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Front cover: An overview of the Arnold Arboretum from Peters' Hill. Photograph by Rácz and Debreczy.

Inside front cover: The twining stems of an old specimen of Japanese wisteria (*Wisteria floribunda*) growing at the former estate of George Rogers Hall in Bristol, Rhode Island. Photograph by P. Del Tredici.

Back cover: *Taxodium ascendens*, the pond cypress, in its native habitat in the Osceola National Forest in Northern Florida. Photograph by Rácz and Debreczy.

Inside back cover: *Abies bornmülleriana*, a little-known species, as portrayed in a plate prepared for the *Dendrological Atlas*. This fir was photographed in its native habitat in Western Turkey, on Mt. Ulu Dagh, about 1800 meters.

Page

- 2 The First Japanese Plants for New England
Stephen A. Spongberg
- 12 The Ghost Bramble—*Rubus lasiostylus hubeiensis*
Richard Schulhof
- 16 The New USDA Plant Hardiness Zone Map
Peter Del Tredici
- 21 The *Dendrological Atlas*: A Legacy in the Making
An Interview with Zsolt Debreczy
- 29 Taxonomic Notes from the Arnold Arboretum
Stephen A. Spongberg



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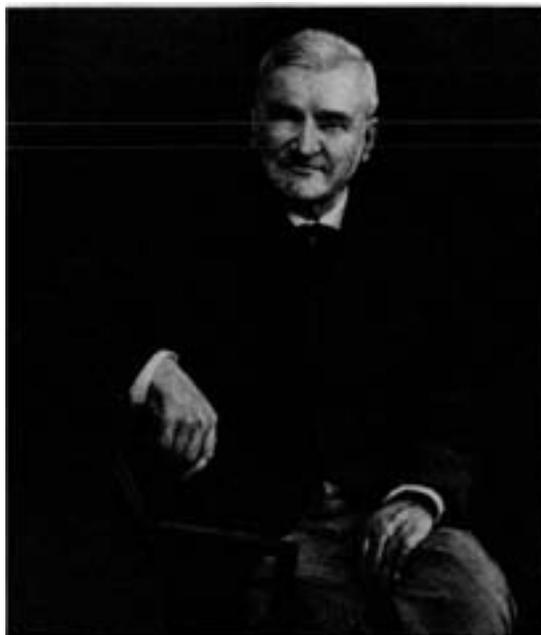
The First Japanese Plants for New England

Stephen A. Spongberg

When an enterprising young American doctor, George Rogers Hall of Bristol, Rhode Island, sailed to the Orient to seek his fortune by opening a small hospital in Shanghai, his contribution was destined not to be in medicine but in horticulture. His shipment of the first living plants from Japan to New England in 1861 was intended for Francis Lee of Chestnut Hill, Massachusetts, but answering Lincoln's call for enlistments, Lee consigned the plants to the historian and horticulturist Francis Parkman, who cultivated them with great success in his garden in Jamaica Plain, Massachusetts. The following year Hall returned from Yokohama, Japan, with other new plants that he brought in person to Parsons & Company, a nursery in Flushing, Long Island, to propagate. It is difficult to overestimate the importance of these early introductions in modern American horticulture.

Kousa dogwoods, hiba arborvitaes (*Thujaopsis dolabrata*), Fujiyama rhododendrons (*Rhododendron brachycarpum*), sawara cypresses (*Chamaecyparis pisifera*), beautiful crab apples with semidouble flowers (*Malus halliana* Koehne var. *parkmannii*), and umbrella pines were among the first Japanese plants that arrived in Boston directly from Japan. F. Gordon Dexter, returning to New England from the Orient in 1861, agreed to take responsibility for this ligneous cargo on the seventy-day passage from Yokohama to Boston and to deliver the plants personally to Francis L. Lee of Chestnut Hill. This unique collection had been carefully assembled and established in Wardian cases for transport to Boston by Dr. George Rogers Hall, then a resident of Yokohama.

During Dexter's absence from the states, Confederate artillery had bombarded Fort Sumter in the harbor of Charleston, South Carolina, and the Civil War had erupted. Francis Lee, about to respond to President Lincoln's call for troops by enlisting in the Union Army, was forced to entrust the nurture of the totally new plants to someone other than himself. He chose Boston's most celebrated horticulturist, Francis Parkman, his friend,



Francis Parkman (1823–1893) contributed greatly to the development of American horticulture. Best known as a rosarian, Parkman published The Book of Roses in 1866, but the diversity of plants he grew in his garden testified to broad horticultural interests. It was in Parkman's garden on the shore of Jamaica Pond that many Japanese plants were first successfully cultivated in North America.

former Harvard classmate, and Jamaica Plain neighbor.

