Join us for the second annual Director’s Lecture Series at the Arnold Arboretum. The series features nationally recognized experts examining an array of contemporary topics related to Earth’s biodiversity and evolutionary history, the environment, conservation biology, and key social issues associated with current science. Opportunities to chat with the the speaker follow each lecture.

Director’s Lecture Series events are free, but registration is required due to limited seating. Register online at my.arboretum.harvard.edu or call 617.384.5277.

The Evolution of Big
Ned Friedman, Director of the Arnold Arboretum and Arnold Professor of Organismic and Evolutionary Biology, Harvard University
Monday, January 9 7:00–8:30pm [Hunnewell Building]
Think you know trees? Come learn about an amazing period when there were no trees, and then, in the blink of a geological eye, several different groups of plants evolved the ability to increase their girth and qualify for placement in an arboretum. Get a sense of what forests looked like in the Carboniferous Period, over three hundred million years ago. Learn about the extinction of all but one of the early arborescent lineages of plants, and discover the evolutionary group of trees that survived to populate the Arnold Arboretum and forests around the world.

Art as a Source of Information on Horticultural Technology
Jules Janick, James Troop Distinguished Professor of Horticulture, Purdue University
Monday, March 5 7:00–8:30pm [Hunnewell Building]
Works of art constitute an alternate source of information on horticultural technology and science, shedding light on the history of technology, crop evolution, lost traits, and crop dispersal. Developments in horticultural technology will be illustrated using examples from the history of art, from Paleolithic sculpture and painting to Renaissance art in its many manifestations. The systematic collection of crop iconography from the artistic record would be an invaluable resource to crop researchers and a project, Plant Image, is now being organized to assemble a searchable database of such images.

The Global Forests of Greenhouse Earth
Kirk Johnson, Vice President of Research & Collections and Chief Curator, Denver Museum of Nature and Science
Monday, February 6 7:00–8:30pm [Hunnewell Building]
Earth’s climate has passed from times characterized by huge ice caps to times when there was almost no ice at all and both Greenland and Antarctica were covered by forests. Kirk Johnson studies fossil leaves to refine geologic time, reconstruct ancient landscapes, track climate change, and document the evolution and extinction of species and ecosystems. For 30 years he has been chasing the 50–100 million year-old-forests of the last great global greenhouse period. Join him as he takes you on a journey to an entirely different Planet Earth—an environment that may help us to better understand changes occurring in our own time.

Exploring Terra Incognita: Microbes On Us, In Us, and All Around Us
Noah Fierer, Assistant Professor, Department of Ecology and Evolutionary Biology and Fellow at the Cooperative Institute for Research in Environmental Sciences, University of Colorado at Boulder
Monday, March 19 7:00–8:30pm [Hunnewell Building]
Microorganisms are ubiquitous. You inhale thousands of microbial cells in every breath and your body is home to 100 trillion of them. Only recently have we been able to describe the enormous diversity of microorganisms that live in familiar environments, from our foreheads and computer keyboards to the soil in our gardens. Noah Fierer will speak about recent work exploring microbial diversity on the human body, the effects these organisms (most of which are not harmful) may have on our health, and how we may be able to use bacteria for forensic identification.
From the Director

My arrival at the Arboretum in January coincided with the opening of our new Weld Hill Research Building, and since that time we have both begun to grow into our new roles and witnessed many remarkable things. One of the best features of our new science facility is its direct proximity to our living collections and landscape, making collecting specimens for study practicable for a host of research areas that would not have been possible before. This has evidently been the experience of our Putnam Fellow, Cary Pirone, who is currently exploring how plants like pines and ginkgos mate and reproduce through biochemical “duets.” And it has been helpful to Peter Del Tredici—our senior research scientist and a leading voice in the study of urban environments—to observe what pops up on its own in the Bussey Brook Meadow, confident that this protected landscape will forever be green. Cary and Peter share some of their work in this issue of Silva.

