

Palms at Kew

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Royal Botanic Gardens, Kew, England

The first collection of palms in England of which good record remains was that of Robert James, 8th Lord Petre, at Thorndon Hall in the county of Essex, some 21 miles east of London. Lord Petre and his wife took great interest in growing unusual plants, and a feature of Thorndon Hall was the "stove," or heated conservatory, which in 1736 contained ten different palms. All are not recognisable at this distance of time, but they plainly included the date-palm of North Africa, a Brazilian fan palm, the oil palm of tropical Africa, and the cabbage-palm which had been found by Sir Hans Sloane in Jamaica.

When Princess Augusta, Dowager Princess of Wales, put into effect in 1759 her plans for a botanic garden at the royal residence of Kew House, there was built a heated house for tropical plants in which palms might find a place. In 1768 this held six species; the date-palm and coconut, the talipot and palmyra palms, the European fan-palm, and a climbing palm or rattan. Additions to this number came slowly through the years, and not more than 20 species were being grown in 1823 when the palms came under the charge of a young man named John Smith.

Smith was a great gardener who combined skill and experience with an independent and purposeful mind. Born in Scotland, the son of a gardener, he had been taken from school at an early age to be apprenticed to his father, and had completed his training by working in several famous gardens. He then travelled south and in 1822, when 24 years of age, he was given employment in the Royal Gardens at Kew at a weekly wage of 12 shillings. In the next year he was

made foreman of the hothouses, and as foreman and then curator he served Kew for over forty years until advancing blindness caused him to retire from active work. He lived on in the neighborhood for many years, employing the days in dictating his memories of what had happened in the Gardens in his time, a record from which springs much of our knowledge of early palms at Kew.

In 1823 when Smith became foreman of the hothouses, he found the palms not only few in number but also badly housed. The glasshouse then used for palms was a lean-to structure, 60 feet long and rising to 15 feet at the highest wall. A central bed was filled with bark from the tanyard, whose slow fermentation provided heat, and in this the tubs and pots of palms were sunk. The finest specimens at this time were two plants of *Sabal Blackburnia* and a *Corypha*; and Smith describes how they and a *Pandanus* were continually pushing their leaves through the glass of the roof. He adds that pity was taken on them in 1828 when the roof was raised 4 feet, but the relief so provided can have been only short-lived.

The year 1841 saw great changes at Kew for in that year the Gardens ceased to be the property of the Royal Family and became instead a Government institution. Sir William Hooker was appointed Director, and, with John Smith as curator, developments were put in motion. High on the list of new works was a Great Stove or Palm House which would provide a suitable habitation for palms and other exotic plants.

The Great Palm House

A fashionable architect of that day,

Decimus Burton, was invited to submit a plan. Burton was a man of some distinction. The tenth son of an architect, he had chosen to follow his father's profession, and before passing the age of 23 had not only set up his own business but was becoming well known for his creative designs. An example of his work familiar to visitors to London is the arch and facade of Hyde Park Corner. But his chief interests were in the country, in laying out gentlemen's estates with dignity and elegance, a house in classical style, an undulating park with groups of trees, in the distance a placid lake.

In March 1844 Burton submitted his plan of the Palm House, a plan which was finally adopted after some modifications suggested by John Smith and by Richard Turner, head of the firm supplying the iron framework. The house was to be 362 feet long, the largest structure of glass which had hitherto been made. It was to have a lofty central chamber 63 feet high and 100 feet across, and a wing to north and south, each 30 feet high and 50 feet across. The structure was to be supported by a framework mainly of wrought iron, and the panes of glass were to be tinted a particular shade of green to moderate the scorching effect of bright sun (a refinement soon shown to be needless in the smoke-filled atmosphere of Greater London). A suitable temperature for tropical plants was to be maintained, even in the depth of winter, by hot-water circulation, and to do this adequately four and one-third miles of piping (later increased to nearly five miles) was reckoned necessary. Twelve boilers installed beneath the building would supply the hot water.

At some distance from the glasshouse was a shaft or ornamental tower designed to provide a chimney for the boilers

and a pressure-head of water. Connecting the two buildings was an underground passage (eventually made 7 feet high and 479 feet long) with a track along which fuel for the boilers could be delivered.

