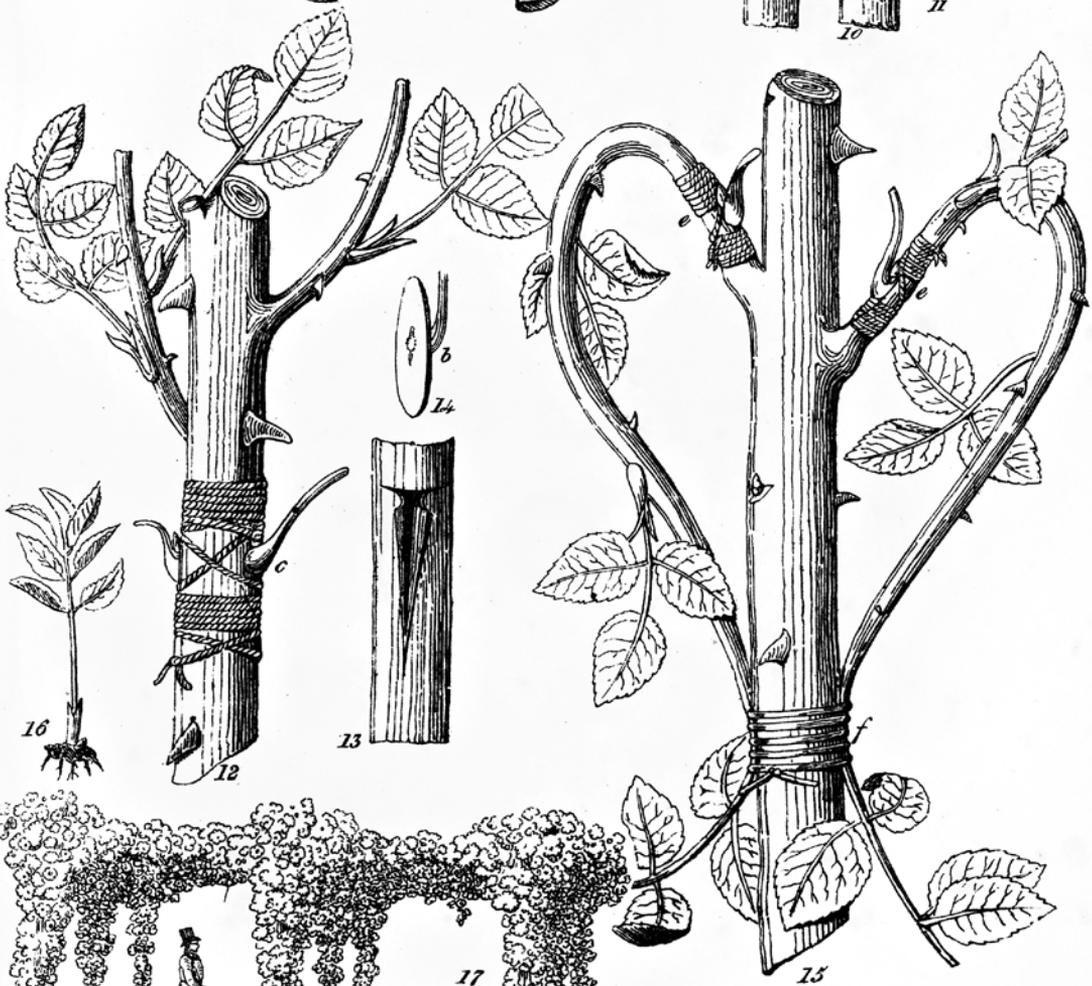
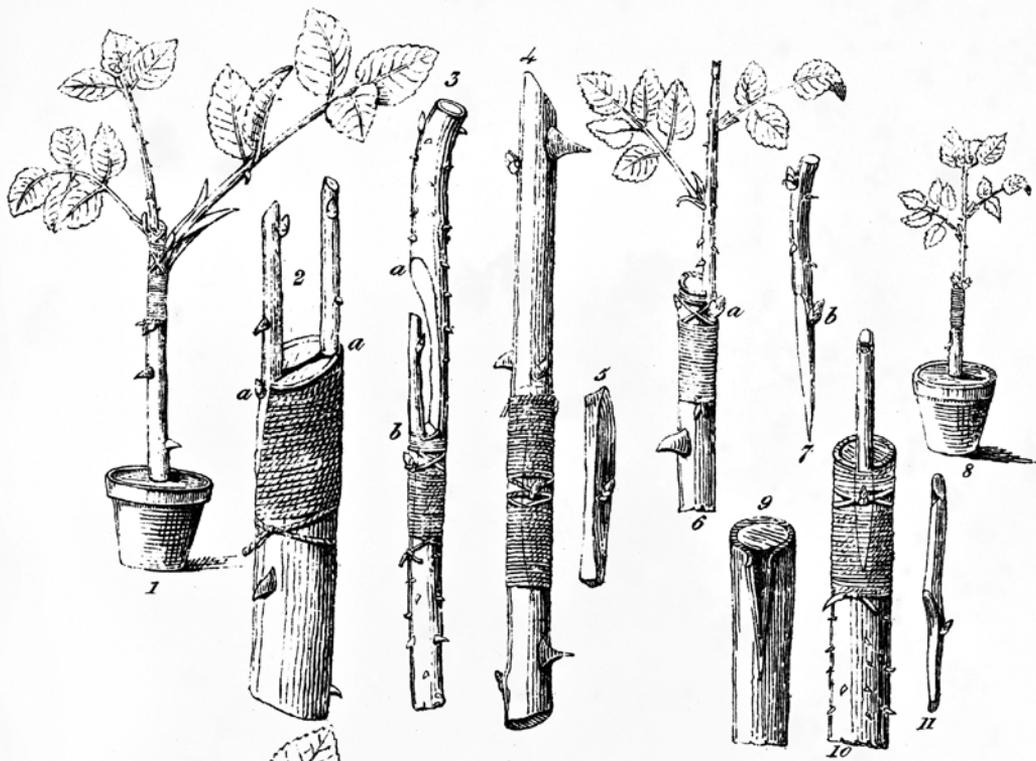


arnoldia

The Magazine of the Arnold Arboretum

VOLUME 78 • NUMBER 5-6



arnoldia

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Front and back cover: The Jesup Collection of North American Woods was designed to capture the beauty and scientific diversity of forests across the United States—including the redwood (*Sequoia sempervirens*) forests of northern California, shown here. Gabriel Moulin, Archives of the Arnold Arboretum

Inside front cover: William Robert Prince published *Prince's Manual of Roses* in 1846, but its popularity was soon eclipsed when Samuel Parsons, Prince's neighbor, published *The Rose: Its History, Poetry, Culture, and Classification*. An illustration from Parsons is shown. Archives of the Arnold Arboretum

Inside back cover: Fruits of a Rehder wingnut (*Pterocarya* × *rehderiana*, accession 1191 *E) droop above a quiet corner of the Arnold Arboretum. Photo by Jonathan Damery

PUBLICATION NOTE: Volume 79 will begin with the first issue published in 2022 and will include four issues.

Arnoldia Reimagined

Jonathan Damery

This issue of *Arnoldia* is devoted primarily to the world of nineteenth-century horticulture and botany, the milieu that shaped the Arnold Arboretum upon its founding in 1872. Yet, in some sense, the issue also represents the culmination of a twentieth-century vision for the magazine itself. Next year, as part of the Arnold Arboretum's sesquicentennial celebration, *Arnoldia* will relaunch with a structure and approach that is dynamic and distinctly modern. The magazine will still appear in print every quarter and serve as a definitive source for novel and interdisciplinary research on trees, shrubs, and landscapes. Yet, an updated format will allow for new points of access—new kinds of content.

In the context of modern publishing, the production of a magazine like *Gardener's Monthly*, which began in Philadelphia in 1859, seems almost inconceivable. Its editor, Thomas Meehan, would have exchanged feedback with authors on handwritten manuscripts. That much can be expected. More miraculous was the printing. The final manuscript would have been typeset by hand, each page composed of thousands of individual lead characters. Once a page was complete, a proofreader would review a test copy, marking errors as an assistant read the original manuscript aloud. According to a detailed account of the process for producing *Harper's Magazine*, outlined in 1865, the initial proofs were often rife with errors. After all, the compositor prepared everything backward, in the inverse of the printed page. After corrections and additional proofing, the process would continue to the individuals responsible for operating the presses, folding machines, and so on—an elaborate, labor-intensive coordination of both mechanical and human power.¹

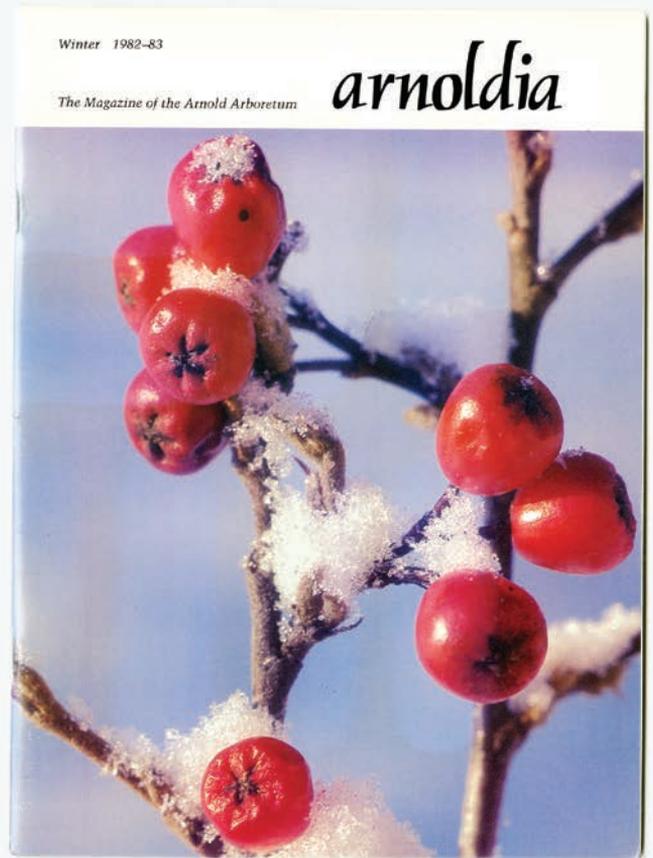
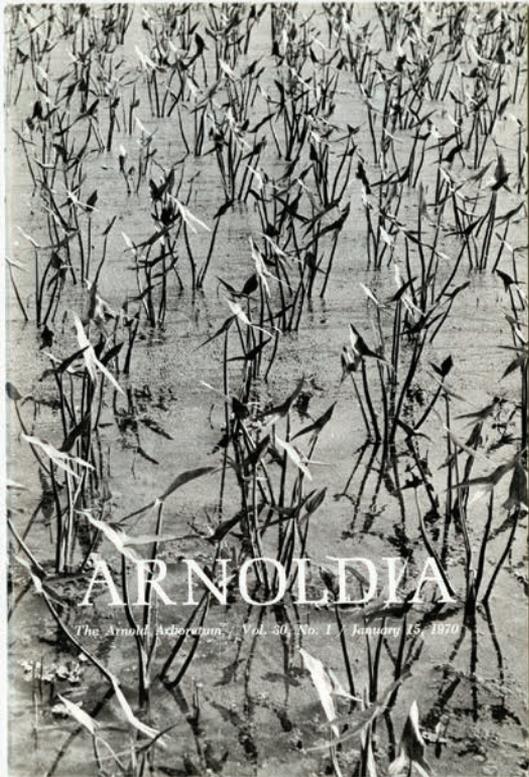
The Arnold Arboretum's first foray into magazine publishing was a monthly titled *Garden and Forest*. It debuted in 1888, weeks after *Gardener's Monthly* ended. Charles Sprague Sargent, the first director of the Arboretum, oversaw the magazine for its ten-year run, but the editorial offices were in New York, a few blocks from the printer: Harpers and Brothers. (*Harper's Magazine* was produced in the same building.) *Arnoldia* was born as *The Bulletin of Popular Information* in 1911, and for the next fifty-nine years, the periodical was typeset by hand, using the same basic method employed for *Gardener's Monthly*. The final person to perform the tedium of creating *Arnoldia* word by word, line by line was Howard Allgaier, the printer for the Harvard University Botanical Museum. Allgaier began producing the publication in 1933, at the behest of Oakes Ames, the supervisor of the Arnold Arboretum. Ames, a bibliophile, was known to say that "a botanist's research should be a jewel worthy of a proper setting."²

Ames also widened the purview of the *Bulletin*. For its first two decades, the periodical had focused almost entirely on plants growing at the Arnold Arboretum, but in 1931, the format shifted to standalone, topical articles. Ames wrote several of these, including one on the botanical drawings of John Singer Sargent.

Facing page: In the early 1930s, when *Arnoldia* was still known as *The Bulletin of Popular Information*, an interdisciplinary spirit emerged that continues to inspire the magazine today. Blanche Ames provided its first contemporary illustrations.

FOTHERGILLA *major*





In 1970, *Arnoldia* was reimagined as a special-interest magazine with multiple features per issue. The current logotype of *Arnoldia* debuted at the end of 1982.

His wife, Blanche Ames, began supplying botanical artwork of her own. The following year, their son coauthored an article about searching for beach plums (*Prunus maritima*) from an airplane. Authors would follow their wide-ranging lead. The name of the publication changed to *Arnoldia* in 1941, but otherwise, the structure and general approach remained the same.

In 1970, *Arnoldia* relaunched under the production of a new printer, the Harvard University Printing Office. At least through the end of the decade, *Arnoldia* was produced on “hot type” machines, which meant that the words were input on a keyboard and cast from lead on the spot.³ This mechanical process had emerged almost a century before, but perhaps owing to the relatively simple one-article format of *Arnoldia*, it had remained feasible for Allgaier to continue setting the type by hand. The change in printers coincided with a dramatic reimagining of *Arnoldia*—a project overseen by Stephanie Sutton, who took over the publication upon the retirement of Donald Wyman, the editor for twenty-nine years.⁴

The 1970 redesign was more than a visual makeover; it also brought new storytelling approaches. The 1960s is often considered an era of innovation in magazine publishing. Large general-interest magazines experienced circulation declines, attributed to the rise of television. (For instance, *Life*, which once claimed to reach the hands of one in four American adults, ceased publication in 1972.) At the same time, special-interest magazines began to proliferate.⁵ The redesign of

Arnoldia firmly repositioned the magazine within this new publishing context. While *Arnoldia* had long hosted a diverse mix of subjects, authored mainly by horticultural professionals, it would thereafter contain multiple articles per issue and showcase a glossy image on the cover.

Over the next five decades, *Arnoldia* went through several visual updates. Among those milestones: the current logotype and dimensions debuted in 1982, and the first color photographs appeared on the interior pages in 2001. Behind the scenes, the modes of production changed dramatically, but our graphic designer, Andrew Winther, skillfully maintained the visual continuity. He began working on the magazine in 1986, while in the art department at the Office of the University Publisher. At that point, the office used offset lithography, and the printing plates were created from photographic negatives of the text and images. By the early 1990s, Winther began designing the layouts on a computer, and ultimately, every aspect of prepress production has gone digital as well.

Despite these changes, the basic architecture introduced in 1970 has endured, with each issue composed primarily of several long-form features. In 2022, when the redesigned *Arnoldia* launches, the feature articles that have long defined *Arnoldia* will remain central to each issue. But in the opening pages, we will provide a new, distinctive space for shorter narratives that capture behind-the-scenes experiences of working with plants in the twenty-first century. We're also adding space for letters, to foster a public dialogue with you, our readers. In the back, we're creating a department composed of essays and opinions. We'll also incorporate contemporary artwork throughout the magazine, building on the legacy established by Blanche Ames ninety years ago.

With the first issue of *Garden and Forest*, published on February 29, 1888, Sargent and the other creators described their commitment to sharing "noteworthy discoveries" in the realm of science and horticultural practice. They promised that the magazine would "place scientific information clearly and simply before the public, and make available for the instruction of all persons interested in garden plants the conclusions reached by the most trustworthy investigators." Articles would cover landscape gardening, forest conservation, entomology, and more. The authors would deal both in history and news. Here, looking into 2022, we're doubling down on these longstanding commitments. Expect the first issue to arrive in March 2022.

Notes

- ¹ Guernsey, A. H. 1865, December. Making the magazine. *Harper's New Monthly Magazine*, 32(187): 1–31.
- ² Allgaier, H. J. 1984. The printing shop. *Botanical Museum Leaflets, Harvard University*, 30(1): 48–50.
- ³ Ashton, P. S. 1980. The director's report: The Arnold Arboretum during the fiscal year ended June 30, 1980. *Arnoldia*, 40(6): 238–293.
- ⁴ Howard, R. A. 1970. The director's report: The Arnold Arboretum during the fiscal year ended June 30, 1970. *Arnoldia*, 30(6), 201–250.
- ⁵ Abrahamson, D. and Polsgrove, C. 2009. The right niche: Consumer magazines and advertisers. In D. P. Nord, J. S. Rubin, & M. Schudson (Eds.), *A history of the book in America: Volume 5: The enduring book, print culture in postwar America* (pp. 107–118). University of North Carolina Press.

The Trees of the Silent Dell

David Barnett

A cemetery, by nature, is a place where the past is always present. On September 1, 2021, I retired from Mount Auburn Cemetery in Cambridge, Massachusetts, on the twenty-eighth anniversary of the day I started employment there. I had arrived in 1993 as the director of horticulture, having a background in public garden management and degrees in horticulture and ecology. At first, I only noticed the natural landscape and the spectacular collection of trees. Mount Auburn, after all, occupies a unique space in the history of American landscape design: It served as inspiration for other pastoral cemeteries in the mid-nineteenth century and, subsequently, for urban green spaces like Central Park and the Emerald Necklace. I didn't initially focus on the monuments and the other "cemetery" aspects of Mount Auburn.

About two years after my arrival, I gave a tour of Mount Auburn to Richard Harris, my major professor from graduate school at the University of California, Davis, who had authored a textbook on arboriculture. We stopped in Consecration Dell, a natural amphitheater in the center of the cemetery, where paths on the shaded slopes overlook a small pond. I explained that we had just initiated a project to restore this area to the woodland habitat that existed when the cemetery was founded in 1831. In fact, Mount Auburn's first president, Joseph Story, delivered his consecration address in this very location, noting the importance of natural beauty when mourning loved ones. "What spot," he asked, "can be more appropriate than this, for such a purpose."

I described how the restoration would require a phased approach to remove all exotic plants, especially invasive species such as Norway maple (*Acer platanoides*), and replace them entirely with native species of trees, shrubs, and woodland groundcovers. I felt proud to describe to my mentor how the restoration plan would allow me to put into practice ecological man-

agement concepts that I had studied in graduate school. We happened to be standing next to a spectacular Japanese stewartia (*Stewartia pseudocamellia*) planted in 1939. I noted that we would not remove the stewartia just because it was an introduced species, but that, when the stewartia eventually died, we would replace it with a native. I also pointed out that the stewartia had a memorial plaque on it with the name and birth and death dates of a woman who had recently passed away.

As we talked, a woman who had been walking nearby came up to introduce herself. She was the daughter of the woman memorialized on the tree plaque. She told me that the family had chosen to purchase the plaque because Consecration Dell was one of her mother's favorite spots. The woman said she visited frequently to think about her mother and thanked me for making Mount Auburn—and Consecration Dell itself—such a beautiful, uplifting, and inspirational place.

From that day forward, my relationship with the landscape changed. Talking to the woman beneath the stewartia, I came to understand the significance of Mount Auburn as a cemetery and the importance of serving our "clients" with compassion and sensitivity. The entire staff understands this—it is embedded in our culture. My colleagues have all had interactions with visiting family members similar to the one I experienced that day. These encounters motivate us to continue achieving the high standards of maintenance of the grounds—from the trees and gardens to the monuments and other built structures—in order to ensure that Mount Auburn Cemetery remains the beautiful and inspirational place that Joseph Story and the rest of our founders envisioned in 1831.

