THE INDIAN BOTANIC GARDEN, CALCUTTA AND THE GARDENS OF THE WEST INDIES

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Within the public and the private gardens of the tropical countries of the world there are cultivated plants whose common as well as scientific names reveal the close ties that have existed between botanical gardens of each area and the botanists that worked in each. African tulip tree, Barbados cherry, Bengal bean, Brazil nut, Ceylon willow, Indian almond, Jamaica plum, Java grass, Jerusalem thorn, Para rubber and Queensland nut are commonly cultivated plants whose names convey the geography of the world. To the botanist the generic names Aegle, Amherstia, Adansonia, Barringtonia, Duabanga, Diospyros, Eucalyptus or Lodoicea convey equally well the connotation of geography and the association of a plant with a particular spot on the globe. How such plants became so widespread in cultivation is not always easy to determine; regrettably, exact records exist for but a few. Even the most famous episodes, such as the stories of the transport of the breadfruit or the Brazilian rubber tree, have been tectomized or glamorized incorrectly on film. There are facts to be gathered from the available historical records in many gardens and countries, however. The time is ripe for an historian of horticulture to re-examine the roles of botanic gardens and botanists in the distribution of plants for their beauty or for their economic value. Any such treatment must dwell at length on the relationships between the countries of India, England and the West Indies. These national relationships, once a compulsory bond, are now a voluntary association of affection and ideology continuing to be mutually beneficial.

KEW GARDENS

Among the botanic gardens of these areas the keystone role was played by the Royal Botanic Garden, Kew, which in 1939 celebrated its bicentenary. Kew Gardens, begun as a private garden of a sovereign, flourished under the guidance and directorship of Sir Joseph Banks, whose multiple role as advisor to King George III, president of the Royal Society from 1778 until his death, naturalist and sponsor of naturalists was most influential.

BOTANICAL GARDEN OF ST. VINCENT

In 1758, the year before the official founding of Kew, the Royal Society, whose role in agricultural development is often forgotten, offered prizes for the improvement of agriculture and horticulture in the American colonies. The first prize offered was "a gold medal for the first person bringing mango seeds to England to be sent to the West Indies for planting" (Premiums by the Society, Established at London, for Encouragement of Arts, Manufacture and Commerce, London, 1756, p. 262). Special prizes were offered for products native to other lands but grown in the West Indies. Included in a list, published in 1760 were prizes for olives, pippin, cinnamon, nutmeg, mace, sarsaparilla, aloes, safflower, indigo, cotton, annatto, vanilla, cloves, pepper, camphor, quinine, various tinctorial plants, and ornamental woods. Many individual colonists attempted such introductions and the establishment of these crops. The prizes and the need represented came to the attention of General Robert Melville, the first governor appointed to the Windward Federation of Islands, Grenada, St. Vincent, Dominica and Tobago, which had been ceded to Great Britain in 1763 following a treaty with France. In 1765 General Melville suggested to a medical officer and ardent horticulturist, Dr. George Young of St. Vincent, the idea of establishing a governmental botanical garden similar to the famous Kew Gardens for "the cultivation and improvement of many plants now growing wild and the importation of others from similar climates." These, he concluded, "would be a great utility to the public and vastly improve the resources of the island" (Landsdown Guilding, An Account of the Botanical Garden in the Island of St. Vincent, Glasgow, 1825). Dr. Young obtained a plot of land in 1765 to establish the first botanical garden in the West Indies and by 1773, when the garden was described as a place of beauty, Dr. Young was awarded a gold medal by the Royal Society for having 140 healthy cinnamon, mango and nutmeg trees in that establishment (Henry Wood, A History of the Royal Society of Arts, London, 1913, p. 93-100). John Ellis, a Fellow of the Royal Society and an Agent
for Dominica, visited the new botanical garden in St. Vincent and offered his support. In 1770 he published in London a treatise entitled, "Directions for Bringing Over Seeds and Plants from the East Indies and Other Distant Countries in a State of Vegetation." In 1775 the first prize was offered by the Royal Society for the introduction of the breadfruit into the West Indies and again Ellis, aware of the problems of the St. Vincent garden, offered a paper entitled, "A description of the mangostan and the breadfruit; the first esteemed one of the most delicious; the other, the most useful of all fruits in the East Indies. To which are added directions to voyagers, for bringing over these and other vegetable productions which would be extremely beneficial to the inhabitants of our West India Islands." St. Vincent fell to attacks of Carib Indians supported by the French in 1779, but was returned to British control by the treaty of Versailles in 1783. In 1793 the most famous of plant introductions reached St. Vincent when the Providence under Captain William Bligh landed the breadfruit plants on the island and departed a few days later carrying 465 additional pots and tubs of "Botanic plants" for His Majesty's garden at Kew (R. A. Howard, Captain Bligh and the Breadfruit, Scientific American, 188:88-94, 1953). For another two decades the St. Vincent garden flourished; but too frequently the influence of a garden is in the hands of its director, and with the death of the energetic and well-liked Dr. Alexander Anderson in 1811, the garden of St. Vincent began a decline. It has never recovered its initial influential role (R. A. Howard, A History of the Botanic Garden of St. Vincent, British West Indies, The Geographical Review 44:391-393, 1954).

