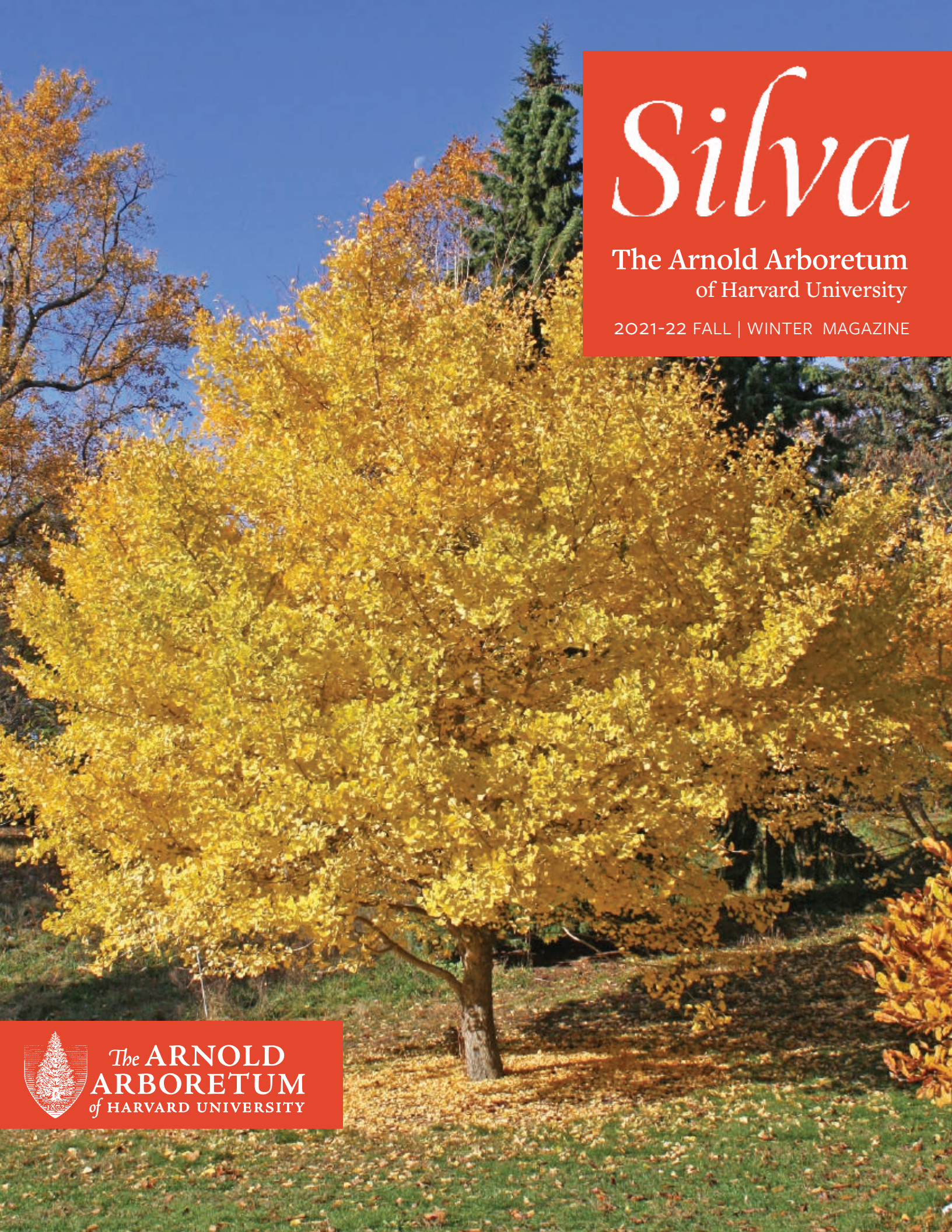


Silva

The Arnold Arboretum of Harvard University

2021-22 FALL | WINTER MAGAZINE

The ARNOLD ARBORETUM of HARVARD UNIVERSITY

Welcome on Wheels

Look for the debut of a new mobile visitor center at our gates this autumn

by Amy Heuer, Digital Programs and Content Manager

For new and returning visitors alike, our amiable and ever resourceful visitor engagement staff create a sense of welcome and endless possibility to those seeking insight and guidance for their explorations. This fall, the launch of a made-to-order mobile visitor center in our landscape will begin an exciting new chapter in this outreach.

With the arrival COVID-19, health guidelines required closing the Hunnewell Visitor Center as a public health precaution. While we kept the Arboretum landscape open and welcoming, our visitor engagement staff transitioned to remote work last spring. By fall, staff members Carena Cremin, Ana Eder-Mulhane, and Regina Mission were back at the Arboretum, greeting visitors and offering assistance from a pop-up visitor engagement tent set up at a number of our gates in rotation. Moving around the Arboretum has enabled us to reach new visitors and connect more deeply with our neighboring communities.

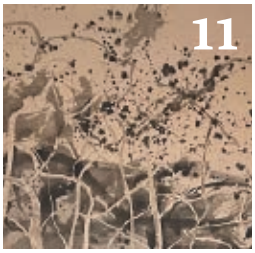
While addressing pandemic safety needs, the tent has also helped us imagine how we can improve the sense of arrival and welcoming for visitors across our 281 acres. The autumn debut of a new mobile visitor center—funded by the generosity of a supporter of the Arboretum and its mission—offers us the opportunity to build on the tent's success while providing more structure and versatility to our efforts.

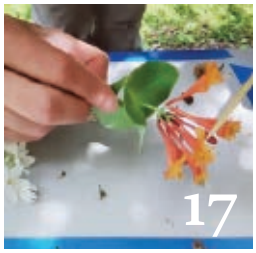
The mobile visitor center will soon become a familiar resource in our landscape, but its portability will allow for a broader reach. We aim to bring this new way of connecting with the community outside our gates, participating in city-wide events and travelling to neighborhoods across Boston. It will spark new opportunities to continue our public mission and to promote the Arboretum as a community resource for connecting with the natural world.

As America's oldest public arboretum and a vital link to nature in Boston, we cherish our long history of engaging thoughtfully and meaningfully with the public. While we're eager for conditions to allow us to safely resume the tradition of welcoming visitors in the Hunnewell Building Visitor Center, we're excited for the opportunities presented by the introduction of this new, mobile approach to connecting with the public. Look for us this fall at an Arboretum gate near you!

