



Dawn Redwood's Journey from Pleistocene China to Modern Mount Desert Island

By Lois Berg Stack and Scott Koniecko

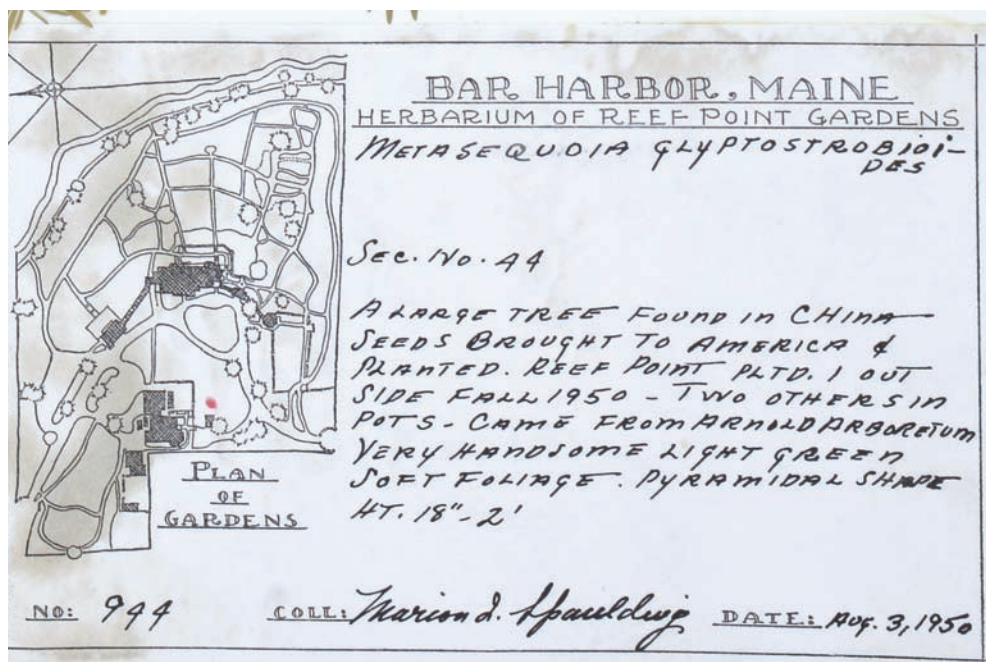
The dawn redwood at Garland Farm, which is just a mile from the bridge between Mount Desert Island and the mainland, is a living tribute to the fascinating natural history of this tree, and to the story of the international collaboration that brought it to Maine. It started its life as one of many seeds collected in China in the 1940s, from a species previously believed to be extinct. Some of those seeds travelled to Boston's Arnold Arboretum, and from there, in order to test the tree's performance in various climates, the seeds were distributed to a large network of institutions and individuals in Europe and in the United States. One of the recipients of the seeds was the renowned landscape gardener, Beatrix Farrand. Farrand planted five dawn redwoods at Reef Point, her Bar Harbor home. When, later in life, Farrand moved to Garland Farm, she took one of these trees with her. The tree at Garland Farm continues to thrive nearly seventy years after its arrival in midcoast Maine.

The Remarkable Natural History of the Dawn Redwood

Metasequoia, a genus of several species of trees, was long known only from fossils. It first evolved about one hundred million years ago in eastern Russia, and from there spread across the land bridge to North America. Fossils show

that from seventy to forty million years ago it was widely distributed across the Northern Hemisphere between thirty-four and eighty-two degrees north latitude (which includes most of modern-day North America, Canada, Europe, and northern Asia). Over time, the genus contracted from several species to just one—the dawn redwood, *Metasequoia glyptostroboides*—which eventually colonized northern Europe. Its geographic distribution was gradually reduced, and then, less than two million years ago, the species spread again, moving west from what is now Japan to what is now mainland China.¹

As home to the richest temperate flora in the world, China has many diverse ecosystems. Still, in modern times, the dawn redwood seemed to have vanished even from China, which fossils indicate was its most recent home. But then, in 1941, Gan Duo (in some papers referred to as T. Kan), of the Chinese National Central University's Department of Forestry, saw a large deciduous-needled conifer (a cone-bearing tree with needle-like leaves that fall each autumn) on a roadside in Sichuan.² Local people called it "water fir" (shui shan), a reference to its robust growth when located near streams or other bodies of water. In 1946, samples of the tree were sent to Xian Xu Hu, Director of Beijing's Fan Memorial Institute of Biology. Hu recognized the connection between fossil records and this new tree, and published an announcement of the discovery of a living species of *Metasequoia*.³ Hu collected seeds and sent them to a number of Chinese and foreign institutions. Seeds arrived at Denmark's University of Copenhagen and perhaps at Amsterdam's Hortus Botanicus by late 1947.⁴ The Arnold Arboretum