The successful restoration of the native woodland in Consecration Dell over the twenty-five years since that memorable conversation has been one of the highlights of my career. In place



Consecration Dell represents a nearly two-hundred-year-old vision for the naturalistic landscape at Mount Auburn Cemetery.

PHOTO BY THE AUTHOR; MAP FROM HARVARD MAP COLLECTION, HARVARD UNIVERSITY

of the Norway maples and other invasive species that we removed, hundreds of native trees and shrubs and thousands of ferns and woodland groundcovers now provide a valuable habitat for the birds, salamanders, and other wildlife residents of Mount Auburn. And yes, the magnificent stewartia remains as well. I like to think that the landscape looks just like “the hill

and the valley, the still, silent dell, and the deep forest” that Joseph Story described so long ago.

David Barnett was appointed president and CEO of Mount Auburn Cemetery in 2008. He retired from that position in 2021 confident that the course has been charted for a bright and successful future as an active cemetery, a historically significant cultural landscape, and a model of environmental stewardship.

The Nauvoo Rose on Temple Square

Esther Truitt Henrichsen

“She brought it from Nauvoo, Illinois, to Salt Lake City in a teapot,” my boss, Peter Lassig, told me. It was the spring of 1980, and we were standing in a quiet corner of Temple Square, in the heart of Salt Lake City. Before us, a small, unglamorous rose was beginning to produce its small, deep-red flowers. Peter had asked me to transplant it to a historic home garden, two blocks away. The rose was growing within a collection of special plants protected by the warmth and shade of a fifteen-foot wall made of adobe and sandstone that surrounds the square.

Peter explained that the rose came from a woman named Elizabeth Hubble. “She walked the thirteen hundred miles from Nauvoo,” he said, “but her rose rode in the wagon and was most likely the only luxury she allowed herself.” Elizabeth was one of seventy thousand Latter-day Saints who made the trek across the plains along the Mormon Trail from 1847 to 1869 before the railroad connected the West to the rest of the continent. Elizabeth was among those who were expelled from their homes in Nauvoo, a city they had built. She would have had little time to dig the plant from her garden, and she made a real commitment to keep it alive for the rest of her journey. She would have watered it from the Platte River in Nebraska, the Sweetwater River in Wyoming, and Emigration Creek as she traveled down into the Salt Lake Valley.

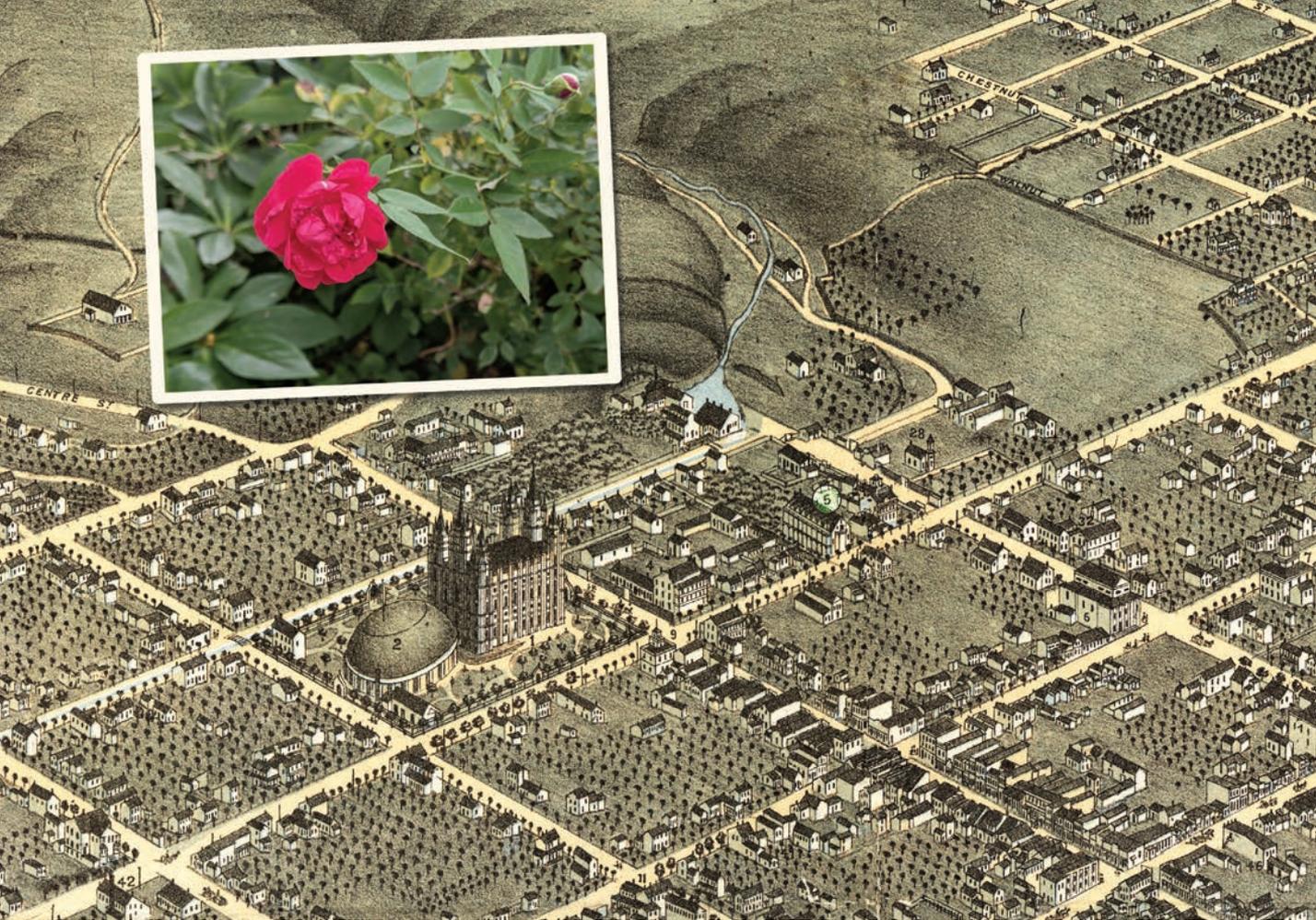
As Peter told me about the storied rose that late spring afternoon, we were standing across from the south door of the Assembly Hall, a beautiful, Victorian Gothic building, completed in 1882, that was about to go through an extensive renovation—the reason it was necessary to move the rose. Temple Square is the most visited site in Utah, which is impressive for a state boasting five national parks. Its ten acres are dominated by the large, domed Tabernacle and the Salt Lake Temple, divided by the Center Mall. With a cathedral of fabulous American and European elms (*Ulmus ameri-*

cana and *U. laevis*) overhead, Temple Square has served as one of the great urban spaces in the United States for well over a hundred years. The perimeter wall was built as fortification when Salt Lake City was still wilderness and now provides a peaceful space amid the noise of growing urbanity.

The next morning, I took a shovel and a pot to dig the little Nauvoo rose, becoming one more in a line of gardeners who had cared for the plant and its provenance since Elizabeth’s family had given it to Temple Square in the 1880s. Peter had been introduced to the rose in 1953, when he was fifteen, by his boss Irvin Nelson. In turn, Irvin had been charged with caring for it by his predecessor, who had gardened at Temple Square since the late 1800s. This location was the second placement for the rose on Temple Square. I was taking it to its first new home in nearly a hundred years.

Towering over the rose were three Japanese tree peonies (*Paeonia suffruticosa*) that were the most tree-like peonies I have ever seen. They had been a gift in the 1930s from Brown Floral, a family-run nursery that is still part of the horticultural fabric of Salt Lake City. Each plant had at least thirty mauve blooms, and they were dug and moved to the garden south of the Temple. Several other plant treasures in this space would also be transplanted.

In the spirit of its century of being a repository of gift plants, this garden between the Assembly Hall and the Temple Square wall was where, six years later, I chose to plant the seven-son flower (*Heptacodium miconioides*). This plant was sent to subscribers of *Arnoldia* when the story of this newly introduced species was published in the Fall 1986 issue. That *Heptacodium* grew into a glorious tree that every few years bloomed at the same moment as the monarch butterfly migration from north to south. You could stroll past the tree and be amazed as hundreds of monarchs were startled into the air. It was cut down a few years ago by a gardener who had no knowledge of its history



By the time this map of Salt Lake City was published in 1870, the Nauvoo rose had been growing in the community for two decades. The rose can now be found in the gardens of the historic Beehive House, mapped with a number 5.

PHOTO BY THE AUTHOR; MAP FROM LIBRARY OF CONGRESS, GEOGRAPHY AND MAP DIVISION

and was cavalier about not wanting to learn from those who had come before.

In the process of digging the rose that morning in May 1980, I was horrified when it split in two. But, this became an opportunity. I carried the little plants across the two blocks to the Beehive House, where I was the summer gardener and weed-puller. I planted them on either side of a path that led to a gate in the cobblestone wall. Brigham Young had built the wall in the 1850s around his two side-by-side homes, the Beehive House and the Lion House. The roses flourished there for two decades, until the cobblestone wall suddenly collapsed, killing one of the pair. The other was moved to another part of the Beehive House garden while the wall was being rebuilt and was never moved back. I was concerned for the future of the Nauvoo rose because it was difficult to find anyone in the next generation who was interested, but I eventually took three cuttings and have grown them in my home garden for the past decade.

I once keyed out the Nauvoo rose and believe it is a *Rosa chinensis* 'Minima', a variety (formerly known as *Rosa indica minima*) introduced into cultivation in the early 1800s. It grows about two feet high and two feet wide, and it blooms from spring to fall. In the intense high-desert sunlight of Utah, it prefers growing in a bit of shade. Compared to other roses, the Nauvoo rose may not seem very glamorous. Elizabeth, however, had the imagination to envision her little plant blooming in her new home in the Great Basin. Her descendants who donated the rose and the line of gardeners who cared for it since have all been connected by the love, care, and determination required to let it grow.

Esther Truitt Henrichsen is the garden designer at Thanksgiving Point Institute in Lehi, Utah. Previously, after completing a master's in landscape history, she worked for many years as a landscape designer at Temple Square.

Five Generations of Russell's Garden Center

Elizabeth Russell-Skehan

I felt the presence of the large video camera and mic over my right shoulder as I opened the photo album of Russell's Garden Center from the 1980s. "There's the four of us," I said with a smile to my husband, Tim, who sat next to me. I was referring to a photograph of us with my mom and dad, wearing our teal Russell's shirts and sitting in front of our new sign on Route 20. The highway connects Wayland with Boston, about sixteen miles to the east.

Our daughter Genevieve, the movie director, encouraged me to continue. "Pretend there's no camera or mic here, and just tell me about the five generations of Russell's."

I began my story, explaining how the business was established in 1876. "My great-grandfather Samuel Lewis Russell was a butcher," I said, "and his original store was called Russell's Provisions." He lived at the farm where Russell's is today, but his store was located about half a mile away, at the intersection of Route 20 and Pelham Island Road, in Wayland Center. It stood near a grocery store called the Collins Market, along with the library, post office, and several churches. Everything was within walking distance. "There were no cars in 1876, for convenience," I said.

Tim held up a picture of the Russell's Provisions storefront for the camera to capture. We were filming a documentary about our family business, aiming to tell the story of how our 144-year-operation—one of the oldest garden centers in the country—tackled the challenges of the pandemic by changing our business dramatically. For us, the family history was a central motivation for maintaining the garden center through the initial closures in March 2020, when we experienced more than a million dollars in losses. We worried that we might have to close the business altogether.

Genevieve asked, "Was your grandfather a butcher too?"

"Not at all" I replied. I explained how my grandfather, Lewis Samuel Russell, was a

farmer. Like his father, he grew vegetables and cut flowers on the family farm, and he also raised chickens and sold the eggs. In 1920, he opened Russell's Market in the space where we now sell garden tools—right next to his house. At that point, cars were becoming more common, which meant that my grandfather could close the original location in town. It wasn't just my grandfather running the market, I explained. "My Grammy, Ruth Russell, would add up customers' purchases on a little pad of paper and collect cash and make change out of her apron pocket."

Genevieve asked me to pause for a moment and instructed the cameraman to zoom in on my face. She then asked, "What was it like growing up on a farm?"

I described how I would visit my grandparents almost every day. I would play in the fields with my sisters and cousins, while my grandfather and great uncle worked nearby planting, weeding, and picking crops. At that point, my parents were involved with the business, so we would often stop to see them in the office, before heading to Grammy's yellow house, which still stands along Route 20. She'd give us fresh bread and sweets that she'd cooked on the old black coal stove. In the evenings, when my grandparents babysat for us, we'd watch Lawrence Welk and Carol Burnett on the television as they counted the cash from the day at their kitchen table. Family and business were inseparable. "They'd hide the cash in an oatmeal box in the cupboard," I said. "Once it was full, my grandma would put it in her bra and ride the bus to deposit it in the bank."

Tim flipped the page of an album from 1965 to reveal a picture of my dad, Lewis Samuel Russell Jr., watering rows of flowers growing in our greenhouses. The cameraman zoomed in with his lens.

My dad joined the business after he returned from the Korean War. By then, a significant part of the business revolved around wholesaling

Facing page: Russell's Garden Center has been a family-owned fixture in Wayland, Massachusetts, for five generations.



cut flowers to florists in the Boston area. My mom, Charlotte, worked as a bookkeeper and also managed the flower deliveries. Twice a week, she would load my sisters and me into the van and deliver flowers. We loved helping her carry the bunches of fresh flowers into the stores. After the energy crisis of the 1970s, we stopped growing cut flowers and closed our greenhouses every winter to conserve heat and save money. With specialization, airplanes and trucks could bring cut flowers from the southern regions of the United States and overseas, so Russell's stopped selling wholesale. My uncle had built several greenhouses, and my dad recommissioned them for growing annuals and vegetables. This transition was the start of the garden center as we know it today—and was yet another instance of the business evolving in response to changes in the market and technology.

"Because we were located on Route 20, we had plenty of customers driving by to stop in," I told the camera. "We added houseplants, cactus, poinsettias, and potted mums and began selling more Christmas trees, wreaths, and fresh floral arrangements." At that point, my dad hired his best friend, Hugh McKenzie, who started the Garden Shop. Hugh added tools, fertilizers, and insecticides, along with garden statuary and supplies for birds. My mom worked long hours, too, and expanded the offerings to include vases, pots, silk flowers, candles, Christmas ornaments, and décor.

At noon, Genevieve suggested we take a break. During the interview, her plan for structuring the film had shifted, and she wanted to run the idea past me. "Mom," she said, "I've decided to start with the history of Russell's before we go into the story of everything you

all did to overcome the pandemic." I agreed that this was a great idea. We had already decided that the last thirty minutes of our movie would be about the remarkable response from our community once we were able to reopen the business in the spring of 2020, after more than a month of closure. We found that the community embraced gardening with newfound enthusiasm—and in the end, Russell's not only survived 2020 but thrived.

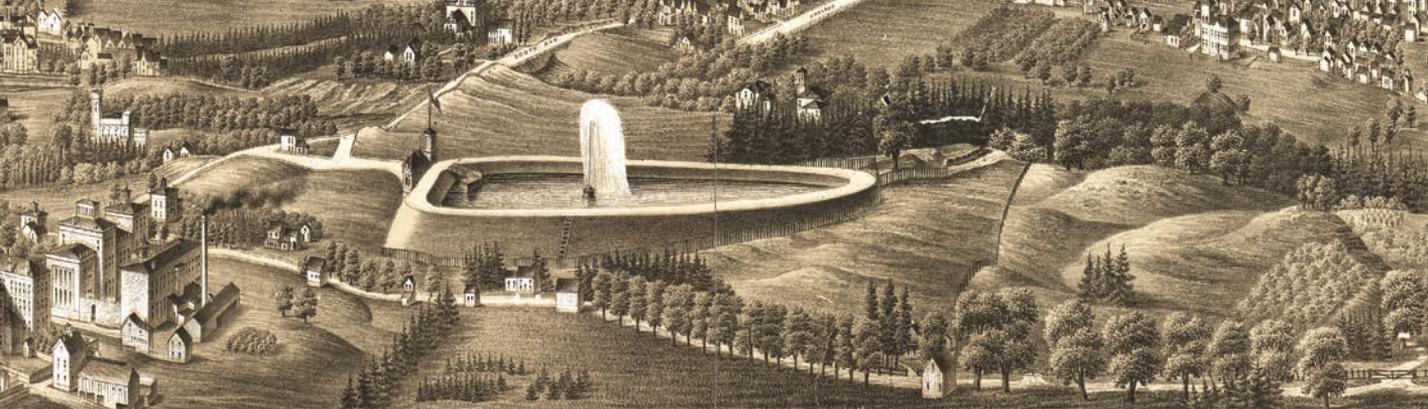
With the camera rolling again, Genevieve asked when Tim and I joined the company. Tim told the story of us joining in 1986. "I'm a recovering mechanical engineer," he joked, "and Elizabeth's expertise is in marketing and advertising. I quickly learned that this was a lot more fun than sitting in an office all day."

I explained how, at this point, I'm delighted that our son, Dan Skehan, has joined us full time. He is the fifth generation to work at Russell's. With a background in accounting, human resources, and financial management, he was instrumental in helping us figure out how to stay in business through 2020. He secured payroll protection loans and helped us furlough and then rehire and train our employees. Moreover, he kept abreast with ever-changing guidelines from the Center for Disease Control and the State of Massachusetts. "He remained calm and added a wealth of knowledge," I explained. "I'm not sure we'd still be in business if we didn't know that Dan would be here to continue the legacy of Russell's Garden Center."

Elizabeth Russell-Skehan is the president and vice president of marketing at Russell's Garden Center. They are now editing a full-length feature documentary film called *Growing Through Covid-19*. To watch a trailer or to donate to the film, visit www.growingthroughcovid19.com.

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The Resilient Trees of Flower City

Mark Quinn

On March 4, 1991, I awoke to a knocking on my door. A coworker from the Monroe County Parks Department in Rochester, New York, planned to pick me up early to go to a trade show in Syracuse. When I glanced at the clock, however, I realized the power was out. The clockface was blank. I dressed quickly in the dark, and when I stepped out the front door, I found that the day's agenda was completely different than planned.

My coworker had indeed arrived to pick me up, but looking down the street, I saw that ice covered everything. My twenty-five-foot-tall white birch (*Betula papyrifera*) was bent over, with the tip touching the ground. (This tree later sprang back, showing the amazing resilience of trees to crises.) We headed for Highland Park, the historic arboretum on the south side of Rochester, where we both worked as horticulturists. After multiple turnarounds due to trees blocking the road, we finally arrived at the Highland Park production greenhouses. The scene that met us was shocking.

A huge limb from a one-hundred-year-old European beech (*Fagus sylvatica*) had fallen on our turn-of-the-century glass greenhouse. Like most of the largest trees in the park, this beech dated to the early 1890s and was planted by horticulturist John Dunbar according to plans drafted by Frederick Law Olmsted. We immediately set to work removing the limb and closing the hole in the damaged greenhouse, stapling poly film to the cypress bars in an attempt to save the delicate orchids inside. As we worked to keep the plants from freezing, we could hear the occasional snap of limbs breaking elsewhere in the park, but we still had not fully comprehended the scale of devastation around us.

Rochester has a special affinity for trees. In the early 1800s, it was dubbed the Flour City,

as waterpower of the Genesee River was used to grind enormous amounts of flour that was then shipped via the Erie Canal. By the second half of the century, however, Rochester became the Flower City, home to many of the country's largest and most prosperous nurseries. Two nurserymen played an especially pivotal role: George Ellwanger and Patrick Barry, owners of the successful Mount Hope Nursery, which they established around 1840.