When Parkman returned to Boston in the fall of 1846 after a summer of arduous adventure exploring the Rocky Mountain region, he was ill and physically exhausted. He had temporarily lost his sight—a recurring impairment that alternated with periods of poor vision—and suffered from headaches and an injured knee that severely restricted his mobility for the rest of his life. With assistance from his sister, the historian nonetheless began to dictate *The Oregon Trail* and plan for the numerous other historic accounts he would eventually write.

Turning to horticulture as an avocation, Parkman directed, from his wheelchair, a small grounds staff at his summer home on the shore of Jamaica Pond. Their labors and Parkman's plans transformed the three-acre site into a horticultural wonderland. The collection of roses alone consisted of over one thousand plants, and other horticultural novelties vied for the admiration of visitors. Lee knew that his new Japanese plants would be pampered under Parkman's supervision, and their growth and horticultural attributes would be duly noted and communicated at meetings of the Massachusetts Horticultural Society.



A view of Jamaica Pond from Francis Parkman's garden. The house is no longer standing (the land is now part of Boston's Emerald Necklace), nor is there a trace of the colorful garden that once flourished on the site.

The Umbrella Pine

One of the evergreen Japanese conifers, in particular, caught the eye of Parkman, who probably gave it the protection of a greenhouse before deciding to test its hardiness out-of-doors during a New England winter. Parkman may also have coined its common name, umbrella pine (*Sciadopitys verticillata* [Thunberg] Siebold & Zuccarini), to denote the spokelike arrangement of its glossy green needles. Not a pine at all, this unique tree has been placed by botanists in its own family—the Sciadopitaceae—and, like the ginkgo, it has no close living relatives. Miraculously, it too has survived from the remote geological past.

Fossils provide evidence that these trees once grew over a wide area of Eurasia and formed an important component of European forests. Brown coal deposits in Germany from the mid-Tertiary are frequently characterized by the remains of the leaves of umbrella pine, attesting to its former abundance. It also once grew in Greenland and Canada, but today the single extant species is restricted in nature to forests occurring between three and six thousand feet in elevation in the mountains on the Japanese islands of Honshu, Shikoku, and Kyushu.

The Japanese umbrella pine has proven hardy in the environs of Boston, and a grove of fifty-year-old trees has firmly established the species in the collections of the Arnold Arboretum. These individuals produce cones on a nearly annual basis, and as they mature the lower limbs die, exposing the trunks of the trees to view. Young trees rarely produce cones and usually retain their lower limbs; consequently, the cinnamon-brown bark of the trunk is obscured by the dense whorls of the dark-green, almost plastic-like leaves. As young trees, umbrella pines grow slowly and symmetrically, forming shapely, evergreen spires that are highly prized as specimen trees in the gardens of those fortunate enough to grow them. When plants can be located in the nursery trade, the prices they command reflect the esteem in which they are held. At



The umbrella pine (Sciadopitys verticillata) constitutes one of the finest conifers available for landscape use in eastern North America. Young plants are slow-growing and achieve a symmetrical, conical habit.

the Arboretum, a younger generation of these trees accents the plantings in front of the Hunnewell Visitors' Center and illustrates their landscape use.

Kousa Dogwood

Another Japanese tree that Parkman was the first to grow in North America along the shore of Jamaica Pond would have aroused the interest of Asa Gray at the Harvard Botanical Garden in Cambridge. It is likely, moreover, that Parkman was aware of Gray's interest in the flora of Japan. Word of the debates at the meetings of the Cambridge Scientific Club



Dr. George Rogers Hall (1820–1899) of Bristol, Rhode Island, the physician turned trader, who first sent living plants from Japan directly to New England.

and American Academy of Arts and Sciences that had raged between Gray and Professor Louis Agassiz in 1859 had surely reached the historian's ears. These spirited discussions had been spawned by Gray's hypothesis concerning the close relationships of the floras of eastern North America and Japan and Darwin's theories of evolution. Gray had argued for the descent of species in the two regions from common ancestors, while Agassiz had attempted to defend the multiple origins of related forms. Gray's reasoning, based on his empirical assessment of factual evidence, won the day and paved the way for the debate over Darwinism, which would occupy scientific center stage in the decades ahead.

