Beginning August 11, the Arnold Arboretum and four additional parks in Boston’s Emerald Necklace provide beautiful and evocative settings for climate-responsive “fog sculptures” by artist Fujiko Nakaya, part of celebrations for the twentieth anniversary of the Emerald Necklace Conservancy (see more on page 4). Calling fog “the most generous medium” for creating art, Nakaya has collaborated for decades with artists, musicians, designers, and more to transform her fog sculptures into “fog performances.” In this spirit, the Arnold Arboretum offers a number of special performances this fall in conjunction with Fog × Hill, Nakaya’s installation on the hillside next to the Hunnewell Building. **All events are free**

### Flow Through
**Saturday, September 22 (rain date Sept. 23): 4:30pm, 5:30pm, 6:30pm, Fog × Hill**
Maria Finkelmeier and the Kadence Ensemble will perform *Flow Through*, Finkelmeier’s composition for large ensemble in an outdoor setting. Featuring thirty performers (brass players, singers, and percussionists), the work is inspired by the fluidity and importance of water to living organisms. The musicians will mingle music with Nakaya’s fog as both descend the hillside and flow among the trees and the audience.

### Music for Atmosphere and Ground
**Sunday, October 7, 4:00pm and 5:00pm, Fog × Hill**
*Music for Atmosphere and Ground* will be presented by composer, pianist, and multi-instrumentalist Ben Cosgrove. Cosgrove will improvise a musical complement to landscape and create a live soundtrack for Fog × Hill that is as fluid, impermanent, and ethereal as the fog moving across it. Ben’s compositions are guided by his deep interests in landscape and ecology.

### Macbeth
**Sunday, October 21, 5:00pm, Fog × Hill**
Witches, blood, political ambition, tragedy—what do they look like? All will be revealed in the fog, or will it? Award winning, professional theater company Actors’ Shakespeare Project (ASP) brings *Macbeth* to the Arnold Arboretum and Fog × Hill. ASP explores Shakespeare’s plays through productions that are informed by the spaces in which they happen. **Co-sponsored by Harvard University Committee on the Arts (HUCA).**

### Songs in the Fog
**Saturday, October 27, 4:00pm and 5:00pm, Fog × Hill**
Returning performer Shinja Choi will sing a selection of songs in the fog for the final days of the Arboretum’s Fog × Hill. A lyric soprano, Choi has performed operas and oratorios with orchestras in Korea, Japan, the United States, and Germany and won competitions in the United States, Austria, and Japan.

### Kids × Fog: Family Drop-ins
Discover Fog × Hill with kids in four family drop-in activities. See details online at [my.arboretum.harvard.edu](http://my.arboretum.harvard.edu)

- **Fog Fall, Rain Fall**
  Sunday, September 9, 10:00–11:00am (ages 3-8)

- **Hydrophobic Lab**
  Saturday, September 15, 2:00–4:00pm (ages 8 and up)

- **Story Time and Hide and Seek**
  Saturday, October 6, 10:00–11:00am (ages 3-8)

- **Engineering in the Fog**
  Sunday, October 28, 2:00–4:00pm (ages 8 and up)

### Help bring the arts to the Arnold Arboretum this autumn!
As a landscape accessible to all without cost, the Arboretum aspires to present these events FREE to the public. Please help make this possible by making a gift today. Click DONATE at the top of the Arboretum homepage to access our online donation form, and designate "Artist in Residence Fund" for your gift. Thank you for your support of the Arboretum as a community resource for arts and culture in Boston!
From the Director

One of the things that sets the Arnold Arboretum apart as a botanical and horticultural collection is the historical significance of its landscape, designed by pioneering American landscape architect Frederick Law Olmsted and considered today among his best preserved works. The thoughtful stewardship of Olmsted’s remarkable handiwork has long been an institutional priority, one that has come into even sharper focus as we prepare to celebrate the 150th anniversary of the institution’s founding in 2022. Whether restoring viewsheds through pruning or strategic removals of non-accessioned material (or occasionally, accessioned plants that are problematic or in decline), creating mulched paths that invite visitors deeper into the collections, or planting meadow habitats that decrease mowing emissions and promote biodiversity, we remain fully committed to keeping Olmsted’s vision of an urban wilderness thriving at the Arboretum.

Fortunately for Boston, we are not alone in our devotion. For the past two decades, the Emerald Necklace Conservancy has worked tirelessly to restore, reconnect, and promote the public’s knowledge and enjoyment of the chain of parks Olmsted designed between the Riverway and the Arborway. To celebrate its twentieth anniversary, the Conservancy commissioned Japanese artist Fujiko Nakaya to bring her signature “fog art” to the Emerald Necklace, and the Arnold Arboretum was selected as one of five locations to host an installation—part of the artist’s first city-wide exhibition, Fog × FLO. You’ll learn more about the piece Nakaya created for the Arboretum in this issue of Silva, as well as some special events scheduled to mingle fog and performance in our landscape (see previous page). Come to see the fog, but stick around to experience the Arboretum in full late summer and autumn splendor. From Arnoldia Associate Editor Jonathan Damery waxing poetic about oaks and acorns from the living collections, to Gardener Brendan Keegan’s efforts to house and track birds that nest on our grounds, to the research on fascinating Dutchman’s pipes (Aristolochia spp.) by our Deland Awardee Harold Suárez-Baron, this issue is your passport to take a deeper dive into the plants and landscape of the Arnold Arboretum.

As we observe the end of one growing season and await the beginning of another, I invite you to visit and explore the fine and enduring legacy of Frederick Law Olmsted, as well as the work of generations of plant explorers, horticulturists, arborists, propagators, curators, scholars, and more who have made the Arnold Arboretum such an irreplaceable jewel in the Emerald Necklace. What Olmsted understood so long ago still holds true today, and perhaps even more so: human beings need to stay connected on every level with nature. This fall and winter, I hope you’ll follow in his footsteps.

—William (Ned) Friedman, Director of the Arnold Arboretum & Arnold Professor of Organismic and Evolutionary Biology, Harvard University
Consider the cleverness of an acorn. I’m thinking particularly of those proliferating this year on a large black oak (Quercus velutina, accession 16893*A) stretching above the Arboretum’s Oak Path. The flowers that precede these acorns are so missable that even The Flora of North America treatment of the black oak, which describes twigs and leaves in precise and intricate detail (“terminal buds ovoid or ellipsoid to subconic”), says nothing more than “flowering spring” to indicate the abundance of catkins, streaming beneath the emerging leaves. Black oaks—and oaks in general—produce ample pollen, which wafts about on currents of wind. The flowers are simply numerous, rather than sweet or showy. Insects and other creatures need not care. Yet come fall, when acorns begin plummeting to the ground with muted (though sometimes head-endangering) thunks, the whole display seems choreographed for attention.

The cleverness of the acorn is that, like chestnuts (Castanea) and hazelnuts (Corylus) and other classic nut-like fruits (I say nut-like because walnuts and hickories—Juglans and Carya, respectively—are technically drupes, not nuts), the acorn wagers a risky reproductive gamble. Acorns are hefty and, to state the obvious, don’t fall far from the tree. Instead they must be hauled around by squirrels and other animals. Water wouldn’t provide this service, and neither would wind. But unlike a cherry or an apple, the acorn plays this game of attraction with the seed itself—the carbohydrate- and lipid-rich embryo—rather than a bright and sugary wrapper. Someone could eat a cherry and still propagate a seedling from the pit, whereas all hopes for an acorn end at the mouth. Nut dispersal is like handing a known criminal cash for depositing in an out-of-town bank. It seems foolhardy, yet given that oaks number among the dominant overstory species in eastern North American forests, the account balance shows little evidence of suffering.

