

from the leaves, punched in the middle, and threaded into books. It is assumed that the name lontar comes from *ron tal*. On Bali the name seems still to be *tala*. It is possible that formerly leaves of *Corypha* were also used for writing material. Every place where *Borassus* occurs abundantly, it is used as a source of sugar, for its edible fruits, the leaves for roof thatch, and the plants usually end their life on this earth at an age of about 50 to 60 years as building material.

Much more could be told about the palms of Indonesia from my own experience and from the rich literature on this subject. At least ten years of study in the field and another in the herbaria and libraries, besides a lot of skill and perseverance, will be necessary before a rather complete taxonomic survey of this marvellous fascinating family can be given in the great new *Flora Malesiana*, edited by professor van Steenis.

## Palms of Brazil

THOMAS MOSES

*São Luiz, Maranhão, Brazil*

Brazil's greatest lyric poet, Gonçalves Dias, when in exile, wrote of his native land as "The Land where Palm Trees Grow." No title could be more fitting. Brazil has always been recognized as the greatest country in the world for palm trees. In pre-Colonial days, the aborigines called this land *Pindorama*, which means "land of palms."

Surely no area of the earth's surface can be compared to Brazil for palms, for no other country has so many species or so many specimens. The species run to over 500 and the specimens to many billions. From the humid equatorial jungle of the extreme north to the plains and swamps of the extreme south, palms abound in almost uninterrupted sequence and in many areas there are dense palm forests which extend for hundreds of miles.

In my 30 years of incessant travel in Brazil I have had unending pleasure among the palms. Day after day, for weeks and months on end, I have traveled up and down the rivers by launch, canoe and raft, and penetrated the forests on horseback or afoot, admiring, studying, counting and collect-

ing. There's a world of interest in a princely palm, whether it be a solitary palm or one in a grove. First, one admires the beauty — elegant and exotic. Then one thinks of it as a member of a family and looks for characteristics and character. Closer observation will reveal something of evolution, environment and enemies. There is no end to the investigation. To the casual observer, however, a palm is a pleasure to the eye. He sees its feather-like fronds like plumes in a lady's headgear. A lone palm in the midst of exogens is a symbol of survival or an ornament to enhance the surrounding verdure, like lace in a female's mantle. And even in the arid areas, a little group of palms is an oasis in the desert, to cheer the heart and renew the body.

In Brazil, palms are the life of the people. Everything for simple people in primitive surroundings is taken from the palms. To them, the palm is the "Tree of Life." In their folklore they tell of a flood and an old chief, Tamandaré, who alone escaped by climbing a palm, ate the fruit to keep alive, and, when the waters subsided, disgorged the seeds to



18. *Orbignya speciosa*, the *babassú* palm. Photograph by Thomas Moses.

repeople the earth. This affection for and dependence on the palms continues. On the lower Amazon, the people chant:

Who comes to Pará, comes here to stay;

Who drinks Assai goes never away.

And south of the Amazon, in the State of Maranhão, where hundreds of thousands of natives squat on the ground breaking the nuts of the *babassu* palm, the people sing:

Babassú, babassú,

Babassú, the wonder tree;

Were it not for babassú

All the world would naked be.

Further south, in the *carnaúba* country, the people recite the poet's version of the palm (*Copernicia cerifera*) which gives them food, drink, raiment and remedies.

This is also reflected in the names they give to their palms, names such as monkey nut, deer nut, dog nut, gipsy nut, vinegar nut, cow saliva nut, devil nut, devil's arrow palm, etc. Some palms

are named according to their appearances and in this they have a wide range of terms to choose from, for there are palms of every conceivable kind of characteristic—palms of stout stem, palms of slender stem, bifurcated palms, pot-bellied palms, ground-trailing palms, aerial-rooted palms, climbing palms. And everywhere there are palms in profusion.

Brazil covers an area of, approximately, 3,289,440 square miles, or nearly half (47.3%) of South America. Most of the country is in the tropic zone and much of it is undeveloped, uninhabited and untouched by the hand of man.

This, then, is an ideal country for palm propagation. In the extreme north, the equatorial forests are a paradise for exotic endogens. In the extreme south, the swamps of the Gran Chaco have a considerable quota of species. And in the arid areas of the central plateau there are palms in abundance.