When the Japanese kousa dogwood (*Cornus kousa* Hance) first came into flower on the shores of Jamaica Pond in the middle of June, Parkman was confronted with the same sense of *déjà vu* Gray had experienced when he sorted Charles Wright's brittle, dried specimens of Japanese plants in the herbarium. The morphological similarity of the Japanese species with the flowering dogwood (*Cornus florida* L.) of the eastern United States, which had flowered earlier in May, became immediately evident. Parkman was growing in his Jamaica Plain garden two closely related species from opposite sides of the world. Here was living proof of the distributional phenomenon Asa Gray had recognized and had gone far to explain. The similarities between the two species, moreover, could be comprehended based on the concept of descent from a common ancestor in the remote past.

Like its eastern North American congener, the ornamental attributes of the kousa dogwood depend largely on the four white, leaflike bracts that subtend the small, tight clusters of true flowers. Held erect on long pedicels, the abundantly produced clusters and their associated bracts stud the branches of the shapely trees in June and appear like thousands of miniature, creamy-white pinwheels hovering above the trees' outstretched branches. The white bracts contrast abruptly with the bright green of the leaves, yet some individuals produce such an abundance of flower clusters that the foliage is almost completely obscured from view by the associated bracts. These disease and pest resistant trees are one of the most valued ornamental subjects available for planting wherever a small tree is required.

Dogwood Fruits

While the Asian and North American dogwoods are undeniably related, they differ from one another in several ways and each is classified as a distinct species. Among other differences, the fruits of kousa dogwoods differ from

the individually borne seeds of the flowering dogwood, each of which sports a bright red seed coat. By contrast, the seeds developed from each flower cluster of the kousa dogwood are embedded in the flesh of a red, strawberry-like compound fruit. The weight of the fruit eventually pulls the initially erect pedicel downward, and the mature fruits hang suspended along the leafy branchlets.

One very plausible explanation for the difference in fruit types between the Oriental and Occidental species relates to their means of dispersal in nature. In the forests of eastern North America, the small fruits of the flowering dogwood are the right size for birds, which eat them and then disperse the seeds after they have passed unharmed through their digestive systems. In Japan and China, where the kousa dogwood is now known to occupy a wide range, monkeys, particularly macaques, are denizens of the same regions, and the larger, bright red, strawberry-like fruits appeal to these arboreal acrobats. These seeds also pass unharmed through the animal's digestive system and are dispersed prepackaged with primate fertilizer. Had New World monkeys occurred in the same regions as the flowering dogwood and not been blind to the color red, our native species might have evolved fleshy compound fruits similar to those of the kousa dogwood. Conversely, had monkeys not occurred in Asia, kousa dogwood fruits would probably be simple and their seeds dispersed by birds.

Parsons and Company

In April of 1862, a year after Francis Parkman received his horticultural windfall, a letter was published in *The Horticulturist or Journal of Rural Art & Rural Taste*, one of the leading horticultural periodicals of the day, which had been founded by Andrew Jackson Downing. Under the title of "Japanese Trees," the notice was signed by Parsons & Co., Flushing, March 20, 1862, and the column began:

A few days since, while sitting in our office, there walked in a gentleman, with an intelligent face, and



A large specimen of Zelkova serrata growing on the site of Dr. Hall's former estate, North Farm, in Bristol, Rhode Island. Photographed in 1987 by P. Del Tredici.

frank, pleasant manner, introducing himself as Dr. Hall of Japan, whom we had for some time known by reputation . . . He informed us that for the past two years he had resided in Yokohama, and being greatly interested in trees and plants, had, for his own amusement, collected in his garden all of any interest which Japan contained . . . Expecting to return home this year, he had also collected a large quantity of seeds of trees and plants, many of them unknown either in Europe or this country. These plants and seeds he had brought with him, except some six Wardian cases yet to arrive, and proposed to place them all in our hands for propagation and culture.

Relating the arrival of the Wardian cases, the article continued,

If you have ever seen the eagerness with which a connoisseur in pictures superintends the unpacking of



The original introduction of the spreading Japanese yew, *Taxus cuspidata*, growing on the site of Dr. Hall's former estate in Rhode Island. This venerable specimen is over 30 feet tall and 130 feet in circumference and has been the source of propagation material for countless generations of cuttings. Photo by P. Del Tredici.

some gems of art, among which he thinks he may possibly find an original of Raphael or Murillo, you will have some idea of the interest with which all, both employers and propagators, surrounded those cases while they were being opened.