Silva

2021-22 FALL | WINTER MAGAZINE





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On the cover
Ginkgo biloba 'Akebone' 822-83*B by Jon Hetman.

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FROM THE DIRECTOR

Kathleen Dooher

Off view for more than a year due to pandemic distancing requirements, the Arboretum's beloved collection of dwarfed plants came back on view for visitors with the July reopening of the path around the bonsai pavilion. The collection thrives under the exacting care of staff in its outdoor display space near the Dana Greenhouses. Typically, the plants come out in early spring, and spend the winter months indoors in cold storage starting in mid to late November.

Andrew Gapinski

For the first fifty years of the Arnold Arboretum's existence, the primary scientific use of the living collection was advancing the field of plant taxonomy—or the classification of organisms to better understand the biological tree of life. This aligned well with Founding Director Charles Sprague Sargent's charge to stock the Arboretum with "all the trees [and] shrubs . . . either indigenous or exotic, which can be raised in the open air," and was facilitated further by the arrangement of the collections so that closely related plants were grouped for comparative study. Taxonomic studies at the Arboretum picked up steam by the early 1900s as Sargent sent staff and contract explorers around the world to bring its temperate trees, shrubs, and vines to grow, study, and classify here in Boston.

Plant exploration by the Arboretum continues to this day—and indeed, has intensified in recent years with our Campaign for the Living Collections—though now the emphasis has shifted from resolving evolutionary relationships to documenting, preserving, and investigating biodiversity in the face of imminent loss. Today the plants we curate and even the landscapes where they grow are studied by researchers across disciplines to learn how climate change and environmental degradation are affecting plants and ecosystems now—and to forecast challenges and opportunities yet to come. While Sargent likely never dreamed that the Arboretum's accessioned plants would be of great service to understanding the health and future of our planet, I am certain their continuing and evolving relevance would be both gratifying and not entirely surprising to such a visionary. His incredible tenure and the hard work of all who have continued our mission over the past century and a half compel us to ensure that the Arboretum continues to operate at the forefront of science and discovery.

This fall and winter the Arnold Arboretum stands at the threshold of celebrating 150 years of collecting and studying woody plants to advance our knowledge of biodiversity and the essential value of trees. As we look ahead, the Arboretum's capacity to protect plants and increase our understanding of climate change are among our most critical priorities. As a member, your generous support makes it possible for us to think expansively about how the Arboretum can continue to help humankind connect to science and the natural world both today and far into the future. It's an immense and humbling responsibility, but one this remarkable institution is uniquely designed, equipped, and prepared to confront with gusto.

—William (Ned) Friedman
Director of the Arnold Arboretum &
Arnold Professor of Organismic and Evolutionary Biology, Harvard University

Michael Dosmann

The vibrant purple flowers of New England blazing star bloom in August and September, attracting bees, butterflies, and other pollinators. Last spotted in the Arboretum and Suffolk County nearly ninty years ago, this native perennial of conservation concern is poised for a comeback in our region partly through efforts by the Arnold Arboretum and Zoo New England.

Doug McGrady

Return of an Old Friend

Restoring wild populations of New England blazing star in Boston

by Brendan Keegan, Arboretum Horticulturist

The Arnold Arboretum is dominated by trees and other woody plants that by and large originated elsewhere—primarily from wild, temperate habitats around the globe. But staff have historically preserved areas of the Arboretum landscape where native understory plants are encouraged to grow spontaneously and by design, and in recent years we have begun collecting and reintroducing herbaceous species that were once common on our grounds. Like our accessioned trees, these plants may be immediately familiar and plentiful in the wild, or threatened and quite rare.

One example of a species poised for a comeback in our landscape is New England blazing star, a plant reintroduced through a collaboration with Zoo New England. For the Arboretum, this species is significant to both history and conservation—the last confirmed wild population in all of Suffolk County was documented in our landscape almost 90 years ago.

New England blazing star (*Liatris novae-angliae*) is a regional endemic perennial in the aster family, found throughout the New England states as well as New York. It is the region's only native species of blazing star and is categorized as either rare or uncommon in every state it occurs naturally. Their beautiful, purple "star" flowers burst open in late summer and early fall, attracting a variety of pollinators including monarch butterflies.

For centuries, the sandy soils found along the coastline, barrens, and expansive fields surrounding Boston provided ample habitat for blazing star. As a disturbance adapted species, it was likely even more abundant during the pre-colonial times in which controlled burns were a common land management technique by indigenous peoples. However, blazing star populations across the state plummeted as habitat disruption and urbanization claimed more and more of the available land.

Arboretum botanist Ernest J. Palmer observed New England blazing star growing in the woodland near the maple collection in 1933, and created this voucher specimen for the Cultivated Herbarium. Part of his documentation of the spontaneous flora at the Arboretum, the voucher provides tangible evidence of the last confirmed sighting of the plant growing wild in Suffolk County.

Staff of the Arboretum and Zoo New England work together to plant New England blazing star in the understory of the beech collection, where the removal of trees suffering the effects of beech bark disease opened space in the understory for the establishment of a pollinator-friendly meadow environment.

Andrew Gapinski

Through a combination of research, robust documentation, and collegial teamwork, victories are attainable in the race to conserve and reintroduce threatened plants.

In Suffolk County, one place that blazing star held out was the Arnold Arboretum. During the early 1900s, the Arboretum's sandy soils and acres of open pasture—interspersed with newly planted trees—provided ample refuge. Even so, as the canopy developed overhead and competition increased with other vegetation on the ground, blazing star began disappearing in our landscape as well.

Most declining species fade without the dignity of acknowledgement. However, in 1933, Arboretum staff member Ernest Palmer observed New England blazing star growing in open woods near the present-day maple collection. Known for his extensive study and documentation of the Arboretum's spontaneous woody and herbaceous vegetation, Palmer preserved a section of the plant for the Arboretum's Herbarium of Cultivated Plants. Though he didn't know it at the time, Palmer had not only documented the last confirmed sighting of New England blazing star at the Arboretum, but also the last confirmed instance of the plant growing wild in all of Suffolk County.