It is said there are over 500 species

of palms in Brazil. I have seen many of them, from the raffia-like climbing palm (*Desmoncus aereus*) to the towering *miriú* (*Mauritia flexuosa*), but I know I'll never need to weep like Alexander the Great, for I'll never fully conquer this great world of palms in Brazil.

Brazil has furnished a number of palms that are among the most popular palms cultivated throughout the world. A few of these are *Arecastrum Romanzoffianum*, *Arikuryoba schizophylla*, *Acrocomia sclerocarpa*, *A. Totai*, *Butia capitata*, *Syagrus Weddelliana*.

### PALM PRODUCTS IN COMMERCE AND INDUSTRY

Palm trees provide many articles of necessity for the people who live far from civilization. The native uses the trunks of slender palms for the walls of his house and the leaves of palms to cover it. Leaves from palms are used to make doors, windows and mats. If the floor has to be raised because the ground is water-logged, he splits the trunks of palms to make the floor-boards. For illumination and cooking, he uses the oil he extracts from the kernels of certain palms nuts by crushing and boiling. Palm nut-pulp, palm heart and mesocarp meal from certain palm nuts are his food and from the fruits of certain palms he can make a substitute for coffee. Palm sap is good wine, fermented or unfermented. Unfolded palm leaves are woven into hammocks, fishing nets, hats and other articles. Old leaves make good brooms. Spathes make fine basins, flower pots and other utensils. Spines from palms are used for nails and needles. Roots are boiled and strained to give a medicine to cure his ills. Nuts are used as cups. Flowers are the finest of decorations. And even the maggots in the trunks and fruits are useful; they make

excellent bait when fishing and are delicious when fried.

When a native needs some ready cash, he can collect some nuts and extract the kernels or beat the wax out of certain palm leaves and sell his products at the nearest trading post. These are the palm products of commerce and industry. They are important in the overall economic picture, not only as items of export but also as raw materials for the domestic industrial machine to supply the population with edible oils and fats, soaps, shampoos and shaving creams, waxes, fibers and by-products such as glycerine, etc. An idea of the importance of these palm products may be gained by considering the present annual production.

#### PALM KERNELS

Coconuts .....	150,000 tons
Babassú .....	80,000 "
Tucum .....	6,000 "
Murúmurú .....	2,000 "
Licuri .....	1,000 "

#### PALM WAX

Carnaúba .....	7,000 tons
Licuri wax .....	2,000 "

#### PALM FIBER

Piassava .....	6,000 tons
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The above figures are only rough estimates, taken from official sources, intended to give a general idea to the casual reader. They do not take into account local consumption, variation of crop totals and methods of compiling statistics, etc. More accurate figures, covering production, consumption and industrial uses can be given by the author.

### PALMS IN ABUNDANCE

In some regions of Brazil, certain species are found in dense stands. Some of these stands extend for hundreds of miles and the number of individual





19. Brazilians breaking *babassú* nuts which are a little larger than duck eggs with exceedingly hard endocarps. Photograph by Thomas Moses.

palms runs into millions and billions. The outstanding are the following:

**Babassú (*Orbignya speciosa*)**

There are several very dense stands of this palm, the greatest being in the State of Maranhão and part of the State of Piauí, covering an area of about 150,000 square miles. The density, of course, is not continuous; there are clearings here and "pockets" there, but some of the "pockets" must have a number nigh to the 7-figure total. As to the total of *babassú* palms in the two states, there has been a lot of wild speculation. Some Brazilians say, quite candidly, "About 10 billion!". This is misinformed exaggeration. Nevertheless, I would say there are about 1 billion. And surely this is something to cause admiration. But I ought to add that many of these stands are too dense to be of economic value. Counts have been made which showed 3,000 palms to a hectare,

whereas the maximum should be about 250.

The *babassú* palm is not the most beautiful of the Principes but it is one of the most important in economic value. It attains a height of about 50 to 60 feet, with leaves 15 to 25 feet in length. The fruit is a hard nut, averaging 4 inches long and hanging in bunches of 100 to 400. This fruit has a fibrous epicarp, a mealy mesocarp and an extremely hard endocarp. Embedded in this endocarp are the kernels which contain about 63 percent high lauric acid oil. To extract these kernels, natives squat on the ground, place the nuts on the upturned blade of an axe and beat them with a piece of hardwood. An average day's production is about 18 pounds per person, though much of this work is done by children who manage to extract anything up to 8 pounds per day. The number of natives breaking



*babassú* in the states of Maranhão and Piauí, at least on a part-time basis, must be near to a quarter of a million.