This herbarium voucher confirms that a dawn redwood grew at Reef Point. The specimen was collected on August 3, 1950, not long after Farrand received seedlings from the Arnold Arboretum. The red dot on the map in the lower right corner shows that the tree was planted between Farrand's house and the gardener's house. Original voucher owned and digitized by University Herbarium (UC), University of California, Berkeley. Courtesy of Beatrix Farrand Society

financed a seed-collecting trip in the fall of 1947, and received its first batch of seeds in January 1948.⁵

The discovery of the dawn redwood and the subsequent worldwide distribution of its seeds happened at an opportune moment. The People's Republic of China was established in 1949, and collaboration between Chinese and Western botanists was suspended for the next thirty years. Had seeds not been collected and sent abroad, it is possible that this species might have been lost in the rapid development—including timber harvesting and land development—undertaken by the new People's Republic of China. This is a very real example of the importance of exploring natural areas, recognizing new species, and reporting findings—as Dr. Gan Duo and Dr. Xin Xi Hu did—in order to prevent species from being lost.

After the tree's discovery, a 1948 coast-to-coast NBC television broadcast about the discovery of a

"living fossil," and a number of popular press articles captivated the general public.⁶ Millions of people learned about the dawn redwood, a tree that is reminiscent of the coastal redwood (*Sequoia sempervirens*) of California and Oregon, but is a wholly distinct, then newly discovered, species. Dawn redwoods grow quickly, can exceed a hundred feet in height, develop a wide conical form over time, and can live for up to six hundred years. The dawn redwood's trunk develops a broad buttressed base, and tapers dramatically upward to a narrow tip. The trunk's reddish-brown bark is a prominent feature in winter after the soft, bright-green needles have turned pinkish-bronze and fallen.

While coast redwoods thrive only in a narrow band along North America's



West Coast, people across the country were excited to learn whether the "living fossil" could thrive in other parts of the country, and about the prospect of growing this exotic Chinese tree in their own communities. To determine where the dawn redwood would flourish, the Arnold Arboretum distributed seeds and seedlings widely, to institutions such as the Royal Botanic Gardens of London and Edinburgh, and also to individuals throughout the United States and to many other countries.⁷

We have no way of knowing if dawn redwoods grew in Maine millions of years ago, because Maine does not have terrestrial rocks (which would contain *Metasequoia* fossils) from the time when the plant grew in northeastern North America. But by the mid-twentieth century, thanks to Reef Point's relationship with the Arnold Arboretum, this tree had arrived on Mount Desert Island.

Dawn Redwood at Reef Point Gardens and Garland Farm

Beatrix Farrand (1872-1959) spent childhood summers at Reef Point, her family home in Bar Harbor. As a young woman, she trained under the guidance of family friend Charles Sprague Sargent, the Arnold Arboretum's first director. She had a successful career as a landscape gardener and was the only female founding member of the American Society of Landscape Architects. She used her gardens at Reef Point to study the performance of both native and introduced plants in midcoast Maine. Even before transforming Reef Point into an educational institution, she shared her gardens with visitors who wished to learn about plants and landscape gardening. Farrand maintained a lifelong relationship with the Arnold Arboretum, and, over the years, she traded seeds and plants with the arboretum. An Arnold plant breeder, Karl Sax, named a forsythia after Farrand. Susan Delano McKelvey, a botanist at the Arnold, was a frequent visitor at Reef Point,

often bringing plants with her. And Farrand served for several years as the Arnold's Consultant Landscape Gardener.

It is no surprise then, that the Arnold Arboretum's plant distribution database lists Farrand as receiving two dawn redwood seedlings on May 4, 1950, and two more seedlings on April 20, 1951.⁸ Farrand's records don't quite match those of the Arnold in dates and numbers; her comments below indicate that she received five dawn redwoods, beginning a year or two earlier.