Among the "originals" transported to Long Island in the glazed cases were the first plants of additional Japanese trees and shrubs that are now mainstays in landscapes in New England and across North America and Europe. Included were plants of the familiar kobus magnolia (*Magnolia kobus* De Candolle) and the now more ubiquitous star magnolia (*Magnolia stellata* [Siebold & Zuccarini] Maximowicz, in America first known and offered for sale as *Magnolia halleana* Parsons),

both prized for their abundantly produced white or pink flowers that herald the arrival of spring. In the Arnold Arboretum both of these precocious flowering species grow near the Hunnewell Visitors' Center and in April annually provide one of the earliest floral displays of spring.

Ten garden forms of the sawara cypress (*Chamaecyparis pisifera* [Siebold & Zuccarini] Endlicher)—each selected and maintained by Japanese horticulturists—and plants of the beautiful hinoki cypress (*Chamaecyparis obtusa* [Siebold & Zuccarini] Endlicher) were exposed to the fresh North American air from within the humid confines of the Wardian cases. Saplings and seeds of a

new elm-like tree, the Japanese zelkova (*Zelkova serrata* [Thunberg] Makino)—destined a century later to be widely planted in American cities and towns as a replacement for native American elms ravaged by Dutch elm disease—provided living evidence of new species to be found growing in Japan. Seeds of Japanese umbrella pines filled a small sack, and several horticultural forms of Japanese maples (*Acer palmatum* Thunberg), Japanese wisterias (*Wisteria floribunda* [Willdenow] De Candolle), and many others, including the raisin tree (*Hovenia dulcis* Thunberg), rounded out the shipment. While most had been described in the floristic accounts of Thunberg in the eighteenth century or later by Siebold in the nineteenth century, none had ever before been available to North American horticulturists. To the zealous plant propagators of the Parsons' firm and to American horticulturists of succeeding generations, several have become the botanical equivalents of canvases by Raphael and Murillo.

One Unfortunate Introduction

Ironically, among the horticultural treasures Hall brought back to the United States, one plant in the shipment was to become more comparable to the Norway rat brought to America by the first European explorers than to any work of art by an Old World master. This particular plant proved so well adapted to the climate and growing conditions of a portion of the eastern United States that it has become a pernicious weed that plagues foresters and naturalists throughout much of the southeast. Initially referred to by horticulturists as Hall's honeysuckle (*Lonicera japonica* Thunberg), this vigorous, twining climber is now more frequently known as Japanese honeysuckle, or simply honeysuckle. This last name is most usual, particularly in the regions where the plant has invaded thousands of acres of woodlands on the Piedmont and Coastal Plain and literally overwhelmed the native vegetation. For many generations of Southerners, its flowers have perfumed the

air and provided drops of sweet nectar to be sucked from the base of its tubular corolla. It has also provided untold hours of sweat and frustration on the part of those who have attempted, most often in vain, its eradication. So widespread and pervasive has it become that only its name suggests its Japanese origin.

If he were alive today, Dr. Hall might be satisfied that his name has generally become disassociated from this plant. He would undoubtedly have preferred to leave the



The flowers of Hall's honeysuckle (*Lonicera japonica*) produce a cloyingly sweet fragrance, which perfumes large regions of the South during the late spring and early summer. Since its introduction, the plant has become a pernicious weed, invading thousands of acres of woodlands along the eastern seaboard of the United States from New Jersey southward.

Japanese honeysuckle in his Yokohama garden. Little did he or the staff of Parsons' Nursery realize that the woodlands of much of the eastern United States from Pennsylvania southward would be forever changed by offspring of a plant carefully transplanted from a Wardian case to a nursery row on Long Island in March of 1862.