Another very large stand of *babassú* is reported in the State of Mato Grosso, near the Bolivian border. This stand is said to extend for 180 miles and is very dense.

### Murúmurú

#### (*Astrocaryum Murúmurú*)

The lower Amazon is noted for its innumerable islands. A few of these are large, like Ilha Marajó, which is about the size of Switzerland; the vast majority are very small and uninhabited. On these islands, however, as well as on both banks of the Amazon and its tributaries, there is dense vegetation. Prominent in this forest growth is the *murúmurú* palm.

Years ago, I spent several months among these islands on a survey of the *murúmurú* palm. I had a motor launch and visited hundreds of the islands, counting and calculating the probable production of *murúmurú* nuts. Later on, I had to go to Manaus (1,000 miles up-river) and beyond, and could have gone right on to Peru and Equador, following the *murúmurú*. I did, however, go to French Guiana, for up there, on the frontier with Brazil, there is *murúmurú* in great density.

The *murúmurú* palm has a short, slim stem, about 6 to 18 feet high and 8 to 12 inches in diameter, covered with long, black spines. It grows in groups and is difficult of access. The fruits, which hang in compact clusters, are like little pears, covered with a reddish pulp. Animals eat the pulp and the natives collect the nuts, for the endocarps contain kernels which have commercial value. From island to island, the natives irregularly ply in canoes and sailboats in the collecting and trading of *murúmurú* nuts. These are piled at the trading posts and eventually taken to the crushing mills at



20. Fruiting specimen of *Orbignya speciosa*. Photograph by Klare Markley.

Manaus or Belem for oil extraction and soap-making.

### Tucum and Tucumá

#### (*Astrocaryum vulgare* and *A. Tucuma*)

These palms are found all over north Brazil. In the Amazon Valley they are known as *tucumá* and *tucumá-açú* and are found wherever *murumuru* is found, but several degrees south of the equator, they mingle with *babassu*. North of the equator they are abundant on the river Oiapoc, the river which separates Brazil from French Guiana. Other species of *Astrocaryum* are *A. manaoense*, which is tall and majestic; *A. Jauari* (*jauari*) which does not grow to any considerable height. The most common type, *A. vulgare*, the *tucum*, grows up to 30 feet.

All the species of *Astrocaryum* are noted for their long strong spines which grow in rings at regular intervals on the trunks, leaves and bracts. The fruits grow in small clusters, each fruit about the size of a pigeon's egg and covered with a yellow-orange pulp when ripe. Animals are fond of this fruit. On Marajó Island it is fed to cattle. Wild pigs and rodents feed on it in the forest.

I have also seen certain fish (*tambaqui*) devour it. More valuable, however, is the kernel within the endocarp. This yields an oil which resembles commercial palm oil and can be used for the same purposes. In fact, I have bought thousands of tons of these kernels for factories in the United States for use in the preparation of cooking oil, salad oil, shortening and other purposes. Here in Brazil, it is used for making soaps and shampoos. The leaves of the *tucum* palm are used by the natives for making hammocks and fish nets.

### **Piassava (*Attalea funifera*)**

Various types of *piassava* are found in Brazil, from Bahia to the north of the State of Amazonas, on the borders of British Guiana. The most important area is in the coastal strip of South Bahia, where there are stands of considerable density. Stands of lesser importance are in the states of Alagoas and Maranhão.

The *piassava* palm, when full grown, rises to a height of 20 to 30 feet, with a stem of 10 to 15 inches in diameter. The leaves are usually about the length of the stem. The fruits are hard drupes of about 4 inches in length and 2 inches in diameter. Mature leaves are used for the extraction of fiber, which is an item of considerable commercial value in the State of Bahia. This fiber is exported to many parts of the world. It is said that the streets of many cities in the U.S.A. and Europe are swept with the brooms and brushes made from the leaves of the *piassava* palms of Bahia.