As for me, I have gotten to know our staff and to appreciate the work they do to expand the frontiers of science, to engage and inspire the public, and to keep one of the world’s most significant collections of woody plants thriving by the best means available. Above all things, the Arboretum endures to increase our understanding of plants and the natural world. This is as true today as it was a century ago, when Ernest Henry Wilson detailed his Asian plant discoveries in letters to Founding Director Charles Sprague Sargent. Our library’s efforts to put this fascinating correspondence online is also profiled inside, along with an account of our curation staff’s work to push our historical plant records into the digital realm. Both of these projects illustrate the importance of expanding access to the very thing that makes the Arboretum so special and so important—its abundant knowledge.

With the coming of fall, many diverse species of plants provide opportunities to “leaf peep” in our landscape, and I hope you will take full advantage. Among the many highlights, we invite you to enjoy autumn’s handiwork in our extensive maple collection. Beautiful and majestic, yes—but also important to research and global diversity; this collection was recently ranked the most important in the world for conservation purposes. Fall is also the time of our annual Plant Giveaway, and I hope to see you there on September 17. Finally, please mark your calendars for this winter’s Director’s Lecture Series—four talks offering a world of ideas in our own backyard.

—Ned Friedman, Director of the Arnold Arboretum & Arnold Professor of Organismic and Evolutionary Biology
Magnificent Maples

Autumn Highlights Abound in the Acer Collection

Nancy Rose, Editor of Arnoldia

You’ll find beautiful autumn color throughout the Arboretum, but the maple collection is a definite hotspot. Maples (Acer spp.) as a group are known for their brilliant displays of fall foliage in shades from gold to crimson, and the maples growing here do not disappoint. The colors are especially striking on clear autumn afternoons when sunlight shining through the thin, translucent leaves makes them glow like stained glass.

The living collection contains 138 of the approximately 230 maple taxa from around the world. The vast majority of maples are endemic to the Northern Hemisphere, with only one tropical maple species dipping just over the equator into the Southern Hemisphere. North America and Europe are home to a number of maples, but Asia is clearly the maple epicenter—about two-thirds of all maple species are native to that region. The genus Acer holds a number of interesting examples of North American–Asian disjunct flora (closely related, similar-looking species that grow on separate continents), including the striking stripe-barked maples Acer tegmentosum from northeastern China and Acer pennsylvanicum (commonly known as moosewood) from eastern North America.

Because of its diverse and extensive holdings of wild-collected maples, the Arnold Arboretum is designated as one of the North American Plant Collections Consortium’s (NAPCC) maple collections. Eleven public gardens and arboreta from Georgia to Vancouver comprise this multi-institutional collaborative for growing and preserving Acer taxa. With multiple sites in varied climates, a wide range of maples can be evaluated and conserved, and data can be shared across all sites.

The Arboretum’s maple collection is especially rich in rare and unusual Asian maples, including a number of endangered species. Because of these valuable accessions the Arboretum’s collection was ranked as the most significant in the world for conservation purposes in a report released last year by Botanic Gardens Conservation International. This organization, which promotes plant conservation efforts at botanic gardens and similar institutions, analyzed the maple collections of 228 institutions in 37 countries and found that the Arnold Arboretum held the greatest number of Acer species listed as endangered or critically endangered in the wild. Because it is not always possible to save wild populations in their native regions, it’s important to preserve species germplasm in institutional collections, and the Arboretum is playing an important role in this regard.
Some Favorites from the Maple Collection at the Arnold Arboretum

*Acer griseum* (paperbark maple) has long been a highly desired species for plant connoisseurs. Most noted for its lovely exfoliating, cinnamon-colored bark, paperbark maple also has an attractive habit, clean green summer foliage, and bright red-orange fall color. The Arboretum’s maple collection contains one of the first paperbark maples in the United States, grown from seed wild-collected in China by E. H. Wilson in 1907.

*Acer triflorum* (three-flowered maple), right, is closely related to paperbark maple. Both species have trifoliate compound leaves and excellent orange to red autumn foliage. Three-flowered maple’s bark is not as showy as that of paperbark maple, but its subtle amber-colored curls and the species’ greater cold hardiness make it an equally appealing tree.

*Acer davidii* (Father David’s maple) often develops nice yellow to orange fall foliage, but its bark draws attention year round. One of the aptly named snakebark maples, it displays striking bark with sinuous vertical stripes in shades of green and white. This Chinese species is one of many named for Father Armand David, a French missionary who lived in China from 1862 to 1874 and introduced many Asian plant species to the West.