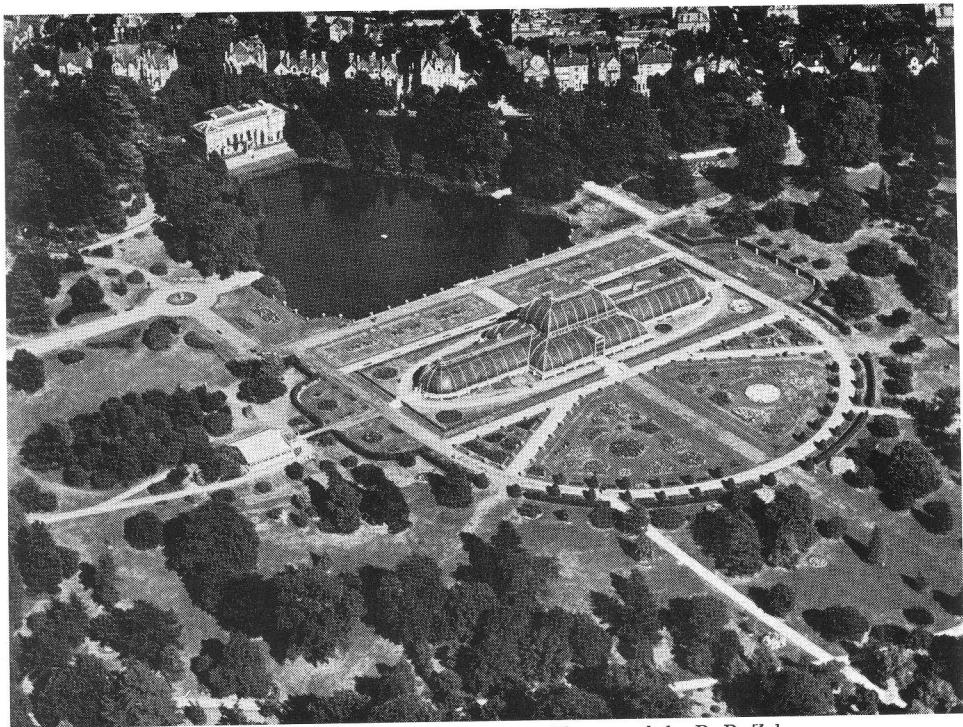
The best position for this new building had still to be decided and the site proposed by Decimus Burton aroused all John Smith's scorn and indignation — "the lowest spot in the parish" he said, "a quagmire for the greater part of the year." Smith, of course, knew what he was talking about, and we read in the *Journal* how, for some winters to come, water seeped into the boiler-room so fast that fire-engines had to be employed night and day to pump out water lest the fires should be extinguished. But this defect was made good in time, and now, as we view this building, the crystal centre piece of the present Gardens, we can see in its admirable siting, the evidence of Burton's genius and artistic vision.

Work on the foundations and boiler-room was started in 1844. Progress on the upper structure was slow and there appear to have been delays in delivery of the ironwork which was being fashioned in Dublin. The construction attracted great interest, and amongst visitors viewing its progress were Queen Victoria and her Consort whose surprise visit is described in a letter from Decimus Burton to Sir William Hooker:

6 Spring Garden,
30th June, 1848

MY DEAR SIR WILLIAM,

I trust that change of air is benefitting your health and that you will soon return in strength . . . You will have heard of the unexpected visit there yesterday of Her Majesty and Prince Albert. Mr. Smith very properly immediately offered his services, and I, who happened to be in the Palm House, was afterwards de-



33. The Palm House, Kew, from the air. Photograph by R. R. Zabeau.

sired to attend H.M. and the Prince who asked many questions and expressed much satisfaction. I took the opportunity of expressing my regret that, in consequence of a serious accident, you had been ordered by your Physicians to the seaside. I added you would be mortified on having a second time lost the opportunity of being present on the occasion of H.M. visiting the Gardens. I added that it would be some comfort if I might say to you that H.M. would again be there this summer. The Queen smiled and said *She certainly should* and I was to inform you so.

You will be glad to hear that the Palm House Flues are greatly improved as to draught.