I mention the particular black oak at the Arboretum because, on a recent late-summer afternoon, I observed tattered shrapnel of numerous acorns lying beneath its canopy. Black oak acorns are generally wider than tall and somewhat resemble Help!-era Beatles cartoons, with the mop-top hairdos (technically called cupules) wrapping down and over the eyes. Yet on closer examination, almost all of the acorns on the ground had been scrutinized already, evidenced by missing chunks and tooth marks tearing into the cupules. Gray squirrels (Sciurus carolinensis) begin working over the canopy of oaks and other nut trees at the Arboretum in early summer, seeming to tend the ballooning fruits with the same watchful care as a gardener who monitors blushing tomatoes. Walnuts, for instance, attempt to deter premature snacking by packing bitter tannins into the outer husk, but in early July, I watched as squirrels rummaged noisily among the branches of a large Chinese walnut (Juglans cathayensis, accession 807-52*C) at the Arboretum, gnawing holes in the fruit husks, as though checking whether the meat inside was developing, and showering the ground with green crumbs. Similarly, acorn cupules cover the immature seeds entirely to start and are eventually outgrown by the mature fruit—an effort to protect against over-eagerness among animal partners before the acorns possess the requisite resources to germinate.

While common usage of the term “nut” often refers to any hard-walled, edible kernel, the fruits of walnuts (including Texas walnut, Juglans microcarpa 10574*B, left) and hickories (like shagbark hickory, Carya ovata 228688*N, right) are actually drupes. True nuts like chestnuts (Castanea), hazelnuts (Corylus), and the acorns of oaks (Quercus) are simple dry fruits in which the ovary wall becomes increasingly hard as it matures, and where the seed remains unattached or free within the ovary wall.
The Arnold Arboretum living collection includes more than 1,100 oaks, comprising 857 accessions, 49 species, 11 infraspecific taxa, 24 hybrids, and 7 cultivars. Among North American native oaks, the Arboretum has large holdings of white oak (*Quercus alba*), northern red oak (*Quercus rubra*), scarlet oak (*Quercus coccinea*), and as seen here, black oak (*Quercus velutina*). Photo by William (Ned) Friedman.
I first wondered whether the squirrels had discarded these black oak acorns because the fruits were rotten or riddled with insect larvae. (I had recently read a research paper from 1930, amusingly titled “Rejection of Wormy Nuts by Squirrels,” which recounted observations at a city park in Columbus, Ohio, where squirrels were tested on their relatively accurate ability to determine whether nut-like fruits were, indeed, infested.) But I managed to open a number of the discarded acorns with my thumbnail and determined that all the seeds appeared to be sound. The internal embryo was full and luminous as a harvest moon, and although my search was far from comprehensive, I didn’t encounter a single acorn with obvious larval traces.

Black oaks—*Quercus velutina* and also many relatives in *Quercus* sect. Lobotae, a group of species collectively (and somewhat confusingly) known as the black oaks—have another strategy for mitigating animal appetites: high concentrations of tannins in the embryo. This might explain the discarded acorns. Numerous researchers over the past fifty years have shown that tannins inhibit digestion among many nut-dispersing animal species, causing an inability to sustain body weight on a complete diet of these fruits. Yet because most members of the black oak subgroup do not germinate until the spring, unlike most species in the white oaks (*Quercus* sect. *Quercus*), these tannin-rich acorns are, nevertheless, worth storing for midwinter survival. (White oaks, while more palatable and less tannin-laden, seem intent on outracing the animal counterparts by drawing on internal nutrients to establish a root almost immediately after touching ground in the fall.) I think economic game theorists would have a heyday with the assortment of attraction and deterrence practices among oak species—a web of deception and cunningness, which appears even more complex once factoring weevils and other insect pests into the ecological equation.

Paleobotanists have discovered that many of the classic plants with nut-like fruits evolved from wind-dispersed ancestors. In the walnut family (*Juglandaceae*), for instance, our exemplary specimen of Rehder wingnut (*Pterocarya × rehdoriana*, accession 1191*D*), located in the back corner of the hickory collection, produces much smaller nutlets that flutter about on two outstretched wings. Birches (*Betula*) are close relatives of hazelnuts and yield even smaller wind-dispersed seeds. Yet the massive stores of lipids, proteins, and carbohydrates within the larger nut-like fruits (the exact ratio varies depending on the species) are not for the creatures alone. Rather seedlings draw on these same nutrient reserves in order to germinate and establish in competitive environments: think of the dense understory of an Appalachian woodland, where black oak seedlings can produce numerous leaves before exhausting their internal supplies, and a similar advantage holds true in dry near-desert environments in Mexico, where shrubby oak species occur with considerable diversity. Even if most nuts are fated for animal consumption—a good case of what ecologists call mutualism—the forgotten few are well provisioned to survive.

At the Arboretum, the highest concentration of oak species occupies the slope north of Valley Road—sandwiched between walnuts and beeches (*Fagus*). You can learn more about the
genus at a Collections Up Close event on September 30 (see page 19). When you visit, be sure to take time to watch as squirrels and other animals do their work. Observe them examining the husks of walnuts and hickories for wormy holes, tossing the bad fruits aside. See them scamper away to bury acorns. Squirrels are known as “scatter hoarders,” which means that they generally hide the fruits in isolated locations, carefully obscuring the burials to evade detection. Studies have shown that individual squirrels can bury well over two-thousand fruits each season, but in an incredible feat of mnemonic recall, they generally recover most of what has been buried. As you observe this evolutionary partnership between animal and plant, consider the great game of chance: the odds that one acorn might be forgotten and grow.
Of Fog and Frederick

Fog × FLO Exhibition brings Fujiko Nakaya’s atmospheric art to the Arboretum

Jon Hetman, Associate Director of External Relations and Communications

Pioneering landscape architect Frederick Law Olmsted and Founding Director Charles Sprague Sargent designed the Arnold Arboretum as a work of art—a beautiful and naturalistic tapestry of rolling landscape and winding pathways created to showcase one of the world’s finest collections of living trees, shrubs, and vines. Walking through the landscape elicits one delight after another, as piquant combinations of colors and textures meld with the sounds, scents, and atmosphere of nature. For more than a century, the bucolic masterpiece Olmsted and Sargent brought to life has inspired many to create artworks of their own that reflect upon and respond to its transformational allure. Now, one artist has created a work for the Arboretum that speaks with nature in its own vocabulary.

As summer transitions to autumn, look for billowing plumes of intermittent fog to envelope the landscape near the Hunnewell Building, beckoning you to immerse yourself in its beautiful, evocative, and ephemeral mist. From August 11 through October 31, visitors to the Arnold Arboretum and four additional parks in Boston’s Emerald Necklace will experience some of Frederick Law Olmsted’s most beloved urban landscapes transfigured by site-specific, climate-responsive installations of pure water vapor created by Japanese artist Fujiko Nakaya. Just as the Arboretum and its sister parks in the Emerald Necklace may at first appear as “nature untouched,” Nakaya’s “fog sculptures” for Boston reflect on the legacy of Frederick Law Olmsted, harnessing the beauty, vitality, and transformational qualities of water in Olmsted’s Emerald Necklace landscapes, including the Arnold Arboretum.