In 1888, Ellwanger and Barry donated land from their nursery grounds to the city to be used as a public park. Later named Highland Park, this land occupied a highpoint overlooking the city and the southern tier hills. Olmsted was enlisted to design a system of parks for Rochester, including North Park (now Seneca Park) and South Park (now Genesee Valley Park). Considering the interest that local nursery owners had invested in tree cultivation, Olmsted designed Highland Park as an arboretum. Many of the specimens to be planted were donated by Ellwanger and Barry. Park Superintendent Calvin Laney began acquiring additional plants for the park, but it soon became clear that more horticultural help was required.

Dunbar was hired in 1891 to oversee the plant collections in the park. He quickly forged relationships with other prominent horticulturists, including Charles Sprague Sargent of the Arnold Arboretum. The similarities between Highland and the Arnold are not just superficial. Both arboreta were designed by Olmsted and were envisioned as features within larger park systems. Both have the distinct feel of an Olmsted design, with curving paths following the contours of the landscape.

Dunbar and the horticulturists who followed him maintained an active relationship with Sargent and others at the Arnold. For many decades,



the institutions exchanged plant material, supporting research at both sites. As time passed, the products of these efforts matured into beautiful collections. In Rochester, the public has come to expect these large, well-maintained trees throughout our arboretum and park system. Still, as a community of tree lovers, we often take for granted the tremendous asset left by our predecessors—until crisis strikes.

The ice storm of 1991 was one of these events. Having saved the orchids, staff turned their attention to assessing the damage to the arboretum. It seemed that almost everything in the collection was either damaged or destroyed. At first, opening roads and paths so people could get around was the priority. This effort to restore access took days. As the work progressed, we started to look at individual specimens and, to our dismay, found many of our most celebrated trees were no more.

One public favorite, a katsura tree (*Cercidiphyllum japonicum*), looked like the last few feet of every branch was broken and hanging. The tree had been received in 1919 from the nursery of Leon Chenault, in Orleans, France. Once the forestry team addressed safety issues elsewhere in the landscape, they turned to the katsura, spending days expertly trimming off every broken limb. Today, three decades later, no evidence of the trauma remains. The katsura has returned bigger and better than ever.

The saddest loss for me was a Persian ironwood (*Parrotia persica*), which had been received from Veitch Nursery, in England, in 1892. The specimen—perhaps my favorite tree in the park—was fascinating, forming an impenetrable maze of eight- to sixteen-inch trunks with gray-green mottled bark. It had been completely uprooted and was lying on the ground. I remember cutting up the branches and wondering if another specimen as impressive as this one existed anywhere. Yet, sometimes having too much to do can play in our favor: with thousands of trees down and in need of work, our team deferred grinding stumps until later. That spring, dozens of new shoots sprouted from the overturned *Parrotia* stump. Over time, our team thinned the shoots, allowing space for some to grow. Now thirty years have passed,

and the plant is once again a tangle of trunks—again one of my favorites.

While so many trees were damaged and lost, others weathered the storm with remarkable ease. Walking through the park, you come to an impressive pair of zelkovas (*Zelkova serrata*), found in the valley behind the historic Lamber-ton Conservatory. One of the trees was received in 1899 from Thomas Meehan & Sons, in Germantown, Pennsylvania, and the other arrived in 1919 from the Arnold Arboretum. These trees stood strong against the ice. Likewise, at the corner of Highland Avenue and Goodman Street, a dawn redwood (*Metasequoia glyptostroboides*) did the same. The tree was grown from seed distributed by the Arnold Arboretum in 1948, when this newly identified species was first introduced to North America. The dawn redwood flexed under the weight of the ice but bounced back with little damage.

Despite the losses to the ice storm, Highland Park recovered. Every morning, I drive through the pinetum, which includes hundreds of varieties of mature evergreens—an uncommon and, I think, underappreciated asset for a city park. The pinetum is particularly impressive in the winter with snow on the trees, giving the impression of being in an evergreen forest far north of Rochester.

As I pull into my parking spot, I glance to a nearby hill where I see two magnificent fern-leaf beech trees (*Fagus sylvatica* 'Asplenifolia') standing amongst a grouping of beech trees of other varieties. These two were donated from Ellwanger and Barry's Mount Hope Nursery in 1892. Looking to the left, I can see an American chestnut (*Castanea dentata*), about thirty feet tall and starting to succumb to blight, a remnant of a former crisis. Each of the trees stands as a living history—a testament not only to their own resilience but to the commitment of the generations of horticulturists who have built and stewarded the plant collections in Flower City.

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Facing page: The author stands with one of the celebrated trees at Highland Park—a katsura tree (*Cercidiphyllum japonicum*) received in 1919.

The Prince Family: Pioneers of American Horticulture

J. Stephen Casscles

It was a beautiful day on August 1, 1782, when Prince William Henry, the third son of King George III, was received at the home and gardens of William Prince Sr. in Flushing Landing, New York. The American Revolutionary War had effectively ended the year before when the British surrendered at the Battle of Yorktown. Yet, the sixteen-year-old visitor, who would, in 1830, rise to the throne as King William IV, had come to present a stand of colors to the King's American Dragoons, encamped three miles to the east of the Princes. The British soldiers were invited for a barbecue of a whole roasted ox at the Prince home, not the kind of warm reception that an American patriot would have given to a future British monarch and his troops.

Prince was a nursery owner, almost forty years older than William, and the visit suggests the prominence of both Prince and the nursery. During the visit, Prince and William discussed their shared interest in growing and breeding plums, a specialty of the nursery. Plums were a critical fruit crop because they could be dried and stored for long periods and used as a nutritious food by the British Navy. Prince had introduced new plum varieties to Long Island, observing the acclimatization of the green gage plum (a common form of *Prunus domestica*). He even developed new varieties of plums, including 'Yellow Gage', which he would officially introduce the year after William's visit.

In 1789, another group of illustrious visitors stopped at Prince's nursery: the newly elected president of the United States, George Washington, and his entourage of vice president John Adams, New York governor George Clinton, and the president of the Continental Congress, John Jay. Washington was less impressed with the nursery than William had been. He noted a large number of young fruit trees but described the shrubs as "trifling" and the flowers as "not numerous." Flushing had been under British

military occupation for the past seven years, and little plant material could be shipped during those long years of hostility. Nonetheless, by the 1790s, the Prince Nursery was likely the largest propagator of grafted fruit trees in the United States. It would grow to become even more: a center of horticultural learning.

The Prince family's horticultural enterprise originated with William Prince's father, Robert, who was born in the 1690s. (His birth year has been variously presented as 1692 and 1699.) By 1723, Robert had begun collecting, growing, and propagating trees for his fruit farm. The plants included varieties of apples, pears, plums, nectarines, peaches, cherries, and small fruits. Throughout Robert's life, the nursery slowly evolved into a vibrant commercial operation, occupying eight acres directly south of what is now Northern Boulevard. This first Prince homestead was a beautiful structure with rounded shingles, set in a bank of flowering shrubs on the western edge of his property, next to the Flushing Creek.

Flushing—in northern Queens County—was an ideal location for a nursery that would grow to become national in scope. It sits on the Long Island Sound, where winters are milder than most other parts of the state and where summers are cooler and less humid than colonial centers to the south. Flushing boasted high-quality topsoil, rich and fertile, with few stones. An underlying subsoil provided good water drainage while retaining sufficient moisture to allow plants to grow quickly. Flushing's location relative to the Port of New York meant that plants could readily be shipped to other parts of the country and Europe. Moreover, Flushing benefited from the cultural and financial rise of New York City. These factors would, in the nineteenth century, induce many other prominent nurseries to establish operations in Flushing.

Facing page: The Prince family of Flushing, New York, operated a vanguard American nursery that opened before the Revolutionary War. Over five generations, the family championed an extensive array of plants from around the world and developed new varieties like the 'Imperial Gage' plum.

Robert and his wife, Mary Burgess, had six children. Their oldest son, William, took over the nursery by 1745, the year before Robert's death. Under William's leadership, the nursery ultimately expanded to twenty-four acres. The diversity of plants increased, as did the total sales. At the time, the standard American practice for propagating fruit trees, especially peaches (*Prunus persica*), was to grow seedlings and not to graft a tree to a suitable rootstock. Because of this seed-grown method, the quality of orchard trees was unknown until they came to maturity. Prince realized the commercial value of predictability and often budded or grafted his fruit trees to keep the variety true.

The nursery expanded quickly between 1750 and the beginning of the American Revolutionary War in 1776. William published his first-known notice of advertisement on September 21, 1767, which stated, "For sale at William Prince's nursery, Flushing, a great variety of fruit trees, such as apple, plum, peach, nectarine, cherry, apricot and pear. They may be put up so as to be sent to Europe. Capt. Jeremiah Mitchell and Daniel Clements go to New York in passage boats Tuesdays and Fridays."

The nursery's first-known catalogue appeared in 1771, a single-page broadsheet. The list contained over 230 plant selections, which was sizable for a nursery in colonial America. In addition to fruit crops, the offerings included evergreen trees, timber trees, and shrubs. Among the ornamental selections, tulip trees (*Liriodendron tulipifera*) and lilacs (three varieties, presumably *Syringa vulgaris*) were among the most expensive. An advertisement published in the *New York Mercury*, dated March 14, 1774, stated that William Prince was selling more than one hundred Carolina magnolias (*Magnolia grandiflora*) that were over four feet tall, raised from seed. He also advertised nine-foot-tall catalpas (*Catalpa speciosa*).

The Revolutionary War halted the shipment of Prince's plants to most parts of the American colonies, except for areas under British control, such as Manhattan, Brooklyn, Long Island, and parts of the South. These wartime closures hurt the business. Reports variously state that somewhere between three thousand to thirty thousand grafted cherry trees were either purchased or confiscated by the British, to be used

as hoops for making barrels. Yet, the Princes were likely British Loyalists and benefited from military protection. In fact, William's daughter Sarah married a British Army Major, Charles McNeill, who resigned from his military service after the war. And the British General Lord Howe ordered army units to guard the nursery, posting soldiers at the entrances.

When George Washington visited the Princes with his entourage in 1789, his assessment of the poor quality and low diversity of the ornamental plants may suggest that nursery was still recovering from the war. Yet, by the summer of 1791, secretary of state Thomas Jefferson and his fellow Democratic-Republican James Madison of Virginia visited the nursery and reported more favorably. The men were touring New York and New England to study botanical curiosities, wildlife, and historic battlefields. They maintained that the tour was for health reasons and scientific exploration. Yet, those versed in politics noted that the trip was conducted through the country's Federalists strongholds of New York and New England instead of areas dominated by Jefferson's political base of Democratic-Republican support.

Jefferson desired to improve domestic agriculture and arranged the nursery stop to discuss his ideas with William. Among the topics, they talked about Jefferson's vision for promoting the cultivation of sugar maples (*Acer saccharum*) for syrup production. Jefferson also took the opportunity to order plants for himself: sugar maples, highbush cranberries (*Viburnum trilobum*), balsam poplars (*Populus balsamifera*), and Beurre Gris pears (a variety of *Pyrus communis*). Later, he expanded his order to include stone fruits and nut trees, along with an array of ornamental trees, shrubs, and roses.

As the United States grew towards the close of the century, so did the Prince Nursery. By 1793, William Prince, at the age of sixty-eight, turned over operations to his sons Benjamin and William Jr. Benjamin maintained the original family nursery for many years, calling it the Old American Nursery, but it was William Jr. who became the primary mover of the family business in the third generation. In 1793, he purchased twenty-four acres directly northeast of the original nursery. There, on the banks of



In 1793, William Prince Jr. purchased twenty-four acres alongside the original nursery, naming the new property the Linnaean Botanic Garden and Nursery. In the decades to come, a cohort of nurseries would open in Flushing, including Parsons Nursery and Bloodgood Nursery, both mapped nearby in 1841.

Flushing Creek, he established his Linnaean Botanic Garden and Nursery. He designed it as a showplace to educate the public on botanical matters, including native plants, new varieties bred in the United States, and plants imported from Europe and farther afield.

William Jr. and his son William Robert Prince took up the cause of identifying and describing plant material so that it could be offered to the public—and they were highly invested in acquiring newly introduced species. In 1804, for instance, Meriwether Lewis and William Clark embarked upon the Missouri River to explore the recently acquired Louisiana Purchase. The expedition had been commissioned at Jefferson's request, and when the explorers returned east, they came bearing seeds and other botanical collections. The Princes were among the first nursery operators to grow and distribute plants from the expedition, and the Oregon grape holly (*Mahonia aquifolium*) became one of their most successful new products. The

Princes were also among the first American nurseries to offer ornamental species from East Asia, like the golden rain tree (*Koelreuteria paniculata*), lacebark elm (*Ulmus parvifolia*), and Chinese wisteria (*Wisteria sinensis*).

By the mid-1830s, William Jr. had ten nursery outbuildings, of which several were greenhouses that contained tropical and subtropical plants from Africa and Asia. Visitors could pay an admission fee to experience the warmth and humidity of the greenhouse—a rewarding respite to escape the dark, cold New York winter. The nursery catalogue listed ten tropical hibiscuses (*Hibiscus*) and two gardenias (*Gardenia*) that bloomed in their greenhouses. Prince grew tropical fruits and flowers specifically for winter viewing. For variety, they also exhibited insectivorous plants such as sundew (*Drosera*), pitcher plant (*Sarracenia*), and Venus flytrap (*Dionaea*). Moreover, in 1833, *The New-York Annual Register* reported that the gardens and nursery covered up to forty

acres and contained approximately ten thousand species of trees and plants, with particular attention devoted to grapes and mulberry trees. Visitors had free access to the outdoor gardens every day, except for Sundays.

At the same time, the commercial operations of the nursery expanded rapidly, as evidenced by William Jr.'s increasingly thicker plant catalogues. He also began to subdivide the products among smaller specialized catalogues. In addition to his standard *Annual Catalogue for Fruit and Ornamental Trees and Plants*, which covered his earlier offerings, he began to issue catalogues that focused on items such as bulbous flowers and tubers, greenhouse plants, chrysanthemums, and vegetable and flower seeds.

William Jr. attracted additional attention in 1828 when he published one of the first strictly horticultural books to come from the United States: *A Short Treatise on Horticulture: Embracing Descriptions of a Great Variety of Fruit and Ornamental Trees and Shrubs, Grape Vines, Bulbous Flowers, Green-House Trees and Plants, &c.* The book described all the plant offerings at the Linnaean Botanic Garden and Nursery, in some sense serving as an extended advertisement. The treatise also comprehensively covered horticultural topics, such as planting, pruning, and propagation. It even included information about soil preferences and methods for fungal disease control.

Over the next three years, William Jr. worked with his son, William Robert, on two additional books, for which his son was the primary author. The first, *A Treatise on the Vine*, was published in 1830 and was the first significant book written in America on grape cultivation. The Princes had systematically tested scores of European grape varieties (*Vitis vinifera*), along with improved varieties of native North American grapes (like *V. labrusca* and *V. riparia*), and interspecific hybrids. The book described over two hundred European grape varieties and eighty American. This work helped to establish viticulture as a full-fledged branch of American horticulture, and for William Robert, grape breeding and cultivation remained a lifelong interest.

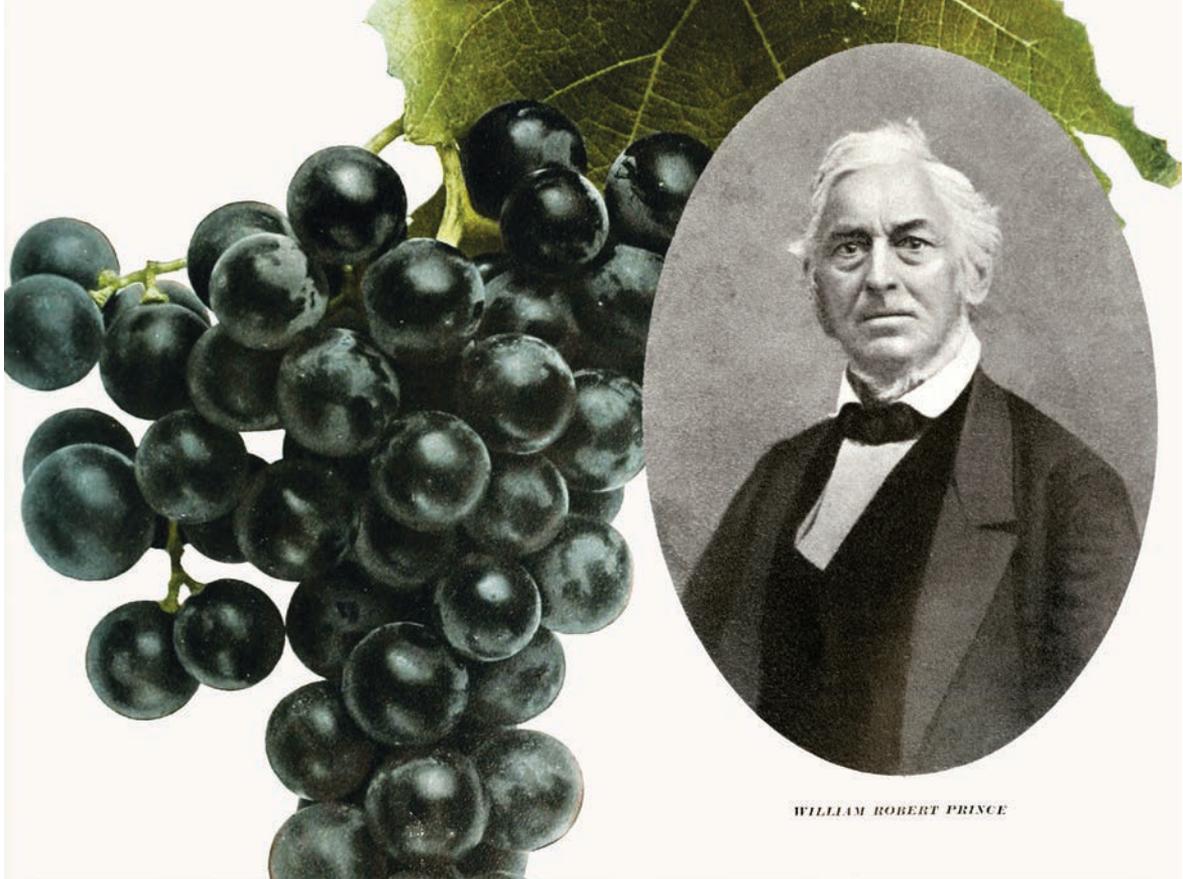
The second book, *The Pomological Manual*, published in 1831, was a two-volume cyclopedia that attempted to catalogue all fruit varieties

cultivated in America, other than apples. (While the father and son intended to treat apple cultivation with a third volume, the work was never published.) Like *A Short Treatise on Horticulture*, this book was widely read in America and became influential among aspiring horticulturalists. Moreover, the Princes paid particular attention to the nomenclature of the fruits covered in all of the publications, untangling confusion occurring in the field. This interest in the accurate classification of horticultural plants began with the work of William Sr., and it was among the family's most significant contributions to American horticulture.

As a testament to William Jr.'s interest in classification, he displayed in his home a bust of Carl Linnaeus, the Swedish botanist who formalized the modern system of botanical nomenclature. William Jr. received the statue in a presentation by New York governor DeWitt Clinton at a meeting of European and American scientists to honor Linnaeus's birthday in 1823. A simultaneous celebration in Virginia was officiated by Thomas Jefferson, an honorary member of the Linnaean Society of Paris.