In the "babassú belt" of Maranhão and Piauí, there is a palm, known to the natives as, "*piassava do norte*", which produces a nut similar to that of *babassú* but easier to crack. The kernels are so like those of *babassú* that the two are mixed and no buyer ever seems to know or notice the difference.



21. *Astrocaryum vulgare*, the *tucum* palm of Brazil. Photograph by Klare Markley.

### **Buriti (*Mauritia vinifera*)**

There are several species of *Mauritia* in north Brazil. The best known is *buriti*. It flourishes in abundance in many parts of the Amazon and in the states of Maranhão, Piauí, Goiás and Mato Grosso. On the lower Amazon, *miriti* (*Mauritia flexuosa*) fringes the river for many miles but is not found elsewhere. These two palms look almost identical at a distance. Closer inspection shows that the *miriti* is taller, the fruits are bigger and of a lighter color. There is a third *Mauritia*, known to the natives as *buritirana*, which is quite abundant on the river Tocantins. The seeds of all three species are used to make a refreshing drink.

The *buriti* palm is a sight worth seeing. Its stout, smooth trunk rises to a considerable height and is topped with a large crown. Long leaf-stalks, with blades at the extremities, spread out in all directions. Enormous bunches of dull-red fruits hang in profusion. These berries, about the size of a hen's egg, have an epicarp covering which resembles small fish-scales, and the mesocarp is a thin covering of pulp which is used to make the greatly appreciated drink

and also a kind of jam. *Miriti* leaves are used for making rope and hammocks but the leaf-stalks of the *buriti* have the widest application of any palm product. They are used for fences, furniture and rafts.

### **Assai (*Euterpe oleracea*)**

There is a variety of *Euterpe* species in many parts of Brazil. The most popular is the *assai*, which is found in density on the Amazon, particularly the lower Amazon. In and around the city of Belem almost every house has *assai* in the backyard. On the rivers and in the forest *assai* is found in great numbers. South of the Amazon, in the states of Maranhão, Goiás and Mato Grosso, another species (*E. edulis*), known as *jussara*, is plentiful and popular.

The *assai* palm is an excellent example of elegance. Its slender, smooth and even stem rises to a height of up to 100 feet and is generally found in clusters of 6 to 12. The leaves are few and short. High up, at the base of the soft stem, clusters of fruit jut out in ornamental fashion. The fruits, of a crimson hue, about the size and shape of cherries, have a pulp between the thin skin and the hard kernel which the natives mix with water to make a popular beverage. Everybody drinks *assai*. It is a staple diet of Amazonia.

### **Macaúba (*Acrocomia sclerocarpa*)**

This splendid specimen of the Principes is found all over Brazil. I saw it on the borders of the extreme north and in many parts of the Amazon. In the extreme south, on the Paraguayan frontier, it is very abundant. Large stands of more than 1 million are found in the valleys of the Rio das Velhas and Rio Grande in the State of Minas Gerais.

*Acrocomia sclerocarpa* is well known in the Guianas and other parts of South America. In the Gran Chaco it is known

as the Paraguay palm. It is a robust species of about 30 to 40 feet high, has a column-like trunk with rings of strong spines at regular intervals, leaves of medium length and bunches of fruit which are round and somewhat larger than tennis balls. The fruits are covered with a yellow-red pulp which smells like fresh bread. Hogs fatten quickly when they eat this pulp. Beneath the pulp is a large endocarp with kernels which contain an edible oil. This oil is used for soap-making in the State of Minas Gerais.

### **Caiaué (*Corozo oleifera*)**

This is the Brazilian version of the African oil palm (*Elaeis guineensis*). It is found all over the central and upper Amazon, from around Itaceatiara to the Peruvian border, but how far north of the Amazon has not yet been ascertained. I found the greatest concentration on the south bank of the Madeira river and east of this river to the river Camuná there is a stand of several million. To pinpoint the general area I chose the little town of Borba.

This American relative of the African oil palm differs from the African species in that it is smaller, almost a dwarf, with a very short stem. The fruit bunches are small and the oil content in each fruit is less, although the oil is somewhat similar. The tree, though it has the appearance of having been chopped, is quite beautiful and ornamental, since it grows in light, sandy soil where the surrounding vegetation is almost akin to scrub.