Today, only one remnant wild population of New England blazing star remains in northeastern Massachusetts. Fortunately, Russ Hopping, Chief Ecologist for The Trustees of Reservations, collected seed from a population near Boxford, MA prior to its eventual disappearance. Dr. Bryan Windmiller and his staff at Zoo New England now use this wild-sourced seed to reintroduce the plant. Working under permit for the Massachusetts Division of Fisheries and Wildlife (MassWildlife), Zoo staff propagate seedlings and plant them in historically relevant sites across the state.

In fall 2020, the Arboretum began collaborating with the Zoo's blazing star conservation initiative. Our plant production staff at the Dana Greenhouses overwintered several hundred blazing star seedlings in our cold storage facilities and nurtured them throughout spring 2021. This helped the Zoo's Conservation Department cultivate many more specimens than would have been possible otherwise. In June, Zoo staff retrieved 80 plants for use at various field conservation sites. Meanwhile, the Arboretum retained 120 for our own reintroduction effort, and we plan to continue this collaboration with the Zoo in coming years.

The plants earmarked for our landscape were planted with both history and ecology in mind. Visitors can find several groupings in the mulched beds adjacent to Meadow Road, the pathway leading from Arborway Gate to the Bradley Rosaceous Garden. This is the closest

Andrew Gapinski

Seed collected by Russ Hopping of The Trustees of Reservations has been critical for the reintroduction of wild-origin populations of New England blazing star across the state. The Arboretum overwintered several hundered seedlings and nurtured them in the nurseries at the Dana Greenhouses through spring 2021, as seen at left. About 120 of these plants were transplanted at the Arboretum, including along Meadow Road not far from Palmer's 1933 collection.

suitable habitat to where Palmer collected his voucher nearly nine decades ago. Others were planted in the beech collection, an area staff are developing into a native plant and pollinator garden while new beech saplings await transplanting from our nurseries.

The reintroduction of New England blazing star at the Arboretum illustrates several important facets of plant conservation. First, this project underscores the value of diligent research and documentation. On a local scale, without Palmer's keen eye and subsequent herbarium voucher, we may never have known that New England blazing star once grew in our landscape. Broadening the scope statewide, ongoing work by Hopping, Windmiller, and MassWildlife ensure that Massachusetts' rare and endangered plants are well documented and thoughtfully preserved.

Another important factor is the value of institutional collaboration. Arboretum staff cooperate with conservation organizations, botanical gardens, arboreta, and individual botanists from around the world to study threatened and rare plants. Our work with Zoo England highlights the value of local ties, cooperating with like-minded institutions to boost populations of at-risk, wild-sourced species. Through a combination of research, robust documentation, and collegial teamwork, victories are attainable in the race to conserve and reintroduce threatened plants.

Finally, the reintroduction of New England blazing star highlights the value of public education for conservation. Visitors who stop to admire the blooms this fall might take a moment to reflect on biodiversity and the processes that cause wild populations to decline. Habitat disruption by humans was, and continues to be, the primary threat to plant and animal populations across our planet. However, as revealed by our efforts with blazing star, there is potential to assist at-risk species, reintroducing old friends for the benefit of people and wildlife alike.

Together for an Improved Local Ecology

Over the past year, the Arnold Arboretum and Zoo New England collaborated on several initiatives focusing on both plants and animals. These include the first ever aquatic wildlife survey of the Arboretum's ponds, which was led by Zoo scientist Dr. Matt Kamm in summer 2020; propagating wild origin New England blazing star for historic reintroductions at the Arboretum and throughout Massachusetts; trapping and relocating turtles prior to the recent trapping and relocatingpond during our 2021 dredging project (see story on page 13); and providing plant material for the Zoo's habitat restoration efforts for the threatened Blanding's Turtle.

These projects primarily involved staff from the Zoo's Field Conservation Department, led by Dr. Bryan Windmiller, collaborating with members of the Arboretum's horticulture team. Windmiller and his staff study and protect plants and animals throughout New England and internationally, beyond the walls of the zoo. They also engage in public education programming through classes, volunteer offerings, and most notably through their HATCH initiative in which school students across Massachusetts raise Blanding's turtle hatchlings in their classrooms.

Grace Burgin

INTO THE FOREGROUND

Let's Botanize invites a closer examination of plants on Instagram

by Jacob S. Suissa and Ben Goulet-Scott, PhD Candidates

To "botanize" is to spend time in any setting (from the city to the wilderness) with the specific intention of observing plant life. As two bonafide botany nerds, there are few things we would rather do than spend the day outdoors with a hand lens, a field guide, and a search image for anything green and leafy. In between our studies as Harvard University doctoral students based at the Arnold Arboretum, we often spend time on the weekends botanizing together in the Arboretum, Blue Hills Reservation, and other protected areas outside of the city. We've even been fortunate enough to study plants together in highly biodiverse areas of Panama and Brazil. No matter where we are, a stretch of trail that might take the average person 30 minutes to cover could easily occupy us for an entire afternoon. We never seem to run out of identification tips, new research questions, or evolutionary stories to exchange about the species we encounter. While walking through the Arboretum one weekend in 2020, we realized that we had the scientific training and media skills to share our enthusiasm for plants with the world. And so, *Let's Botanize* (@letsbotanize on Instagram) was born.

Often, plants are viewed as a green monolith, or simply the background to life. With *Let's Botanize*—an Instagram-based science communication series—our mission is to reveal the full morphological, ecological, and evolutionary diversity displayed across the plant kingdom. As gardening, outdoor recreation, and house-plant cultivation increase in popularity, we are creating a digestible entry point for a broad audience to indulge their curiosity about plant life and biology more generally. Given that plants are the biological foundation upon which almost every ecosystem is built, an appreciation for these organisms is crucial to understanding how life on this planet is sustained. By bringing plants into the foreground, we hope to inspire an awareness that we, as humans, are also participants (and impactful ones at that) in these complex and interdependent ecosystems.

