in palms including the sealing wax palm, *Cyrtostachys Lakka*, with its bright scarlet petioles, a large *Kentiopsis* and a *Clinostigma*. Unfortunately many of the palms are not labeled and are of species unfamiliar to the author. Lack of labels, however, is forgivable in this secluded section of a garden which hosts over 100,000 visitors a year.

Foster Tropical Garden is now part of



17. The massiveness of *Metroxylon amicarum* (formerly *Coelococcus carolinensis*) is felt as much as it is seen. Next to the figure in the foreground are two *Howeia*, behind them is *M. amicarum*. Note the huge tree at the far right towering over everything else. These great trees are found throughout the garden. Photo by E. Charles Cornell.

a larger concept known as Honolulu Botanic Gardens which is being developed into an unusual and commendable garden complex. This complex when completed will consist of five sites located in five different climate and ecological environments: Foster Garden in the warm humid zone, Wahiawa Garden in the cool humid tropics at 1,000 feet elevation, Koko Crater Garden for plants

requiring hot dry conditions, Sandy Beach Botanic Garden for tropical shore plants, and Kawainui Swamp for one hundred acres of tropical water gardens. When completed this endeavor, reaching out from the nucleus of Foster Garden, should become one of the world's truly great botanical gardens.

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