### **Inajá (*Maximiliana Martiana*)**

From the borders of French Guiana right down to the State of Mato Grosso this palm is found in greater or lesser degree, usually in abandoned plantations. The greatest concentration, however, is on the Ilha Bananal, the longest inland island in the world, measuring



about 80 miles long. The *inajá* flourishes there by the million.

This is indeed a portly palm. It rises to about 40 feet. The trunk base is wide, usually about 20 inches in diameter. Then it tapers off to about 14 inches in the middle trunk. The upper trunk widens out again to support the crown of long spreading leaves and the very heavy bunches of fruit which are backed by an immense spathe. The kernels contain from 50 to 60 percent of a white solid fat and the kernel oil is similar to that of coconut oil. The leaves can be used for making hats and mats.

#### **Carnaúba (*Copernicia cerifera*)**

In northeastern Brazil one finds the *carnaúba* palm, mostly in the wild state. The straight, roughened stem rises to a height of about 45 feet and is topped with a spreading crown of palmate leaves. These leaves must be among the most valuable in the vegetable kingdom, for they contain wax which the world uses to polish floors, furniture and cars.

The *carandá* (*Copernicia alba*) is of the same genus as *carnaúba* but is not much used to produce wax as it is found in humid, swampy forestland, stretching from the Amazon down through Mato Grosso to the borders of Paraguay and Argentina.

The more valuable stands of *Copernicia cerifera* are found in the central plateau of Brazil, particularly in the states of Ceará and Piauí, areas afflicted with periodical, prolonged droughts. But the greater the drought the greater the production of wax. Wax production, per palm per annum, is about 130 grams.

The *carnaúba* wax palm is one of the very few palms planted and cultivated in Brazil. Extensive plantations are found in the states of Ceará and Piauí. The Johnson Wax Company has, for years,

maintained an experimental station and promoted planting and production.

#### **Coconut (*Cocos nucifera*)**

This palm is not a native of Brazil. I mention it because many people are of the opinion that it is. The history books tell us that it came to Brazil from Africa in the slave ships. Here it found favorable soil and other conditions and now it is found from Bahia to the borders of the northern Territories. No palm is so widely spread as the coconut. It is found in the furthest interior. But, as it was first landed and planted in what is now the State of Bahia, the people everywhere call it *coco da Bahia*. And it so happens that, from Bahia north through the states of Sergipe, Alagoas and part of Pernambuco, there is what we may call a "coconut belt." In this belt, a coastal strip, there must be many millions of *Cocos nucifera*. Official figures give production at 300 million nuts per year.

Twice I made a survey of this "coconut belt" in (1946 and 1950) and I had many surprises. It surprised me to see how many coconuts were produced and how few were crushed for oil extraction. This is because of the export of unripe nuts to Rio, São Paulo and other big cities for the consumption of the "milk." The extraction of endosperm from ripe coconuts for culinary purposes was also a surprise. This is a prime by-product in all of the six or eight small desiccating mills. And the intensive and extensive planting of dwarf coconuts was no less a surprise.

The coconut palm needs no description. However, the dwarf species is not so well known and it may surprise many Americans to hear of a coconut palm which has very little trunk, produces from 100 to 400 nuts a year and has bunches of coconuts so low that supports

have to be put under them to keep them off the ground. Furthermore, these dwarf coconut palms produce within 2 to 3 years after planting.

### The Royal Palm (*Roystonea oleracea*)

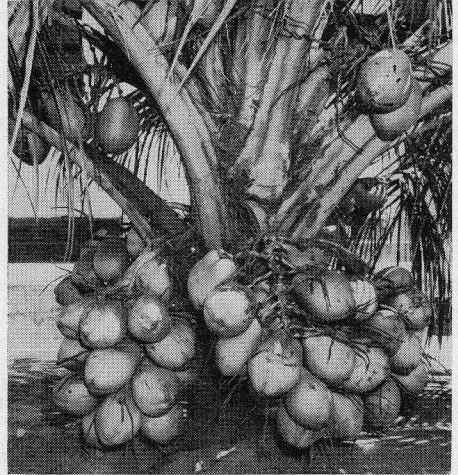
Like the coconut palm, the royal palm is not a native of Brazil. This point is of no importance, since *Roystonea oleracea* is beloved by all Brazilians as no other palm is beloved. It is found in almost every public square throughout the country. It adorns the entrance to many important buildings. It is an ornament in many a private garden. The avenue of royal palms in the Botanical Gardens of Rio de Janeiro is an unforgettable sight and probably the world's most inspiring display of palms in all their grandeur and glory.