As we created content for *Let's Botanize*, over time we realized that plant life is a much more effective substrate for teaching about ecology and evolution than we initially appreciated. For one, plants are plentiful and stationary, meaning it is easy to closely observe and interact with them in natural settings. Also, as the foundational organisms in most ecosystems, they provide ample opportunity for discussing ecological processes. Finally, most people are already familiar with the incredible variation expressed in plants that allows one to see how mutations arise and lead to evolution in real time. By linking complex phenomena to familiar species and patterns we can easily articulate deeper evolutionary and ecological concepts.

Since our first post in January 2021, we have grown our follower base to almost 2,000 people and reached a broad audience of over 20,000 from around the world. We aim to continue to improve and grow our presence as well as increase our capacity to make longer, more dynamic videos to increase our reach. We have already started collaborations with the Arnold Arboretum, the Harvard LabXchange, the Harvard Museum of Natural History, and the Botanical Society of America. These partnerships will increase our reach from the informal educational setting of Instagram to also include explicitly educational platforms.

In our own experience, learning about plants and our individual interconnectedness within ecosystems has enriched our lives. If our videos and other content can shift other peoples' perspectives, we have fulfilled our goals. As the conservationist Baba Dioum famously said, "In the end, we will conserve only what we love, we will love only what we understand, and we will understand only what we are taught." With *Let's Botanize*, we hope that as we share our passion for plants, we also inspire a deeper appreciation for the interconnectedness of life in hopes to inspire stewardship that will be necessary to ensure the future of Earth's ecosystems.

Among the many botanical topics addressed by Jacob and Ben since launching their *Let's Botanize* posts on Instagram are (clockwise from top left) flowers and their pollinators, spotlighted by Jeruselem artichoke (*Helianthus tuberosus*) and a carpenter bee; carnivorous plants like sundews (*Drosera rotundifolia*); lichens like *Usnea strigosa* growing on a buckeye tree; the diversity of orchids, such as our native New England species *Cypripedium acaule*; ferns and their leaves, illustrated by ostrich fern (*Matteucia struthiopteris*); and fruits and seeds, like those of the Korean spindle tree (*Euonymus oxyphyllus*). Join the fun and wonder by following @letsbotanize on Instagram.

All images by Jacob Suissa and Ben Goulet-Scott for *Let's Botanize*

A Shifting Climate

Interview with artist Lizi Brown

by Sheryl L. White, Coordinator of Visitor Engagement and Exhibitions

Artist Lizi Brown merges an unabashed simplicity with a draftsperson's expertise in works featured in her virtual show at the Arnold Arboretum, *Growth Spurts, Knobs, and Knuckles: An Environment of Trees* (July-October 2021). Brown achieves an affinity with her vision that is applied to her art, lending an often quirky yet always intimate essence to her chosen media of ink and paper. Initially Brown envisioned an installation as its own environment, a surround to bring her unique interpretation of Arboretum trees to each visitor who wandered into her created landscape. In this assembled environment, trees vibrate and twist, reach for the sky, or sink into the loam. Although current health guidelines necessitated a shift to a virtual exhibition, Brown's Environment of Trees still invites the online visitor to "wander" among her images and explore trees enduring a changing climate.

***Q:** You've said that as a child you enjoyed a creative environment, using paper, scissors, ink, and paint—the same elements we see in your art for this show! Can you talk a little about the actual process, its evolution, and how the landscape informs the media?*

I love working sustainably. My relationship is to the landscape, so my media are all non-toxic. I use a brown, heavy-weight contractor paper, which relates to the earth and the warmth of the wood. To work on the very long sheets, which allows this fabulous scale [up to eight feet in length], I built a hip-height table and can walk the length of the piece. My process is to start light using a spray bottle with water and ink, then layer up to dark. I found I could get dozens of tones from the naked paper all the way to black. When a darker black was needed, I used a latex paint and "double black"—the printer's term to hit again with paint or ink—saturating those areas and spanning the entire spectrum of light to deep dark. To create the lightest lines (see *February Sisters* at left) that reveal the paper's surface, I use stencils or tape to mask the shapes.

Growth Spurts, Knobs and Knuckles:

An Environment of Trees

At left, *February Sisters*, ink and paper, 91″ × 35″. At right, *Sprint*, ink and paper, 92″ × 35″. Both copyright 2021, Lizi Brown.

***Q:** Many or most of the trees you have depicted in your show are living specimens at the Arnold Arboretum. How did the Arboretum and its collections inspire you to develop these paintings?*

Trees affect where and how I live. The idea of a forest is important for my ability to live in the city. In the Arboretum, I have the time to "be with a tree in a safe place in the middle of the city." The dynamism, stature, even the gestures are caught in climate shifts and become part of my experience. There is a sense of scale—though not a natural landscape, you can experience the full personality of a tree, as well as marvel at non-natives you wouldn't see without travel.

***Q:** You teach beginning and advanced painting at the School of the Museum of Fine Arts (SMFA) at Tufts University. What do your students teach you?*

Teaching is great, it made me a better artist. I find I have a deeper understanding of mistakes when I observe students learning. I experience joy in discovering how creative they can be. They try things I wouldn't think of. During the pandemic I could focus more, so in fact, it was great for me. This was in contrast to the teens [students] who were crazed by it. During the year I learned how to make videos. I shot one on technique to make the work of making art accessible to my students. During COVID, some improved, the virtual aspect allowed them more privacy to take chances in their own space.

Working on these ink paintings is similar, the process is immediate and risky because of the fluidity of the medium. But I have courage and take a chance, jump in, and give it a try.

View the online exhibition ***Growth Spurts, Knobs and Knuckles: An Environment of Trees*** by Lizi Brown via **arboretum.harvard.edu/events**

Teaming Up for Wildlife

Partnering with Zoo New England to preserve turtles and other pond life

by Brendan Keegan, Arboretum Horticulturist

Danny Schissler

Among the most popular visitor destinations at the Arboretum are three man-made ponds—named for Arboretum historical figures Alfred Rehder, Charles Faxon, and Jackson Dawson—which lie adjacent to the Bradley Rosaceous Collection. This past summer, Faxon and Rehder Ponds underwent a massive restoration project. Using a floating barge, contractors removed thousands of square feet of sediment and debris, enlarging the ponds and increasing their capacity and value for storm water management.