*Acer saccharum* (sugar maple), right, is the quintessential emblem of autumn in New England. Leaf-peepers from around the world visit the region to enjoy the display of yellow-gold, orange, and scarlet fall color displayed by this majestic species. Sugar maple also provides one of North America’s unique food delights, maple syrup.

The foliage of *Acer pseudosieboldianum* (Korean maple), left, looks similar to its better known relative Japanese maple (*Acer palmatum*), but with its often multi-hued fall color it may be even more stunning. This species is also somewhat hardier, giving maple lovers in colder regions (USDA Zones 4 and 5) a better option.

Take a tour to explore the maple collection or a class to learn about fall color at the Arnold Arboretum.

*A Treasure Trove of Maples*  
Thu Oct 20  1:00–2:30pm

*Autumn Colors: A Mystery Revealed*  
Tue Oct 25  7:00–8:30pm
A walk down the Blackwell Footpath in the Arboretum’s Bussey Brook Meadow presents visitors with opportunities to observe a spontaneous wildflower meadow, a flourishing wetland, and a diversity of both native and introduced plants and animals. A report published by the City of Boston Environment Department in 2000 included the Bussey Brook Meadow in its inventory of the city’s significant “urban wilds”—areas not maintained to a proscribed horticultural standard and lacking amenities other than unpaved pathways. Unlike many of the locations included on the list, the 24 acres that make up Bussey Brook Meadow are an ideal site for research, because it is protected through the Arboretum’s indenture and not subject to loss from future development. As interest in the subject of “urban ecology” has blossomed over the past twenty years, ecologists have found that traditional concepts of natural systems ecology do not adequately describe the complex interactions that characterize urban environments. Recognizing the need for more information and new conceptual approaches, the National Science Foundation established two Long-Term Ecological Research (LTER) sites in 1999 specifically devoted to the study of urban ecosystems. Over the past ten years, studies at sites in Phoenix and Baltimore have generated abundant data about the ecological functioning of modern cities. The initial success of these projects have highlighted the need for more sites where urban ecology can be studied over time.

In 1996, the Arboretum Park Conservancy partnered with the Arboretum to preserve this landscape, which was assembled from parcels of land that formerly belonged to the MBTA, the City of Boston, and Harvard University. Under the current management regimen, the meadow will serve as a site where Arboretum scientists and visiting scholars can document long-term changes in plant succession and measure ecosystem functions including vegetation structure, wildlife abundance, phenology, and biogeochemical cycling. In addition, the Arboretum will continue to maintain the Blackwell Path which crosses the parcel as a pedestrian link from the Forest Hills subway station to the historic landscape. In the past year alone, Bussey Brook Meadow has spurred four separate studies by researchers from Tufts and Boston Universities, and has been used by students from the Harvard Graduate School of Design, Harvard Medical School, and Brandeis University. The Arboretum has also become a participatory member of two ULTRA (Urban Long-Term Research Area) exploratory projects funded by the National Science Foundation and USDA Forest Service. One is coordinated by the Geography Department of Boston University, while the second is a multi-institutional endeavor coordinated from the University of Massachusetts, Amherst. As such, Bussey Brook Meadow becomes a permanent site for monitoring spontaneous urban ecology that can only become more valuable over time.

Symphyotrichum pilosa (frost aster) is among the "cosmopolitan mix" of native and exotic plants that grow spontaneously in Bussey Brook Meadow.

The Ecology of an Urban Wild

Monitoring Spontaneous Plants in Bussey Brook Meadow

Peter Del Tredici, Senior Research Scientist
For most of us, the word pollination suggests a pollen-covered bee flitting from flower to flower, or perhaps wind-borne particles floating from one plant to another. Whatever the means, pollination involves the transfer of male gametes contained in the pollen grain to the female gametes contained in the ovule. It is this meeting of sperm and egg in plants that enables fertilization and leads to seed formation.