By the time William Jr. died in 1842, Flushing had become a vibrant center for American horticulture. Bloodgood Nursery had been established there in 1798 and would become known as a specialist in maples. (A common Japanese maple even bears the name of the nursery: *Acer palmatum* 'Bloodgood'.) G. R. Garretson Nursery, a seed company specializing in flowers and vegetables, was established in 1836 and would grow to cover one hundred acres, supplying wholesale seeds to nurseries across the United States and offering retail via mail order. But the most famous of these newer operations was Parsons Nursery, established in 1838; the Parsons family would later play a central role in introducing plants from East Asia, especially Japan.

Meanwhile, William Robert had been assuming increasing responsibility for the Linnaean Botanic Garden and Nurseries. In the 1820s, he expanded the nursery, purchasing three large parcels so that his land holdings may have totaled up to 113 acres. These properties were located adjacent to a house he bought for himself in 1827. The home had a wide center hall,



William Prince Jr. and his son William Robert Prince (above) authored seminal American horticultural manuals. In *A Treatise on the Vine*, published in 1830, they promoted new grape varieties, including 'Isabella', which became a favorite of American viticulturists.

with two solid Dutch doors on either end and a bust of Linnaeus (likely from his father) on a bracket against the wall. The house's formal gardens contained two ginkgos (*Ginkgo biloba*), which were among the oldest in the country, and an old cedar of Lebanon (*Cedrus libani*) that the Princes had imported from France.

Under William Robert's leadership, however, the business began to struggle. In the 1830s, he speculated heavily in the domestic silk industry and may have been a key contributor to the skyrocketing prices for mulberry trees (*Morus alba*), the food source for silkworms. He imported more than one million mulberry trees from France in 1839, and shortly afterward, the price for mulberry trees crashed. When this venture failed, the Princes could not keep up with mortgage payments on the nursery, and by 1841, they lost the Linnaean Botanic Garden and Nurseries in foreclosure. These events spawned a bitter controversy with the property's new owner, Gabriel Winter, who was married to one of William Jr.'s cousins. Although William Robert continued to raise and sell plants from an adjacent nursery property, he and Winter competed in horticultural publications over

the right to sell plants as the Linnaean Botanic Garden and Nurseries. Ultimately, the Princes kept the name, and Winter sold the remaining plant inventory and subdivided the original property for housing development.

By 1846, the finances at the new Prince nursery began to stabilize, and William Robert published *Prince's Manual of Roses*, his third and final significant contribution to horticultural literature. At his new botanic garden, William Robert grew over seven hundred rose varieties, and the book provided detailed descriptions of varieties and featured many roses from China. He also included information about horticultural care and propagation. It was one of the very best works on this subject. Still, it was eclipsed in popularity by Samuel B. Parsons's book published the following year: *The Rose: Its History, Poetry, Culture, and Classification*. Parsons—the proprietor of Parsons Nursery in Flushing—ultimately revised his book as *Parsons on the Rose: A Treatise on the Propagation, Culture, and History of the Rose*. The competition between these books suggests the horticultural ferment that was occurring in Flushing during this period.

Later, William Robert went on two extended botanical expeditions, to California (in 1849) and Mexico (in 1850). While these trips suggest that the business was doing reasonably well, William Robert began to gradually withdraw from the day-to-day management of the nursery around 1855, at the age of sixty. Instead, he devoted his energy to other botanical interests, including research on botanical medicinal remedies. He also continued to breed and evaluate new varieties of fruits and ornamental plants, especially grapes, strawberries, and roses. His oldest son, William III, meanwhile assumed increasing responsibility for the enterprise.

William Robert's career reflected the changes that were going on in the American horticultural community. His father had been a founding member of the New York Horticultural Society in 1818 and joined the Massachusetts Horticultural Society after it was established in 1829, but he was also a member of the Linnaean Society of Paris, the Horticultural Society of London and Paris, and the Academy of Geogofili, based in Florence, Italy. William Robert invested his energy into the increasingly sophisticated American horticultural societies rather than those in Europe. He contributed many articles to the leading American agricultural magazines of the day, such as *The Rural New Yorker* and *Gardener's Monthly*. Moreover, he was a member of the American Institute of the City of New York and the American Pomological Society.

On March 28, 1869, William Robert died at his home in Flushing, and as it turned out, the esteemed business died with him. William III had enlisted for the United States Army during the Civil War, and he chose to remain in the military. William Robert's second son, LeBaron Bradford, pursued a career in law and politics. *Gardener's Monthly* printed a two-page obituary for William Robert. It was a sad and respectful tribute to his horticultural brilliance while nonetheless remarking on his combative personality. Meanwhile, the Massachusetts Horticultural Society issued a full resolution commemorating his life as a "pioneer in the field of horticulture," a title that seems equally appropriate for the three generations of Princes that came before him.

In 1939, efforts were made to move William Robert's house to the site of the New York World's Fair, to demonstrate a historic colonial homestead, but the campaign came to no avail. Later, New York City park commissioner Robert Moses rejected a proposal to move the structure to Flushing Meadow Park. Moses's vision for a "modern city" had little space for old wooden buildings. In its last few years of use, the structure served as a rooming house and a club. The shabby, unpainted building was then boarded up and surrounded by billboards and a gas station. The house was torn down in 1942. Of course, by that point, the lush greenhouses that once welcomed winter visitors had long ago disappeared, and the nursery property had been subdivided and sold for development.

Yet, the 150-year story of the Prince family lives on today. The family built a foundation for commercial horticulture in the United States. They championed the cultivation of plants from across the country and around the world, and their publications promoted best practices in horticulture. They even helped with establishing a more systematic approach for horticultural nomenclature. Moreover, the success of the Prince nurseries is inextricably linked to the subsequent generation of horticulturists who established businesses in Flushing. This expanding group of nursery owners became leaders in their own right. In this way, a horticultural legacy that began with one family who lived on the edge of Flushing Creek became a national and international story.

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Such a Fine Assemblage: The Jesup Collection of North American Woods

Kathryn Mauz

On May 18, 1885, an important exhibition heralded as a “noble gift to the city”¹ opened at the American Museum of Natural History in New York. Beneath the high ceilings of the exhibition hall, glass cases displayed 350 specimens as the Jesup Collection of North American Woods. Each was a whole log, about four and a half feet tall, still cloaked with bark as in life, with the upper half cut away to reveal the wood inside. Many of the specimens were accompanied by original watercolor illustrations of foliage, fruit, and flowers.

A writer announced of the exhibit in *Harper's Weekly*, “The average visitor will be impressed and surprised by the beauty of some and by the extreme oddity of others.... The various coloring of the woods, often rich and sometimes startling, and running into the most delicate shades, and the strength or grace or whimsicality of form, as traced in the divers[e] coursings of the grain, are matters to attract even the casual eye, and to stamp as absurd the hasty judgement which would say that a collection of logs can not be interesting.”²

Over the coming years, the collection grew to include more than five hundred species. It represented the scientific and philanthropic vision of two noteworthy individuals: Morris Ketchum Jesup, one of the founders of the American Museum of Natural History, and Charles Sprague Sargent, the director of the Arnold Arboretum. The collection remained a cornerstone of the museum's exhibits for more than six decades. The fact that an exhibition of this magnitude could almost entirely vanish from the public memory seems almost improbable. Yet, the story of its exile is as intriguing as that of its origins.

A Generous Friend

On the occasion of the Philadelphia Centennial Exhibition of 1876, William H. Brewer, a professor of agricultural science at Yale University, observed, “America has long been described by geographers and naturalists as the wooded continent, distinguished for the luxuriance and extent of its forests and the number of its arboreal species.”³ At that time, scientists were beginning to comprehend the vastness of North American forests, but popular appreciation of this forest wealth lagged behind. At the Exhibition, audiences were introduced to displays of American woods and wood products through exhibits mounted by individual states and by the United States Department of Agriculture, which showcased specimens representing four hundred tree species from around the country.⁴ Such exhibits distilled an abstract general abundance into the remarkable variety of trees that comprised the country's forests. The Exhibition's millions of visitors vastly exceeded the number of people who had ever traveled across the country or explored its forested lands, and early efforts to organize around the idea of forest conservation took root at that gathering.

At the time, there was not a museum in the country that possessed a similar, permanent exhibit that could perpetuate the transient awe from the Centennial Exhibition into an enduring educational mission. In 1880, such an exhibit—but one even more monumental—became Jesup's vision for the American Museum of Natural History. A forest lover himself, Jesup was also keenly interested in the uses of forests and, increasingly, in the roles forests played in the wider landscape of human settlement and industry. Jesup and the museum's director,

Facing page: The Jesup Collection of North American Woods revealed the wonder and scientific diversity of North American forests by showcasing wood samples from more than five hundred tree species. As one commentator later said, it was “a perfectly unique collection which cannot anywhere be repeated.”



WOODS OF THE STATE OF TEXAS
This wood is very hard and heavy, and is used for building purposes. It is found in the eastern part of the State, and is one of the most valuable woods of the country. It is a member of the Leguminosae family, and is very durable and long-lived.

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The Jesup Collection emerged from the collaboration of Morris K. Jesup (right) and Charles Sprague Sargent.

Albert S. Bickmore, discussed the possibility of developing this exhibit at the museum for the expressed purpose of showcasing the contributions of American forests to industrial and artistic endeavors.

In August 1880, while attending the annual meeting of the American Association for the Advancement of Science in Boston, Bickmore approached Harvard botany professor Asa Gray for advice. He described the museum's planned Department of Economic Botany, which was primarily to feature important products from the forests of the country. Gray directed him to interview Sargent, who at the time was in charge of the census of American forests for the Tenth Census of the United States. Bickmore spent an afternoon at Dwight House on Sargent's Holm Lea estate in the suburb of Brookline. Although Sargent was away conducting fieldwork, Bickmore toured the grounds and learned about the work Sargent was pursuing for the forest census.

Bickmore soon wrote to Sargent in care of the Palace Hotel in San Francisco, where Sargent was briefly stopped along the last leg of

his grand tour of western forests. As Bickmore explained, a "generous friend" of the museum wished to develop an "instructive and attractive collection" of the wood products of North American forests, "placing it in a tangible, visual form before our citizens and our tide of visitors from all parts of the continent."⁵ Of course, that unspecified friend was Jesup, who would become the museum's president from 1881 until his death in 1908. His foresight had led him to Sargent, whose zeal and breadth of knowledge were positively suited to realizing this singular goal, and whose awareness of his own expertise prevented him from letting the opportunity pass to someone else. Jesup also sponsored other collections and many expeditions in varied fields of study during his tenure at the museum, and Sargent simultaneously expanded the Arnold Arboretum's living collection and pursued an astounding schedule of publication. Yet, the wood collection was seen as a crowning achievement during the lifetimes of both men. It was, according to one commentator, "a perfectly unique collection which cannot anywhere be repeated."⁶

Unprecedented Activity

Following his return from the west, Sargent met with Jesup and Bickmore in New York in the first week of November 1880. In response to the proposed project, he sent a seven-page letter describing his "suggestions" for the wood collection and its exhibition, which in effect were stipulations to guarantee his participation. Sargent believed that the collection should incorporate every tree species that grew naturally in the United States, even those that were of limited distribution or held little economic value. As a reflection of his recent and ongoing work on the forest census, he argued that only this approach would allow the collection's importance to be realized by both the public and scientists, who, he would later assert, "will value it in proportion to its completeness."⁷ Further, Sargent insisted that the exhibit be arranged according to the botanical relationships of the species, following the organization of his report for the forest census, and that the labels should incorporate the data from his investigations as to each species' geographic distribution and the properties of its wood. He shared Jesup's interest in including foliage and fruit to illustrate the aspect of the living trees, as well as the products derived from the trees that were important to commerce and the trades.⁸ In essence, it would be a full-scale adjunct to his census report, one that Jesup hoped would also have popular appeal and that all concerned believed would be an asset to the museum.⁹

Sargent's primary role in the project was to direct and coordinate the field efforts and, later, to provide interpretation for the resulting specimens. By mid-December 1880, once a general plan for the collection was understood, he was becoming impatient to send collectors into the field.¹⁰ The first to be recruited were alumni of the forest census who were familiar with both the terrain and tree species they were to locate, as well as the rigors and routine of moving logs from the forests to the railroads for shipping. Some were in the field as early as January, and specimens began arriving at the museum in early March 1881.

Charles Mohr, a physician and botanist who lived in Mobile, Alabama, was charged with finding trees in the Gulf Coast states. (Records

show that the first specimen to be received may have been *Yucca treculeana*, or Spanish dagger, an arborescent species, if not precisely a tree, sent from Texas by Mohr.¹¹) Samuel B. Buckley, a botanist and long-time resident near Austin, Texas, began collecting nearby and at points across the southern interior of the state. Allen H. Curtiss, a naturalist living in Jacksonville, Florida, was sent to explore southern Florida, the Florida Keys, and the interior Southeast; in his first season, Curtiss sent more than forty specimens, and he ultimately contributed more than any other collector.

George W. Letterman, a schoolteacher and amateur botanist in Allenton, Missouri, began his work that spring in Arkansas, made numerous collections in southern and central Missouri, and later ventured as far as northeastern Texas and Louisiana. Henry W. Ravenel, an accomplished botanist of Aiken, South Carolina, sent specimens from the Piedmont and coast of South Carolina and Georgia that year. Starting in the fall of 1881, John H. Sears, a naturalist in Salem, Massachusetts, explored the "Atlantic forests" of northern New York state and eastern Massachusetts. For the first two years, Vermont botanist Cyrus G. Pringle traveled well beyond his home state to collect in Arizona, California, and the Pacific Northwest, and later sent logs of several species from Texas and northern Mexico, as well; second only to Curtiss in number of specimens sent, Pringle certainly traveled more extensively for the project than anyone else.

The collecting corps came to include physicians, veterans of state geological surveys and departments of agriculture, itinerant botanists, horticulturists, foresters, several of Sargent's professional acquaintances in the lumbering and milling industries, Sargent himself, and even the collection's caretaker, Samuel D. Dill, at the museum. The majority of specimens were collected by a handful of men, but over time more than fifty individuals contributed material to the Jesup Collection.

Sargent initially envisioned an ambitious schedule, entailing just one or two years to complete the explorations necessary to find and acquire the specimens.¹² That, like the costs involved, turned out to be underestimated—not

only were there unforeseen delays but more species in newly explored places were discovered over time, in part as a result of Sargent's own studies. As time went on, Jesup sometimes questioned the necessity for including extraneous, noneconomic species, noting to Sargent, "Its completeness in a scientific or botanical sense, to my mind is secondary."¹³ To Bickmore privately, he observed that many tree species, "while they may be rare and valuable in a scientific sense, are useless economically owing to the remote and inaccessible districts where they grow and the necessary cost of transportation to manufacturing centres."¹⁴

Sargent nonetheless continued to send collectors far afield and on special trips for newly discovered or rare species in the interest of amassing a comprehensive collection. He had taken on the project gratis, with an eye toward his own long-term interests in American forests. With the collection's scientific contributions as his priority, Sargent advised Jesup early in 1881, "It is not too late for us both to retire altogether from the undertaking, which unless carried out largely will add neither reputation to the Museum, nor credit to the parties most interested."¹⁵ The project went on, and fifteen years later he emphasized the significance of the work to Jesup: "The formation of your Collection, the publication of my book, and other causes have led to an unprecedented activity in dendrological exploration and study in all parts of the country and several new species of trees have been discovered."¹⁶ Sargent's aim was to represent the arboreal flora of the continent, and he wanted Jesup's vision to match his own.

It Should Contain Every Tree

As the sponsor of the collection, Jesup not only funded the collector's activities but organized logistics for travel and shipping. He was wealthy and generous, but disciplined and frugal in his philanthropy, interested to see that his money was well spent for the greatest benefit. To this end, he set as a goal keeping costs of travel and freight to a minimum, even zero, whenever possible. Nonetheless, the cost of transportation, shipping, and tracking the specimens across the country represented the majority of the project's expenses and occupied

much of the correspondence between Sargent and the museum during these early years.

In the early weeks of 1881, Jesup personally communicated with the officers of dozens of railroad and steamship companies in order to procure travel passes for the collectors and free shipping for the weighty specimens they were expecting to send to New York from points around the country. Because the favors granted were often specific to individual collectors, over certain routes, and good only for specified periods of time, this became for him a never-ending task that strained his ample reserves of tact and humility. Through Jesup's general success in securing waivers, Sargent could then assign collectors to regions where they could travel freely and ship at no or reduced cost.

In practice, there were frequent misunderstandings on the part of station agents who were unaware of these unconventional arrangements or would not act on them. Specimens were sometimes shipped from points or by routes other than what had been agreed upon, exceeded the weights and dimensions originally anticipated, were delayed so long that they decayed in transit, or were occasionally even lost. The railroads, and Jesup, wanted definite parameters ahead of time, whereas Sargent better understood the idiosyncrasies and exigencies of field work and insisted that flexibility was necessary. It was Jesup's money, and indeed his reputation, at risk, and these overages and losses were routine points of contention between the two principals almost from the beginning.¹⁷

As the true scale of the task became apparent, Jesup questioned Sargent's early estimates about the cost of the project. He had initially thought that the collection could be completed for ten thousand dollars or possibly less,¹⁸ but that sum was exceeded before the end of the second year of work; total expenditures multiplied fivefold before the sixth field season and continued to grow from there.¹⁹ Although Sargent promised to proceed as economically as he could, he maintained his emphasis on the need for a complete and scientifically valuable set of specimens. Following one expensive expedition in 1885, for example, Sargent countered Jesup's objections, telling him, "I hope you will not endeavor to separate practical value from

scientific value in your mind when considering this collection. They cannot safely be separated. And it is because I have always refused to do this in the treatment of the matter that the collection is what it is, the best of its kind."²⁰ Bickmore and Jesup at the museum recognized that ceding some control to Sargent (and absorbing additional expense) was necessary both to achieving that goal and to maintaining goodwill in general.²¹

Nearly two decades after the project's inception, as he and Jesup revisited this same familiar disagreement in 1899, Sargent argued, "It should contain every tree described and illustrated in my *Silva of North America*."²² Although their differences in philosophy did not entirely fade over time, Jesup grudgingly found himself obligated to continue to subsidize these missions—well into the 1890s and, for a few species, even past the turn of the century—rather than risk the appearance of incompleteness once so many others had been gathered. Early on he remarked to Sargent, "To have our museum contain that which cannot be found at any other will fully compensate me for the cost."²³

A Grand Showing

Unlike the small blocks of wood Sargent prepared for his census investigations²⁴ or the short logs cut lengthwise for display at the Centennial Exhibition, the museum's specimens were to be whole logs, over five feet long when collected, and of such diameters as necessary (from a few inches to three feet or more) to represent the best-grown examples of the trees. Collectors routinely shipped thousands of pounds of specimens at once, where certain individual logs could weigh hundreds of pounds when freshly cut. At the outset, Sargent anticipated that about four hundred species would need to be assembled, but that number increased by another one hundred or more over time.

Within the year, Bickmore reported to Sargent, "We have been frequently receiving the magnificent series of logs your agents have gathered until they make a grand showing in the cellar."²⁵ After the first full year of fieldwork, nearly three hundred were in various states of preparation at the museum, with more arriving by the month.²⁶ Incoming shipments were

initially delivered to the museum's "new building" (opened in December 1877²⁷) on Manhattan Square, west of Central Park. When space became limited, the logs were directed instead to the historical Arsenal building, where the museum's collections were originally housed, near the eastern boundary of the park.