Yours very truly,
DECS. BURTON

At last, in July 1848, the house was considered ready to receive plants, and

John Smith records for us his feelings in going into the great structure to arrange their disposal. He saw ironwork in every direction, massive girders in iron, the gallery with its two spiral iron staircases, the iron plates forming the flooring, all, he says, more like "some dockyard smithy or some iron railway station than a hothouse to grow plants in." A firm of shipwrights was employed to move the large sabals, one of which with attached soil weighed $17\frac{1}{2}$ tons and had to be manhandled over rollers from the old hothouse half a mile away.

The palm collection was soon in place and to it was added a collection of cycads and of screw pines and tropical plants of economic interest, bananas, mango, coffee and cacao. At first the plants stood in pots or tubs on the metal flooring, but in 1854 Smith was given his way and some of the iron plating

was removed to make six large beds of soil in the central room. Planted in these, the larger palms were encouraged to make much better growth and the mango tree was described as fruiting well.

The new Palm House was greeted with delight and admiration by the visiting public. The Director, in the official guide-book, described it as the glory of the Gardens, and other writers wrote its praises in all the fulsome verbiage and pride of achievement appropriate to the mid-Victorian period. "Truly this is a magnificent work, worthy of this great nation, and of the delightful science the interests of which it is so eminently calculated to advance" (Philip H. Gosse, 1856).

The tropical plants being now so satisfactorily housed, Decimus Burton was asked to design a house for plants requiring protection in the winter but no great degree of heat. The Temperate House or Winter Garden which he planned was more grandiose than the Palm House, having a spacious central hall, 216 feet long and 140 feet wide, with a large wing to the south and another to the north connected to the centre by two smaller chambers octagonal in shape. Building of the central hall and octagons was begun in 1860 and completed four years later, when part of the palm collection was transferred to beds in the central portion. The wings were not added until much later, and it was not until 1899, long after its designer's death, that the building reached its completed length of 628 feet enclosing an area of one and two-thirds acres under glass. Although to the external view this building lacks the distinction of the Palm House, internally its uncrowded spaciousness is most attractive. It has proved no less favourable a setting for palms, many of which prefer its cooler and less humid climate.

Sources of the Palm Collection

In the skilled hands of John Smith, and swelled by contributions from many parts of the world, the palm collection improved rapidly in variety and condition. From earliest days of the Royal Garden, travellers and residents abroad, whether surgeons of the Royal Navy, or Army Officers on overseas duty, colonial governors, missionaries, or traders, had been encouraged to send plants from the countries they visited. Moreover, from 1772 onwards, Kew employed its own collectors, young men trained in the Gardens and sent to distant parts to seek plants for the collection.

First among these was Francis Masson who from the Cape of Good Hope sent plants to Kew over a period of years, 400 species in all, some of which have since become popular garden-plants. A cycad or sago-palm, *Encephalartos longifolius*, which was collected by Masson and came to Kew as a young plant in 1775, still grows in the Palm House, a veteran of 186 years and a living link with this enterprise of the eighteenth century.

Two Kew men were with Captain Bligh when, following the disastrous voyage of the "Bounty," he made his second and successful voyage in H.M.S. "Providence" carrying plants of breadfruit from the South Seas to the West Indies. One of them, Christopher Smith, collected palms in the West Indies and these were brought to Kew by Captain Bligh in 1793.

From Australia came a number of palms including the graceful *Livistona australis*. This was received in 1808 from George Caley, a man of unusual character. The son of a Yorkshire horse-dealer he had become interested in plants through their use in treating sick horses. He obtained employment as a gardener at Kew, and after three years was sent



34. A palm from New Zealand, *Rhopalostylis sapida*, in the Temperate House, Kew, (left); *Cryosophila*, a graceful fan palm at Kew (right). Photographs by R. R. Zabeau.