Throughout the project, visitors asked about the potential harm caused to aquatic wildlife by the dredging equipment. Of particular concern were turtles, often seen in the water, along the banks, and even crossing the road. Fortunately, a conservation-focused collaboration with Zoo New England ensured that wildlife preservation was part of our planning from the beginning. Working together, we minimized harm to our aquatic organisms while learning more about them and their habitat.

Our wildlife preservation planning for Faxon and Rehder Ponds began last winter when Arboretum staff discussed proposals for our pond restoration project with experts with the zoo's Field Conservation Department. Department head Dr. Bryan Windmiller and ecologist Dr. Matt Kamm were particularly concerned about our resident turtles because the sediment targeted for removal serves as their hibernation habitat. Furthermore, unlike fish or frogs, turtles have limited capacity to move out of the way once dredging begins. To minimize risk to these animals, Windmiller and Kamm recommended delaying dredging until well after the hibernation period had passed, allowing us to remove as many turtles as possible from the targeted ponds with the time gained.

The first step was easy. We delayed dredging by several weeks, allowing the warm spring weather to coax the turtles from their torpor. The next step—trapping and temporarily relocating the animals—required significant effort. Windmiller and Kamm taught our staff how to install, monitor and remove turtles from floating funnel traps, and tutored us on how to safely carry the turtles to nearby Dawson Pond. They also recommended locations for barrier fencing and bucket traps to prevent relocated turtles from returning to the project sites once dredging got underway. Our staff waded into the ponds each morning to check and rebait the traps, document any turtles caught, and carefully move them to Dawson Pond. Our efforts benefited from baseline surveying work that Zoo New England conducted during summer 2020, in which 38 turtles were caught and given an identifying notch on their shells.

Ultimately, we removed over 80 turtles during six weeks of our daily monitoring activity. These included snapping turtles, painted turtles, and red-eared sliders ranging in size from two-inch hatchlings to a 28-pound snapper approaching 50 years in age. Many of these were the same individuals, caught multiple times as they attempted to return to their home territory or to migrate between ponds. However, at least ten of the turtles had not been previously documented by our colleagues at Zoo New England. This data point may indicate a healthy movement of turtles to and from the wet meadow located nearby.

In addition to turtles, trapped wildlife included American bullfrogs, American toads, and even a brown bullhead catfish. During the Zoo's 2020 surveying, a yellow-bellied slider, goldfish, koi, and several species of frogs were also tallied. This species composition reflects the cosmopolitan nature of our urban environment. As the ponds are man-

Danny Schissler

Arboretum horticulture and operations staff, including the author at left, were trained by personnel from Zoo New England to install, monitor, and remove turtles and other captured wildlife from traps placed in Rehder Pond (seen here) and across Meadow Road in Faxon Pond. Animals were removed daily from the traps and carefully moved to nearby Dawson Pond to await completion of the project.

Ultimately, we removed over 80 turtles during six weeks of our daily monitoring activity. These included snapping turtles, painted turtles, and red-eared sliders ranging in size from two-inch hatchlings to a 28-pound snapper approaching 50 years in age.

Andrew Gapinski

made, the organisms within them must have either migrated from nearby wetlands or been introduced. The snapping and painted turtles may well have come from the historic wet meadow, itself a former Atlantic white cedar bog. However, the goldfish, koi, and pond sliders likely originated from fish tanks elsewhere. After outgrowing their tanks (or their welcome), these animals were "freed" to our ponds, an unfortunately common urban practice that has long-term, detrimental impacts on local wildlife. Red-eared sliders, for example, grow much larger than our native painted turtles and outcompete them for feeding and basking territories.

Once dredging concluded, we removed the fencing, buckets, and traps and watched as the turtles resumed their migrations into our renovated ponds. Turtles have keen memories for location and the disturbance will not have gone unnoticed. To help patch up their habitat, we replanted damaged sections of shoreline with locally-sourced native plants. In addition, dead trees and branches were laid along the shoreline to serve as cover and basking locations while the vegetation re-establishes.

The project also offered an opportunity for us to help turtle conservation efforts championed by Zoo New England elsewhere in the state. Prior to dredging, Zoo and Arboretum staff took cuttings of swamp loosestrife (*Decodon verticillatus*) growing in Faxon and Rehder ponds. The Zoo used these cuttings for improving wetlands they manage for Blanding's turtles, a threatened species in Massachusetts. Swamp loosestrife provides valuable shelter for young Blanding's turtle hatchlings as they forage for food and hide from predators in the shrubby wetlands which this species prefers.

After a summer of heavy rain, the swelled banks of Rehder and Faxon Ponds attest to their value for stormwater management. Meanwhile, ongoing survey work will help determine how turtles and other wildlife adapt to the new conditions. As with the thousands of plants we grow and steward, we remain ever eager and committed to protect and learn more about them.

Wonder Spot: Healthy Ponds

Wonder Spots help families explore the Arboretum landscape through seasonal investigations about the natural world. Check out our Wonder Spot focused on Rehder and Faxon Ponds and the wildlife that live in them. Find signs in the landscape or explore online at home.

Find Wonder Spots at **arboretum.harvard.edu/visit**

The Arboretum Experience

American Repertory Theater creates live and digital experiences in the landscape

To experience the transformative power of nature in Boston, you need only enter one of the Arnold Arboretum's many gates and allow the biosphere to awaken the senses. Now the American Repertory Theater (A.R.T.) at Harvard University has teamed with the Arboretum to interpret and communicate that experience through the vocabulary of art and performance. This fall, the two institutions unveil the *The Arboretum Experience*, a free and collaboratively developed collection of audio plays, movement meditations, and live pop-up performances.

Highlighting themes of resilience, healing, wellness, and joy, *The Arboretum Experience* was designed to engage and reconnect visitors with the arts, with nature, and with one another amid the challenges and uncertainty of a global pandemic. "With the *The Arboretum Experience*, the team and I aimed to create an experience to honor what the world was—and what the world is still going through—as well as help us begin to come back," says project director Summer L. Williams.