The presence of the dawn redwood at Reef Point was verified in the Reef Point Herbarium, a collection of pressed plants that Farrand intended to be used as a teaching tool—a collection largely assembled by Marion I. Spaulding, a young landscape architect who worked for Farrand for a few years in the early 1950s.⁹ Among the hundreds of herbarium specimens is one of the dawn redwood, collected from a Reef Point tree on August 3, 1950. The dawn redwood specimen's feathery branches fill the voucher sheet and still retain their green color. Spaulding's enthusiasm is evident in her comments on the voucher sheet: "A large tree found in China—Seeds brought to America & planted. Reef Point pltd. 1 out side fall 1950—two others in pots—came from Arnold Arboretum. Very handsome light green soft foliage. Pyramidal shape. Ht. 18"-2'."¹⁰ The map on the voucher shows that the tree was planted between Farrand's house and the gardener's house, a place where it could be observed frequently.

Farrand wrote about her dawn redwoods several times, revealing both her

excitement about being part of the Arnold Arboretum's effort, and her professional interest in the plants' performance at Reef Point. Farrand's first written comment on the dawn redwoods was made soon after the plants arrived at Reef Point, as she was transforming her Bar Harbor property from a family home into the research and educational institution, Reef Point Gardens. As Director of Reef Point Gardens, she submitted an annual Report of Progress to her board of directors, citing the events of the previous year that were part of the development of the property's gardens and other collections. In her 1948-49 report, Farrand wrote: "When the chief propagator from the [Arnold] Arboretum came to talk to the Bar Harbor Garden Club in mid-June he brought with him three youngsters of the rarest plant in the world, *Metasequoia glyptostroboides*. This tree, thought by botanists to exist only in fossil form was discovered in Southwest China and its seeds sent to the Arnold Arboretum which financed the expedition to collect them. The metasequoias are growing well and appear to like this part of the world."¹¹

In her 1949-50 report, she listed many plants that had arrived in the previous year, noting: "We have been the proud recipients of many plant gifts as the Arnold Arboretum has sent us two more metasequoias. One of last year's trees spent the winter in an unheated frame and is now planted out at the request of the Arnold Arboretum."¹²

Farrand's 1950-51 annual report was coauthored by Robert Patterson, a local architect, landscape architect, and friend.

The two collaborated on many projects. In this report, they recorded that "Our five metasequoias from the Arnold Arboretum are all thriving even better than those at Jamaica Plain. One was planted out last winter, at the request of the Arboretum authorities, and survived the mild winter triumphantly. Two more have been planted out and the larger two are growing vigorously in their teak tubs."¹³ Patterson further expressed his excitement in an article about conifers, which he wrote in 1952 for the Reef Point Gardens Bulletin, a publication intended to keep subscribers abreast of developments at Reef Point Gardens. "Deciduous conifers are not usual," he wrote, "but both American and European larches thrive, and *Metasequoia glyptostroboides*, also deciduous, is being tried in different situations, with the fingers of the gardeners crossed in the hope it will survive."¹⁴

In her 1952-53 Report of Progress, Farrand informed her directors that "The five *Metasequoias* are now all planted out and have survived another winter from their far away Chinese home, and although they do not grow as furiously as in Oregon and Washington states, they are creditable and brave."¹⁵

As her Reef Point Gardens developed, Farrand hosted many garden clubs and groups of university students and botany enthusiasts. Farrand's last reference to the dawn redwoods suggests a new dimension to her appreciation of the trees—as director of the Gardens, she saw them not only as spectacular in themselves, but as a part of the educational experience her institution could offer. In her 1953-54 annual report, she noted that "Certain uncommon plants are noticed by knowing eyes, for example ... five thrifty *Metasequoias*."¹⁶ Farrand must have found it gratifying to see visitors recognize and appreciate the dawn redwoods, but, unfortunately, Reef Point Gardens only existed for a few years after this report was published. A combination of difficulties, including financial concerns and the changing demographics of Bar Harbor, led Farrand



Beatrix Farrand planted her dawn redwood behind the old part of the house at Garland Farm, where it continues to serve as a backdrop for her famous Terrace Garden.