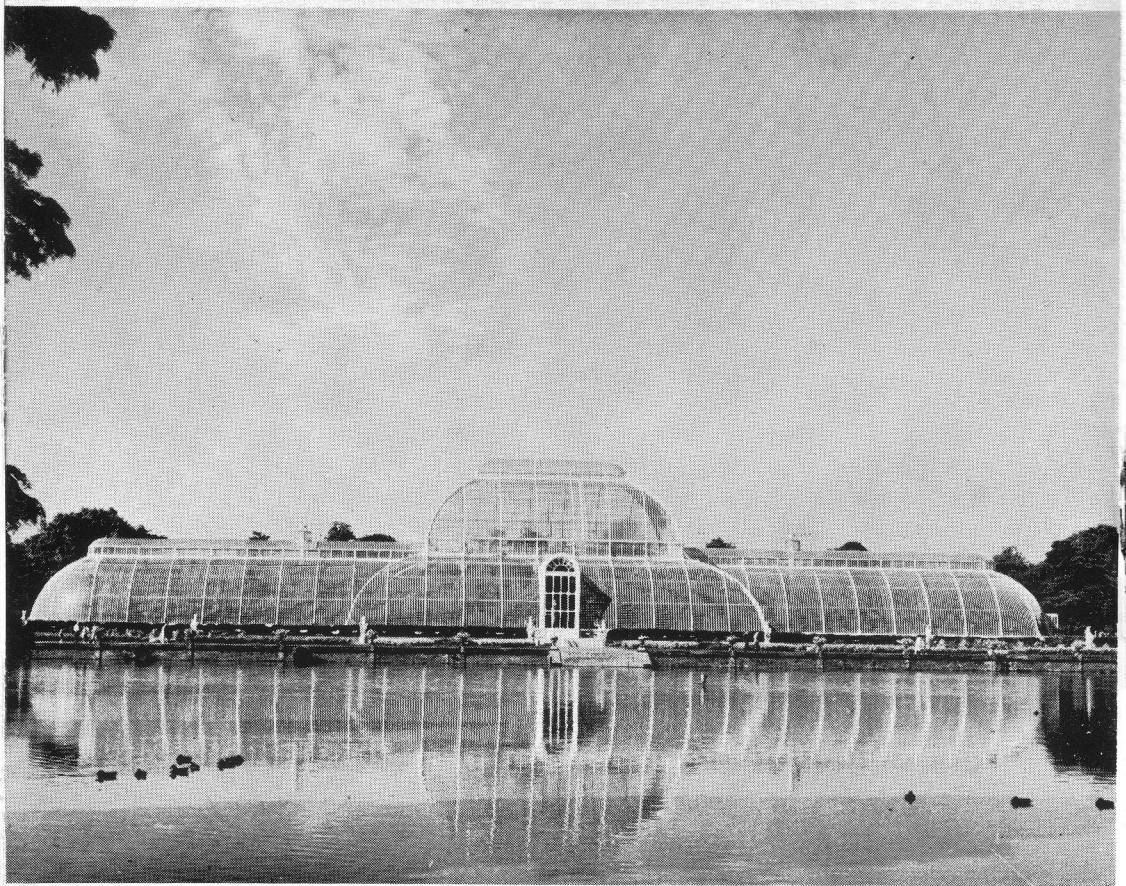
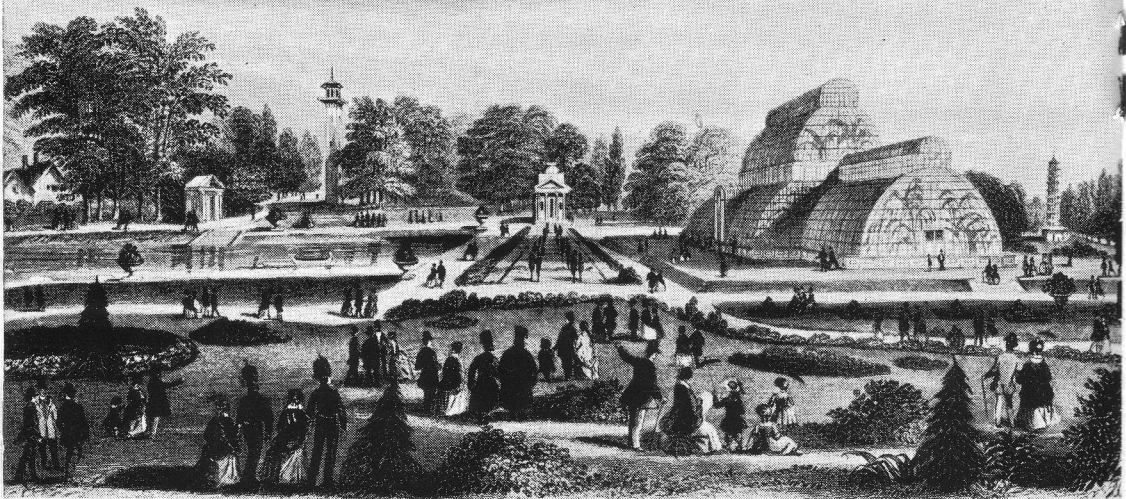
to New South Wales where he proved an industrious collector, sending many plants to England.