Fujiko Nakaya (right) first exhibited one of her signature installations at the 1970 World Exposition in Osaka, becoming the first artist to create a sculptural fog environment. Her exhibition marking the Emerald Necklace Conservancy’s twentieth anniversary, Fog × FLO, was organized by curator Jen Mergel (left). Nakaya’s "fog sculptures" for Boston reflect on the legacy of Frederick Law Olmsted, harnessing the beauty, vitality, and transformational qualities of water in Olmsted’s Emerald Necklace landscapes, including the Arnold Arboretum.

The first city-wide exhibition in the artist’s fifty-year career, Fog × FLO: Fujiko Nakaya on the Emerald Necklace was commissioned to honor the twentieth anniversary of the Emerald Necklace Conservancy—a private, non-profit stewardship organization founded to maintain, restore, and protect Olmsted’s titular chain of Boston parks. Organized by Boston-based guest curator Jen Mergel, the exhibition places five of Nakaya’s “fog sculptures” in conversation with five of Olmsted’s historical landscapes: the Arnold Arboretum, Franklin Park, Jamaica Pond, Olmsted Park, and the Fens. The shape-shifting, cloud-like forms of fog generated by her works delight the senses and harmonize with Olmsted’s naturalistic constructions. More so, as technical installations comprising high-pressure water nozzles, electric generators, and computerized controls, the works also acknowledge Olmsted’s engineering genius of preserving the integrity of natural systems and hydrology in his parks.
At the Arboretum, Nakaya created Fog × Hill on the hillside adjacent to the Hunnewell Building, stringing a series of her patented nozzles in midair between two massive accessioned conifers, an eastern white pine (*Pinus strobus* 50-2014*A*) and a Carolina hemlock (*Tsuga caroliniana* 19447*F*). The fog created between the two trees floats down the hillside to mingle among the magnolias planted below in a waterfall effect, or what Nakaya calls a “fog fall.” The vapor rhythmically gathers and dissipates in shifting air currents and natural light, enveloping the trees and shrubs gracing the hillside and inviting visitors to interact with it in a familiar, yet awe-inspiring experience.

Part of her creative process involves spending time getting to know the physical spaces that will host her sculptures, including researching climatic conditions and observing the interplay of trees and topography. “Professor Friedman [Arboretum Director William (Ned) Friedman] took me all around the Arboretum,” Nakaya said of her visit to Boston last winter. “He explained the life history of each tree, each plant in the Arboretum with passion.” After first considering a spot in the Arboretum’s conifer collection, Nakaya selected the sunny field next to the Hunnewell Building Visitor Center, envisioning the delight of children who gather there to run and play. “I thought fog can make this spot a place of extraordinary experience,” she said. “Not a spectacle, but a place of deeper inner emotions. Fog will transform instantaneously an ordinary, everyday spot into an elusive time and space.”

Calling fog “the most generous of mediums” as an art form, Nakaya has a long history of collaborating with musicians, dancers, light and performance artists, and more to catalyze the aesthetic possibilities that her installations evoke. With this in mind, the Arboretum has partnered with a number of artists and art organizations to present free “fog performances” in conjunction with Fog × Hill during the run of the exhibition, including solo and ensemble music performances, family drop-in activities, and even highlights from Shakespeare’s *Macbeth* (see full program on the inside front cover). With dynamic and ethereal fog as both setting and inspiration, Nakaya’s work offers a highly visible platform for artists of diverse fields to experiment, create, and debut their own original art for the public.

Performance seems perfectly suited as a complement to Nakaya’s art. Part of the beauty of the Arboretum installation and the other works comprising the Fog × FLO exhibition is the singularity of the experience, as the topography of each site and the ever-changing conditions of light, weather, and wind make each occurrence of fog a unique and unrepeatable “performance” of its own. As such, the experience bears repeating, and visitors are rewarded by viewing and interacting with Fog × Hill at different times of the day and under various conditions.

“Atmosphere serves as a mold and wind is carving the sculpture in real time,” Nakaya says, describing the kinetic interplay between fog and environment that characterizes her work. “Fog is positive and negative, living and dying,” she explains. “It condenses and evaporates simultaneously, with dynamism and vulnerability. There is no point of focus, only in the mind.”
At left, the fog created at Fog Hill rhythmically gathers and dissapates on the hillside next to the Hunnewell Building, floating down to the wide expanse of lawn carpeting its base. Plumes of vapor beckon visitors inside the cloud, interacting with the vapor as it glides through the trees and over the grass, as well as on the hillside itself via a mulched path running behind and through the spray zone (top, photo by Jen Mergel). “I thought fog can make this spot a place of extraordinary experience,” explained Nakaya. “Not a spectacle, but a place of deeper inner emotions.”
A Year for the Birds

New bird boxes and nesting platforms encourage domesticity in the landscape

Brendan Keegan, Arboretum Gardener

While the trees in our landscape turn gold and orange and autumn leaves drift to the ground, the blue sky above is filling with birds. Millions of birds, so many that they display on radars, migrate through New England each fall, flying from breeding grounds as far north as Alaska to “winter” territories stretching from the Southern U.S. to the southernmost tip of South America. Some 119 species have been documented at the Arboretum during fall migration, making it a great time to visit and witness this incredible natural phenomenon.

This year’s migration is particularly special since it occurs during “The Year of the Bird,” commemorating the centennial of the Migratory Bird Treaty Act. Initially signed between the United States and Canada (and later by Mexico, Japan, and Russia) the agreement protects over 1,000 species from unregulated hunting and other harm. Although New Englanders cherish migrating birds as a beloved sign of fall, many of these species would likely have gone extinct without the safeguards of this powerful piece of legislation.

To commemorate “The Year of the Bird” at the Arboretum, horticulture staff installed 20 new or renovated nest boxes for both year-long avian residents and seasonal migrants. Monitored twice a week from April to August, these boxes provided data about nesting birds in the Arboretum. For example, the first species to move in were resident black-capped chickadees (Poecile atricapillus). These small birds typically stay in the region throughout the year and start searching for nest sites in early spring, well before migrants return. Our first female began her nest construction on April 24, the first egg was laid on May 4, and the first fledglings emerged on June 7. In sum, black capped chickadees attempted nests in six of our seven nesting tubes and successfully raised young in four of them, for a total of 30 young birds fledged.

Male tree swallows (Tachycineta bicolor), colored brilliant blue and white, returned in mid-April from their wintering grounds in southern Florida and coastal Texas, Mexico, and Central America. Females arrived a few weeks later, and nest construction began on May 1. Although most built their nests with dry grasses, an enterprising female in a nest box by the Hunnewell Building constructed her abode with last year’s leaves from a nearby ginkgo. Tree swallows raised young in seven of our nine boxes, averaging five eggs per clutch and a total of 32 fledglings, the last of which left the nest on July 20.

Although a pair of eastern bluebirds (Sialia sialis) briefly occupied a Peters Hill nest box—our first documented attempt in 10 years—house sparrows (Passer domesticus), a threatening, non-native competitor, drove them off. Despite this unfortunate loss, we largely succeeded this season in keeping house sparrows out of our boxes and away from established nests. Regular box checks preempted them from building nests in the first place while “sparrow spookers,”
installed after cavity nesting birds laid their first eggs, deterred their takeover attempts. Sadly, even with these efforts, house sparrows killed one adult tree swallow early in the season while nest building was still in progress, emphasizing the danger this introduced species poses to native birds.

Our screech owl (Megascops asio) boxes, installed too late in spring to attract any owls, provided a home for a pair of house wrens (Troglodytes aedon) and secretive great crested flycatchers (Myiarchus crinitus) instead. Although house wrens are fairly common in the Arboretum, this was our first documented breeding pair of flycatchers since 2005. Arriving in May and departing in September, these birds overwinter from southern Florida to northern South America. If they survive the migration, breeding adults sometimes return to the same nest cavity year after year—hopefully we will see them, and their offspring, again!