GARDENS IN JAMAICA

Although the government botanic garden in St. Vincent is the oldest in the West Indies, it was not without its competitors from the beginning. In the colony of Jamaica farther north another influential man, Hinton East, maintained a private garden as early as 1772 and was active in correspondence to introduce new plants to the island. Hinton East along with Wallen and Hope, now famous names in West Indies horticultural history, prevailed upon the Jamaica House of Assembly to establish a government garden on that island. In a matter of a few years such gardens were established: the Bath Garden at the eastern end of Jamaica, a government garden adjacent to East's own property and soon to include it as well, and later the Hope Garden near Kingston and the gardens at Castleton and at Cinchona in the mountains. East's garden, known as the Liguanea garden, survived his death in 1792. A catalogue of East's garden was published in three editions. The first, issued by Broughton in 1793, listed 193 plants introduced into Jamaica by Hinton East between 1772 and 1791. The Liguanea garden soil was not the best for the purposes intended and the garden was finally sold in 1811. It was East's garden as well as his personal role which gave the impetus to horticultural development in Jamaica, unequaled in the other West Indian islands.

CALCUTTA BOTANIC GARDEN

On the other side of the world, by contrast, the respected Indian Botanic Garden began as a commercial garden under the auspices of the East India Company in 1786. Lt. Col. Robert Kyd of the Hon. East India Company Bengal Engineers wrote to the Public Department suggesting "the propriety of establishing a Botanical Garden, not for the purpose of collecting rare plants as things of mere curiosity or furnishing articles for the gratification of luxury, but for establishing a stock for disseminating such articles as may prove beneficial to the inhabitants and which ultimately may tend to the extension of the national commerce and riches" (A. T. Gage, Jourri. Roy. Hort. Soc. 51:71-72, 1926). Gage, in his report of the history of the Calcutta garden, noted that "before the sanction of the Directors reached Calcutta, the Government there had started the garden 'on a proper spot of ground' in the vicinage of Calcutta'." Colonel Kyd held charge of the Garden until his death in 1793 and was succeeded in the superintendency by William Roxburgh. No records of the correspondence of these men are available, but it is apparent that Sir Joseph Banks, through Kew and the Royal Society, was the intermediary of exchange with other areas including Jamaica. Hinton East in Jamaica and William Roxburgh in Calcutta were both correspondents of Sir Joseph Banks. Seemingly voluntarily, Banks sent to East seeds of Desmodium gyrans which East acknowledged by stating, "You have not been misinformed Sir with respect to a Garden which I have been for a few years passed cultivating for the purpose, in good measure, of introducing and establishing in this my Native Country, the Produce of others which may be either useful or ornamental, and I have the pleasure to add that I have already been tolerably fortunate in my pursuit". Thus in 1784 the exchange between Liguanea Garden and Kew was established in the simple words of East, "Whatever you may at any time think proper to send me, will be taken care of"
CONTACTS BETWEEN CALCUTTA AND THE WEST INDIES