Caley's plant of *Livistona australis* at Kew long outlived him, but was surpassed in size by another sent from Australia in 1824. The sender was Allan Cunningham, a botanist trained at Kew, who, in his travels after plants, became one of the pioneer explorers of that country. He pursued his journeys with great ardour and disregard for comfort, and at his early death was said to have worn himself out with his exertions. His plant of *Livistona australis*, "for many years one of the greatest ornaments of the Palm House," reached the glass roof and was felled in 1876. A large palm of this species is conspicuous in the Temperate House, but this plant came to Kew from the Royal Gardens at Windsor and has no known connection with Allan Cunningham. Other species sent by him

still represented at Kew include the elegant palm which bears his name, *Archontophoenix Cunninghamiana* in the Palm House, and *Rhopalostylis Baueri* and *R. sapida* which are handsome features of the Temperate House.

A new palm was found by the collector William Milne, who sailed in the ship "Herald" on a survey of islands in the South Pacific, in 1853. On the small island of Lord Howe was seen "a dense forest of palms." From here Milne sent the umbrella palm, *Hedyscepe Canterburyana*, which later became popular as an ornamental.

A collector given a specific assignment to seek out a palm was William Purdie, who sailed for Colombia in 1843 with instructions to find the palm yielding vegetable ivory. The nuts were already familiar in Europe as an article of trade, being valued as a substitute for ivory in the making of billiard balls, chessmen,





35. The Palm House when completed was the largest glasshouse hitherto seen (left above).
36. The Palm House, Kew, as restored in 1959 (left below). Photograph by R. R. Zabeau.
37. The Palm House, opened in 1848, was hailed with delighted admiration (above).

and buttons. But, although they were understood to be borne by a palm, its identity and appearance were not properly known. For three years Purdie travelled in Colombia covering rugged and difficult country, and collecting rare and beautiful plants. He was able to find *Phytelephas macrocarpa* growing in abundance on slopes above the River Magdalena, and to describe its short almost recumbent stem, its spreading decorative fronds, and the scent which made the countryside fragrant as inflorescences opened on the separate male and female palms. He sent over 100 viable seeds to Kew, and seedlings raised there were distributed to other botanic gardens. A female plant, flowering at Kew in 1855, attracted much notice. The plant now in the Palm House arose as an off-shoot off an old plant, perhaps a seedling of Purdie's.

Amongst other Andean palms of which he sent seeds was the remarkable wax palm, *Ceroxylon alpinum* Bonpl. (*C. andicola* Humb. & Bonpl.). It owes its name to a coating of wax covering the trunk, which, scraped from the stem and mixed with tallow, makes very good candles. At Kew this palm is reckoned to be slow-growing, and a specimen in the Palm House with trunk 23 feet tall may perhaps be from seed sent by Purdie. His task completed in Colombia, Purdie went to Trinidad as Superintendent of the Botanic Garden, whence he continued to send palms and other plants to Kew.

With the development of botanic gardens in many overseas dependencies, the exchange of plants with Kew increased greatly. A list of palms being grown at Kew, given in the Director's report for 1882, includes 420 names. In the critical light of today, many of these names would not be regarded as distinct or as representing good species. There can be

no doubt, however, that the collection at that time was one of great wealth, remarkable for its number of species and wide geographical range.