We also installed a great horned owl (Bubo virginianus) platform, although again too late in the spring to attract residents this season. These large owls often perch in our conifer collection, where individuals can be heard calling for mates during late winter and early spring mornings and evenings. However, they do not build their own nests, instead relying on those built the previous year by red-tailed hawks (Buteo jamaicensis), ravens (Corvus corax), and crows (Corvus brachyrhynchos). Since these nests are not abundant in the Arboretum (and since great horned owls have been documented using platforms), we plan to add at least one more platform to increase nesting habitat in the Arboretum landscape.

If you are interested in learning more about birds this fall, there are many opportunities at the Arboretum. Check our events calendar to sign up for one of Arboretum Docent Bob Mayer’s several bird walks that focus on seasonal migrants, attend an introduction to birding workshop, or swing by the Hunnewell Building Visitor Center to see our nest box display. Visit our website for blog posts on birds in the landscape and consider contributing to help fund future habitat enhancement projects. At the very least, come for a walk on the grounds. While you admire the migrating birds in the treetops above, listen for the hopeful whisper spoken by rustling autumn leaves and departing wingbeats: “See you in the spring”.

As year-round residents, black-capped chickadees get a head start on finding a suitable nesting site in early spring. Above, chickadee young at 14 days old huddle at the bottom of a nesting tube, already exhibiting the markings of their species.

If you are interested in learning more about birds this fall, there are many opportunities at the Arboretum. Check our events calendar to sign up for one of Arboretum Docent Bob Mayer’s several bird walks that focus on seasonal migrants, attend an introduction to birding workshop, or swing by the Hunnewell Building Visitor Center to see our nest box display. Visit our website for blog posts on birds in the landscape and consider contributing to help fund future habitat enhancement projects. At the very least, come for a walk on the grounds. While you admire the migrating birds in the treetops above, listen for the hopeful whisper spoken by rustling autumn leaves and departing wingbeats: “See you in the spring”.

Learn and Discover at the Arboretum

**How Birds Migrate**
Wednesday, October 3, 7:00–8:00pm [HB]
Lorna Gibson, Professor of Materials Science and Engineering, MIT

**Introduction to Birds and Birding**
Saturday, October 13, 1:00–3:00pm [HB]
Brendan Keegan, Gardener, Arnold Arboretum
Flowering plants represent nearly ninety-five percent of all described species in the plant kingdom and display extraordinary diversity in their floral anatomy. This astonishing variation is paralleled by the sophisticated ways in which flowers are pollinated. For many plants pollination occurs through an interplay of visual, olfactory, and sensorial stimuli that arise between insects and flowers. Such interactions are spawned by a plethora of floral features, such as shape and symmetry, surface texture, hairs, scents and nectar production, and the existence of a broad palette of colors. This dynamic and complex process ensures the transfer of pollen from one flower to another, allowing for reproduction and seed formation.

Pollination in Dutchman’s pipevines (Aristolochia) is truly one of the most astonishing systems in flowering plants. Flies are its reproductive agent, attracted by the flower’s rank odor, which simulates decaying organic materials, carrion, or even fungi. This scent attraction can occur in combination with fly pheromone chemicals produced by the flower. Dull purple and maroon colors, and/or hairs called trichomes inside the flower can also increase the chance of a successful pollination event. The flower itself is pipe-shaped, forming a convoluted and tubular structure consisting of a balloon-like portion at its base called the utricle, followed by a narrow tube, and ending in an expanded, flattened portion called the limb (see the figure on page 11). This atypical flower temporarily traps insects and releases them afterwards to increase the chances of successful pollen transfer.

Pollination in Aristolochia takes two to three days, and begins with potential pollinators arriving on the limb, likely attracted by the colors and scent, often loaded with pollen from another flower. Small flies begin their journey by passing through the tube and reaching the utricle. This a road with no return as the tube is densely covered by downward-pointing trichomes covered in slippery wax that trap the flies and make their journey out more difficult. Thus, position, number, and density of trichomes in the tube and the utricle are an essential feature of the flower’s trapping mechanism. Once flies arrive at the utricle and begin their search for an alternative way out, the flowers provide a window effect—thinner areas beneath the pollen sacs and the receptive portion of the stigmas allow light to enter the inside of the shady utricle. The deception triggers the expected escape behavior and flies move around the reproductive structures, first leaving the pollen on the stigmas and afterwards gathering a fresh pollen load from the anther sacs. The pollen discharge and reload takes one to two days, during which time the flower nourishes the fly with nectar and water likely produced in the long multicellular trichomes that cover the inner utricle. Finally, once pollination is complete, the flower triggers its own decay, leaving the fertilized ovules and withering the rest of the structure, disarming the trichomes so that the insects can fly off to the next flower.
The genetics of trichome development has been studied in model plant species, but research is sparse across flowering plants and nearly unexplored in floral organs. Thus, the genes responsible for forming trichomes, as well as the timing of their activation, have been minimally compared across flowering plants. In that sense, Aristolochia flowers provide a spectacular atypical flower in which to assess these mechanisms. So far in my home university in Colombia, we have been able to sample neotropical as well as South American native taxa like Aristolochia fimbriata (white veined pipevine) as representatives of the herbaceous trichome-bearing species. However, some species like A. macrophylla, a deciduous, woody, climbing vine native to eastern North America, lack trichomes in the flower, allowing us to better understand why trichomes are present in some pipevines and absent in others.

As a Deland Fellow at the Arnold Arboretum, my research focuses on the genetic mechanisms underlying trichome development in Aristolochia flowers. This research comprises not only a wide-ranging comparative study of anatomical and functional traits in the flowers, but also a detailed evaluation of the genetic information that might determine the formation of these structures in the flower. Receiving the Deland award has offered me an exceptional opportunity to enrich my research as a graduate student, taking full advantage of the resources, outstanding living collections, and state-of-the-art laboratories at the Arnold Arboretum to carry out cutting edge research.

Together, this study will provide the first comparative and comprehensive data of its kind on the genus, which may allow us to build a more complete understanding of the genetic basis of trichome formation in Aristolochia flowers. With all this new knowledge, I hope to construct a clearer picture of how these ancient and unusual plants have successfully evolved to adapt and persist in different environments across our planet.

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Floral Development and Function in Aristolochia

Aristolochia is a genus composed of about 540 species of herbaceous perennials and twining vines commonly referred to as birthworts, pipevines, and Dutchman’s pipes. The living collection holds four temperate zone species, including A. macrophylla, native to the eastern United States from Georgia and Alabama to the south, west to Kansas, and north to Maine and southern Ontario, Canada. Its very large leaves are dark green and heart-shaped, and provide an essential food source for developing pipevine swallowtail butterflies (Battus philenor).

The pipe-like flowers of A. macrophylla occur in May or June, emerging in bud at less than a half of a centimeter in length from the axils of the leaves (above, far left). The bud develops into a flower in about 10 days, forming a balloon-like portion called the utricle, which houses the fused style and stamens; a narrow zone called the tube; and an expanded portion called the limb with a brownish-purple opening. When fully mature (above, far right) the flower is approximately 3.5 centimeters in diameter, and emits a pungent odor to attract the flies that serve as the vine’s pollinators. Flies enter through the limb and get trapped temporarily inside the floral tube, leaving pollen on the stigmas and becoming covered in pollen themselves as they seek an exit.
Cultivating a Venerable Lineage

Catching up with Willard Hunnewell, Arboretum Member and Internship Donor

Janetta Stringfellow, Director of Institutional Advancement

It’s a challenge to write a short profile about a Hunnewell. The family looms large in horticultural circles of New England, the founding of Wellesley, and indeed in the history of the Arnold Arboretum. I open one Arnoldia article and then another, followed by one Wikipedia page and then another—but it’s far too much to condense here, and what can I say that hasn’t already been said?