When the logs were prepared in the field, collectors were careful to wrap each one in burlap or other "bagging" material, sometimes also in rawhide, and to construct crates in which the log could be shipped with ample padding to preserve the bark intact. Once at the museum's workshop, they underwent a lengthy process of preparation for eventual display. Because the logs were shipped "green" and were full of moisture, the primary concern was for drying them carefully to prevent "checking" or splitting that would ruin them for display. Bickmore himself devised a method of boring holes into the bottom of a log to allow the wood to "season" or dry out more evenly.²⁸ Bickmore notified Sargent further, "We have a fire under the boilers in the cellar constantly so that that is probably the driest room in the building, and the heat is gentle & slow and I believe particularly well adapted to preparing the fine logs that are now coming in, and I think there will be no necessity of having the specimens kiln dried, unless you have reason to suspect they contain destructive larvae."²⁹ It was estimated that logs could lose up to half their weight in drying, and that thorough seasoning could sometimes require one or two years.³⁰

Following the drying process, the logs were cut to a uniform fifty-six inches in height; the upper twenty-four inches was sawn longitudinally in half, and the top edge of the cut end was beveled, resulting in the grain of the wood being exposed in three directions. Finally, one half of the cut surface was finished with varnish to provide a clear view of the grain. Sargent requested that a diagram be made of each log to show the pattern of the bark, the widths of the sapwood and heartwood, and the growth rings apparent in cross-section;³¹ these data, as indicators of growth rate, were eventually reported for many species in Sargent's fourteen-volume *Silva of North America*, but the diagrams themselves have not survived.

Jesup's initial hopes that the collection would be ready for public viewing by the autumn of 1882 were not realized, but both he and Sargent agreed that the collection's "value and permanence," from a scientific standpoint, and its "beauty and usefulness" to the public would be favored by postponing until all the specimens were fully seasoned, prepared, and labeled.³² The exhibit space dedicated to the Jesup Collection was intended to be on the third floor of the Arsenal, an area the museum regarded as "dangerous" even when exhibits had been open to the public there a decade earlier.³³ Almost immediately, there were concerns about the combined weight of the specimens.³⁴ When the walls of the building were observed to have to spread slightly by October 1882, the Department of Public Parks architect, Calvert Vaux, insisted that the excess weight be removed to comply with his specifications: not to exceed thirty-eight and a half tons, evenly distributed in the halls and the octagonal alcoves at each corner.³⁵ At that time, there were 388 logs on-site and in preparation, with 60 more expected to "complete" the collection.³⁶ This circumstance hinted at another persistent theme that would follow the collection through time: housing it would always present substantial, even prohibitive infrastructural challenges.

Soon, the allotted hall at the Arsenal became a workshop and storeroom for the log specimens rather than their exhibit space. By the spring of 1883, construction at the museum's new building included the installation of "a large glass case, in two sections, extending along the middle of the Lower Hall," meant to accommodate the log collection but necessarily displacing an exhibit of shells to another floor.³⁷ By that autumn, there were two large cases, each 135 feet long, with six additional cases along the side.³⁸ The initial delay of six months had extended to a full year, and even then, opening by the *following* year was in doubt. In February 1884, Sargent estimated that just 105 specimens were "finished and ready";³⁹ in April, he wrote to Jesup and Bickmore to suggest delaying until the spring of 1885, when he thought that as many as 350 specimens would be fully prepared for exhibition.⁴⁰

A Credit to the City

With a date finally fixed for the exhibit's opening, Bickmore promoted it as "the first effort yet made in this country to gather the native woods together in one collection on a scale commensurate with the extent of the new continent and the importance of its forests."⁴¹ Sargent had been at work on a condensed version of his census report, enumerating 412 species as *The Woods of the United States*, which would serve as a guidebook to the collection.⁴² In April, he reassured Jesup, "The geographical labels will be finished this week. They have cost me an immense amount of labor & bother, but I think they will be a great success, and are certainly the best things of the kind ever attempted. I shall be in N.Y. next week, long enough to see that everything is properly arranged."⁴³ In his annual report to the trustees of the museum, Jesup hoped that the collection "will prove another popular attraction to the museum, and be the means of largely increasing the knowledge and information of the people on the subject of our forests, now demanding so large a share of public attention."⁴⁴

The exhibit opened to visitors on May 18, 1885, to popular acclaim. In addition to 350 logs with their labels, the new exhibit featured about eighty watercolor illustrations of the foliage, flowers, and fruit of tree species, prepared by Mary Robeson Sargent (Sargent's wife) at Jesup's request. These, in particular, met with high praise: "The artist has been true to nature, without loss of refined and purely artistic method, a combination almost unknown in what is called a scientific treatment of natural objects. The result is delightful ... many persons will appreciate for the first time the beauty and grace possessed by the flowers and fruits of many of our common forest trees."⁴⁵ For the benefit of individuals wishing to study the woods from a botanical perspective, a corresponding herbarium had been prepared by Charles Faxon, the assistant director and herbarium curator at the Arnold Arboretum, and shipped to the museum that spring.

The Jesup Collection was soon described in the press as "a credit to the city, and a lasting testimonial to the wisdom and public spirit of

Facing page: The press lauded the opening of the Jesup Collection in 1885. This engraving by C. Graham appeared in *Harper's Weekly* shortly after the exhibition opening.



THE JESUP COLLECTION OF AMERICAN WOODS.—DRAWN BY CHARLES GRAHAM.—[SEE PAGE 350.]

- 1. "Toothache-Tree" (Prickly Ash). 2. Giant Cactus. 3. An Excrecence. 4. Parkinsonia Microphylla. 5. Bull Pine. 6. Yucca Baccata. 7. Spanish-Bayonet.



A large cross-section of a Douglas fir (*Pseudotsuga menziesii*) appears among cases in the American Museum of Natural History's Forestry Hall, shown in 1903.

the gentleman who caused it to be created."⁴⁶ It was a first step toward Jesup's original ideal, still awaiting not only more species but examples of economic products and additional illustrations to fully represent the American forests. As far as Sargent's objectives, there was also more to come, but scientific visitors had already found it as informative as it was popular.

Worthily Housed

In its first incarnation, the woods exhibit occupied the lower floor of the Museum, "in the space between the rows of side cases," leading to the observation on opening day that the space "is too contracted for this use, and the floor has a cluttered appearance which those who recall its original spaciousness and light will regret. Plainly the time has come when

a new wing for the Museum is demanded, so that this collection, unique in its scientific and industrial importance, shall have the sweep of an entire floor."⁴⁷ At the time, the logs shared the hall with the collection of mammals, whose curator was critical of the disruption to those displays.⁴⁸ Sargent, naturally, weighed in, complaining that "nothing can be worse than the present mixture of mammals & woods."⁴⁹

While there were already long-term plans for additions to the museum's building, Sargent proposed an alternative idea to Jesup: the museum should construct a separate one-story building for the purpose of housing the wood collection and associated forestry resources, including a library and herbarium, and call it the Jesup Building. He wrote to Jesup, "The whole thing could be put up in a couple of

months and you could have your collection in safe quarters where it could never be interfered with by any one & arranged in such a manner that there never could be any danger of its becoming merged or mixed with the other collections."⁵⁰ It is clear that Sargent wanted to resolve some of the fundamental curatorial problems that the collection was already experiencing, but it is also tempting to suppose that Sargent wanted his own museum of woods (and that Jesup would build it for him). That notion was never pursued, but the Jesup Collection did prevail in occupying the lower hall all to itself.

A new display was opened to the public on November 15, 1890, revealing 425 species and almost 250 watercolors, arranged in family groups in the cases along each side of the hall.⁵¹ While this was seen as an improvement, and many visitors believed the collection actually was complete, Sargent advised Jesup not a year later, "I don't think that we ought to consider the arrangement as final or that the collection is worthily housed or properly arranged until some radical change is made by which sufficient room for its display can be had."⁵² In 1893, planning began for the construction of the museum's southeast wing, part of the Seventy-Seventh Street facade, the ground floor of which would be dedicated to the wood collection when it was completed in 1895.⁵³

As the new wing took shape and its opening drew closer, there ensued a paramount disagreement (most emphatic and least charitable on the part of Sargent) over plans for the new hall. In a two-page, typewritten response to Jesup's early scheme for cases and general arrangement, Sargent replied vehemently, and disproportionately: "A good deal of additional work in connection with the Collection has been laid out for me but I confess I do not feel much like undertaking it if the results are to be as bad as you seem to be determined to make them." He asserted that his reputation among scientists could suffer if Jesup's plans were followed, concluding, "This, from my point of view, is the unfortunate thing in the whole matter and why I believe that I have not been treated properly by you."⁵⁴ Jesup wrote out a six-page reply (that he did not send) in which he recounted their previous discussions about the design. He concluded,

"It would be more agreeable to me in meeting with objections from yourself to have them presented to me in a spirit of help and friendliness ... During the many years of our friendship I have exerted myself to please you, and shall continue to do so in any way I can, but I expect consideration at your hands also."⁵⁵

In place of this letter, Jesup sent museum secretary John H. Winsor to consult with Sargent in person about the central points of dispute, namely the design of the new cases and the placement of the immense cross-sections of coast redwood (*Sequoia sempervirens*) and giant sequoia (*Sequoiadendron giganteum*). In short, Jesup had wanted to include two or more round cases to break up the "monotony" of the exhibit, but doing so would have interrupted the botanical order to a degree that Sargent could not tolerate. At the same time, Jesup had arranged to place the cross-sections of the big trees just outside the main hall, on either side of the entrance, in part because of the architectural requirements for supporting them; Sargent was adamant that they should be placed in the center of the hall with the other logs, despite that this arrangement would require structural reinforcement of the floor. Jesup's proposal took into account the flow of visitors, the overall aesthetic, costs, and the physical constraints of the building; Sargent worried most about what other scientists would think of the exhibit and felt that those concerns had not been adequately considered.⁵⁶ Citing engineering and safety factors, an Executive Committee of the museum resolved the practical question, temporarily, in favor of the original layout.⁵⁷

Early in 1896, when the specimens were moved into the new hall and the watercolors were hung, the debate subsided, and Sargent's attention turned back to his usual curatorial concerns. Jesup assured the museum's trustees that the lower hall of the new East Wing had been designated for the "permanent lodgment" of the wood collection and concluded, "It is thought that no better plan can be conceived whereby the effectiveness of the exhibit can be increased."⁵⁸ Not surprisingly, however, even this latest arrangement would be revised again as specimens were added to the exhibit, at Sargent's urging, through the early 1900s.⁵⁹

Jesup Collectors

More than fifty collectors helped with acquiring, packaging, and sending large wood specimens for the Jesup Collection of North American Woods. The specimens originated from thirty-two states, along with four Mexican states and one Canadian province.

Several collectors were especially prolific. Their general collecting locales are shown on this map of coniferous and deciduous forests, prairies, and treeless regions, created for the 1880 Census of the United States.

Charles Sargent often commemorated the careers of collectors in his *Silva of North America*. These excerpts suggest the nature of the collectors' accomplishments.

● State or province represented in the collection.

Cyrus Pringle

Pacific Northwest, Arizona, California, Texas, and Northern Mexico

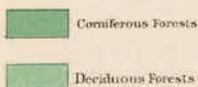
"He made for the Jesup Collection of North American Woods ... a large collection of timber specimens from some of the most inaccessible and difficult regions ... Becoming interested during this journey in the flora of Mexico, he has for the last twelve years devoted himself exclusively to its exploration. During his annual journeys, which have extended over many of the states, he has made large and unrivaled collections ... and has discovered many undescribed genera and species."

Samuel Buckley

Southern Texas

"*Buckleya*, a remarkable Santalaceous genus, of which he discovered the flowers and fruit, and which is represented in the flora of America by a graceful shrub of the mountains of North Carolina ... fitly commemorates Buckley's zealous and too little appreciated labors in the cause of science."

LEGEND.



A topographic map of North America, excluding Mexico, showing forest, prairie, and treeless regions. The map is color-coded: green for forested areas, tan for prairie, and white for treeless regions. Major geographical features like Hudson Bay, the Gulf of St. Lawrence, and the Gulf of Mexico are labeled. A grid of latitude and longitude lines is overlaid on the map. Several yellow circles with black outlines are placed across the map, each with a black arrow pointing to a brown callout box containing a botanist's name and a quote. The callouts are for George Letterman, John Sears, Henry Ravenel, Charles Mohr, and Allen Curtiss. The map title is 'MAP SHOWING THE POSITION OF THE FOREST, PRAIRIE & TREELESS REGIONS OF NORTH AMERICA EXCLUSIVE OF MEXICO. Prepared under the direction of C.S. SARGENT, SPECIAL AGENT.'

George Letterman

—
Missouri, Arkansas, and
Northeastern Texas

“He finally in 1869 settled in Allenton, Missouri, a railroad hamlet about thirty miles west of St. Louis ... The distribution of the trees of this region before Mr. Letterman’s travels was little known, and much useful information concerning them was first gathered by him.”

John Sears

—
Northern New York
and Eastern
Massachusetts

Henry Ravenel

—
South Carolina and Georgia

“No other American botanist, perhaps, has minutely studied so many forms of the vegetable kingdom as Ravenel, and none has been more respected or beloved.”

Charles Mohr

—
Gulf Coast

“He made his home at Mobile, Alabama. Here for many years he has been a successful manufacturing druggist, and has devoted his spare time to the study of the flora and the natural resources of the state.”

Allen Curtiss

—
Florida
and Interior Southeast

“He has found many plants, including a number of tropical trees, not known in the territory of the United States before his time.”

MAP
SHOWING THE POSITION OF THE
FOREST, PRAIRIE & TREELESS REGIONS
OF
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Practically Complete

As Sargent's early work on the forest census had concluded in 1884, his focus shifted to taxonomically oriented investigations in support of his *Silva of North America* and other publications. For nearly two decades, the development of the Jesup Collection was synergistic with that work. Sargent never rested in his ambition to add species to the wood collection, even when his practice conflicted with Jesup's financial concerns and with the museum's pragmatic considerations for their curation.

As early as April 1883, after more than two full years of collecting effort, Sargent had indicated that there were twenty-one species needed to complete the collection.⁶⁰ Still, in February 1886, he reported that there were another "18 or really 19," of which several had already been sent for.⁶¹ Just a year later, he wrote, "I find that there are still a few species which must be added to the Jesup Collection in order to make it complete, and that, moreover, a few important species are not yet properly represented in the Collection."⁶² Sargent reflected in 1889, "I consider that the collection is practically complete,"⁶³ but that notion was short-lived.

Sargent soon organized a special expedition to the West Coast and Arizona in 1891 for several unrepresented species. In January 1894, Jesup reported that Sargent had sent him "the gratifying assurance" that the collection "is now complete"⁶⁴—even as Sargent was preparing to leave on another collecting trip to Arizona to support his work on the *Silva*, resulting in at least one new specimen for the museum.⁶⁵ In April 1898, another twenty-eight species were called for.⁶⁶ In May 1900, Sargent wrote to museum secretary J. H. Winser, "We have been finding a lot more trees in the United States during the last year. None of them are very large but all have a scientific interest.... Now what I want to know is whether I shall go ahead and use my discretion in obtaining such material as may be necessary to complete the Collection."⁶⁷ A year later, Sargent ordered several more specimens from Arkansas, Texas, and Missouri, and noted, "I understand there is still a good deal more work to do on the collection before it can be considered complete."⁶⁸

Very late in this process, Sargent occasionally accompanied his requests with a lament, such

as, "If it is not continued, I shall be saved a lot of disagreeable bother and letter-writing."⁶⁹ Jesup at times wondered at the necessity of so many very similar species, the number of duplicate specimens that had been sent, and the many that needed to be replaced over time because of damage or decay. He was also not naïve to the fact that he was often financing Sargent's research by supporting new collecting trips for certain trees, and he once expressed frustration about this habit.⁷⁰ In a note to himself on the back of one letter, Jesup wrote, "I wonder when the getting of specimens is going to stop."⁷¹ Both men were clearly tiring of the work of supervising and organizing the collection, wanting it to be both comprehensive and finished, but Jesup's support continued. Still additional specimens were received at the museum late in 1901,⁷² but by July 1902, Sargent was again discussing sending a collector for more.⁷³ In 1908, the year of Jesup's death, thirty-five specimens (possibly the last) were added to the exhibit.⁷⁴

Intelligence, Technical Knowledge and Enthusiasm

While Sargent continued to direct the collection of new specimens, the opening of the museum's public exhibit in 1885 had added an informal duty: the role of absentee curator. Although S. D. Dill, an experienced carpenter, had been hired specifically to oversee the preparation and installation of the logs and related materials, as well as to build the cases for them, Sargent had ideas of his own about how the collection should be handled and displayed. Beyond persistently lobbying for more space, he involved himself in the minutiae of how logs should be arranged, directly supervised the preparation of labels, and critiqued the display of illustrations following his occasional visits to New York.

Only months into the exhibition, Sargent wrote to Jesup with concerns that some specimens housed in new cases were "already suffering from extremes of temperature as I feared that they would." He added that he was "very anxious & troubled" that Dill's workroom in the Arsenal was inadequately heated and exposed the specimens to "danger of destruction by fire or at the hands of outsiders."⁷⁵ Nearly fifteen years later, he offered a similar assessment and insisted that Dill be provided with a workspace



Cross-sections of giant sequoia (*Sequoiadendron giganteum*, left) and coast redwood (*Sequoia sempervirens*) flank the entrance to Forestry Hall. The giant sequoia is the only specimen from the Jesup Collection now displayed at the museum.

that better protected the specimens, adding, "The money value and cost of these specimens is small in proportion to the expenditure of intelligence, technical knowledge and enthusiasm necessary to procure them, and it is discouraging after all the labor which has been expended in getting them if they are allowed to go to ruin in the Museum."⁷⁶

Although work remained to be done, and to Sargent's dismay, Dill, the collection's chief preparator, caretaker, and de facto on-site curator for twenty years, left the museum for his native Nova Scotia in 1902. To facilitate interpretation of the specimens, museum director Herman C. Bumpus began an inventory of the wood collection in 1903⁷⁷ and enlisted Roy W. Miner from the Department of Invertebrate Zoology for the

task. Even at that time, the museum's growing bias toward other facets of natural history, to the neglect of botany, was apparent to Bumpus, who frankly acknowledged the economic entomology and wood collections as the entirety of the museum's botanical holdings.⁷⁸ The "Forestry Department" (comprising essentially the collection itself) was without a dedicated curator until 1907, when Alfred C. Burrill, an entomologist by training, was appointed to oversee the exhibit of woods.⁷⁹

In 1909, Mary C. Dickerson was hired as curator of the Department of Woods and Forestry and served in that capacity for a decade.⁸⁰ During her editorship of the *American Museum Journal*, forestry was several times a featured topic. In her 1910 guide to "Trees and Forestry,"

which drew examples from the Jesup Collection, she expanded on themes of ecology and conservation that were not only current but had long been advocated by the collection's progenitors, Jesup and Sargent.⁸¹ Just two years after Jesup's death, museum president Henry F. Osborn reported, "The Jesup Collection of North American Woods is being rearranged and installed in a way to bring out more clearly the classification of trees, their relationship and their economic uses."⁸² With the wood collection numbering 505 specimens on display, additions were made for several more years in the form of watercolors, photographs, and wax models of foliage, flowers, and fruit;⁸³ Mary Sargent had continued to add to the watercolor series, until more than four hundred paintings were on display with the logs. Space continued to be a problem as time went on (there, and throughout the museum), and activity centered around rearranging specimens to avoid crowding to the extent that was possible.⁸⁴

Aside from Sargent, who had contributed his knowledge during the collection's genesis, only an oversight committee—chaired in absentia by Gifford Pinchot (cofounder of the Yale Forest School) and James W. Toumey (the school's first Morris K. Jesup Professor of Silviculture)—afforded forestry expertise after the turn of the century. It was not until 1917 that the department had the benefit of an in-house, credentialed forester. During an era of very limited departmental budget, Yale graduate and future forest ecologist Barrington Moore had been hired as assistant curator, and it was hoped that his experience would contribute to topical research and education at the institution.⁸⁵ He was shortly called to service in the First World War, however, and by 1920 both he (for other opportunities) and Dickerson (for health reasons) had left the museum. This loss of expertise and energy only compounded the obstacles faced by the wood collection and related subjects that Jesup had promoted. As institutional memory of the collection's formation had been episodically lost since the turn of the century, and the collection's place of priority eroded after the death of its creator and benefactor, its fate became inexorably linked to that of the department going forward.