Gymnosperms—the non-flowering seed plants that include conifers (pine, spruce, and fir) and ancient lineages like cycads and gingko—do not have ovules surrounded by layers of tissue like the angiosperms. Instead, the ovules are exposed; in fact, gymnosperm means “naked seed.” During pollination, pollen from male cones drifts through the air to reach the ovules, which are usually borne on the scales of a female cone. Each ovule produces a small droplet of liquid—the pollination drop—which captures this airborne pollen. Then the drop pulls back into the ovule towards the egg, taking the pollen with it.

Many aspects of gymnosperm pollination remain unexplored, particularly those processes that may be influenced by chemical signals. Due to the ovule’s exposure in gymnosperms, pollen does not have to grow through tissue to reach the egg. Previous studies have found little evidence of mechanisms which might exclude certain types of pollen or foster the growth of others. Based on these factors, scientists long assumed that pollination was a much simpler task for non-flowering plants than for flowering ones. Yet recent research indicates that gymnosperm pollination is also quite complex. We now know, for example, that the pollination drop contains a rich mixture of chemical compounds, including proteins, which are likely involved in a variety of pollination processes.

Pollination has been well studied in the flowering plants (angiosperms), which provide most of Earth’s plant diversity. In flowers, the ovule is buried deep within layers of tissue called the carpel. When pollen lands on the receptive portion of the carpel, it grows through the tissue in order to reach the egg and deposit its sperm. Pollen of different species may land on a single flower, but chemical signals between the pollen and female tissues help determine which types of pollen will successfully breach the carpel and fertilize the egg.

As a Putnam Fellow at the Arboretum, I have the opportunity to utilize its diverse living collection to explore the complexities of pollination in gymnosperms. My research involves collecting pollination drops from Arboretum plants, using biochemical methods to identify the proteins they contain, and using microscopy to explore how pollen grows and develops within the pollination drop and the ovule. Coupled with other studies, this work will advance our knowledge of the processes involved in pollination, and ultimately will contribute to our understanding of the mechanisms which underlie the tremendous diversity found in the plant kingdom.
Though the Arboretum has collected and studied woody plants for nearly 140 years, its use of electronic technologies to document this work has only truly flowered in the past few decades. Leading the charge today to develop and improve how information is gathered, stored, and shared is George Morris, the Arboretum’s director of information technology. George and his team—Stephen Hill and Donna Tremonte—help staff to effectively use technology to advance the work of the Arboretum and to make that work accessible to anyone, anywhere. George can fully appreciate the importance of data in science, as he began his own career conducting research as a technical assistant in the laboratory of Nobel Prize winning biologist Susumu Tonegawa. His interest in and proficiency with computers grew through his lab experiences, and he went on to build and manage data systems in support of research organizations in the pharmaceutical industry. Since his arrival at the Arboretum in 2007, George has championed the Arboretum’s efforts to be on the leading edge of information technology in facilitating research, documenting the collections, and providing educational enrichment.

Q. What role does information technology play in the management of the Arboretum’s library, archival, and living collections?

A. Information, knowledge, and experience are valued currency, and, like other forms of capital, are immensely more valuable when shared and moved from person to person. In many ways, the role of IT at the Arboretum is to help orchestrate this movement of information, promoting global knowledge of woody plants.

As practitioners in the knowledge economy, we accumulate and store knowledge in the form of various collections—the Arboretum’s unique and valuable collections lie at the heart of all we do. For example, the Arboretum library’s holdings of books, manuscripts, and photographs are cataloged and stored electronically. Staff and scientists can quickly run queries to find specific resources not only in our own collections, but also in the vast collections of the Harvard libraries and universities globally. In addition, IT plays a key role in helping to ensure the security and control of items distributed by these libraries.

Another critical area where my team plays an enabling role is in cataloging our living and archival plant collections. Computerized systems are used to keep track of a multitude of information about plants, which are stored in databases at the Arboretum. We’re developing new tools that will allow anyone to access this treasure trove of data through the internet.

Q. One of the advances your team has shepherded is the use of wireless networking. What are some examples of how this technology is used at the Arboretum?

A. The Arboretum has implemented a high speed and secure wireless network that has helped in numerous ways,
not the least of which is saving money. The Hunnewell Building was wired for a computer network in the mid 90s, and today that cabling is incapable of keeping up to speed with modern software systems. Rewiring would have been a costly and disruptive undertaking, but with the new wireless network, staff and visitors may enjoy the benefits of faster internet access.