When William Bligh was sent out on the second trip for the breadfruit, Banks sent along two gardener, James Wiles and Christopher Smith, to care for the plants. They were instructed to obtain the breadfruit and other plants and to transport them to the West Indies. Those for Jamaica were to be delivered to Hinton East, who unfortunately died before their arrival. In the face of this circumstance, James Wiles was then instructed to remain in Jamaica to care for the breadfruit plants, and later served as superintendent of the Liguanea Garden started by Hinton East. Christopher Smith, the second gardener, accompanied the remaining Pacific Island plants plus the acquisitions from St. Vincent and Jamaica to England where these plants were delivered to Kew and represented the largest single shipment received to that time by the Royal Botanic Garden. Shortly after his arrival in England Christopher Smith learned that Sir Joseph Banks had recommended him as a gardener for the East India Company garden in Calcutta where he was to serve under the newly appointed William Roxburgh. Thus Smith, with a knowledge of the transport of plant materials and experience in the Pacific Islands, St. Vincent, Jamaica and Kew, went to work for Roxburgh in India. Roxburgh reported his own appointment to Banks by sending a consignment of plants. He asked Banks for additional "useful plants and those of the West Indies and America," probably with full knowledge of the shipment Smith had accompanied around the world (Roxburgh letter Dec. 1, 1793 in The Banks Letters, ed. W. R. Dawson, p. 715). Almost immediately on his arrival in Calcutta, Smith was sent on an expedition to Malacca and the Spice Islands to collect plants. The shipment of some of these which reached Kew in 1796 was noted by Banks to be the second largest received, exceeded only by the shipment transported by Bligh. Some of these plants surely reached Jamaica as well, for in 1798 Roxburgh directed via Kew a shipment of a valuable grass which he thought should be introduced in the West Indies, and the following year a shipment of five boxes was noted to be "2 boxes for Kew, 2 for the Directors and one for Jamaica" (The Banks Letters, ed. W. R. Dawson, p. 717).

The early lists of the three botanic gardens are of interest for the areas or origin of the plants cited. Regrettably, not all can be accurately documented since the native country rather than the source is often given. Nearly contemporary editions would be Aiton's Hortus Kewensis, 2nd edition 1810-1818, Roxburgh's Hortus Bengalensis, 1814, and Broughton's Hortus Eastensis, 3rd edition 1806. A specific plant supplies an interesting correlation of these gardens. An African food plant introduced by slave ships to Jamaica prior to 1778 was listed in the first edition of Hortus Eastensis (1793) with a full Latin description but no Latin name. In 1806 John G. Koenig published a description of this plant based on the information given in Hortus Eastensis plus material of it in the Banks collection and named it in honour of William Bligh as Blighia sapida, the now famous "akee" of Jamaica. The plant was listed under this Latin name in Hortus Bengalensis in 1814 as an African plant introduced by "Wm Hamilton in 1797" yet in 1813 Roxburgh, in a report on the growth of various plants in the Calcutta Garden had noted Blighia sapida as "one (young plant) received from Sir Joseph Banks into this garden in 1807" (Roxburgh Trans. Soc. Encour. Arts. 1814:208). We also know that Blighia sapida was included in the shipment of "Jamaican plants" aboard the Providence which left the West Indies for Kew in 1793.

A similar episode is found in the West Indian mahogany, Swietenia mahagoni, long one of the spectacular avenue trees of the Calcutta garden. Although the catalogue Hortus Bengalensis cites the tree as "West Indian," the introduction acknowledges "The Mahogany tree, for instance, which but a few years ago was brought from Jamaica to this country, thrives so luxuriantly in Bengal, that many thousand trees of it are growing here. The Pimento . . . prosper now as well in Bengal [sic] as in their native soil . . . " (Hortus Bengalensis, Intro. p. vi). Thus, although but eight plants in Hortus Bengalensis are cited from Jamaica, there are an additional sixty from the West Indies, and although Calcutta is not mentioned specifically in Hortus Eastensis, there are 104 East Indian species as well as others from Ceylon. One suspects that Banks, Roxburgh and Smith played a greater role in plant introduction between India and Jamaica than can be verified.