I’m writing at my desk in the Hunnewell Building, named after Horatio Hollis Hunnewell (fondly known to the family as HHH), one of the Arboretum’s earliest and most significant benefactors, well remembered in horticultural circles for championing rhododendrons and staging the first major exhibition of the plants on Boston Common in 1873. For inspiration, I look out my window at a cedar of Lebanon (Cedrus libani). One of its hardy Turkish siblings still lives in the Hunnewell Pinetum, given to the family by Charles Sprague Sargent in the early 1900s—a coup since nobody save Sargent believed the species would survive here. I’m swirling in facts about rhododendrons, Italian topiaries, Wellesley College and the town that shares its name, the first golf course…and then I discover something truly astonishing (at least to me). Several branches of the Hunnewell family had homes in Boston’s Back Bay in the nineteenth and early twentieth centuries, including 303 Dartmouth Street and 151 Commonwealth Avenue. These two houses were purchased by Charles Merrill in 1957 and turned into the Commonwealth School, where I worked for 15 years prior to coming to the Arboretum in 2017. I thought I had made a big leap, but really I just left one Hunnewell building for another. I’ll take it.

But the focus of this article isn’t me or even Horatio Hollis Hunnewell, but 97-year old Willard Peele Hunnewell, great-grandson of HHH and a decades-long member and inveterate visitor of the Arnold Arboretum. Willard is a friendly and familiar face at Arboretum lectures, special events, tours, and even the occasional Tree Mob. Importantly, Willard and other family members continue to build on the legacy of sharing plants and knowledge established over a century ago by HHH and Charles Sprague Sargent, two friends who spent years and often their own capital to launch expeditions in search of new species to grow in Massachusetts.
While it’s wonderful to see Willard at the Arboretum, it is even more rewarding to visit him in Wellesley on the expansive estate HHH started to design in 1843, with enough acres for most of his 9 children to build their own homes and where he planted more than 2,000 trees in just four years. The family has remained engaged and enthralled with the open space on the banks of Lake Waban, preserving the land from division and development. Here Willard is surrounded by cousins and in-laws and nephews and nieces, and happily points out who lives where. George, one of his two sons, lives just down the street in Sherborn, and Willard’s face lights up when he talks about his grandson Nicholas and the plans he’s drawn up for one day making Willard’s house his own.

Willard finds nothing surprising about the younger generation wanting to stay in Wellesley to continue the family traditions. Preserving history and heritage are important to Willard, a responsibility shared in trust among the various branches of Hunnewells. And this can prove a full time job, particularly when it comes to plants.

Willard was born the youngest child of Walter Hunnewell, one of the grandsons of HHH. He and his siblings Caroline, Walter, and Jane all demonstrated a natural and profound attachment to the trees, plants, and landscapes that were and remain so central to the family—rhododendrons, orchids, magnolias, camellias, and conifers are particular favorites. Willard and his siblings always used Latin botanical names for plants, ever curious to increase their knowledge. He spent a great deal of time tending the greenhouses himself; in fact, another tradition is that the family continues to honor and practice horticulture. Their New England work ethic runs deep—they gather every year to prune the Italian topiaries along Lake Waban, and it’s not unusual to still find a Hunnewell or two pruning the roses.

Every year on Thanksgiving morning, at least two to three dozen family members gather to measure their trees, a practice that has continued for more than one hundred years. Willard notes, “I’m 97 years old and I can’t remember not measuring the trees.” With a tape measure at the ready, family members encircle the same 30 trees year after year, cutting notches in the bark so they always measure in the same place. This practice surely extends from the family’s legacy of horticultural experimentation, tracking how representative specimens were faring in regard to growth and vigor. Today the records provide real data on weather and growing conditions going back to the late 1800s.

Willard carries the mantle of a famous great-grandfather with ease. He’s at home here in Wellesley in every sense of the word, and with good reason. Aside from a stint in the Navy in WWII, when he traveled the globe as a navigator on a landing ship tank, he has mainly stayed in place where he was raised. Inheriting the family green thumb, he has spent much of his life supporting not only his family’s eminent collection of trees, but those of the Arnold Arboretum as well—stewarding the historic connection between the two landscapes and the fruits of the remarkable friendship between HHH and Sargent.

In 2000, to further honor that connection in perpetuity, Willard and many other members of the extended Hunnewell Family established the endowed Isabella Welles Hunnewell Internship Program. Named to honor the wife of HHH, the program enables the Arboretum to offer annual paid internships in collections management to those with interests in horticulture and landscape maintenance, arboriculture, plant production, and collections curation. Each year, the Hunnewell interns enjoy a field trip to the Hunnewell Estates, and later family members visit the interns at the Arboretum to learn about their annual capstone project—this year, it was a renovation plan for the Walter Street Gate and the collections there.

Willard’s strong commitment to maintaining the vitality of his family’s longstanding connection to horticulture and the Arnold Arboretum infuse every step when I join him for a walk in Boston or Wellesley. When we trek around the Hunnewell Pinetum, Willard is firmly in his element. The landscape seems to shed decades away as he ambles up and down slopes, pointing out favorite specimens and sharing their history, one tree at a time. 

Willard Hunnewell’s great-grandfather, Horatio Hollis Hunnewell or HHH, was one of the most prominent horticulturists in America in the nineteenth century, and in 1892 donated the Arboretum’s administration building which bears the family name.
Learn at the Arnold Arboretum

Featured Programs

SEPTEMBER

Role of Clouds and Particles in Climate... with a Dash of Fog
Monday, September 17, 6:30–8:00pm [HB]
Daniel Cziczo, PhD, Professor of Atmospheric Chemistry, MIT

Particles in our atmosphere, whether from the natural environment or from human-built engines, affect climate in ways we don't yet fully understand. MIT Professor Dan Cziczo will speak of particles and clouds in our atmosphere and how climate is influenced by them. The evening will begin outdoors at Fog x Hill, Fujiko Nakaya's fog exhibit (read more on page 5) at the Arboretum and then shift indoors for a lecture about clouds and climate. Arrive promptly at 6:30pm to view Fog x Hill, a timed-release landscape experience.

Fee Free, but registration requested

COG Design Showcase and "Charlestage"
Thursday, September 20, 6:00–8:00pm [HB]

The Community Outreach Group for Landscape Design (COGdesign) showcases final designs for eight 2017-18 projects. Projects range from community gardens in Chelsea and Mission Hill to parks, plazas and stormwater management plans for transitional housing, after school programs and community groups in five additional Boston neighborhoods, and in Framingham. Following the showcase, Landing Studio will present their design solution for Charlesgate, a complex project to restore ecological infrastructure performance, urban connections, and public access to the terminus of the Olmsted-designed Emerald Necklace.

