

actually shin up the tree? I wouldn't put it past him. Now this means that these bulbils develop quickly into healthy plants that can be detached, potted up and replanted. If they develop into bulbil-bearing palms, they are useless for a crop but, as they are clones, they are very useful for experimental work and it may be possible to get up to 250 a year from one tree. It is also possible that some or all of them may bear nuts but at present it's a case of wait and see.

In another garden a hybridization program is going on, the genetics of which are in charge of Dr. Kiyonagi of the same Institute. There is a dwarf coconut palm that matured some two and a half years earlier but has only a low yield of comparatively poor nuts. Here there is a huge experimental acreage with the soft blue of one of the great Indonesian mountains rising dramatically behind it; it is planted with one row of tall palms and four rows of dwarfs. The male flowers of the tall palms fertilize the dwarfs, which have had their male flowers removed. The resulting hybrid seedlings are likely, on the evidence of trials elsewhere, to do better than either parent and it is hoped that all new plantations or renewals of older ones in Indonesia will be entirely from these hybrids supplied by the government. This project has been given financial help from the UN. Actually, a private French firm has produced similar hybrids from one African and one Malayan palm species and is selling the nuts. But each nut for growing is far too expensive for Indonesia, so the country has had to start its own program. So far, there has been no time to breed and evaluate the F_2 generation. That, surely, means looking another twenty years ahead; we cannot indefinitely hurry the processes of nature.

There are also fertilizer trials going on. Interestingly, it is possible by fair-

ly heavy doses of fertilizer, much of which is produced in Indonesia, to revitalize old trees for a few years at least. During these critical years a new planting of hybrids will have time to grow.

With all this program, the Institute is bound to specialize in coconuts. Spices will be dealt with in the future in another Institute: the cloves, the nutmeg, and mace, the balm which grows wild and smells of cough cures, the peppers, and cinnamon. The Manado Institute has a banana expert, a very pretty one: many girls go through university nowadays and there are several on the staff. Bananas are a common intercrop with coconuts and so, for example, is maize; all crops must have their place in practical research.

I get the feeling that the Indonesians are very nice people to work with and for. At one plantation office, we were entertained with a charming xylophone concert and everywhere we visited a couple of tender coconuts would be picked and offered to us. Ever since, I have been trying to think of an English work which describes the fairytale taste or the texture of the slippery delicious kernel. I am sure the Indonesians have the exact word for it!

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Notes on Palm Uses in a Spanish Treasure

The thousand-mile-long desartic peninsula of Mexico's Baja California would seem to be an unlikely habitat for palms, yet that land is the home of several interesting taxa that may be seen growing wild, especially in the rocky canyon bottoms. One of these is the San José hesper palm, *Brahea brandegeei*, which is often planted as

an ornamental in southern California. Indeed, the late William Hertrich considered it the finest ornamental fan palm for the area.

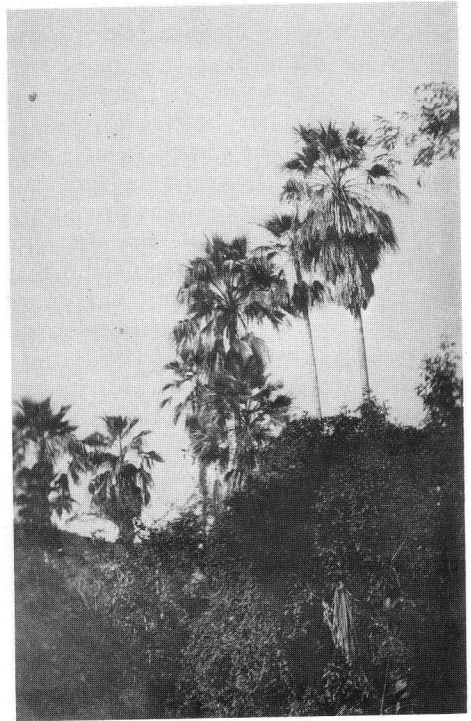
This Mexican species became known to botanists for the first time when specimens were collected in October 1900 by T. S. Brandegee and Kate Sessions near San José del Cabo at the southernmost tip of Baja California (Fig. 1). In 1903, Carl Purpus formally described the palm as *Erythea brandegeei*. To Kate Olivia Sessions (1856–1940), one of California's first great plantswomen, can be given the credit for introducing the species into horticulture, for from her nursery in San Diego came dozens of interesting ornamentals that now grace the California scene.