### SOME PALM HISTORIES

#### The Story of the Royal Palm

The pride of Brazil is the royal palm. Few people in the country, however, know that it is not native to Brazil. Nor do they know how it came to Brazil. The story is interesting.

In 1808, during the Napoleonic War, a Portuguese frigate, the "Princesa do Brasil", foundered off the coast of Gôa. The French captured the crew and took them, as prisoners of war, to the Island of Mauritius. The skipper of the captured crew, Luiz de Abreu, negotiated with his captors the ransom price for himself and his men. But before leaving Mauritius, he collected the seeds of some local plants and these he smuggled out with him. These seeds were presented to the Prince Regent of Brazil, D. João VI, who planted them in the Royal Gardens in Rio de Janeiro. One type of seed was a palm—a palm more beautiful than any hitherto seen in Brazil.



22. Heavy clusters of fruit are borne close to the ground on the dwarf coconut in Brazil. Photograph by Thomas Moses.

The curator of the Royal Gardens, Serpa Brandão, was very jealous of this unique species of palm. He had the seed collected brought to him and what he did not require for planting was destroyed in his presence. Thus, he thought, the Royal Gardens had the monopoly of the royal palm. But to his amazement, and that of D. João VI, many private gardens in Rio de Janeiro had specimens of the palm. An enquiry was set up and it was discovered that servants and slaves in the Royal Gardens had stolen the seeds and sold them in the city.

Today, the royal palm flourishes all over Brazil. Hardly a city of any size is without some specimens. The original, planted by D. João, VI, is still alive, though not flourishing any more.

#### The Story of the Dwarf Coconut Palm

In 1925, a Commission from the Ministry of Agriculture, visited Ceylon. When returning to Brazil, they were given some seedlings of king coconut (*niyor garding*). These were dwarf

palms from the Andaman Islands, and were regarded more as curiosity than plants of economic value. They were distributed to some botanic gardens and agricultural institutions. Soon they were forgotten and the seedlings allowed to die. Fifteen years later, however, a good friend of mine, Dr. Samuel Hardman, Director of Agriculture in the State of Pernambuco, remembered the dwarf palms and hunted around until he found two survivors. He made nursery beds and set up a propaganda campaign for dwarf palm planting. Soon there was a wild demand for dwarf palm seeds and seedlings. The wonders of the dwarf palm had been discovered: it produces in 2 to 3 years, gives 100 to 400 nuts a year (as against 30 to 40 of the common coconut), has a trunk so low that the bunches need props to keep them off the ground. Everybody was extolling the dwarf palm; its rapid growth, its productivity, the sweetness of its fruit, etc. So the dwarf palm spread from Pernambuco to the furthest limits of the land. Today, it is estimated, there are more than 10 million dwarf palms in Brazil—all this from two lone specimens found, or refound, in 1940.

### The Story of the Carnaúba Wax Palm

The story is told that the Greek Orthodox Church priests in Russia had a problem. It was that the faithful, during the winter season, were stealing the candles from the altars because of the animal fat they were made of. One day a priest heard of a Brazilian palm which produced wax from which candles could be made which people would not steal to eat. The Church authorities made enquiries and these led to a contact with an English businessman in Brazil. He was James Frederick Clark, head of a firm in Parnaíba, Piauí. Mr. Clark's

firm obliged by shipping *carnaúba* wax to Russia and this, more than anything else, helped develop the *carnaúba* wax trade, a trade which is, today, one of Brazil's greatest exportable assets. A few years ago, the people of Parnaíba, to mark the centenary of James Frederick Clark, erected a monument in the shape of a *carnaúba* palm in granite with a bust of Mr. Clark atop. No church thieves ever did a greater service.

### The Story of Babassú

*Babassú* nuts are noted for the hardness of their endocarps. In this hard shell, about the size of a duck or goose egg, are kernels which contain oil of a high lauric acid type. The problem of cracking these nuts and extracting the kernels has occupied many mechanical minds and some of the stories are worth the telling.