The first direct contact between Jamaica and Calcutta appears in the Journal of the Jamaican House of Assembly, where it is recorded that in 1812 Dr. Stewart West, "Island Botanist," reared local plants both for the island and for Great Britain and that in 1813 he sent a large-collection of plants of timber trees of the island to the East India Company's botanist at Calcutta.

With the death of Sir Joseph Banks in 1820, the
garden at Kew began a decline which, unfortunately, was paralleled in other tropical botanic gardens previously nurtured by his interest and support. A rejuvenation did occur when Sir William Jackson Hooker became director of Kew in 1841 and continued under the aegis of his son, Sir Joseph Hooker, who became director in 1865. Sir William's personal interest in Jamaica was clearly expressed when he sent Nathaniel Wilson from Kew to Jamaica to take charge of the gardens there. Wilson took with him a large number of economic plants new to the island, and he encouraged the government of Jamaica to seek still another more tropical area for an experimental garden. Such a spot at Castleton was bought and established in 1860. The following year Hooker sent seeds of Cinchona, the source of quinine, to Jamaica. In 1868 the House of Assembly records show that 600 acres of land were purchased in the mountains and 40 acres were planted with five species of Cinchona. These plants exist today in many mountain areas and around the Cinchona Gardens in the parish of St. Andrew. In 1869 Assam tea was also planted at the Cinchona plantations. In the same year 400 species and varieties of plants arrived by ship from Kew for the Castleton Gardens. Included in this shipment were many Indian plants which appear to have included the first Bombay mangoes, now so popular.

Roxburgh's most notable successor was Nathaniel Wallich, who served as director from 1817 until 1846, during which period the scientific work of the staff at Calcutta increased. Following Wallich's retirement, a succession of directors paid less attention to the garden itself, for Sir Joseph Hooker, after visiting the gardens of Calcutta in 1858 and again in 1869, wrote to his father to report that they "had suffered to get out of order for the last dozen years" (L. Huxley, Life and Letters of Sir Joseph Dalton Hooker, London, 1918. Vol. I, p. 235). With the personal interest of the younger Hooker, the revitalization of the garden occurred. Thus when Sir William sent Cinchona to Jamaica in 1861 he also wrote to Dr. Thomas Anderson, who had assumed the directorship of the Calcutta Botanic Garden, "I have not written you since you left, in fact I have been so anxious about the Cinchonas you so gallantly took out that I was indifferent to everything else in your way out till I should hear the result" (l.c. Vol. II, p. 2). In 1873 Sir Joseph Hooker obtained the seeds of *Hevea brasiliensis*, and about 12 plants were raised at Kew and sent to Calcutta. It was three years later that seeds were sent to various other places including Jamaica.

The interchange between Jamaica and Calcutta was furthered also by Sir J. P. Grant. During Sir Joseph Hooker's visit to India, Sir John Peter Grant was Chief Justice of Calcutta and his son of the same name was Secretary to the Government of Bengal. The son became Lieutenant Governor of Bengal and in 1866 was assigned to Jamaica as its governor, taking with him a keen appreciation of botanic gardens and the friendship of Sir Joseph Hooker. It was at his special request that the Bombay mangoes were imported for the Castleton Garden. In 1905 Sir Joseph wrote to William Fawcett of Jamaica, "when Sir J. P. Grant was appointed Governor, be, being an Indian friend of mine, asked me what he could do for the introduction into the Island of useful vegetable products and he came and stayed with me for a couple of nights to talk it over" (l.c. III, p. 407).