By nature, wireless networking promotes mobility, and this has enabled us to restructure the way staff collaborate with each other and use their workspaces. Additionally, this mobility has permitted our curatorial staff to do more of their work in the landscape, greatly improving the way they catalog and document our plants. In the future, wireless systems will enable the placement of sensing devices on the grounds to greatly enhance the collection of environmental data.

Q. Many systems at the University and beyond are moving to the internet for increased accessibility. Will the advances your team is making be visible to the public sometime soon?

A. Many of the databases used at the Arboretum were developed before the internet became a primary means of human interaction. Today, much of our work focuses on developing tools to make more of our data freely accessible online. We recently implemented some core technologies that have greatly increased the amount of information available online, and we have also improved our capacity to create and manage activities electronically with our constituents. One of these is our new online registration system, and we plan to introduce more features and functionality like this in the coming months. We are particularly excited to add geospatial context to our data through Geographic Information Systems (GIS)—for example, to provide the exact location of the dove tree in the Explorers Garden.

Q. Researchers in the Weld Hill Research Building require high performance computing for data analysis, increasing demand for computing capabilities. How do you navigate this complicated arena to ensure that the Arboretum achieves a leadership role in its scientific pursuits?

A. An important lesson I’ve learned from more than 20 years in IT is that the research computing field is both costly and rapidly changing, and it’s best to partner with larger organizations whenever possible. My initial focus has been to connect with the various research computing organizations at Harvard, like the Faculty of Arts and Sciences and the Harvard Medical School. Other partnerships outside of Harvard play a role as well. The effectiveness of the Arboretum’s relatively small data center in the new Weld Hill Research Building will be maximized by shared computing capabilities with other institutions that have similar needs and mission-directed goals.

Q. Many of the Arboretum’s scientists work in the field in remote areas overseas, like the forests of Asia and Indonesia, where electronic resources are at a minimum. How do you help them stay connected to their colleagues at the Arboretum and around the world?

A. To operate effectively, software systems used in research rely on computing power and reliable networking. Through virtualization technology, our scientists in the field can connect with whatever bandwidth they may have at their disposal and view the software and databases maintained by our powerful computers in Boston. We’re collaborating with our partners at the Smithsonian Institution and the Center for Tropical Forest Science to further develop and leverage this capability.

Q. What opportunities lie ahead for information technology at botanic gardens and arboreta?

A. The primary opportunity today for botanic gardens and arboreta is to modernize and update their legacy cataloging systems. Most plant-collecting institutions possess incredible treasure troves of interesting and valuable data that are unfortunately locked away in systems that are not easily accessible to horticulturists, scientists, and the general public. Solutions underway at the Arboretum to address this challenge will be freely available to our peer organizations, and the results over time will exponentially increase the scope of available data and its value to us all.
Whether brought about by nature or humans, all landscapes change. While the living collections at the Arnold Arboretum currently consist of nearly 15,000 accessioned trees, shrubs, and vines, tens of thousands of others have been planted, observed, and ultimately removed over the course of the Arboretum’s history. While many of the plants of yesteryear are no longer growing on the grounds, thorough record keeping prolongs their collection value indefinitely.

In addition to a number of bound ledgers, the Arboretum’s system for plant documentation prior to the 1980s entailed an extensive card file—much like the outmoded card catalogs of libraries. Staff used the handwritten or typed cards to record source and collection information for accessioned plants along with subsequent observations, name changes, and condition details. When the Arboretum established its electronic collections database (BG-BASE) a quarter century ago, only the cards representing living accessions were reviewed and entered—retrieving records on ‘dead’ plants required some detective work with the card file and ledgers. Now, as part of a multi-year project funded by the Institute of Museum and Library Services (IMLS), we are streamlining oversight of the collection both present and past by integrating legacy collections data into BG-BASE.

With some 55,000 cards to process, much work remains, though the value of capturing this information is already evident. Take, for example, the cards documenting the Crataegus (hawthorn) collection. Compelled by the puzzling taxonomy of this group, founding director Charles Sprague Sargent named over 700 hawthorn species and attempted to establish a comprehensive collection on Peters Hill. Since many of the trees from Sargent’s study were removed in the 1940s, much of what had been learned about these plants lay dormant in the card file. Through the IMLS project, records for more than 2,700 hawthorns have been added to BG-BASE, providing staff and researchers with integrated data for about 3,300 plants—a more than five-fold increase!