A Valuable Introduction

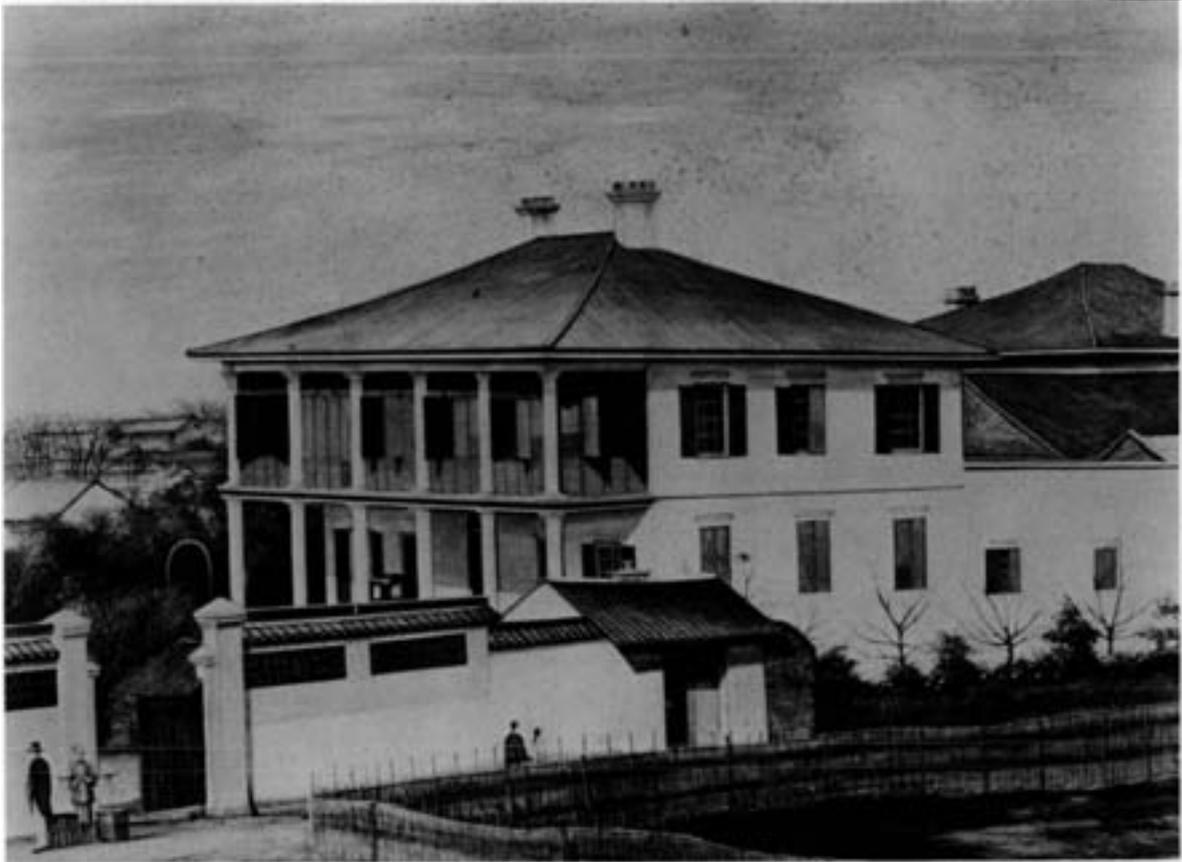
At North Farm, Dr. Hall's Rhode Island estate on the shores of Narragansett Bay—now a condominium development—a venerable, multistemmed Japanese yew (*Taxus cuspidata* Siebold & Zuccarini) planted by Dr. Hall on his return from Japan dominates one corner of the old garden. This tree is now over 30 feet tall and over 130 feet in circumference. A bronze plaque at its base indicates that it ranks as the first Japanese yew to be planted in North American soil. It was certainly not the last, for in northern regions of the United States this species has become the signature shrub of the modern-day urban and suburban landscape. While the Japanese honeysuckle has invaded southern woodlands, the Japanese yew has achieved the status of the quintessential landscape shrub in northern cities and towns.

Japanese yews constitute one of the mainstays of the American nursery industry. Countless thousands of balled and burlaped individuals annually fill the sales areas of bona fide nurseries as well as hardware stores, supermarkets, and other retailers who attempt to capture a part of the spring market for landscape trees and shrubs. Plants of this species used in foundation plantings alone probably number in the millions. All too frequently, yews are yearly clipped and shaped with pruning shears and hedge clippers into rounded balls, boxlike cubes, and cones. All across New England—like chessmen standing sentinel at entryways or guarding gravesites in suburban cemeteries—the Japanese yew is omnipresent and contributes to the monotonous repetition of suburbia.



The hinoki cypress (Chamaecyparis obtusa) growing at North Farm in 1987. Photo by P. Del Tredici.