The core creative team behind the project includes Williams, playwright Kirsten Greenidge, musician Tim Hall, and choreographer Jill Johnson. Four audio plays set in the Arboretum landscape were created under the leadership of Greenidge with a team of playwrights including M. J. Kaufman, Melinda Lopez, Sam Marks, and Mwalim *7. Inspired by the traditions of fairytales, proverbs, ghost stories, and myths, these 40-45 minute plays weave narratives of personal experience and sensitivity with our innate human need to connect with the outdoors and other living things.

Visitors can access the plays by using the camera on their mobile device to scan QR codes on event signs posted at Arboretum gates. Additional QR codes connect users to guided and interactive "movement meditations" designed by A.R.T. dance artists to activate visitors' bodies, breath, and imagination as they engage physically with nature. "The meditations aim to invite visitors to slow down, commune with nature, and connect to their bodies in open-ended ways," says Johnson. "Our hope is that these offerings are responsive, restorative, and care-filled experiences that inspire visitors to return to the Arboretum for soul sustenance and well-being again and again."

Live, pop-up performances in our landscape with local artists are also planned this autumn for in-person

American Repertory Theater

Members of the creative team behind *The Arboretum Experience* share a moment together in Explorers Garden on Bussey Hill during rehearsals. Pictured left to right are multi-media artist Daniel Callahan, musician Tim Hall, director Summer L. Williams, choreographer Jill Johnson, and playwright Kirsten Greenidge.

engagement with A.R.T. artists beginning Saturdays in September. The combination of recorded and live-performance aspects of *The Arboretum Experience* invites both personal reflection on its universal themes as well as a deeper appreciation of how nature unites us as a community—and indeed as a species. "The most exciting thing has been to think about those who will stumble upon this incredibly wide-ranging experience and see themselves in it," explains Williams. "The people who will maybe connect a little more with others after having walked in their shoes."

Like the Arboretum itself, *The Arboretum Experience* aspires to bring people together to consider the essential value and meaning of nature and imagine collective pathways forward in connecting humans and their environment. "As artists interpret nature and create novel insights," suggests Arboretum Director William (Ned) Friedman, "botanists and horticulturalists can help infuse meaning into artistic endeavors. In every case, the interplay between the creative arts and the landscape and plants of the Arboretum allows us to reveal new insights into our shared and individual experiences and our connection to the natural world."

Hands-On in the Virtual Realm

Digital programming sustains the power of nature study for remote learners

Using live specimens, document cameras, and video, Arboretum educators created ten Interactive Virtual Learning modules for remote nature study for Boston Public School classrooms. Above, Nature Education Specialist Ana Maria Caballero spotlights the parts of a trumpet vine (*Campsis radicans*) flower.

by Ana Maria Caballero, Nature Education Specialist

Our Field Study Experiences programs bring elementary students in grades Pre-K through 5 out of the classroom and into nature, guiding them in hands-on study of life science in our landscape. When schools closed in March 2020 due to the COVID-19 pandemic, the Arboretum followed suit, cancelling all in-person programs for Spring 2020 and the entire 2020-21 school year. Despite this, our longstanding commitment to students and teachers in Boston Public Schools never wavered. We sprang into action to create ten Interactive Virtual Learning modules which we "delivered" online to 132 classes in 27 schools with 83 teachers. Using live specimens, document cameras, video, sound, and photography, we brought nature to students in a safe, equitable, personal way—while expanding our capacity and increasing opportunities for learning through the winter.

Similarly, we replicated our formula in Field Study Experiences of small adult-to-child ratios and practical interaction to introduce a new remote program, Digital Nature Buddies. With the help of fourteen of our volunteer guides, we led groups of five to nine students throughout the fall, winter, and spring. By working together over the course of four sessions, students fostered trust and esteem with their Arboretum "nature buddy." In all, twenty-two teachers from eleven schools signed on for our sessions covering nine topics. According to teachers, students still remembered their "buddies" long after their sessions ended, asking "When will we see them again?"

We designed both virtual programs to capitalize on how children learn best—through their senses and language mediation. In a session on evergreen leaves, students view and describe a variety of examples, and sketch close-up images of scale-shaped arborvitae leaves. Another on cones

We are reaching more students and families in Boston and beyond in ways we never imagined before the extraordinary conditions of the past year and a half.

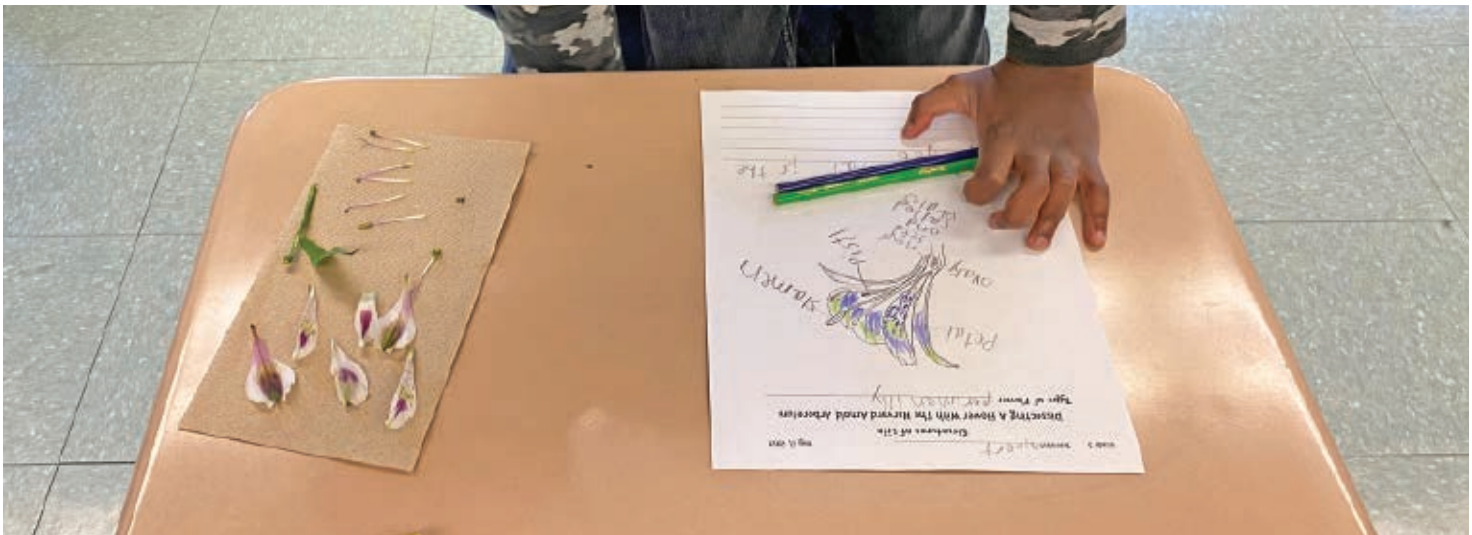
Digital Nature Buddies connected Boston Public School students in classrooms and at home with Arboretum educators for hands-on learning in the virtual space. At left, a student uses a hand lens to view and draw an Peruvian lily (*Alstroemeria* spp.) flower, and label its dissected floral structures (below).