Only recently have we learned that the San José hesper palm had been known by early Spanish missionaries some 200 years before the Brandegee and Sessions expedition. San José del Cabo, which gave the palm its English name, was the site of one of a number of Jesuit missions established throughout the peninsula during the period 1697–1768. The Jesuit Miguel del Barco (1706–1790) has given us the first informal records, principally concerning uses, about this palm under its then-used colloquial name of "palma colorada," literally "red palm."

Padre Barco lived for 30 years in Baja California but later in life was forced into exile in Italy where, during the 1770's, Barco prepared a manuscript chronicling the natural history as well as the general history of the Baja California he had come to know so well. However, for over two centuries the priest's manuscript remained essentially unknown. Fortunately, it was carefully preserved at the National Vittorio Emmanuele Library in Rome. In 1973, thanks to the scholarly editing of Dr. Miguel Leon Portilla (Director of the Institute of Historical

Research of the National Autonomous University of Mexico) Barco's work . . . a modern Spanish Treasure, was finally published (Barco 1973).

The Barco chronicle is instructive reading for anyone interested in the history or natural history of Baja California during the 18th century. The historical and biological areas occupy about equal parts in the volume but five of eleven chapters on natural history are concerned with the local plants. Of primary interest to palm enthusiasts are the several descriptive paragraphs (a page and a half, principally in chapter 4, entitled "De los Arboles de Naturaleza Regular") about *Brahea* but discussed under the subtitle "Las palmas coloradas," as they were then known. Since Barco's com-



1. *Brahea brandegeei* at San José del Cabo, Baja California, Mexico. Photograph by Kate Sessions in 1900 courtesy L. H. Bailey Hortorium.

ments may be of interest to readers of *PRINCIPES*, I am giving a free translation from the Spanish of the account about *Brahea* together with editorial comment [in brackets]:

"The red palms of the south are well known in California [i.e. Baja California]. They are very tall [to 125 ft, according to Bailey, 1937], and when cut one notes that the wood is red even though the outer stem surface has a normal palm color, namely gray. The wood of this palm is very strong and durable and hence it is used for beams, but only in its natural form [as a whole trunk], being cut only to the length required. Nor would it be wise to finish them otherwise, for then the trunks would lose much of their strength which lies principally in the outer part. Because of this they leave the more slender specimens, cutting only those with a diameter of 18 dedos [approximately 1.3 ft]. Although the wood of the [native] poplars [*Populus* sp.] and pines [*Pinus cembroides*] is very lustrous and better, the latter occur in large ravines in the interior mountains hence are very difficult to obtain. They make little use of those trees, but they value all the palms for roofing, especially that of churches. Besides the red palm, there is another kind [*Washingtonia robusta*] that closely resembles it superficially but which, when cut down, is seen to be different, for it has a white wood that is less solid and less durable than the wood of the red palm.

"When the southern [southern Baja California] Jesuit missions were founded [between 1720 and 1733], there were many stands of palms in the region because none of the local Indians [the Cochimi Indians] made use of these large palms. During the revolt of 1734, people from the province of Sinaloa [in mainland Mexico] came to southern Baja California to

pacify it. These immigrants started to cut and eat the hearts of the palms, called palmito, and it was from them and others at that time or a little before that the Californians [Cochimi] learned to eat the palmito that they had previously not known to be edible. They liked it so much that in a short time a large number of beautiful palm stands were destroyed, because once the heart was cut out the palm died without sprouting from another part as in other trees. To cut the palmito, they climb to the top of the palm armed with a small but heavy belt knife and there cut the heart. Or else they sever the trunk with an axe from below, felling the whole palm and then cutting out the palmito in safety and without fear. Those who climb to the crown for palmito have to take care not to fall because the trunks are very tall, straight, and slim in comparison to their height. They have no leaves except near the tip or bud and there are no branches so, aside from the difficulty and danger of climbing so high on a trunk without any rope, cutting the palmito while the palm is bending and vibrating to one side and the other is frightening even to an observer from the ground. Apart from the weight of its large and heavy leaves at the top, the trunk bears also the weight of the man, and this combination causes the top to vibrate, even more if there is wind.