Dawn redwood's trunk tapers dramatically to a narrow tip, a characteristic best appreciated in winter after the needles drop. The buttressed base of the trunk becomes much more pronounced with age. *Photographs on this and the facing page by Nikolai Fox for the Beatrix Farrand Society*



to dismantle the house and sell the property in 1955. She moved to Garland Farm, her last home, and now the home of the Beatrix Farrand Society. She took some plants with her, including a single dawn redwood that she planted near the house. The fate of the other four dawn redwoods is unknown, but the Garland Farm specimen continues to produce good growth, and does not display the shrubby multiple-trunk appearance of dawn redwoods that die back in winter. The Garland Farm *Metasequoia* may one day reach the hundred-foot height of its Chinese counterparts, and develop the broad buttressed base that inspires awe in those who view older specimens. In the meantime, we can continue to learn from Beatrix Farrand by visiting Garland Farm, to see the dawn redwood, her Terrace Garden, and the other plantings around the house. We can also study the Reef Point Herbarium, including the beautiful image of the dawn redwood, at Garland Farm's summer herbarium exhibitions. Summer programs and seminars at the farm carry on Farrand's mission to teach people about plants and landscape gardening.

Dawn Redwood's Performance in American Gardens

In 1968, the Arnold Arboretum's Donald Wyman surveyed the dawn redwoods that had been distributed twenty years before, assessing the tree's performance over time in various climates.¹⁷ Most of the plants he surveyed were in the United States, including some in southern New England. The largest tree, in Princeton, New Jersey, had, remarkably, grown to sixty feet in two decades. Wyman reported that the dawn redwood's good performance in northern sites is evidence of its ability to withstand much colder temperatures than it would experience in its native habitat, and although late spring and early fall frosts can cause damage to the trees, many of the *Metasequoias* he observed were

thriving. Unfortunately, the Reef Point plants were not included in Wyman's survey. Perhaps Farrand's death in 1959 had broken the link between Bar Harbor and the Arboretum. If the Reef Point plants had been included, they would have been the most northerly of the East Coast plants in the survey, and thus could have supplied important data to the report. Also, the variety of the placement of the five specimens on Farrand's property might have provided useful information about this species' response to various soils, water regimes, light levels, and other environmental variations.

The dawn redwood grows too large for most urban landscapes, but it can be grown in more expansive rural landscapes, and it grows to impressive proportions in large spaces such as college campuses and parks. Whether grown in an open area where its wide-branched form can develop fully, or planted in groups to evoke the sense of a forest, the dawn redwood is a majestic tree. The Arnold Arboretum's extensive distribution of dawn redwoods demonstrated that it can be successfully grown over a wide geographic range. Beatrix Farrand's trees grew at the northern edge of the distribution area, and the Garland Farm tree has already survived nearly seventy Maine winters. This tree reminds us not only of Beatrix Farrand's contributions to the American landscape, but also the discovery of this "living fossil," and of its long and interesting journey from China to Mount Desert Island.

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1. Hong Yang, "From fossils to molecules: the *Metasequoia* tale continues," *Arnoldia* 58, no. 4 (1998-1999): 60-71.
 2. H. H. Hu, "How *Metasequoia*, the 'living fossil,' was discovered in China," *Journal of the New York Botanical Garden* 49, no. 585 (1948): 201-07.
 3. Ibid.
 4. Keiko Satoh, "*Metasequoia* travels the world," *Arnoldia* 58/59, no. 4/1 (1998): 72-75.
 5. Ibid.
 6. *Metasequoia glyptostroboides* Records, 1940-2010. Archives of the Arnold Arboretum of Harvard University. In addition to fifty-seven scholarly publications about the dawn redwood, these records include thirty-two newspaper and popular articles, plus a file of "copies of clippings discussing the discovery of *Metasequoia*, most of them printed in 1948." The number of these articles printed over the course of more than half a century testifies to people's sustained interest in this species.
 7. Satoh, *Metasequoia* travels the world.

8. *Database of Metasequoia distribution 1948-1980* (Harvard University, Boston MA: Arnold Arboretum).
9. The original Reef Point Herbarium is currently housed at University of California, Berkeley. The herbarium's vouchers have been digitized, making them accessible in two ways:
 - (1) the entire collection can be accessed online at: <http://ucjeps.berkeley.edu/>; and
 - (2) many of the digitized vouchers have been printed and are displayed in themed herbarium exhibitions each summer at Garland Farm, 475 Bay View Drive, Bar Harbor, ME
10. Marion I. Spaulding, *Metasequoia glyptostroboides*, Voucher #944 (Bar Harbor, ME: Reef Point Herbarium, Reef Point Gardens, 1950).
11. Beatrix Jones Farrand, *Report of Progress 1948-1949, Report to Board of Directors of Reef Point Gardens* (Bar Harbor, ME: Reef Point Gardens, 1949).
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17. Donald Wyman, "*Metasequoia* after twenty years in cultivation," *Arnoldia* 28, no. 10-11 (1968): 113-123.