An Old-Fashioned Systematic Arrangement

Unlike other collections and exhibits prepared by the various dynamic and actively growing departments of the museum—especially Mammalogy and Ornithology, Paleontology, and Anthropology—the wood collection remained little changed from the 1910s through the 1930s. While the curatorship went unfilled, the Jesup Collection had a champion in museum director Frederic A. Lucas, who in 1922 wrote to President Osborn, "It is extremely important that we should revive our forestry department, for its own sake and also in memory of Mr. Jesup."⁸⁶ Following Lucas's death in 1929, George H. Sherwood, as museum director and curator of the Department of Education, became its defender. After his death eight years later, the scientific staff of the museum proposed that "an attempt be made to place some one in charge of the wood collection."⁸⁷ For another decade, the Department of Forestry and Conservation was again chaired and staffed by scientists borrowed from other departments, until a curator was hired for the position in 1946.

In the meantime, the finished logs not only occupied an entire exhibit hall but myriad smaller duplicates and miscellaneous wood samples took up valuable storage space when lack of such space at the museum was a chronic problem. Discussions about disposing of the Jesup Collection began to stir at least as early as 1937, when museum director Roy C. Andrews (Sherwood's successor) had suggested that the collection be donated to the New York Botanical Garden "or some other institution" in order to create space for new exhibitions. In response, the museum's Council of the Scientific Staff resolved that the collection remained important scientifically as well as to the work of the Department of Education, and argued that to give away this "superb gift" could discourage other donations to the museum.⁸⁸

When the question resurfaced in 1942 under the museum's new director, Albert E. Parr, calls to abandon the wood collection were again met with protest. Informal opinions attributed to the museum's Advisory Committee on Plan and Scope included regret "that serious proposals have been made to burn up the collec-



After more than sixty years on public display, the Jesup Collection was dismantled in Forestry Hall in 1948.

tion," and indicated a strong consensus that the museum had an obligation to find "a satisfactory or a better home for it" in order to avoid a "gross" breach of trust.⁸⁹

Parr's plans for the museum were dampened during the ensuing years of the Second World War as the institution adjusted to extended absences among curatorial and administrative staff who had joined the armed forces, changes in visitation and patronage, curtailed research activity, and altered demands on the museum's technical and human resources.⁹⁰ Following the war, Parr discussed the process of "reconversion" from the distorted wartime operations of the museum to a post-war vision for its future. He made it clear that he saw this

process, both inevitable and necessary, as an opportunity to focus the museum's scope and actively integrate its research and educational activities across disciplines and into the wider landscape of public consciousness. He wanted to find alternatives to standard approaches to exhibition, where "an old-fashioned systematic arrangement of specimens, unrelieved by an occasionally freer use of artistry, becomes dull and boring to the spectator."⁹¹ Abandoning staid practices was the foundation for planning the museum's "program of modernization" in the years to follow.⁹²

In addition to its orphan status among the departments of the museum, there may have been no single display in the museum at that

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Artists create detailed replicas of trees for the Olympic Forest diorama during the renovation of the Forestry Hall in 1952.

time that so epitomized a nineteenth-century-style exhibit than the Jesup Collection of North American Woods. Shortly after Parr became the museum's director in 1942, he initiated discussions with botanist Bror E. Dahlgren, once an assistant curator in the Department of Invertebrate Zoology at the museum, who since the 1920s had been affiliated with the Field Museum of Natural History in Chicago. Dahlgren was asked to reconsider how the subjects of forestry and conservation would be represented at the museum. Initially, his advice pertained to a rearrangement of the existing log specimens, "to break up the single linear, traditional systematic arrangement," emphasizing instead the geographic distributions and asso-

ciations of the many species represented. He envisioned this new scheme as representing the composition and structure of regional American forests, resulting in displays that were more like the dioramas familiar from the museum's zoological exhibits.⁹³ Even with this new thinking toward repurposing the logs, however, the collection's future was not secure.

In July 1946, botanist Henry K. Svenson became chair and curator of the reconstituted Department of Forestry and General Botany, which counted two other museum associates, Clarence Hay (anthropology) and Charles Russell (education), as its scientific staff. As a longtime consultant to the museum while a curator at the Brooklyn Botanic Garden, Svenson had

been designing a new forestry hall and began his tenure at the museum with a preliminary plan for the new exhibits. He recognized the historical importance of the wood collection as "a heritage of the America that is past, and that our forests would no longer provide such a fine assemblage of material," and noted that it would "become of greater and greater value as time goes on." At the same time, Svenson recognized that the future of the department would be a departure from its past. The emphasis of its work would not be on specimens, which would be kept "behind the scenes," but on illustrating the integrated relationships and landscape processes represented by forest vegetation.⁹⁴ Toward this end, the existing Hall of Forestry was closed on November 1, 1948, after which the exhibits were dismantled.⁹⁵

As exhibits were revised, Parr explained in 1951 that the role of natural history museums in the progress of science had been evolving over the prior decade. There remained an abiding interest in individual organisms, which were the realm of basic research and a staple of the museum's scientific program. At the same time and increasingly, the museum identified new objectives for their work: understanding the interactions of organisms with their environment (their ecology) and recognizing the necessity for their conservation in nature. It was in these areas where Parr saw the museum's most critical educational mission.⁹⁶

An early expression of this philosophy was the Felix M. Warburg Memorial Hall of Ecology. Occupying the space where the Jesup Collection had been exhibited, several new exhibits were intended to illustrate the ecosystems of New York State and how the human population influenced the landscape. Adjacent to this, in the southeast corner of the first floor (formerly known as Darwin Hall or the Hall of Invertebrate Zoology), the new Hall of North American Forests was unveiled on May 14, 1958, featuring life-sized dioramas of eleven forest types from across the continent. Where the hundreds of individual trunk segments, separate models of foliage and flowers, and illustrations that populated the former hall had left their forests of origin to the imagination of visitors, the new displays revealed integrated forest ecosystems,

with characteristic herbaceous plants, animals, and physical elements (sunlight, water, soils) conspicuously represented in three dimensions. The focus of the new hall was on forests as habitats, the interrelationships among organisms that live in forested regions, and the importance of maintaining these ecosystems.⁹⁷

Although the tree species themselves were no longer the *raison d'être* of the new exhibits, the new hall was, effectively, an embodiment of the ideals that its namesake had hoped to promote through the assembly of the original Jesup Collection. The new exhibits were met with admiration.⁹⁸ Of all the pieces formerly on display, only the large cross-section of giant sequoia remained, as it does today. Meanwhile, as the penultimate step toward disposition, the woods had been officially designated a "scientific storage collection" in 1953, and the specimens were sequestered elsewhere in the museum.⁹⁹

Ponderous and Not Easily Handled

In September 1956, Parr ultimately succeeded in convincing the museum's Management Board that "there was no probability of this material [the wood collection] ever being put to any real use by The American Museum of Natural History." He asked the board to approve the transfer of the Jesup Collection to the Smithsonian Institution, which he hoped "would guarantee proper care and use of the material in accordance with the purposes for which it was collected."¹⁰⁰ With the board's approval to pursue disposition, then-curator of the museum's Department of Vegetation Studies, Jack McCormick, initiated correspondence with the National Museum to effect this transfer. Because the Smithsonian was preoccupied with the construction of new buildings and other exhibits, these discussions proceeded intermittently over the next two years.

The director of the Smithsonian's Museum of Natural History, Remington Kellogg, finally submitted a formal request to Parr in December 1957. His proposal outlined a dramatic new vision for the specimens:

Our plans foresee the utilization of the collection in several ways. The large redwood, Sitka spruce, Douglas-fir, sugar pine, ponderosa pine, white pine, oak, walnut, and longleaf pine trunk

specimens are being considered in connection with exhibits, in the coming Museum of History and Technology, on early lumbering in the Northeast, the Lake States, the Central Hardwood Region, the Southern Pinery, the Pacific Northwest, and the California Redwood Region.

A few of the other large specimens may possibly be halved lengthwise, one half being exhibited with tangentially and radially cut boards from the other half, and the remainder cut into study samples for distribution to educational institutions, colleges, universities, and museums.

The remainder of the collection would eventually be cut into study samples for distribution as stated above. We would retain at least two specimens of each species that is cut.¹⁰¹

Parr expressed reticence toward the Smithsonian's plans to destroy the majority of the logs, but he was steadfast in his determination to relocate the huge collection.¹⁰² The museum's Board of Trustees approved the transfer at its April 1958 meeting.¹⁰³

Despite this progress, the arrangements for the collection's transfer remained suspended for another two years. Parr retired, and James A. Oliver became the museum's new director in 1959. During this same time frame, both the directorship of the Smithsonian's Museum of Natural History and the curatorship of its Department of Botany (which included its wood collection) also changed.

In 1960, William L. Stern became the Smithsonian's new curator of the Division of Woods. Stern, formerly the curator of the Samuel J. Record wood collection at Yale University, had earlier in that role declined the museum's offer of the Jesup Collection. He explained to McCormick, "We refused on the grounds that the space needed for storage would be beyond our means, that many of the pieces were ponderous and not easily handled." At the Smithsonian, Stern was again faced with the prospect of acquiring the Jesup Collection. In January 1960, he noted to McCormick, "If I had been Curator of the Division of Woods in the National Museum at the time the Jesup Collection was offered, I do not know how I would have reacted to the offer.... I just hope that there will be no restrictions on cutting the specimens and that there are no qualifications regarding the handling of the

material once it is in the National Museum."¹⁰⁴ Stern had expressed his opinion to the Smithsonian's new director of the Museum of Natural History, Albert C. Smith, that despite "the historical importance and unique nature" of the Jesup Collection, "it would not greatly increase the usefulness of our present collections for anatomical study."¹⁰⁵

In his correspondence with Oliver in June 1960, Smith explained, "One of the problems that we both inherited, in connection with our new positions, concerns the Jesup Collection of Woods of the United States.... I am now in the embarrassing position of having to ask you to allow the Smithsonian Institution to reverse itself, as to acceptance of the Jesup Collection."¹⁰⁶ He indicated that although one or two of the monumental cross-sections might still be useful in their exhibits, the costs of relocation and the ever-present problem of storage were obstacles to their previously agreed-upon plans. Oliver, of course, was disappointed but acknowledged the Smithsonian's position.¹⁰⁷ For the sake of the logs, it was certainly a fortuitous development: the very scope and volume of the collection that had inspired museum visitors had made it difficult to accommodate elsewhere, and just as onerous to cut up into tiny hand samples. These were only the first obstacles the museum encountered in its efforts to dispose of the Jesup Collection, but the reasons would not change going forward.

McCormick next approached William C. Steere, director of the New York Botanical Garden. After initially suggesting that the garden could accept the Jesup Collection, however, the offer was declined later in 1961.¹⁰⁸ Following McCormick's departure from the museum in August of that year, at which time the Department of Vegetation Studies disappeared forever, Oliver took up the cause himself. To an inquiry from Stanley A. Cain, of the University of Michigan School of Natural Resources, he wrote: "This collection is really a very important one and it should be transferred to a single institution intact. The bulk of the collection is one of the big problems that hinders anyone from accepting it. However, there are no restrictions on it and the wood samples could easily be cut up for other institutions."¹⁰⁹ This

latest offer was not pursued. With essentially the same preamble, Oliver next approached the Field Museum of Natural History, but received no favorable reply.¹¹⁰

Happy to Turn it Over

As Oliver's frustrated efforts began to resemble desperation, a promising inquiry arrived from the Pacific Northwest. Early in 1963, Oliver had spoken with a man named Lloyd S. Millegan, a retired public servant who lived in McMinnville, Oregon, and ran a small marquetry business, Lloyd's of Oregon, in nearby Portland. Millegan envisioned mounting a display of the logs at the New York World's Fair in 1964, then displaying the collection in Portland to generate publicity and business for his handicrafts. Having been unsuccessful in finding another museum to accept the collection, Oliver explained that the museum was "eager" and "would be happy to turn it over to anyone who will undertake the cost of packing and transporting the entire collection from the museum to the new location." He emphasized that "the entire collection be taken in its entirety because we have no personnel to dispose of it properly piecemeal."¹¹¹ When another group, coincidentally also in Portland, inquired about the collection later that year, Oliver asked Millegan to submit a formal offer indicating his intentions and to confirm that the collection would be removed by February 1964.¹¹²

While Oliver awaited word from Millegan, he continued to entertain correspondence with Aldred A. Heckman, director of the Louis W. and Maud Hill Family Foundation in St. Paul, Minnesota. Through the common acquaintance of William Steere at the New York Botanical Garden, the Hill Family Foundation had been in discussions with the Gallery of Trees Committee, a group of industry and civic leaders as well as forestry professionals, about assisting them in acquiring the Jesup Collection for their museum in Portland. Heckman explained, "There is real interest in having the Collection in Portland." He emphasized that there was both local expertise available to prepare and interpret the proposed exhibit, as well as an audience already interested in trees and forestry attending the existing forestry museum.

Further, the City of Portland and the Oregon Museum of Science and Industry had indicated willingness to participate in structuring the acquisition.¹¹³ Steere himself wrote to Heckman, "Naturally I am deeply grateful to you for your personal interest in seeing that an exhibit of national importance is not reduced to veneer or small samples—or ashes."¹¹⁴

At an early meeting in January 1964, the Gallery of Trees Committee proceeded to address questions about transportation of the collection and the siting, design, and construction of a new building to house it. The Hill Family Foundation offered to defray the costs of transporting the collection to Portland, provided that it be publicly owned and exhibited. The City of Portland's Park Bureau and the Oregon Museum of Science and Industry were identified as the preferred partners.¹¹⁵ Whether it had intended to or not, the meeting illustrated the contrast between the committee's plans, for which the organizers could demonstrate institutional, technical, intellectual, and financial support, and those of Millegan, whose intentions had not addressed any of the real practicalities involved with adopting these specimens.

Both the Gallery of Trees Committee and the Hill Family Foundation had been surprised to learn of Millegan's prior claim, but their strong interest in obtaining the logs for Portland's museum compelled them to include him in their discussions. Millegan was asked to explain his relationship to the collection. The meeting minutes recorded: "He asked for it not knowing then what could be done with it. His offer was accepted.... [He] said he had no deed for the collection, merely a letter saying he could have it."¹¹⁶ He was asked what conditions he would place on forfeiting his "claim" to the collection so that the committee could proceed. Millegan stipulated first that the collection should be freely accessible and well presented; beyond that, he wanted to use the exhibit to educate visitors about marquetry and its use of various woods, and to display his marquetry products alongside the exhibit.¹¹⁷ At this time, Heckman indicated to Oliver that there would be no further discussion among the foundation and the entities in Portland until Millegan's position was clarified. He concluded, "It seemed

to me that we were rapidly getting to the point of having too many cooks as far as the North American Woods Collection is concerned."¹¹⁸

The chair of the Gallery of Trees Committee, Thornton T. Munger, addressed Oliver shortly after the meeting, indicating that the committee was "impatient" to understand where they stood in relation to Millegan's plans to acquire the collection.¹¹⁹ Heckman soon wrote to Oliver, as well, reinforcing the message of progress that had been made toward planning for the collection's move to Portland under the assumption that Millegan would cede the collection. He added, "We thought that if funds were assured to cover the costs of transporting the Collection to Portland and preparing it for display, the decisions regarding these other matters would be made with reasonable speed. This is as far as we can go. The next steps will have to be taken in Portland."¹²⁰

Millegan subsequently contacted the committee to revise his terms for relinquishing his claim to the collection, introducing the demand that he be allowed "to operate in the exhibit area a concession where selected gift and educational items in wood could be purchased." The committee's chair, Munger, was a retired forester of long tenure in the U.S. Forest Service whose career and research had been devoted to developing methods for sustainable forestry and conservation. He and the Gallery of Trees Committee envisioned a much broader mission for the collection, that it would illustrate the forest resources of the country for the benefit of public education. Neither the committee, nor the City of Portland, nor the Hill Family Foundation approved of the idea of using the collection to support a commercial enterprise, which in terms of the proposed new building would also be prohibited by city ordinance.¹²¹ Although the committee was at an impasse as the negotiations stretched into April, May, and June, Munger had continued to plan as though a compromise would eventually be reached.¹²²

After hearing again from Munger following a meeting in May, Oliver decided to finally draw the matter to a close. He informed Millegan in June, "You have repeatedly stated that you were interested in acquiring this collection and were given several deadlines for the acquisition of

the collection.... I think we have been exceedingly patient in waiting for you to fulfill your intentions. Therefore, your option to the collection has been withdrawn and we shall seek to dispose of the collection through other channels."¹²³ Oliver notified Munger of the transaction and renewed his offer to the Gallery of Trees Committee, with the only requirement being "that we hope it will be exhibited for the benefit of the public and will be available to students for study." He urged that the collection be transferred by September 1.¹²⁴ The Gallery of Trees Committee was relieved, the Hill Family Foundation was satisfied, and the City Council and Oregon Museum of Science and Industry all agreed that the collection would finally belong to Portland.

In the meantime, the Gallery of Trees Committee had reached a consensus about the location for the new exhibit. Rather than constructing a new building, the Jesup Collection could be displayed on the unoccupied second story of the old Forestry Building, a stupendous log structure that had been built in northwest Portland for the Lewis and Clark Centennial Exposition of 1905. The main floor was already in use as a museum of forestry and the logging industry, and it was thought that the log specimens would complement these exhibits. Because the aging balconies required engineering changes to accommodate the collection, the committee intended to store the collection once it arrived in Portland while funding was raised for the renovations.¹²⁵

Just a month after the final July meeting that approved of these plans, tragedy swept them all aside. A fire started in the office of the Forestry Building on the evening of August 17 and rapidly spread to the entire structure. The next morning, Munger observed the smoldering remains, which included the entire contents of the city's forestry museum that he had helped to oversee.¹²⁶ By 1971, when the new Western Forestry Center building opened, the story of the calamity in the museum's own informational materials had come to include the Jesup Collection and its miraculous escape of this fate by having still been in storage in Portland.¹²⁷ Twenty years after the fire, the story read: "When the old log museum burned in August



In 1971, the Jesup Collection of Woods reopened in a new home at the Western Forestry Center in Portland, Oregon.

1964, two box cars full of the Jesup collection had just arrived. Sidetracked and waiting to be unloaded, the collection narrowly missed destruction in the fire. The exhibit then was stored by the city until the new forestry center opened in June 1971.¹²⁸ In fact, the Jesup Collection had still been safely in New York.

Munger wrote to Oliver just days after the fire, expressing the committee's sadness at the loss and explaining its plans to rebuild. He noted, "It is very fortunate that the Jesup Collection was not there."¹²⁹ At the museum, Oliver and his staff were solidifying plans for an early October moving day. The Santini Brothers moving company was contracted to pack and transport the collection.¹³⁰ On October 6, 1964,

the specimens departed the museum aboard three moving vans destined for Portland, Oregon (the surviving paperwork gives no indication that railroad cars were employed).¹³¹ How they were stored once they arrived there is not recorded, but it is possible that the Gallery of Trees Committee took advantage of one of the offers for local warehouse space that had been made during their planning process.¹³² The Jesup Collection would not be put on display for nearly seven more years while a new building was constructed, but that building promised to include dedicated space for the logs.