Fee Free, but registration requested

Cosponsored by the Community Outreach Group for Landscape Design and the Arnold Arboretum

Hands-on Classes & Workshops

Chainsaw Use and Safety
Saturday, September 22 (rain date Sunday, September 23), 9:00am–3:00pm [HB-Garage]

Small Trees for Small Spaces
Sunday, October 21, 10:00am–12:30pm [HB]

Growing Woody Plants from Seeds
Saturday, October 27, 9:00am–12:30pm [DG]

Growing Woody Plants from Hardwood Cuttings
Saturday, December 1, 9:00am–12:30pm [DG]

Introductory Tree and Shrub Pruning
Saturday, December 8, 9:30am–Noon [HB]

Winter Tree Identification
Saturday, February 9, 1:00–4:00pm [HB]

Getting Rooted in Urban Gardening
Sunday, March 3, 2:00–4:00pm [HB]

Pruning Project: Hydrangeas
Saturday, March 23, 10:00am–noon [HB]

Full details at my.arboretum.harvard.edu

ABBREVIATIONS KEY

[HB] Hunnewell Building, 125 Arborway, Boston
[DG] Dana Greenhouses, 1050 Centre, Boston
[HUH] Harvard University Herbaria, 22 Divinity Avenue, Cambridge
[WH] Weld Hill Building, 1300 Centre, Boston

CONTACT
Pamela Thompson, Manager of Adult Education
617.384.5277 | adulted@arnarb.harvard.edu
Introduction to Botany
8 Tuesdays: September 18, 25, October 2, 9, 16, 23, (no class on October 30), November 6, and 13, 6:30–8:30pm [HUH]
K. N. Gandhi, Botanist, Harvard University Herbaria

Learn botany from Kanchi Gandhi, a dedicated instructor and plant nomenclature specialist at Harvard University. Among the topics to be explored: plant cells and tissues, anatomy and morphology, reproduction, nutrition, growth and development, plant diversity, evolution, classification, and nomenclature. This course offers both lecture and laboratory activities to new students or serves as a refresher course. Required text: Botany for Gardeners by Brian Capon.
Fee $240 member, $290 nonmember
Credit MCLP: 1ceu; MCA: 1ceu

OCTOBER

How Birds Migrate
Wednesday, October 3, 7:00–8:00pm [HB]
Lorna Gibson, Professor of Materials Science and Engineering, MIT

Bird migration is one of the most remarkable phenomena in nature. Lorna Gibson will describe the why, when, and where of migration, how fast and far birds travel and how they find their way. She’ll also address tracking by ornithologists.
Fee Free, but registration requested

Fifty Shades of Green:
Tales from the Hothouse
Friday, October 12, 7:30–8:30pm [HB]
Terry Huang, MSc, Living Collections Fellow, Arnold Arboretum

Back by popular demand with more content! Terry Huang's bawdy botanical review delves into the sex lives of plants, dramatically explaining the challenges of courtship and consummation for those rooted in place. Alluring suitors with a pungent rotten odor, promising nectar for the exchange of goods, or going at it alone, plants have evolved interesting strategies to ensure their continued existence. From mutualistic partnerships to deceit-filled ones that would rival the most twisted romance, his vivid pollination stories reveal the ingenious ways flowers deal with one of life's (most) important needs: sex. (Adult content: Rated PG)
Fee $5 member, $10 nonmember

What's Going on in this Graph?
Monday, October 22, 7:00–8:30pm [HB]
Sharon Hessney, Writer and Moderator of New York Times Learning Network “What’s Going On in This Graph?”

Graphs can help convey information that might otherwise take several paragraphs to explain. But it is easy to misread or not fully understand the content and context. In this participatory program, we will decipher several graphs based on data from Arnold Arboretum curators and scientists. We will also look at the data and decide whether the data are well-represented and convey the story intended. If reading graphs is intriguing but challenging for you, gain more practice and insights.
Fee Free member and student, $10 nonmember

NOVEMBER

Design with Plants
4 Thursdays: November 1, 8, 15, 29, 6:30–8:30pm [HB]; and 1 Saturday, November 3, 9:30–11:30am [Garden Visit]
Christie Dustman, Certified Landscape Designer, APLD

Does your garden hang together? Come and learn to think about plants in terms of their form and function first, and then learn some strategies to more successfully lay out your planting plan. The class will consist of classroom exercises, lectures, and a visit to a nearby gardens on a Saturday. It is helpful if you have a drawn plan of a garden area you are working on.
Fee $140 member, $182 nonmember
What Nature Sounds Are Music?
Saturday, November 17, 2:00–3:30pm [HB]
David Rothenberg, Professor of Philosophy and Music, New Jersey Institute of Technology

Bird song, whale song, bug song? Are these music? What of the whistle of the wind? David Rothenberg, author of three books, *Why Birds Sing*, *Bug Music*, and *Survival of the Beautiful*, will do his best to answer these questions and fuel further thinking about noise, communication, and song in nature. A composer and jazz clarinetist, he has written and performed on the relationship between humanity and nature for years, and improvised with whales, cicadas, and other creatures.

Fee Free member and student, $10 nonmember

Introduction to Bonsai
Saturday, November 3, 1:30-4:30pm
Glen Lord, Horticulturist and Bonsai Specialist

In this class, Glen Lord will speak first about the history of bonsai and demonstrate the methods employed in creating and caring for dwarfed trees. Participants will plant a tropical specimen and learn about basic pruning, styling, and aftercare. The methods learned in this class can then be applied to other plants, such as temperate trees. The class fee includes a tropical plant, tools, soil, and a pot.

Fee $65 member, $80 nonmember

The Ethics of Species Conservation
Tuesday, December 4, 7:00–8:15pm [HB]
Ronald Sandler, PhD, Chair and Professor of Philosophy; Director, Ethics Institute, Northeastern University

Rapid ecological change challenges traditional conservation paradigms and strategies. It has also led some conservationists to endorse novel techniques such as assisted colonization, gene drives, and even de-extinction. This talk will explore the values and philosophies that underlie species conservation under conditions of rapid change, asking us to consider what is valuable about species and why we ought to conserve them.

Fee Free member, $10 nonmember

Landscape for Life
4 Wednesdays: January 9, 16, 23, 30, 12:00-3:00pm [HB]
Mark Richardson, Botanic Garden Director, NE Wild Flower Society

This intensive introductory course will provide you with the knowledge, skills, and understanding to create a great-looking garden that is healthier for your family and the environment. This class is based on the principles of the Sustainable Sites Initiative, the nation’s first rating system for sustainable landscapes. The comprehensive curriculum covers a range of topics, including soils, water, plants, and landscape materials.

Fee $185 member, $218 nonmember

Garden Design Workshop for Home Gardeners
5 Wednesdays: February 6, 13, (skip 20), 27, Mar 6, 13, 6:30–8:30pm [WH]
Christie Dustman, Certified Landscape Designer, APLD

Grappling with how to start designing your home garden space? Design a layout plan for an area of your yard in this beginner-
level class. Learn the organizational components of a coherent garden and practice the process of design with award-winning designer Christie Dustman. You will leave class with a plan in progress from which to continue your design explorations. This class is primarily about garden spaces rather than specific plant selection. You will be required to draw a base plan for your site (with tutelage in class) and will need to purchase some drawing tools and pay for copying. Limited to 16 students.

Fee: $145 member, $188 nonmember

Do Your Garden Plants Have a Backstory?
Thursday, February 28, 6:30–7:45pm [HB]
Michael Dosmann, Keeper of the Living Collections, Arnold Arboretum

Museums assign value to their collections by understanding each piece’s backstory—for instance, where did it come from, who created/collected it, what does it represent, what feeling does it elicit? The plants in our own gardens can and should do the same, but too often have become generic and mundane because their backstories are forgotten. Perhaps even worse, we may be losing our own personal connections to what we grow. Michael Dosmann will provide his own perspective on how to re-engage with our garden plants in ways that make it personal.