"The Mission Indians, not generally having axes with which to cut the palms at the base, climb in the manner described, and in four or five years the great palm groves of their territory stand dead without a leaf, like a crowd of large snuffed-out candles. Rainwater penetrates the center of the trunk, which is not so solid, and the palms decay easily, a situation that does not occur when the whole palm is felled because then water cannot enter the

pithy pulp. Formerly, many palm stands existed in the land, then desert, up to the midpoint between Santiago and La Paz [or about 100 miles north of San José del Cabo]. Having commenced to work mines, the operators and timber cutters of those establishments started to cut the palms with axes in order to eat the palmito, besides the many that were cut for construction which, so the story goes, were carried to the sea by water from great rains and consequent floods in the arroyos. Certainly palmito is delicious and esteemed for salads, and in places where it exists the Spaniards eat it as a delicacy"

Barco's paragraphs describe uses of *Brahea brandegeei* which until now have been unrecorded. Of special interest is his description of the use of palmito or palm cabbage. Curiously, this is the earliest reference I know of the use of this delicacy in the New World. Much older references are found for the Old World. Yet one must assume that Amerindians have been eating palm cabbage for many centuries. Strangely, Barco's Baja Californian Cochimi appear to have learned about the edibility of palm cabbage as a result of the spread of Jesuit Missions from mainland Mexico.

LITERATURE CITED

- BAILEY, L. H. 1937. *Erythea*. Gentes Herbarum 4: 83-118.
 BARCO, MIGUEL DEL. 1973. *Historia Natural y Crónica de la Antigua California*. Ed. Miguel Leon-Portilla. Universidad Nacional Autónoma de México.

Note: An English translation of the Barco work is to be published by Dawson's Book Shop in Los Angeles, California. There will be some corrections and additions to footnotes relating to plant names in the original publications. These have been made by Dr. Annetta Carter, student of the Baja California flora, who states that the palma colorada "is most abundant in the Cape Region but extends north almost to latitude

26°N. In the vicinity of Loreto, it is called 'palma de taco' or 'palma de tlaco.' The leaves are valued for thatching." Dr. Carter further states that a "palma blanca," incidentally mentioned by Barco in two different places in his chronicle (pages 56 and 62) probably represents *Washingtonia robusta*, which is "common in the northern part of the Sierra de la Giganta."—W.H.H.

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Palms in Utah

24 April 1979

Residents of St. George, Utah, are calling the windmill palm, *Trachycarpus fortunei*, the "snow palm" after the bitterly cold winter of 1978-1979.

White-dusted windmills were a common sight in the normally sunny desert resort, which received a total of 24.5 inches of snow in January and February.

A late-winter inspection tour showed that a week with low temperatures under 10 degrees Fahrenheit, the lowest being three above zero, did not visibly damage any of the hairy-trunked fellows.

St. George sits at an elevation of 2760 feet 120 miles northeast of Las Vegas, in the U.S. Department of Agriculture's plant hardiness Zone 6, and *Trachycarpus fortunei* usually fruits every year.

This past winter's intense cold may not have tilted any windmills in Utah's "Dixie," as it's called by locals, but it may have claimed the lives of many California fan palms.

Washingtonia filifera was planted in front of numerous motels and residences in St. George, but it seemed obvious from drooping brown fronds that few individuals survived. Many specimens were quite tall.

25 July 1979

I have just returned from a four-day stay in St. George. Frankly, I was