At the new Western Forestry Center, which opened in June 1971 in Washington Park, west of downtown Portland, the Jesup Collection

was “the background theme that links together feature displays at the Forestry Center. Some of the largest logs are stationed at the entrance and around the outdoor covered walkway; inside, smaller specimens circle the first-floor display room. Other logs fill corners and file along corridors.”¹³³ Following their move, the logs had been cleaned, refinished, and given new labels by local members of the Society of American Foresters and the International Wood Collectors Society. The historical value of the 505 logs said to be on display, representing trees of such stature that in many cases could no longer be observed in the United States, was well appreciated, and the collection remained a popular exhibit.¹³⁴ As the Western Forestry Center expanded its educational mission and shifted its focus to forests at a global scale, taking on the name World Forestry Center in 1986, the collection’s relevance was again eclipsed by its physical footprint. About January 1994, the collection was donated to Agricenter International in Memphis, Tennessee.¹³⁵ Although exhibited there for several years, the logs have since spent more than two decades in storage.

A Heritage

Following Jesup’s death, Sargent reflected, “The formation of the Jesup collection of North American Woods ... was a matter of national importance. The preparation of this collection enabled us to study the distribution of the economic value of many trees which, before Mr. Jesup’s undertaking, were largely unknown. I think it can be said that this collection is the finest representation of forest wealth that exists in any country.”¹³⁶ In its time on exhibit, the collection was marveled at by audiences for more than eighty years altogether. It provided not only Jesup and Sargent but some early influencers of American forestry—including Heinrich Mayr, Carl A. Schenck, Gifford Pinchot, Bernhard E. Fernow, Barrington Moore, and later even Thornton Munger—with inspiration and a platform to promote a growing movement supporting the conservation of American forests. What the logs represent has not changed, and their historical significance has only grown.

Apart from the varied circumstances leading to their assembly in New York from all across

North America, as a group the collection has twice crossed the country; it has evaded annihilation more than once, each time saved by well-meaning caretakers facing formidable logistical challenges. More than 120 years since the consolidation of the collection, although many of the logs are superficially weathered and show wear and tear from handling and the elements, their number is mainly intact. The wood itself has largely not suffered and will be restorable in some future, truly permanent, home. Research to document the geographic origins of individual logs is ongoing; these findings will enable many of them to retake their scientific potential, where study of the wood itself may contribute meaningfully to the knowledge of our environmental past. All of them may yet function as emissaries for their species and for the forested regions from which they came—possibly even more so today than at the time of the collection’s unveiling, when many contemporaries believed that such trees would be lost from America’s forests in time, even as forests generally were disappearing, and that such a collection could never again be made.¹³⁷

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Notes

- ¹ A Noble Gift, *Sun* (New York), 17 May 1885, p.8.
- ² American Woods, *Harper’s Weekly* 29(30 May 1885), p.350.
- ³ Brewer, 1877: 4.
- ⁴ Norton, 1879: 110.
- ⁵ A. S. Bickmore to C. S. Sargent, 12 Sep 1880, Letterpress Books, 3a: 273, AMNH.
- ⁶ Joseph H. Choate, in Hovey 1907: 5.
- ⁷ C. S. Sargent to M. K. Jesup, 2 Nov 1885, Departmental Records, 091, Ser. I, AMNH.
- ⁸ C. S. Sargent to M. K. Jesup, 11 Nov 1880, Departmental Records, 091, Ser. I, AMNH.
- ⁹ Trustees of the American Museum of Natural History 1881.
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Thomas Meehan: The Horticultural Popularizer

Anthony S. Aiello

Aside from details exchanged among horticultural history buffs or students of botanical Latin (who know *Meehania*, a genus in the mint family), little is widely known or remembered of the life and work of Thomas Meehan, a Philadelphia nurseryman, author, editor, and social reformer who rose to prominence in the second half of the nineteenth century.¹ Meehan immigrated to Philadelphia when it was still a set of disparate and unincorporated townships on the cusp of transformation into a major industrial city. Upon his arrival, he inherited a horticultural mantle from the Philadelphia Quakers who had studied the flora of the eastern United States and built notable collections of plants in their gardens. Meehan looked to these established collections and assumed the role of the horticultural popularizer. During his long career, he used his nursery and publications to encourage the cultivation of an ever-widening palette of plants.

Meehan's desire to engage a broad horticultural audience was clear from the start. In his first book, *The American Handbook of Ornamental Trees*, published in 1853, Meehan described his intention of creating something for "extensive popular use."² This goal persisted as he continued to write and edit a series of prominent horticultural magazines, and towards the end of Meehan's career, Charles Sprague Sargent, the director of the Arnold Arboretum, described Meehan's accomplishments as "a most important factor in increasing the cultivation of American trees and shrubs."³ In Philadelphia, Meehan led a remarkable life, contributing to a staggering array of fields. His work is hard to encapsulate, so this article will not offer a complete accounting; instead, to use Meehan's own words, it will present "an anthology, and will not aim at anything further than to cull the most beautiful, interesting, and important."⁴

At Bartram's Garden

Meehan was born in Potter's Bar near London, England, in 1826. From an early age, he was trained in horticulture by his father, himself a well-known gardener. Meehan held several prominent gardener positions as a teenager, before pursuing his formal education at the Royal Botanic Gardens, Kew, graduating in 1848.⁵ Having been refused a gardening position in England based on religious grounds, Meehan saw the opportunities offered in the United States. By March of the same year, he arrived in Philadelphia, where he would spend the remaining fifty-three years of his life.⁶

Once in Philadelphia, Meehan quickly became acquainted with the leading horticulturists of the city. He began by working for Robert Buist, who was establishing Rose-dale Nursery on what was then the rural edge of southwest Philadelphia. The nursery was famous for its seed business and its selections of fruit and ornamental trees. After one year with Buist, Meehan accepted an offer to work at Bartram's Garden.⁷ At that point, the garden was transitioning from ownership by the Bartram family to Andrew M. Eastwick, a railroad magnate, who had recognized the garden's importance and built an elaborate Victorian home there, preserving the original Bartram house and its famous plant collection.

Until 1850, Bartram's Garden had been operated by the founding family. John Bartram, the patriarch, had been a royal botanist for the king of Great Britain. He and his son William explored the eastern United States, collecting seeds that they propagated for their garden and distributed to other respected horticulturists throughout America and Great Britain. William maintained the garden upon his father's death. In turn, William's niece Ann Bartram Carr and her husband, Robert, were the third generation

Facing page: Thomas Meehan was a central booster of American horticulture in the late nineteenth century. As a nursery owner, he promoted an ever-widening palette of plants, and as a horticultural writer and editor, he did the same. He is photographed here for the Centennial Exposition of 1876.



Thomas Meehan

W. Curtis Taylor.

914 Chestnut Street.

Centennial Portrait Gallery  *Representative Men of*
PHILADELPHIA

to build the collection, continuing the family's international trade in seeds and plants.

One can only imagine Meehan's fascination with this plant collection, undoubtedly one of the best in the United States at the time and one primed for study by a keen student of horticulture. While he was there, Meehan began collecting notes for his first book, *The American Handbook of Ornamental Trees*. He fitted out a place to write in the woodshed that John Bartram had used for potting and packing seed.⁸ It is difficult to imagine what Meehan's experience was like in that woodshed, but from a photograph that he published of the structure years later, it appears analogous to an artist's garret, cramped quarters but perhaps a place with little to distract the author from his work. In the garden, what would Meehan have experienced? From the *Handbook*, published in 1853, we get a sense of the diversity and size of the trees growing there. Fittingly, many of the trees that Meehan described would have been potted up in the very same building where he collected his observations as much as a century later.

Meehan first intended for the book to list the trees growing at Bartram's Garden, but it evolved into a more comprehensive project that included all the trees (and some shrubs) cultivated throughout the Delaware Valley and presumably across the Northeast. In 1852, while he worked on the project, Meehan left Bartram's Garden to work for Caleb Cope, the former president of the Pennsylvania Horticultural Society. Cope's Springbrook estate was located along the Delaware River in far northern Philadelphia.⁹ In presenting his authorial credentials, Meehan acknowledged his time at Kew and several "superior establishments" in Philadelphia. He added that "nothing has been admitted into the body of the work that has not been the result of the personal experience of the author. No tree is described as being in cultivation which the author has not himself seen."

Meehan's horticultural ambitions are evident from his ability to visit and bear first-hand witness to so many trees in such a short period. The pace is even more remarkable given that travel on unimproved roads among the surrounding counties was challenging. Yet, Meehan's inveterate field research not only allowed him to understand the regional horticultural

diversity but also brought him into the gardens of prominent botanical collectors. The *Handbook* documented the gardens of the early Philadelphia Quaker botanists and described the transition from the local horticultural heritage to a broader palette of plants from Europe and Asia. Here we see Meehan serving as a bridge between two eras: from the horticultural legacy of the late 1700s and early 1800s to the broader and more outward-looking horticultural developments of the late nineteenth century.

The *Handbook* provides glimpses into the most renowned collections of the time. Of course, Meehan describes numerous notable trees at Bartram's Garden, including an old Franklin tree (*Franklinia alatamaha*, listed as *Gordonia pubescens*), which was likely one of William Bartram's original eighteenth-century collections. Meehan also lists massive specimens like a ninety-three-foot-tall Kentucky coffeetree (*Gymnocladus dioica*) and a fifteen-foot-tall cornelian-cherry (*Cornus mas*), a European species that would have been a collector's tree at that time. Meehan also describes plants at the home of Humphry Marshall—author of *Arbustrum Americanum: The American Grove*, who lived near West Chester—and the now-forgotten arboretum of John Evans, which was one of the most significant collections of its time, located in Radnor, about fifteen miles west of Philadelphia.

The best extant example of a nineteenth-century arboretum that Meehan visited is that of the Peirce family, which now comprises the core of Peirce's Park at Longwood Gardens. The Peirces began their collection in the early 1800s, creating one of the finest regional arboreta by building on their forerunners, the Bartrams and Marshalls. The collection became renowned for its scale and diversity. Meehan describes several notable trees at this location, some of which remain today. For example, in his description of eastern redbud (*Cercis canadensis*), Meehan mentioned that he had "seen fine specimens of this in Mr. Pierce's [sic] fine avenue." Similarly, he listed a cucumbertree magnolia (*Magnolia acuminata* var. *subcordata*, then *M. cordata*) with a four-foot circumference in Peirce's arboretum. In recent years, this tree was named as the cultivar 'Peirce's Park', and although the original tree was lost during a storm in April



ARCHIVES OF THE ARNOLD ARBORETUM, MEEHAN'S MONTHLY (VOL. 6)

Thomas Meehan compiled notes for his first book in John Bartram's woodshed—a place where the Bartram family likely potted some of the very trees that Meehan described decades later.

2020, several young ones are planted throughout Longwood Gardens.

Meehan's horticultural explorations were not limited to prestigious gardens. A favorite tree citation in the *Handbook* is of paper mulberry (*Broussonetia papyrifera*), a curious species native to East Asia. Meehan wrote that it "thrives on the sea-shore," growing in Cape May, New Jersey. Boat travel from Philadelphia to Cape May was then much easier than overland travel, and Cape May's geography led to its development as a Victorian-era resort. One can picture Meehan taking a busman's holiday to the beach, recording notes even during precious personal time. At the time, he would have been courting his future wife, Catherine (Kitty) Colflesh, and one can imagine her joining him on tree-hunting excursions.

Meehan's appendix is equally informative for students of horticultural history because it lists tree species recently introduced but which he had not observed. This detail helps to date the introduction of these species into the United

States, or specifically Philadelphia. For example, Meehan lists nine species of maple in the main text: six native to the eastern United States, along with two common European species, the hedge maple (*Acer campestre*) and Norway maple (*A. platanoides*). In his appendix, however, he listed maples that he was aware of but had not seen. These included the vine maple (*A. circinatum*) from the Pacific Northwest, and the Bosnian and Italian maples (*A. obtusatum*, and *A. opalus*, respectively), which were just appearing on the East Coast.

Germantown Nurseries

In 1854, Meehan started a nursery in partnership with William Saunders of Baltimore in the Germantown section of Philadelphia, well outside the developed portions of the city.¹⁰ While Saunders's involvement lasted only a year, the Germantown Nurseries quickly became one of the regional leaders in growing and selling trees, shrubs, and perennials. Meehan's brother Joseph joined the operation in 1859, and his



Elms flank the entrance to Meehan's Nurseries, photographed around 1902.

three sons (Thomas B., J. Franklin, and S. Mendelson) came on board in the decades to come. As evidence of the success of the operations, what had begun as a few acres of land in Germantown grew to 75 acres by the late 1800s and then to 150 acres by the turn of the twentieth century, encompassing property in Germantown and suburban Dresher, Pennsylvania.¹¹

The nursery was especially known for its diverse offerings of North American trees. By 1893, a correspondent for *Garden and Forest* noted that "Mr. Meehan early recognized that ... American plants are the best for America" and went on to say that "in no other place are American trees and shrubs raised in such quantities." Their offerings included native species that were difficult to find at other nurseries. Yet, Meehan simultaneously offered and promoted non-natives species as they became available.¹² This Janus-like approach to horticulture con-

tinued the link to Philadelphia's horticultural heritage while recognizing the changing demography and tastes of the city's gardeners.

American nursery catalogues from the mid-1800s reveal that most ornamental trees offered were from North America and Europe, with a smattering from Asia Minor and Asia.¹³ A watershed moment in the availability of greater plant diversity occurred at the Centennial Exposition, the first official world's fair held in the United States, which took place in Philadelphia from the spring to autumn of 1876. As a celebration of the one-hundredth anniversary of the signing of the Declaration of Independence, the event exposed a vast audience to a wide array of modern conveniences, inventions, and international cultures. Also, through various horticultural exhibits, the Exposition introduced Asian (particularly Japanese) plant species to a broad American audience. Prior to the Exposition,

Japanese species were slowly making their way into Boston and New York but had yet to see wider availability.¹⁴

Meehan created an arboretum of over seven hundred trees for the Exposition. Local newspapers described it as a “grand miniature forest” that was especially noteworthy for its collection of “trees and shrubs of the United States.”¹⁵ Other prominent nurserymen had displays nearby, including Josiah Hoopes (whose display included twelve hundred evergreens and forty varieties of ivies), Robert Buist (showcasing trees, shrubs, and herbaceous plants), and S.B. Parson & Sons (who were reported to have “remarkable Japanese plants, maples, evergreens, azalias [sic], new shrubs, and half hardy plants”).¹⁶

After the Exhibition, Meehan and the other nursery owners provided portions of their outdoor collections to Philadelphia’s Fairmount Park. Therefore, the diversity of their displays is suggested in Joseph Rothrock’s catalogue of the trees and shrubs in Fairmount Park, published in 1880. The catalogue documents early introductions of Asian species, including Japanese maple (*Acer palmatum*), Asian magnolias (like *Magnolia campbellii* and *M. denudata*), panicle hydrangea (*Hydrangea paniculata*), and the lacebark pine (*Pinus bungeana*).¹⁷ After the event, the diversity of plant offerings from Japan rapidly increased, and by the end of the 1800s, many now-familiar plants, and many that we still think of as “rare and unusual,” were regularly offered for sale.

Meehan was quick to recognize the importance of these introductions. When he wrote about the other nursery displays at the Exhibition in *Gardener’s Monthly*, a magazine that he had edited since 1859, he remarked on the “special bed” of Japanese plants shown by S.B. Parsons & Sons. Among the most striking plants, he reported, was the red-leaved Japanese maple (now *Acer palmatum* forma *atropurpureum*).¹⁸ By 1882, Meehan’s nursery catalogue offered one-foot-tall specimens of this for two dollars, then among his most expensive offerings. On the back cover of the same catalogue, he proudly advertised the “Japan Snowball” (*Viburnum plicatum*), claiming that his nursery had been first to introduce it into the United States. This claim was accompanied by the only illustration in the catalogue, suggesting that Meehan fully

recognized the commercial importance of these newcomers.¹⁹ By the 1890s, Meehan’s nurseries were offering a weeping Japanese cherry (what would now be considered *Prunus subhirtella*), Asian magnolias and maples, and even umbrella pine (*Sciadopitys verticillata*) and Hiba false-arborvitae (*Thujaopsis dolabrata*).²⁰

In some sense, Meehan’s nursery served as a laboratory for him to study plants. A perfect example of this is the daimyo oak (*Quercus dentata*). At a meeting of the Academy of Natural Sciences of Philadelphia in 1886, Meehan presented a short description of the floral structure of *Quercus dentata*, grown from seed that he had received from Japan at the time of the Centennial Exposition.²¹ By 1895, the daimyo oak was offered by his nursery, described as “a rich addition to our list of oaks ... in May the yellow flowers, in long aments, make it attractive in a way no other oak is.”²²

Despite his ever-increasing interest in non-native species, Meehan maintained a strong affinity for native plants. In the same 1895 catalogue in which he advertised the daimyo oak, Meehan wrote that “for twenty years or more we have been trying to impress upon American planters the importance of using Native Oaks in landscape works ... and finally, after all these years, planters began to realize that we were right and to recognize in the American Oak, the ‘King of Trees.’”²³ And while Meehan is often most associated with woody plants, his catalogues have a large diversity of native herbaceous perennials and hardy ferns—many sought out by today’s keen gardeners.

Meehan’s nursery distributed plants to botanical institutions, including the Arnold Arboretum where a few dozen specimens are still alive. The most historically significant are two Franklin trees (*Franklinia alatamaha*, accession 2428-3*A and *B), propagated in 1905 from a plant that Meehan provided about thirty years earlier. These are believed to be the oldest living representatives of the species.²⁴ Other Meehan plants at the Arboretum include a group of five black oaks (*Quercus velutina*, accession 1237), acquired in 1873, when the Arboretum was only a year old, and a Southern red oak (*Q. falcata*, accession 3333*A). These North American oaks are now living reminders of Meehan’s commitment to the “King of Trees.”

Horticultural Writer and Editor

Meehan was a prolific author throughout his career. He served as editor of the *Gardener's Monthly* until 1888, when its publisher, Charles Marot, died. A few years later, *Meehan's Monthly* was born and continued until 1902. Over his forty years as the editor of monthly publications, Meehan generated a vast amount of material to read. His prodigious output is hard to encapsulate or even anthologize. The tone of the publications was conversational and newsy, and his personal writing style was both informative and approachable. In a period before easy (not to mention instant) communication, these journals regularly shared information and current trends, mixed with a bit of human interest.²⁵

In the initial issue of *Garden and Forest*, in 1888, an unsigned editorial (perhaps written by Charles Sargent, who "conducted" the magazine) commented on the loss of the *Gardener's Monthly*: "Ever since we have been interested in the cultivation of flowers we have looked to the *Monthly* for inspiration and advice, and its pages have rarely been turned without finding the assistance we stood in need of." The editorial continued by celebrating Meehan's imprint on the publication. "Fortunately, the *Gardener's Monthly*, and its modest and accomplished editor, Mr. Thomas Meehan, were one and the same thing. It is Mr. Meehan's long editorial experience, high character, great learning and varied practical knowledge, which made the *Gardener's Monthly* what it was. These, we are happy to know, are not lost to us, as Mr. Meehan will ... continue to delight and instruct the horticultural public."²⁶

In the late 1870s, Meehan had also begun a multivolume work titled *The Native Flowers and Ferns of the United States*. The project is another testament to his long-standing love of North American plants. In the preface to the first volume, Meehan described how the project emerged from his desire to write a scientific treatment on the North American flora. Although he pitched this idea to a publisher, he ultimately decided, once again, to focus on engaging a more general audience. "A purely scientific and systematic treatise ... must necessarily be limited to a small circle of readers," he explained, "and even in this small circle there

would be but a few who would care to subscribe to a work, the end of which they might never live to see." Four volumes were produced, and Meehan's voice shines through them. He lushly described almost fifty species in each volume, often incorporating history, poetry, and horticultural information. The entry for each species included a lavish color illustration.²⁷

The project was revived in 1891 when *Meehan's Monthly* was launched. While *Meehan's Monthly* was a newsy horticultural periodical, in keeping with the style and tone of the *Gardener's Monthly*, each issue began with a description of a native species and was accompanied with illustrations prepared for unpublished volumes of the *Native Flowers and Ferns* project. *Garden and Forest* celebrated the arrival of this new periodical: "Mr. Meehan's return to horticultural journalism will be welcomed by many readers of the *Gardeners' Monthly* who felt something like a personal bereavement at the discontinuance of that excellent magazine."²⁸

Along with these horticultural pursuits, Meehan maintained a long-running correspondence with many notable botanists of his time, including George Engelmann, Asa Gray, and Charles Darwin. Much of this correspondence concerns specific observations or botanical questions, often relating to articles that Meehan would eventually publish in the *Proceedings of the Academy of Natural Sciences of Philadelphia*, where he long served as the vice president.