The Palm Collection Now

A list of palms growing now at Kew would include about 125 species. Only one is grown out-of-doors without protection, the windmill or Chusan palm, *Trachycarpus Fortunei*. This palm finds good use in China where its leaves are made by peasants into hats and rain-proof capes, while its fibre provides rope for Chinese junks. It was first sent to England by one of the greatest plant-collectors (though not a Kew man) Robert Fortune, and a tall plant near the Main Gate at Kew is believed to be one of six plants received from him in 1849. Other younger plants are grouped near the Temperate House. Although they grow well, flowering and fruiting abundantly, these palms look strangely out of place in an English garden, as if perhaps they had strayed out of the glass-house on an unusually hot afternoon, and had found themselves locked out at closing time.

The great central room of the Temperate House provides a spacious setting for some of the finest palms. Chief among them is the coquito nut palm of Chile, *Jubaea chilensis*, a palm whose fronds brush the roof at 55 feet, with massive trunk 34 feet tall to the base of the leaves and 8 feet 11½ inches in girth 5 feet from the ground. This great palm is thought to date back to 1843, in which year a purchase of seed was made, and, during a large part of its life, it stood under the gallery of the house about 25 feet west of its present position. In 1938 its upward growth was being checked by the sloping roof, and a decision was made to move the palm into the centre where the height of the



38. *Jubaea chilensis*, the largest palm at Kew. Photograph by R. R. Zabeau.

house is greatest. To do this, the base of the palm, including roots and accompanying soil, was enclosed in wooden casing and the whole was slowly shifted inch by inch—no mean task for the total weight was reckoned to be 43 tons. In its native land this species is valued for its edible kernels or nuts. Charles Darwin, in the account of his voyage, describes how it is felled for extraction of the sap, which is then boiled to the consistency of syrup and eaten as palm honey. Later writers comment on the continued destruction of the palm to provide this Chilean delicacy.

Mention has been made of the tall palm *Rhopalostylis sapida*, with closely ringed trunk and stiff, erect, pinnate leaves, which is conspicuous in this house. Equally tall is a species of *Phoenix*, thought to be *P. reclinata*, with

single curving stem clothed with leaf-bases and topped by graceful feathery fronds. This palm is almost a centenarian having been given to Kew as a young plant in 1866.

Lord Howe Island, though small and distant, provides three elegant palms to grace the Temperate House, the *Hedyscepe Canterburyana* to which reference has already been made, and *Howeia Belmoreana* and *H. Forsteriana*. These graceful species with green, leaf-scarred trunks, and dark-green fronds, were at one time so popular as ornamentals in the nursery trade that the sale of seed from that island made a useful source of revenue for the isolated community.

The greater part of the palm collection is to be found in the Palm House where it occupies much of the high central portion, and shares with the screw-

pinus or Pandanaceae the north wing. The southern wing is filled with cycads or sago-palms, a collection of this order which is probably without rival in its variety and range.

Of the palms, the most striking perhaps, on account of the great size of its pinnate fronds, is the sugar palm *Arenga pinnata*. Although the plant in the Palm House is relatively young, with trunk little more than 3 feet high, its great fronds rise up 30 feet and more to the gallery of the house. This is a Malayan palm of many uses, a source of fibre, of toddy, and, most importantly, of sugar. The flow of sugary sap is induced by wounding and then by tapping the stalk of the male inflorescence. The juice, when boiled down, yields a dark impure sugar, much appreciated in the Far East.

Less handsome, but of greater economic value, is the African oil palm, *Elaeis guineensis*, a slow grower in the crowded conditions of the Palm House, whose fruits are a commercial source of vegetable fat and soap.

The palm reaching highest in the house is a species of *Calamus*, a rattan or climbing palm, whose stem is less than two inches thick at the base, but whose topmost frond is more than 50 feet up, almost touching the glass roof. The grace and elegance of this palm belie its aggressive character. The stem is thickly covered with black spines; the fronds, also spiny, have mid-ribs extended to form harpoon-like whips with reflexed barbs. Armed with these, the rattan scrambles upwards through the vegetation, intent only on raising itself above its neighbors into the sunlight.

Not much less in height are some palms of more independent habit, the *Ceroxylon* to which reference was earlier made, and a species of *Cryosophila*.

Occupying the centre of the house, a position it has had since 1878, is the Indian date *Phoenix sylvestris*, now a fine specimen with trunk about 21 feet high and total height of 36 feet. This species resembles the better-known date-palm, with its stiff blue-grey foliage, but is less valued for its fruit than for its leaves used for brooms and basketwork, its fibre made into rope, and its sap which in Bengal is boiled down to sugar on an extensive scale.