By the turn of the new century all these gardens were firmly on their feet. It is no coincidence that the Bulletin of Miscellaneous Information, Kew, the Annals of the Calcutta Gardens, and the Bulletin of the Botanical Department, Jamaica, all started in 1861 and that these publications were exchanged, thereby informing each staff of the work of the other. The plants that were sent in each direction became some of the important crop plants, some of the most beautiful ornamentals, and even some of the noxious weeds. This free interchange without adequate records has created some interesting and peculiar taxonomic problems for the systematic botanist and for the horticultural plant taxonomists. One such example is found in *Cordia obliqua* Willd., described from a plant of Western India in 1794. In 1861 the botanist Grisebach described *Cordia tremula*, a species widely accepted as a native plant of the Antilles. Only careful study by the monographer, I. M. Johnston, finally ascertained that the two plants were the same species and that this attractive tree was introduced to Jamaica and the West Indies from India sometime during the 18th century (Jour. Arnold Arb. 30:122-123, 1949). A more recent example is found in a plant described as *Ixora rosea* Wall, in the Botanical Magazine (2420, 1823) from a specimen grown at Kew. The plant was said to have been introduced in the Botanic Garden at Calcutta in 1815 by M. R. Smith and that it is native in the hilly parts at the border of Bengal. It has apparently never been collected in the wild again and may be different from that described in Roxburgh's catalogue. However, the plant illustrated has persisted in cultivation in the West Indian botanical gardens all these years, only to become popular as an item in landscaping within
the last three years. Perhaps no cultivated plant in
West Indies gardens attracts so much attention as
Amherstia nobilis, discovered in 1824 by Wallich, then
superintendent of the Calcutta gardens. The species
under cultivation is of variable density of flowering, and
its defiance of easy propagation has added to its
interest.

The discoveries of the botanists associated with the
Calcutta Garden continue to add beauty to the tropical
gardens of the New World and the Old World. The
names of Roxburgh, Wallich and Griffith, to name but
a few of those associated with the garden at Calcutta,
are also attached forever with such spectacular culti-
vated plants of the West Indies as Butea frondosa Roxb.,
Thunbergia grandiflora Roxb., Clerodendron nutans
Wallich, and Graptophyllum pictum (L.) Griffith. The
gardens of Asia also possess equally beautiful trees,
shrubs and herbs native to tropical America, obtained
and distributed by the directors of gardens in the West
Indies. Included in such a list would be Lantana
camara, Rondeletia odorata, Guiacum officinale and
Triplaris americana.

One wholeheartedly wishes a long and flourishing
existence to these gardens of distinguished history and
long records of service. Advanced methods of trans-
portation, of plant propagation, and of plant culture
offer each area opportunities for enhancing its beauty
and economic welfare through continued cooperation
of the publicly supported botanic gardens.

EXPLANATION TO THE PLATES
1. Botanic Garden, St. Vincent. Established in 1765, this
garden received the first breadfruit plants transported
by William Bligh. Palms dominate the garden today.
The small shelter covers a fountain shaped in concrete
as an inverted flower of Allamanda cathartica.
2. Botanic Garden, Bath, Jamaica. The first government
garden established on Jamaica in 1778. The largest
trees in the West Indies of Barringtonia speciosa and
Pterocarpus officinalis may represent two of the original
introductions.
3. Amherstia nobilis Wallich is cultivated infrequently in
the West Indies due to difficulties in propagating the
species. No data are available on the first introduction,
whether it was as a living plant or by seed
4. Castleton Gardens, Jamaica. Founded in 1860, this garden
occupies a moist valley in the mountains and has under
cultivation many species not grown elsewhere in the
West Indies.
5. Hope Botanic Garden, Jamaica. Formal herbaceous
beds are maintained in this garden which is perhaps
the garden most commonly visited by tourists to the
West Indies. It was founded in 1873.
Pl. 1 : Botanic Garden, St. Vincent.

Pl. 2 : Botanic Garden, Bath, Jamaica.
Pl. 3: *Amherstia nobilis* Wallich.

Pl. 4: Castleton Gardens, Jamaica.

Pl. 5: Hope Botanic Garden, Jamaica.