Advocate for Urban Green Space

In the later years of his life, Meehan became actively involved in urban improvement. In 1883, he accepted a role on the Philadelphia Common Council in order to ensure the creation of city parks and preservation of Bartram's Garden.²⁹ Meehan was instrumental in forming the City Parks Association, creating lasting green space in the most urbanized neighborhoods. He is credited with introducing nature study and kindergarten to Philadelphia public schools, and he strived to improve the educational system for working-class families throughout the city.³⁰

Among these accomplishments, it is the preservation of Bartram's Garden that is the most noteworthy. In 1879, Andrew Eastwick died,



Thomas Meehan's work on *The Native Flowers and Ferns of the United States* serves as one of the clearest examples of his lucid writing style. Each of his entries was accompanied by chromolithograph illustrations prepared by Louis Prang of Boston. The illustrations and excerpts here appeared in later installments of the project in *Meehan's Monthly*.

**Pinkshell Azalea
(*Rhododendron vaseyi*)**

"It is one of a number of beautiful plants missed by the early explorers of the Mountains of North Carolina, and which have been brought to light only in modern times."

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Coast Cholla (*Cylindropuntia prolifera*)

“Animals take the fruit to their haunts, use the flesh, and scatter the undigested seeds in various directions,—certainly many fruit-bearing plants are widely distributed in this manner. Those who think this feature a special adaptation will see in the absence of spines in the fruit of this species, strong confirmation of this view. The plant would be spiny, it would be contended, in order to protect it against browsing creatures; while, when consumption instead of protection became useful to the plant, the production of spines would be arrested.”



Rosebay Rhododendron (*Rhododendron maximum*)

"In a state of nature the Rhododendron inhabits wild, rocky places, in uninhabited regions where the foot of the traveler is rarely seen ... So far away are they generally in their gloomy homes that even the great traveler, John Bartram, had not met with them anywhere west of the Schuylkill river."

and for nearly a decade, the resolution of his estate and the fate of Bartram's Garden remained unresolved.³¹ Shortly after Eastwick's death, Sargent, using his connections in Philadelphia, tried to organize a group of "liberal gentlemen" to purchase the property.³² This effort was unsuccessful because the owners of the estate believed that "they could make more [profit] by destroying its botanical associations, and turning the whole into building lots."³³

Sargent continued to provide support on a national level through *Garden and Forest*, arguing in an unsigned editorial that "the name of Bartram's Garden should be preserved and ... should be maintained in as near the condition as its first owner left it."³⁴ Meanwhile, Meehan and members of the City Parks Association continued the local campaign. Ultimately, the City of Philadelphia appropriated funds to purchase Bartram's Garden in 1889, took ownership in 1891, and finalized the purchase in 1893.³⁵ As a result, more than forty years after Meehan had first worked at the historic garden, it became preserved in perpetuity.

This achievement must have been remarkably gratifying for Meehan, seeing the preservation of the place that helped to launch his career and that had such horticultural significance in his adopted city.

Once the future of Bartram's Garden was settled, Meehan's foresight in creating open space throughout the city was acknowledged with another *Garden and Forest* editorial: "The fact that the people of Philadelphia are securing a series of small parks is largely due to the public-spirited and tireless efforts of Mr. Thomas Meehan, the well-known horticulturist ... Many generations of Philadelphians will have a good



Partridgeberry (*Mitchella repens*)

"It is remarkable that a plant so attractive in so many ways should not have become more attached to the public mind, or received more attention from polite writers, but the author can recall no instance in American poetry or general literature in which the Partridge berry plays a conspicuous part."

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reason to remember with gratitude his disinterested efforts for the improvement and happiness of his fellow men."³⁶

Meehan's Legacy

As a coda to his life, Meehan was awarded the Veitch Memorial Medal in 1901, a few months before he died. He followed Sargent and Liberty Hyde Bailey as the third American to win this honor. In conferring it, the Royal Horticultural Society recognized his "distinguished services in botany and horticulture." Seeing Meehan in the company of these two towering figures of late nineteenth and early twentieth-century

American horticulture affirms his stature among his peers: Sargent, one of the great dendrologists of his era, who brought the Arnold Arboretum to prominence, and Bailey, a man of astoundingly broad interests and accomplishments who combined the science of botany with the art of horticulture. Meehan pursued similar combinations and was interested not only in the world of horticulture but in using it for the betterment of his fellow citizens.

It is worth pondering what Meehan would think if he were to see the state of contemporary horticulture. Certainly, many if not most of the trees that are commonly planted across the Northeast would be familiar to him. Having straddled the divide between native and non-native plants, he might think that there would be no need for invidious comparisons between the two groups. And he might be bemused at the trends in “new” native plants, having promoted many of those species in his various publications and through his nursery. If nothing else, although his name may have faded, Thomas Meehan’s impact as a promoter of modern horticulture has not.

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The Intertwined Attractions of Plants, Moths, and People

Kamaljit S. Bawa

It was a warm and humid night in September of 2003. In a tropical forest by the coast of Madagascar, Phil Devries, an entomologist and noted nature videographer, swatted mosquitoes hovering around his face. He had been waiting eagerly for a visitor since seven o'clock. As the night transitioned to early morning, without any signs of the visitor, the tension and anxiety in Phil's mind increased. For the visitor, Phil Devries was inconsequential; the desired object was Darwin's orchid near which Phil (or the Butterfly Man, as he is popularly known) had parked himself to photograph the orchid's pollinator.

"Good Heavens what insect can suck it," Charles Darwin is said to have remarked in reference to the nectar in the long floral tube of *Angraecum sesquipedale*, now known as the Darwin's orchid, native of Madagascar.¹ Darwin had received the orchid on January 25, 1862, from James Bateman, a businessman, collector of plants, and horticulturist, who grew orchids. Darwin then famously predicted that *A. sesquipedale* must be pollinated by a hawkmoth with a proboscis that measured at least eleven inches in length.²

In 1903, almost forty years after Darwin intuited its existence, a hawkmoth with long mouth parts was described by Walter Rothschild and Karl Jordan. It was isolated from moth specimens collected on an earlier expedition to Madagascar by Jules Paul Mabille, a French naturalist. Rothschild and Jordan named the species *Xanthopan morganii*. However, it was not until 1992, a good ninety years later, that Lutz Wasserthal, a German biologist, observed *X. morganii* visiting the flowers of *A. sesquipedale* in real life. Only then was the connection between orchid flowers and moths finally confirmed.³

Visits of moths to flowers in the wild are hard to observe. And so, Wasserthal had to use large flight tents to photograph the two partners

engaged in the mutually beneficial relationship. Finally, in 2003, after spending several nights in the Madagascar forest, Phil Devries was able to photograph the evasive moths visiting the flowers of *A. sesquipedale* in the wild—at around three o'clock in the morning.⁴

The correlation between the length of the floral tube and the length of moth's proboscis led Darwin to infer the process of coevolution, in which natural selection favors reciprocal increases in the length of the floral tube and moth's proboscis. Heritable variation—in this case, variation in floral tube and the length of proboscis in moths—is the raw material on which natural selection acts. Between Darwin's original prediction and the eye-witness observation, 130 years had passed. Nothing in science comes easy. Not even for Darwin.

It was Gregor Mendel, an Austrian monk, who proposed the principles of inheritance in 1865, based on his experiments with peas. From Darwin's orchids to Mendel's peas, plants have played an important role in the study of evolution. Curiously and coincidentally, both Darwin and Mendel were contemporaries, and although Mendel's work filled a critical gap in Darwin's theory of evolution by natural selection, the two men did not know of each other's work!

While Darwin is noted for his work on evolution, he is much less known as an ardent botanist. He was greatly interested in the reproduction of plants, particularly orchids. He wrote several books on plants: *The Power of Movement in Plants*, *On the Various Contrivances by Which British and Foreign Orchids Are Fertilised by Insects*, *On the Good Effects of Intercrossing*, *The Different Forms of Flowers on Plants of the Same Species*, and *Insectivorous Plants*. Plants were critical to the formulation of his ideas both about inherent variation and how natural selection acts on this variation to enable evolution.

Facing page: Darwin's orchid (*Angraecum sesquipedale*) is one of thousands of night-flowering plants pollinated by moths. In this case, only one pollinator can accomplish the task—*Xanthopan morganii*.

Moths and Sex Pheromones

It is March 1974, and I am waiting, at evening time, under a large *Luehea speciosa*. The tree stands in a dry tropical forest in Guanacaste Province, Costa Rica. The previous day, I had seen its large white flowers start to bloom around eight o'clock in the evening. And so, the next day, under the tree and in the light of the moon, I staked a vantage point and started my watch. At exactly a quarter to eight, and almost like magic, the large white petals start to unfurl. In a quarter of an hour, almost a hundred flowers in my field of view have opened in near-perfect synchronicity. In my five decades of fieldwork in Costa Rica, that night was one of the most memorable and remains permanently etched in my memory.

Plants depend on a wide variety of animals to get cross-pollinated. The diversity of these pollination systems is on full display in tropical evergreen forests, the world's most species-rich ecological communities. On any given day, at any time during a short walk through the forest, one can encounter flowers of many sizes, shapes, and colors that are pollinated by insects—largely bees, butterflies, and flies—and, at times, birds. For a different set of plant species that start to open their flowers around dusk and at night, insects (beetles and moths) and mammals (primarily bats) take over the role of major pollinators.

All across the globe, but mostly in the tropics, tens of thousands of plant species are pollinated by an equally large number of moth species at night. Moth-pollinated flowers are almost always white and tubular, with nectar at the base of the tube. They blossom in the evening, soon after dusk, and the blooms last for one or two nights. During this time, the moths visit them frequently, making multiple forays throughout the hours of the night.

Insect pollinators visit flowers for food, but, to them, flowers are more than a food source. They are also sites of mating and, often, a source of compounds that play an important role in facilitating these sexual encounters. Flowers produce a variety of volatile compounds to attract insects, such as moths. Smell plays an important role in attracting insects from afar, especially at night, when visual cues can only

function once the pollinators approach the flower closely.

Female moths use volatile compounds produced by flowers to synthesize sex pheromones, which they release to attract males. In some cases, the volatiles associated with the floral smell simply induce female moths to produce large amounts of sex pheromones, but in others, the female moths can absorb or ingest the volatiles and convert the compounds directly into pheromones. The males are not left behind. In some species of moths, males sequester pyrrolizidine alkaloids from flowers to use them as precursors for the synthesis of pheromones. Sometimes, the males even transfer the alkaloids to the female during mating, for the defense of eggs against predators.⁵ Thus, flowers play a critical role not only in the provision of food and nutrition but also in the mating and reproduction of pollinators.

Evening Fragrances and Romantic Nights

Thirty years later, I am in Bangalore, the techno-hub of South India. It is again late evening, and I am passing through a small market buzzing with people. Walking in front of vegetable and food stores, I am overpowered with fragrances emanating from buds and flowers of jasmine (*Jasminum*) strung together for hair adornments. And indeed, I see many women walking around with their long hair arranged in many different styles and adorned with strings of fragrant jasmine.

Throughout remembered history, and for millennia, flowers have been a part of daily life in India, as adornments for gods and humans. The Hindu epic *Rāmāyana* about the life of Ram, one of the most celebrated gods of Hindus, includes references to Sita, Ram's wife, decorating her hair with floral arrangements. And in a well-known epic poem written in the fourth century CE, the playwright Kālidāsa included a verse in which sensuality and pollination merge:

Sensuous women
in summer love
weave
flower earrings
from fragile petals
of mimosa



Chains of white jasmine (*Jasminum*) are worn as a hair adornment in Tamil Nadu, India. The flowers become increasingly fragrant in the evening.

while wild bees
kiss them gently⁶

Anthologies of classical Tamil, written between 100 BCE and 250 CE, describe the flowers that women bear as those of jasmine. For men, too, flowers have been a bedtime adornment for ages, and the exchange of flowers between individuals has always carried unspoken and covert sexual connotations.⁷

From trees in Costa Rica that use flowers to attract moths to women in India who use flowers for adornment, the fundamental motives of life are the same irrespective of geographies, gender, or species. But the enchantment of

union does not stop there. The collision of these seemingly different worlds gets closer and more intimate. *Jasminium sumbac* and other species of *Jasminum* are native to South India and other parts of tropical Asia. Jasmine flowers are highly fragrant, pollinated by moths, and here, too, the maximum production of aromatic compounds is between seven and eight o'clock in the evening!⁸

Moon and Sex

Back in Costa Rica and on another moonlit night, I am driving to my campsite after a full day of fieldwork in the dry deciduous forest.



Flowers of *Bombacopsis quinata* open at sundown, seemingly more abundant in the treetops when the moon is full.

There is little traffic on the Pan-American Highway, which means that I can easily observe the star-studded trees of *Bombacopsis quinata*, a relative of the silk cotton tree, on both sides of the road. Under the full moon, it is a beautiful sight, with a tree coming into view every few minutes. The “stars,” indeed, are large, white, moth-pollinated flowers, perched high in the leafless crowns of these very large trees. For the past several evenings, I have been passing by these trees in flower, but this time, the number of flowers on the trees appears to be unusually large. Flowers in this species last for a single night, but individual trees flower over many weeks, with a new batch opening every night. It seemed that the intensity of flowering was associated with lunar cycles, with the largest number of flowers opening on nights with the full moon.

While, on this evening drive, I cannot confirm the correlation between the intensity of flowering and phases of the moon, researchers would later document such trends for other species. Moths are known to be more active on moonlit nights, and pollination can be more intense during a full moon for moth-pollinated species, as, for example, in *Ephedra foeminea*, a gymnosperm. In contrast to most gymnosperms, which are wind-pollinated, this species attracts moths by secreting a pollination drop from its cones. Individual plants produce their maximum amount of pollination drops during full moons. Meanwhile, a related species of *Ephedra* is wind-pollinated, and in that case, there is no connection between pollination and lunar cycles.⁹

Is there a general correlation between lunar cycles and pollination intensity for the thou-

sands of night-blooming plant species? We do not know. Recently, researchers have shown that a desert cactus (*Cereus peruvianus*), presumably pollinated by bats, puts on its largest display of flowers around the full moon. The species flowers over a few months with the number of flowers going up and down with the lunar cycles.¹⁰

The moon has always been associated with romance in our own human cultures. Surprisingly, there is insufficient data to establish a link between sexual activity with lunar cycles. Interestingly, though, research has shown that a larger proportion of females demonstrate ovulation during the full moon, and all genders experience higher aggression levels and less sleep.¹¹

Intertwined in the Web of Life

It is evening again, and the sex lives of plants, moths, and humans intertwine. All of these organisms use the same compounds to attract mates: smell is a main stimulant for each. Plants, indeed, cannot smell, yet floral volatiles are a major incentive for moths to visit flowers.

Among the three partners, plants reign supreme. They seem to dictate the terms of the relationships. Moths, in fact, are held in bondage. They cannot attract mates without pheromones for which the plants hold the precursors. Humans also seem to be dependent on plants as intermediaries, although they, of course, can do without them.

For those who study life on earth, the interconnections among plants, moths, and humans are not surprising. We are a part of the web of life that has celestial connections with other planets. These connections are vital for maintaining all lives, especially ours. We should celebrate and value these connections that enrich our lives by ceasing our assault on nature.

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Otherworldly Wingnuts: *Pterocarya* × *rehderiana*

Jared Rubinstein

A rarely visited corner at the Arnold Arboretum is nestled beneath the tall stone wall that separates the hickory collection from traffic on Centre Street. In late summer, the area feels otherworldly. The heavy overstory filters the light and cools the air; the humidity seems to increase; and densely planted shrubs block out the surrounding views and noises. The corner is dominated by a planting of seemingly colossal hybrid wingnuts (*Pterocarya* × *rehderiana*), with their drooping Spanish moss-like fruits and twisted forms. Standing next to their large multistemmed trunks can make you feel miniature.

Wingnuts are closely related to hickories (*Carya*) and walnuts (*Juglans*). There are six species of *Pterocarya*, with native ranges clustered in China, Japan, Southeast Asia, and the Caucasus. In addition to cultivating representatives of five of the six species, the Arnold Arboretum has eight specimens of this unusual hybrid, all of which grow in this out-of-the-way corner.

The oldest of the eight originated at the Arboretum from seed sent, in 1879, by Pierre Alphonse Lavallée of the Arboretum de Segrez, outside of Paris. At the time, the Arboretum de Segrez was one of the largest in the world (and a noteworthy landscape where Marcel Proust once suffered an asthma attack but still managed to write a poem about its beauty). Lavallée collected the seeds from a Chinese wingnut (*P. stenoptera*) in his arboretum, and, once they germinated in Boston, the seedlings were planted along Centre Street.

Two decades later, Alfred Rehder, an Arnold Arboretum taxonomist, noticed that the trees didn't look quite like the Chinese wingnut. "The trees in the Arnold, known as *Pterocarya stenoptera* ... I can no longer consider, after much study, as the real species of that name," Rehder wrote to the German Dendrological Society in 1903, "but now consider [them] a cross between this and *P. fraxinifolia* [the Caucasian wingnut], which in its characteristics almost exactly stops between the two species."

Rehder hypothesized that pollen from a Caucasian wingnut growing at the Arboretum de Segrez must have landed on the flowers of a Chinese wingnut growing nearby. We don't

know who collected and brought the Chinese and Caucasian wingnuts to Paris, but it may well have been the first time that the two species, normally separated by the thousands of miles between the Caucasus Mountains and eastern China, were growing in the same place.

Rehder conferred with Camillo Schneider, a taxonomist working at the Vienna Natural History Museum, who agreed with Rehder's assessment. Based on their correspondence, Schneider published the first botanical description of the new hybrid in 1906. Writing in German in the *Illustriertes Handbuch der Laubholzkunde*, he identified the unique characteristics of the buds and rachises of the "Bastardes" growing at the Arnold Arboretum and officially named the hybrid for his friend, choosing the Latin name *Pterocarya* × *rehderiana*.

Four trees (accession 1191) from Lavallée's 1879 shipment still grow along the Centre Street wall, hidden behind the hickory collection. In addition, four neighboring trees (23119) were accessioned as seedlings from the original trees. When the wingnuts fruit in midsummer, they offer a dazzling display of long, pendulous clusters of winged nutlets (hence the common name) that dangle from what seems like every branch. One particularly large specimen, accession 1191*E, has an incredible form, with leaders that shoot up more than 125 feet and droop over the Works Progress Administration-constructed bus shelter on Centre Street.

As with many hybrids, *Pterocarya* × *rehderiana* seems to display hybrid vigor and, according to Rehder, are "much hardier and more satisfactory than their supposed parents." A windstorm in October 2020 took out one of the leaders from accession 1191*E, but overall, the hybrids don't seem terribly affected by the cold New England winter, even after more than 140 years growing at the Arboretum. While the hybrids are a product of a chance cross that would likely have never been possible in the wild, the trees have more than claimed their uncanny home.

Jared Rubinstein is an associate project manager at the Arnold Arboretum. For more on the taxonomic history of the Rehder wingnut, see his 2020 article with Michael Dosmann in *Novon*, issue 28(4).