Towards the end of last century, a shipment of palm nuts arrived at the English port of Liverpool. They were labelled "cohune nuts." Actually, they were *babassú* nuts. The receivers soon set to work to open them. They used hammers, chisels and other kinds of gadgets but the results were negligible. Finally, they cast the nuts into the sea.

At about the beginning of World War I, another English firm interested in *babassú*, sent out to Brazil a number of machines which, they claimed, would break *babassú*. They were hailed as the certain solution to the problem. Lots of leaflets were distributed, premiums were offered to the native with the highest production and, finally, the machines were sent into the interior. A little later, the enthusiasm died down. The natives couldn't handle the strange device. It was too complicated. In a short time the machines were all broken. They called them "machines for *babassú* to break." And broken they certainly were, with-





23. Cutting leaves of the wild Brazilian wax palms (*Copernicia cerifera*), a source of carnauba wax. Photograph courtesy S. C. Johnson & Son, Inc.

out having produced a pound of kernels. Some years ago, I found one of them abandoned in the forest.

In more recent years, many attempts have been made to make a machine which will break *babassú* efficiently and economically. Individuals, organized firms, and even Government Commissions have tried to solve the problem. Many millions of dollars have been

spent and many machines have appeared, from little portable contraptions to huge, high-powered mechanical constructions complete with brinefloats and dust absorbers. All have gone through the motions, often at extraordinary expense, but none has been put into permanent operation.

Meanwhile, as it was in the beginning, the natives squat beneath the palms,

place the nuts on an up-turned axehead and beat them into splinters with a piece of hardwood. Thus they remove the kernels, 80,000 tons of them a year.

Another story worth telling is that of the furor caused during Franklin D. Roosevelt's second presidential campaign. The subject was *babassú*. Roosevelt, in his Good Neighbor Policy, had signed an agreement with Brazil (in 1935) to allow certain vegetable oil-

seeds, like *babassu*, to enter the U.S.A. free of the three-cents tax levied on copra. This brought a storm of protest from the Middle West. Governor Landon, the Republican candidate and Roosevelt's opponent, made the most of the situation and Republican newspapers published, with big headlines, articles with captions such as "What is babassu?" So *babassú* played a part in U.S. politics, even in a presidential election.

## Allagoptera And Diplothemium

HAROLD E. MOORE, JR.

The small palm genus *Diplothemium* (about five species) occurs in Brazil and Paraguay. It was described by Martius in 1824 and was elaborated by him in 1826 to include four species, one of which, *D. caudescens*, has since been separated as *Polyandrococos caudescens* (Martius) Barbosa Rodrigues. Still later, in 1845, Martius described a fifth species (since variously placed in *Jubaea*, *Polyandrococos* and *Parajubaea*) and equated *Diplothemium* with *Allagoptera* which had been described in 1821.

Although the priority of *Allagoptera* was thus made clear over a century ago, the name *Diplothemium* has been used by most students of palms to the present. Some may argue that long usage would suggest attempting to conserve the name *Diplothemium* despite its few species and relative unimportance. But even if *Diplothemium* were conserved, an earlier epithet is required for one of the two better known species. Thus adherence to the rule of priority and the use of *Allagoptera* seems the better solution, especially in view of the need for careful study of the relationship between the genus and *Syagrus*. Since at least one species appears to have some into culti-

vation outside botanical gardens recently, it may be helpful to point out the correct names to be used at present under the *International Code of Botanical Nomenclature* (1956) and to comment briefly on these names.

*Allagoptera* was described by C. G. Nees in a list of corrections and additions following the appendix to the second volume of Prince Maximilian of Wied-Neuwied's *Reise nach Brasilien*, an account of the Prince's travels in Brasil during 1815, 1816, and 1817. According to *Isis von Oken* 1821: 578, 1821, this volume appeared at Easter, 1821 [April 22, 1821]. Essentially the same description appeared shortly thereafter in the botanical periodical *Flora* for May 21, 1821. The genus and its sole species, *Allagoptera pumila* Nees, were based on specimens of a small palm found by Prince Maximilian either behind the sand dunes on the coast between Sagoarema [Saquarema] and the *fazenda* of Pitanga on the way from Rio de Janeiro to Cabo Frio, or in a similar situation farther north between Vitoria and Rio Doce. This little palm was known locally as *cocos de guriri* or *pissandó* at the first place mentioned,