Attracting the eye by their shapeliness are two fine specimens of *Pritchardia pacifica*. Claimed by some to be without rival for its ornamental effect, this fan-leaved palm was found by Seeman, the authority on palms, in the islands of Fiji, and three seedlings were sent by him to Kew in 1864. This is no ordinary palm, for Seeman notes that, in the primitive life of the Polynesian islands at that time, the ownership and use of this palm were reserved for the aristocracy.

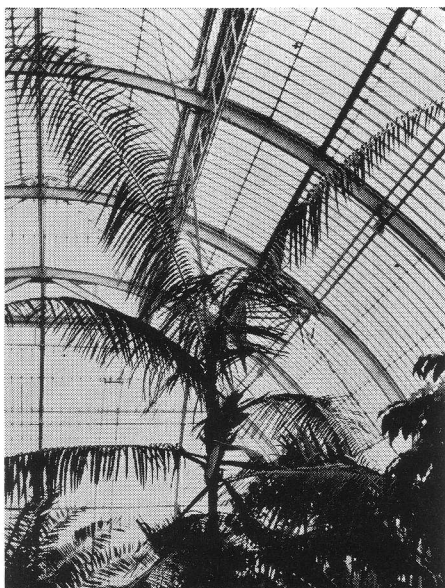
Another handsome fan-leaved palm, labelled as *Sabal Blackburniana*, recalls Lord Petre and his collection, for this name was first applied to a palm given by him to a Mr. Blackburne in 1737. The Kew specimen is indicated as coming from Bermuda (1), and is the palmetto which is so pleasing a feature of these islands. Other palms attracting attention in the Palm House include the Chinese fan-palm, *Livistona chinensis*, which grows rapidly and fruits readily in this house; the invaluable coconut, *Cocos nucifera*, of which there is a young plant; the fishtail palm, *Caryota mitis*, with its bipinnate fronds ending in wedge-shaped sections; and the Canary date, *Phoenix canariensis*, its crowded leaf-bases geometrically arranged on the stem.

The structure of the Palm House it-

¹And if so should be called *Sabal bermudana* [Ed.].

self has not remained unaffected by the passage of years. Some damage was suffered in wartime by bombs which, falling near though not on the structure itself, caused shattering of the glass. More disastrous than war-damage has been the corrosion of the iron-work fostered by a century of moist heat. This so weakened the framework that in 1952 the building was declared unsafe and was closed to the public. With dismay it was learned that the structure was considered beyond repair and would need to be replaced. Further tests indicated that repair might yet be possible and a major restoration was started in 1955. Section by section, the glass was removed, the girders strengthened by welding of steel plates, and all the iron-work cleaned from rust and treated. In replacement of the glass, longer curved panes, admitting more light, were inserted. When this was done, it was possible to see the grace and lightness of Burton's design revealed anew.

On May 29th, 1959, during the commemoration of the 200th anniversary of the Gardens at Kew, Her Majesty Queen Elizabeth visited the Palm House which her ancestor Queen Victoria had viewed with so great interest during its con-



39. Armed with hooks on its leaves, the rattan scrambles above its neighbors. Photograph by R. R. Zabeau.

struction 111 years before. In re-opening the doors to the public, the Queen at the same time opened a new chapter in the story of Burton's Palm House, and one which all concerned hope will be prosperous and make for progress in the knowledge and appreciation of the family of Palms.

Daddy of the Palm Canyons

RANDALL HENDERSON*

Within a radius of 150 miles of my home town of El Centro, California, I have tramped the length of many palm canyons—and now I have found the daddy of them all.

It is in Baja California, approximately forty miles south of the boundary established many years ago when United States and Mexico settled their dispute over the ownership of 1500

miles of rich coastal terrain along the Pacific. United States got Alta California, and Mexico retained the peninsula, designated by the Jesuit padres as Baja California.

The palm trees which grow wild in the southwestern sector of the Great American desert do not know anything about boundary lines. I have found many lovely oases on both sides of the international border.

The best known and largest forest of palms on the Alta California side of the

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