Fee Free member, $10 nonmember

MARCH

Native Bees in the Hood
Tuesday, March 5, 6:30–8:30pm [HB]
Nick Dorian, PhD student, Tufts University

In this workshop, you will learn about the biology and diversity of native bees and why they are important pollinators. Nick Dorian will dive into the city lifestyles of bees and the strategies they employ to be successful in these anthropogenic landscapes. In the second part of the workshop, he’ll focus on native bee decline and conservation and answer common questions. Nick will teach the fundamentals of gardening for bees, and at the end of the workshop, provide the opportunity for participants to build their own mason and leafcutter bee hotel.

Fee $15

Cosponsored by Agricultural Hall and the Arnold Arboretum

Cultivating Legacies: New England Women in Horticulture and Landscape Design
Saturday, March 9, 9:30am–1:00pm [HB]
The impact women in the 20th century made on botany and landscape design is often overlooked. The Arnold Arboretum was one of the few institutions in America that encouraged women to study with and be mentored by established botanical and landscape design professionals. Mary (Polly) Wakefield, Eleanor Cabot Bradley, Martha Brooks Hutcheson, Marian Roby Case, and Marjorie Russell Sedgwick developed exceptional personal garden spaces and designed outstanding professional landscapes, and were also very active in the conservation and preservation of New England open space. This seminar illuminates these women’s roles in creating and protecting New England landscapes, how the Arboretum contributed to these endeavors, and how we can continue to raise the visibility of these special places. Program includes an associated exhibition in the Arnold Arboretum’s historic Library Reading Room.

Fee $50

Co-sponsored by The Trustees of Reservations, the Mary M.B. Wakefield Charitable Trust, and the Arnold Arboretum of Harvard University

SAVE THE DATE

The American Chestnut: When Will It Flourish Again?
Saturday, March 30, event time to be announced

Experts share perspectives on the history of American chestnut (Castanea dentata): its significance as a forest species and subsequent decimation by an introduced blight; ongoing research in blight resistance and gene manipulation, and the prognosis for this tree’s future.

Scheduled speakers are William A. Powell, College of Environmental Science and Forestry, SUNY; Edward K. Faison, Highstead Arboretum; Lisa Thomson, Sara Fitzsimmons, and Jared Westbrook, The American Chestnut Foundation; Michael S. Dosmann, Arnold Arboretum; and David R. Foster, Harvard Forest.

Details forthcoming online
Visit, Explore, Discover

Visitor Information

The Hunnewell Building is open for restroom access and business guests on weekdays 9:00am to 5:00pm and on weekends 10:00am to 5:00pm. The Visitor Center in the Hunnewell Building is open 10:00am to 5:00pm; closed Wednesdays and holidays.

Services in the Visitor Center include:

- Personal assistance and recommendations to enrich your visit
- Membership information
- Maps and postcards
- Changing exhibits including curated art shows
- Activities for children and families
- Lost and found: 617.384.5209. Unclaimed items are donated to charity after two weeks.

The Arnold Arboretum Horticultural Library is open Monday through Friday, 10:00am–3:45pm. For information, visit our website, email hortlib@arnarb.harvard.edu or call 617.522.1086.

Volunteer Interpreters are stationed outdoors in the landscape, ready to give a boost to your visit with information and hands-on fun. Weekends September through October from 1:00–3:00pm, see calendar.

Discovery Packs may be borrowed from the Visitor Center with tools and activities for hands-on exploration with children. Try our newest addition, the “Be an Engineer” pack! Connect bamboo sticks and stick-lets to create bridges, shelters, sculptures, and whatever else the imagination conjures.

Visitor Parking and Driving Permits
Street parking is available along the Arboretum’s perimeter. Individuals with special needs may request a driving permit at the Visitor Center, weekdays only (closed Wednesday), from 10:30am to 3:00pm. Please call 617.384.5209.

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Art Exhibitions

Turning Wood: The Art of the Woodturner IV
October 5–October 7, 2018

An Exhibition by the Association of Revolutionary Turners (ART), Central New England Woodturners, and Massachusetts South Shore Woodturners

Opening Reception, Friday, October 5, 5:00–7:00pm, Hunnewell Visitor Center
Select work on display in the Hunnewell Visitor Center, September 20–November 4

Returning for the fourth year, The Art of the Woodturner IV brings amazing sculptural, functional, and creative turned wood art to Arboretum visitors. This show presents art that appeals to the eye, as well as the touch. Unique in relation to most woodworkers, due to the use of a lathe, woodturners turn out practical pieces or “turn” to the purely aesthetic. Look for work turned from deaccessioned Arnold Arboretum trees, and join us for lathe demonstrations throughout the weekend.
An Artist’s Perspective

The Arboretum and Botanical Artist, Regina Gardner Milan

October 12, 2018–February 3, 2019
Opening Reception, Saturday, October 20, 1:00–3:00pm

Regina Milan spent a year of discovery at the Arboretum. Botanical jewels of each season—early larches, spring blossoms, fall acorns, autumn leaves—are captured in her exquisite paintings. Walks in the woods with her father were the first window into the spellbinding allure of nature, and later, she found that observing nature often produces scenes of larger-than-life beauty. The Arboretum’s exhibition magnifies nature’s productions, fully illuminating the elegance of plant life as small as a seed pod. This show captures the beauty of the Arnold Arboretum in those larger-than-life forms.

Regina received a Certificate of Botanical Illustration with distinction from the Society of Botanical Artists, London, England, where she received the President’s Award. She has exhibited in many juried shows throughout the US and world, including the 2016 New England Society of Botanical Artists’ show at the Arnold Arboretum. She teaches graphic design as an Associate Teaching Professor at the University of Massachusetts, Lowell, and is president of MILAN concept & design, a graphic design firm founded in 1988.

Transitions: Winter into Spring

Photographs of the Arnold Arboretum by Chris Morgan

February 8–May 5, 2019
Opening Reception, Saturday, February 9, 1:00–3:00pm
Snow date: Saturday, February 16, 1:00–3:00pm

Chris Morgan’s goal as a photographer is to evoke the emotions he feels when he views the patterns and textures in nature: from the shapes of trees to the movements of birds, he brings details to life. With its rich collection of flora and fauna, the Arboretum has interested him for over fifteen years, especially during blizzards, when dramatic photo opportunities await. Marrying the arts and the sciences, his images allow him to explore large-format photography in creative ways through digital panorama techniques. Morgan has photographed on five continents for over forty years; however, currently spends much of his time photographing year-round in the Arnold Arboretum. He is a computer consultant, puzzle designer, musician, magician, author of five books, and a scholar who has lectured extensively on writer Lewis Carroll.

Exhibitions are displayed in the Hunnewell Building Lecture Hall, which is occasionally reserved for meetings and classes. Call 617.384.5209 for exhibition availability; see page 18 for Visitor Center hours.

Special Events

Collections Up Close: The Oak Collection

Sunday, Sept 30, 1:00–3:00pm; Oak Collection near Centre Street Gate, Arnold Arboretum

Collections Up Close events offer a great way to explore one of the many plant collections and learn more about their breadth, history, and uniqueness. Join us in the oak collection on Bussey Hill for fun family activities, an “All Things Oak” tour at 1:30pm with Arboretum docent Marty Amdur, and even a mini oak herbarium. Free
Landscape Explorations

Guided Tours

Landscape tours are available each Saturday at 10:30am and Sunday at 1:00pm until November 4 and resume in April. Weekday tours are on Mondays and Thursdays at 10:30am in September and October. Please check our website for additional details for each tour. Tours last approximately 90 minutes, are geared toward adults, and are free of charge. Our tours are for individuals, not organized groups. However, private group tours are available for a fee upon request. To learn more see my.arboretum.harvard.edu or call 617.384.5209.