encourages students to take cones apart to locate the seeds inside, and features time-lapse videos of cones opening and closing in dry and wet weather. For a session on flowers and pollination, students dissect flowers alongside a virtual guide and document their scientific discoveries.

The potent combination of caring adults and carefully curated slides—along with a detailed plan and a sense of humor—allowed us to continue connecting with our students in relevant and meaningful ways. Throughout our remote programs, children expressed wonder, asked questions, provided evidence to support their answers, and formed hypotheses about natural phenomenon—all scientific practices that underpin the successful approach of our Field Study Experiences. Like our in-person programs, the lessons also encourage children to go outside, duplicate experiments they viewed digitally, and discover more on their own.

Looking ahead, our learning programs for children will be enhanced by these experiments in virtual teaching. Our volunteer guides have expressed interest in continuing to share nature with Boston schoolchildren beyond the usual fall and spring seasons of our flagship Field Study Experiences. In addition, we have expanded content for a virtual program called 30-Minute Nature featuring downloadable Google slides and extensive teacher notes. By sharing this and other content on the Arboretum website, we are reaching more students and families in Boston and beyond in ways we never imagined before the extraordinary conditions of the past year and a half.

Far from the washout we may have anticipated, the energy and innovation marshaled to confront the challenges of a global pandemic resulted in a banner year for our important work with Boston Public Schools students and teachers. More than 5,300 students and their teachers from thirty schools directly benefited from the coordinated efforts of Arboretum staff and volunteers—a 150% increase over previous years. Many others have benefited from the online resources we make available to anyone desiring to share nature with children. While we look forward to when classrooms may be welcomed back into our landscape for in-person learning, the remarkable opportunities sparked by "going virtual" are likely here to stay.



150 and Growing

Jon Hetman

Celebrating the sesquicentennial year of the Arnold Arboretum

by Jon Hetman, Associate Director of External Relations and Communications

The year 2022 heralds our observance of one hundred and fifty years since the birth of the Arnold Arboretum. Our sesquicentennial offers a unique opportunity to celebrate our illustrious past and help define and amplify what it means to be a twenty-first century arboretum in service to science and humankind.

When the Arnold Arboretum came into being in 1872, nothing quite like it had been conceived in America. Founding Director Charles Sprague Sargent set out to create a synoptic "living collection" of the world's temperate woody plants, enlisting pioneering architect Frederick Law Olmsted to lay out the Arboretum in the naturalistic style he had popularized with his design of New York's Central Park more than a decade earlier. Though a true believer in the scientific merits of a botanical collection, Sargent was also a gardener who appreciated the formal and picturesque aspects of plants. Olmsted rose to the challenge, creating a masterwork of organic beauty that respects science as well as scenery. The Arnold Arboretum remains one of his most loved and best-preserved landscapes.

But what makes the Arboretum truly stand apart from its peer institutions, both in the past and today, is the fact that it welcomes everyone to partake of its wonders as an open civic space, free to all who enter. The agreement Harvard forged with the City of Boston in 1882 gave nearly all the land occupied by the Arboretum to the City so it could be enjoyed in perpetuity by its citizens. Urged by Olmsted—himself a vocal proponent of commons and public parkland as testing grounds for democracy and urban fellowship—and championed by Sargent, this landmark deal secured our landscape as public resource for a possible 2,000 years. It also ensured that the Arboretum and the public would foster a mutually enriching and enduring bond across many generations.

As we look to the future, this milestone offers a peak opportunity to foster deeper connections with our community and to renew our historical commitment to both biodiversity and human diversity for the next

100 years. First, we aspire to reaffirm our founding public promise as a free and open resource for public health and learning, championing radical accessibility to our landscape and working toward environmental justice in our landscape. Secondly, we will continue to use our collections, expertise, and scholarship to contribute meaningfully to global efforts to fight climate change and preserve biodiversity. Finally, as we acknowledge and amplify how far the Arboretum has come, we will redouble efforts to deepen the world's understanding of nature and elevate the relevance of the Arboretum and its mission to the next generation.

The sesquicentennial of the Arnold Arboretum marks a time of celebration for the gift that this landscape and its botanical riches provide to all of us as individuals, as a community, and as a species. The Arboretum belongs to everyone and its benefits are universal, so a salutation of its long history and promising future is truly everybody's celebration. The year ahead will be highlighted by moments of festivity and community. Public events are planned for each season including music and theater performances, interactive experiences in the landscape, and spotlight events focused on the seasonality and diversity of our collections. Annual events—such as Lilac Sunday and the Director's Lecture Series—will be specially designed to reflect the sesquicentennial observance. We also plan to share stories of our mutual, human connection to this special landscape. Emphasizing joy and renewal, our activities throughout 2022 will highlight the Arboretum's essential role in sharing nature with the public.

We hope you will join us over the coming year in celebrating the special relationship the Arnold Arboretum has fostered with the people of Boston, with scientists across many disciplines, and with tree and nature enthusiasts everywhere.

Jon Hetman

Planned Giving

An Enduring Connection

James Arnold Society Members Roberta Apfel and Bennett Simon

When Dr. Roberta (Robbie) Apfel and her husband Dr. Bennett Simon contemplated retirement in the late 1990s, Jamaica Plain and the Arnold Arboretum beckoned. Though they had visited often for years, a burgeoning interest in plants and nature made our landscape an increasingly personal and enriching destination. "It felt like this was a chance to learn more about the Arboretum and get to know it better," Robbie recalls.