When not pruned to within an inch of its life but allowed to grow and develop naturally, the Japanese yew assumes a pleasing, widely branching habit. Its growth rate is slow, but it will eventually achieve a good size unless pruning shears are resorted to. Its lustrous, dark-green needles contrast with the abundantly produced seeds, each embedded in a bright red, fleshy aril-like covering, adding to the ornamental aspect of the plant. Another attribute that recommends its judicious landscape use is its tolerance of light shade. When a dark evergreen is needed in such a location, the Japanese yew should rank high on the list of candidates.



A painting by an unknown Chinese artist of George Rogers Hall's Shanghai residence in the coastal city where Hall founded the Seaman's Hospital.

Dr. Hall's Medical Career

But who was Dr. Hall, recently of Japan, who brought the Japanese yew to North America, who sent cases of exotic plants to his friend Francis Lee, and who generously offered the Parsons' Nursery horticultural treasures from his Yokohama garden? A native Rhode Islander, George Rogers Hall was born near Bristol in March of 1820 and graduated with the class of 1832 from Trinity College in Hartford, Connecticut. After graduation, Hall matriculated with the Harvard Medical School class of 1846. Once his medical education was completed, he sailed for China and the new opportunities that awaited enterprising Yankees in the wake of the Opium War.

Settling in the foreign compound in Shanghai, Hall formed a partnership with another physician, John Ivor Murray, and in 1852, the two medics opened the Seamen's Hospital, with beds for twelve patients.

As the number of foreign vessels calling at Shanghai increased, Hall's medical practice flourished and the hospital staff was enlarged to include another physician and an apothecary. But despite the influx of American and European seamen requiring medical attention, the venture realized only small profits. Compared with the fortunes being made in commercial ventures, the hospital business hardly repaid the efforts involved.

Leaving the hospital and his medical prac-

tice behind, Hall joined with two friends in a business enterprise. His new partners were Edward Cunningham and David Oakes Clark, both from Milton, Massachusetts. These young New Englanders had been encouraged to enter the China trade by an old hand in the business, Robert Bennett Forbes, long time Milton resident and partner in Russell & Company.

Hall's decision to give up his medical career was undoubtedly a difficult one, yet pressing financial need forced his hand. In 1850 he had returned to the United States to marry Helen Beal, daughter of a Kingston, Massachusetts, lawyer. Together they returned to Shanghai, and in the space of four years three sons were born to the young physician and his wife. With the Taiping Rebellion looming on the horizon—an internal revolt that nearly saw the overthrow of the Manchu dynasty, a revolt fueled by government corruption and a socioeconomic decline that had worsened in the wake of the Opium War—Mrs. Hall left Shanghai with their three sons and returned to America in 1854. Sadly, the youngest son, George Rogers, Jr., died on board ship. With a young family to support, Hall decided to remain in China long enough to make his fortune before returning to the States to rejoin his wife and family.

A Garden in Yokohama

It was at this time that Dr. Hall turned to business interests, and with his friend, Cunningham, first visited Japan on Cunningham's schooner yacht, the *Halcyon*. Dealing in fine Chinese and Japanese curios—porcelain, lacquer work, bronzes, jade, and ivory—brought significant profits, but even more money could be made through speculation in gold and silver. A considerable fortune was

accumulated in this way, and toward the end of his Oriental sojourn Hall decided to establish himself in Yokohama, where direct access to the recently opened Japanese market was possible.

In Japan, George Rogers Hall's latent interest in plants emerged, and he diligently set about assembling a collection of Japanese species in his Yokohama garden. Many plants were obtained from Philipp Franz von Siebold, who had returned to Nagasaki and his beloved Japan in 1859, the same year Hall moved to Yokohama. Robert Fortune visited Dr. Hall when he traveled to Yokohama in 1860, and arrangements were made whereby Fortune's collections could be held in the physician's garden until they could be planted in Wardian cases for shipment to England. Without a doubt, the Scots collector shared some of his collections with the Yankee physician turned trader and plantsman.

And so it was that a first New England-bound shipment of Japanese plants arrived in Boston in 1861, and a second larger consignment arrived in 1862 when Hall returned home to Rhode Island to be reunited with his family. George Rogers Hall was the first American to send a wide assortment of Asian plants to eastern North America, where most were destined to join their New World relatives in landscapes across America.

This article was excerpted from Dr. Spongberg's forthcoming book, *A Reunion of Trees* (Harvard University Press, 1990). This book is the first volume of a three-part Arnold Arboretum Sourcebook Series, funded in part by the National Endowment for the Humanities.

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