Theme Tours

Theme tours offer a look into a special focus or area of the Arnold Arboretum. They are led by Arboretum staff or Arboretum volunteers. The Arboretum calendar provides further descriptions of these tours and others. Meet at the Hunnewell Building unless otherwise specified. The tours below are geared toward adults, free, registration requested.

From Seed to Tree
Dana Greenhouses’ Staff
Two Tuesdays, Sept 4 & Oct 2, 1:00–1:45pm [Bonsai/Penjing Pavilion]

‘Chinese Wilson’, the Arboretum, and Plant Exploration
David Tarbet, Arboretum Docent
Sunday, Sept 9, 10:30am–Noon

Fall Bird Walks
Bob Mayer, Arboretum Docent
Two Saturdays, Sept 29 [Arborway Gate] & Oct 13 [Peters Hill Gate], 8:00–9:30am

Medicinal Plants at the Arnold Arboretum: An Exploration of Wild and Cultivated Remedies
John de la Parra, Associate, Harvard University Herbaria; Ernest Anemone; Federico Uribe Toro, Arboretum Docent
Saturday, Sept 29, 1:00–2:30pm

The Arboretum-Japan Connection
Michael Dosmann, Keeper of the Living Collections
Tuesday, Oct 9, 4:00–5:30pm

Here Come the Seeds: The Journey of a Seed from Collection to Propagation
Tiffany Enzenbacher, Manager of Plant Production
Wednesday, Oct 17, 5:00–6:00pm [Bonsai/Penjing Pavilion]

Fall into Health
Rhoda Kubrick, Arboretum Docent
2 Sundays, Oct 21 & Nov 18, 10:30am–noon

Peters Hill: Discover the Other End of the Arboretum
Kevin Schofield, Arboretum Docent
Wednesday, Oct 24, 4:00–5:30pm [Peters Hill Gate]

How the Arboretum Became the Arboretum: The First 25 Years
Emily Wheeler, Arboretum Docent
Sunday, Oct 28, 11:00am–12:30pm [Centre Street Gate]

The Secret Lives of Roots
Andrew Gapinski, Manager of Horticulture
Wednesday, Nov 7, 2:30–4:00pm

Winter Wellness Walks
Arboretum Docents
4 Sundays, Dec 9, Jan 13, Feb 10, Mar 10 1:00–1:45pm

The World of Witch Hazels
Andrew Gapinski, Manager of Horticulture
Wednesday, Feb 6, 2:30–4:00pm

Propagation of Historic Lineages
Sean Halloran, Plant Propagator
Wednesday, Feb 13, 1:00–2:00pm [Bonsai/Penjing Pavilion]
Explorations for Families with Children

Discover the Arboretum on guided walks especially for families. Walks highlight plants, natural phenomena, and develop observational skills in children. One adult can bring a maximum of three children; suitable for children ages four through eight. Meet at the Visitor Center. Free, registration is requested at my.arboretum.harvard.edu

Seeds with Wings
Sunday, Sept 16, 2:00–3:30pm

Teddy Bears’ Picnic
Sunday, Oct 21, 2:00–3:30pm

What is Beautiful to You? Fairy House Construction
Sunday, Nov 18, 2:00–3:30pm

Short Days, Long Nights
Sunday, Dec 16, 2:00–3:30pm

MEMBERS’ TOUR DAY

Saturday, October 20, 2018, 10:00am-noon

Each year the Arnold Arboretum hosts a morning of staff-led tours offered exclusively to members of the Friends of the Arnold Arboretum. Celebrate autumn on Members’ Tour Day and explore colorful foliage, fascinating fruits and seeds, and the diversity of bark types by exploring the Arboretum’s ever-evolving landscape. Our staff experts will guide you off the beaten path to delve into the wonders of our living collections. Invitations will be mailed in late August to current members and registration is required.

Forest Bathing Half Day Retreat

Tam Willey, Certified Forest Therapy Guide
First Saturday and first Thursday of each month through November, 8:00–11:00am

Did you know spending time in nature has been medically and scientifically proven to treat stress-related illnesses? Relax and unplug in the Arnold Arboretum on a guided forest bathing walk, a slow-paced, facilitated combination of wandering, sitting, and resting. Register online at my.arboretum.harvard.edu

Fee $40 member, $50 nonmember

THE ARNOLD ARBORETUM OF HARVARD UNIVERSITY relies on the generous financial support of our members and donors. We are grateful for your participation, which helps to steward the well-being and care of our magnificent landscape and living collections and sustains our programs in science, horticulture, and education. There are numerous opportunities for learning and fun through your membership benefits and our array of public program offerings. Visit our website arboretum.harvard.edu to learn more and view the calendar of activities. Please contact 617.384.5766 or membership@arnarb.harvard.edu for more information.
The Autumn Willows

In addition to samples representing the living collection, the Arnold Arboretum Herbarium in Jamaica Plain contains specimens of plants cultivated across the world including unique historical ones. One example is a widespread yet in some respects unusual European species—Salix pentandra, known as laurel willow or bay willow due to the similarity of its broad, shiny leaves to bay leaves.

The paramount, illuminating part of any herbarium sample is its label. On the sheet illustrating S. pentandra, the label heading reads: Toepffer, Salicetum Exsiccatum. German botanist Adolph Toepffer wrote the monograph Bavarian Willows, yet he is best known historically for his Salicetum Exsiccatum, an extensive series of duplicate willow samples forwarded with his comments to leading botanical institutions and researchers across the world. Producing and disseminating such duplicates—called exsiccates, or exsiccatae—was a common way to share knowledge about plants at the time when scientists communicated by snail mail. Toepffer’s series contained a staggering number of sampled plants: 772, all of them cultivated at a nursery near München (Salicetum Kranzberg). In German, the label further reads: “This is our latest-flowering willow; its catkins remain on branches until late in the fall.” Dates for the two collections combined on a single sheet are June 20, 1906 (catkins with immature capsules at upper right) and September 5, 1906 (mature catkins bursting with fluffy wind-dispersed seed at lower left).

In fact, bay willow starts flowering in June, while most other willows are already in fruit, and then holds its fruiting catkins through the fall and winter. Among the European willows, this species has unique phenology (timetable), yet not quite unique worldwide. S. serissima, a close relative of S. pentandra aptly called autumn willow, does the same trick here in New England. In his chapter on willows in the Flora of North America, George Argus commented on this unusual adaptation: “Their seeds remain dormant throughout the winter and germinate in the spring, thus enabling them to invade fens by completing their first annual growth before the sedges and grasses are tall enough to shade them out.” To fully appreciate this departure from the norm, keep in mind that willow seeds typically don’t have a dormancy period and must germinate promptly upon reaching the ground. While S. serissima grows across Canada and the northern US, in Massachusetts this special shrub occurs only in the Berkshires. As a matter of fact, there is one “autumn willow” on each of the three continents of the Northern Hemisphere: the third is the East Siberian species S. pseudopentandra. All three are closely related.

Remarkably, more than a century after it was assembled, herbarium samples like those created by Toepffer for his Salicetum Exsiccatum continue to stir thoughts, encourage comparisons, illuminate history, and share their stories with anyone eager to discover more.