As a teacher, Robbie was invigorated by the opportunities presented by the Arboretum's volunteer programs, first training as a docent tour guide and later joining the corps of volunteer guides who facilitate the Field Study Experiences for elementary students in Boston Public Schools. As a docent, Robbie's tours have mirrored her own growing knowledge of the plant kingdom, from her fascination for conifers ("Conifers in Winter") and dwarfed plants ("Bonsai Matching") to researching trees as cultural and literary touchstones ("Trees Inspire"). "I love giving tours because I like meeting new people," she says. It's a great way to share, we end up learning so much from each other."

After more than twenty years as members, Robbie and Bennett express astonishment at how much the Arboretum has contributed to their own sense of nature and world. "The Arboretum has been such a great place for us," she continues, "there's always something new to discover. It's a constant delight and always a learning experience when we're here." Bennett agrees, noting that the Arboretum's work aligned with their shared concern over our rapidly changing world. "Being involved with the Arboretum," he says, "has transformed our view of ecology and the environment—it's really been an eye-opener for us to climate issues."

Jon Hetman

"That connects with our wish to support the Arboretum," says Robbie. "We are very concerned about what's happening with climate change and the loss of biodiversity, and the Arboretum is working to combat that on so many levels." Thinking of the Arboretum's future, Robbie and Bennett set up a charitable gift annuity that provides them income while promising a legacy to benefit the Arboretum and its critical work. "It's gratifying to have commitments and to make investments in the places we think are important," says Bennett. "This is a place we care about."

With the establishment of their gift annuity for the Arboretum, Robbie and Bennett are recognized as members of the James Arnold Society for Planned Giving. If you too are inspired by the potential to invest in the future of the Arboretum through your estate planning or seek help with bequest language or giving options, please contact Jon Hetman, Associate Director of External Relations and Communications, at jon_hetman@harvard.edu or call 617.384.5763.

From the Collections

Golden Larches NEVER DISAPPOINT

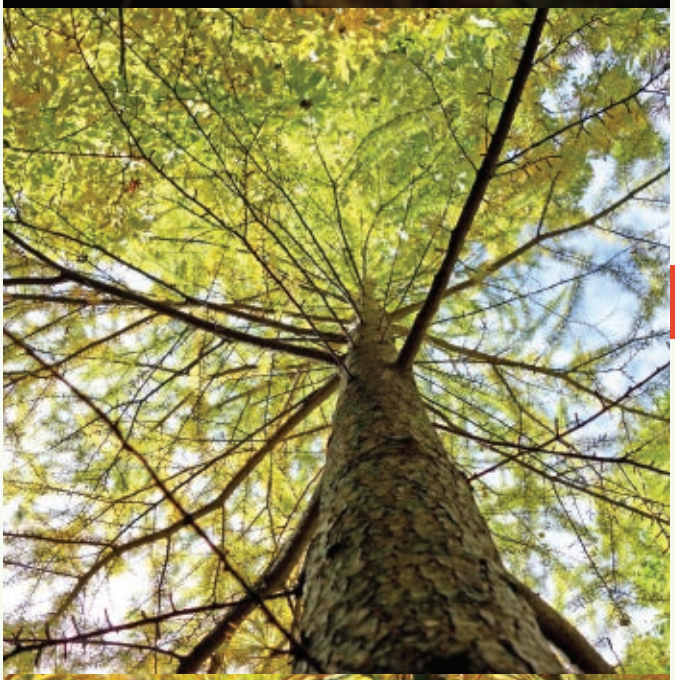
by William (Ned) Friedman, Director

Every fall, one of the highlights on the grounds of the Arnold Arboretum is our magnificent collection of twenty golden larch trees (*Pseudolarix amabilis*). These fall stunners can be found at three different sites in the collections: a beautiful old grove anchored by specimens going back to the late nineteenth and early twentieth centuries in the conifer collection near the Walter Street Gate; a much younger grouping on Peters Hill, collected in the wild from China's Zhejiang Province in 1994; and a lone tree (why no conspecific company?) growing on the back side of Bussey Hill, just off Beech Path.

The golden larch is the sole extant species in its genus (*Pseudolarix*). One can hardly be faulted, with a name like that, for thinking it is closely related to the larches (genus *Larix*)—especially since larches and golden larches are both deciduous conifers that turn color and drop their needles (leaves) every fall. However, nothing could be further from the truth. Recent research shows that the golden larch is most closely related to (evergreen) hemlocks, and the larches are most closely related to (evergreen) Douglas firs. Hence the evolution of deciduousness in golden larches and larches occurred separately and represents an instance of convergent evolution.

Over the years, my regular fall pilgrimages to the golden larch trees at the Arboretum have always been a high point of the transition to winter. As the short days and cool nights of early November work their magic on the species, I recommend a visit to the golden larches in each of their three locations at the Arboretum. The grouping on the south-facing slope of Peters Hill near the Mendum Street Gate provides a perfect backdrop to the adjacent collection of ginkgoes. Late in the day, a few flecks of sun sneak through the surrounding canopy and light up individual short shoots against a dark background (59-89*K; top image). The lone golden larch growing on Bussey Hill (59-89*N; center image) rises majestically to the sky, and shines like a beacon among adjacent trees on a crisp sunny day. And be sure to spend some time admiring the mature grove of golden larches standing together next to Bussey Brook (59-89*H; bottom image) while at the height of their glorious peak of fall color.

Sign-up to receive Ned Friedman's **Posts from the Collections** by email from our homepage at **arboretum.harvard.edu** or follow **@nedfriedman** on Instagram.



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Ready, Responsive, Resilient

ARNOLD ARBORETUM
MEMBERS make a difference

As unexpected and extreme weather events tied to climate change increasingly affect our landscape and plants, the Arboretum requires a reliable stream of funding to address damage and impacts, preserve public safety, and ensure the integrity and continuity of our collections. ***Your membership and donor support*** provide the essential resources we need to ensure that whatever challenges nature has in store, we are prepared and positioned to meet them head on.

THANK YOU FOR YOUR COMMITMENT TO OUR FUTURE.

The ARNOLD ARBORETUM of HARVARD UNIVERSITY