Among the newly digitized records is the card pictured here, which documents an accession of Crataegus punctuata f. aurea (dotted hawthorn). On the reverse side of this card (top) a 1953 observer noted and briefly described the plant’s flowers on May 20 and its fruits on September 10. Although this particular tree was removed in 1985, these annotations provide researchers with valuable phenological data on the growth and natural history of the species. This and other information provided on the cards—such as periodic measurements, verifications, and reasons for removal—can also help Arboretum horticulturists better understand the track record, performance, and cultural needs of the plants in their care. Moreover, six other cards documenting separate collections of C. punctata and its varieties have also been digitized. Some of these records represent wild-collected provenances, including Mount Pleasant in eastern Indiana and Shawneetown in southern Illinois. When considered with source locations for all dotted hawthorns ever cultivated at the Arboretum, a rough distribution of the species begins to take shape.

Though it’s just one of thousands of cards, this example illustrates the value of incorporating archival information into the Arboretum’s electronic records. With the digitization and georeferencing of nearly 1,800 paper maps of the collection—an additional component of this project already underway—we will also be able to pinpoint where these plants once stood. Although the Arboretum has changed significantly in the 139 years since its founding, information captured by this project will help facilitate a more comprehensive understanding of our dynamic collection of plants.

Grant Enables Arboretum to Digitize Written Plant Records

Jonathan Damery, Curatorial Assistant
The plant collections at the Arnold Arboretum might never have become so rich in Asian taxa were it not for the intrepid collecting expeditions that Ernest Henry “Chinese” Wilson (1876-1930) made in the early twentieth century. Though Wilson’s travels have been extensively documented in books and periodicals, a more personal depiction of the man and his work can be found in his extensive correspondence with the Arboretum’s first director, Charles Sprague Sargent (1841-1927). Sargent hand-picked Wilson for the Arboretum’s first expedition to China in 1907, and their letters construct the whole story—people and places visited, remarkable plants encountered, and the many logistical challenges faced by plant explorers in remote foreign locations.

Staff in the Arboretum’s Horticultural Library have worked for several years to make all of Wilson’s archives accessible to online audiences. In 2003, a project funded by Harvard University’s Library Digital Initiative captured 2,496 of Wilson’s images from eastern Asia on Harvard’s online archive of visual resources (via.harvard.edu). Wilson created these images using a large format, Sanderson whole-plate field camera, complete with bellows, a cumbersome wooden tripod, and crates of heavy, fragile, glass-plate negatives that captured both breathtaking detail and broad, undistorted perspectives. These photographs provide a rare visual record of China before its revolution, highlighting not only plants but also documenting elements of cultural heritage including temples, houses, boats, and people going about their daily lives.

In 2008, the Arboretum was invited to participate in the Harvard University Library’s Open Collections Program, “Expeditions and Discoveries: Sponsored Exploration and Scientific Discovery in the Modern Age.” This project included the digitization of Wilson’s manuscripts including a treasure trove of diaries, notebooks, field books, and travel documents. The handwritten correspondence between Wilson and Sargent adds essential color, context, and commentary to these materials.

The penmanship of E. H. Wilson does, however, present a challenge. Some of the letters written during his trips to China are quite difficult to decipher, even for the practiced eye. In the 1980s, Arboretum volunteer Carin Dohlman transcribed 145 of Wilson’s letters written between 1906 and 1919. Since these transcriptions provide a template for how to read Wilson’s other manuscripts and field notes, they are of great value to researchers. In 2011, the Library digitized the transcripts which had been formerly available only in hard copy, arranged them chronologically, inserted them into the library’s electronic finding aid for the Wilson archive, and made them available online. Now, anyone with internet access can explore the story behind the story.

To learn more about Wilson, please drop by the Arnold Arboretum Horticultural Library anytime between 10:00am and 3:45pm, Monday through Saturday, or view the Wilson collection online by clicking on the personal papers link in the library’s archive collections pages.
The Arboretum offers a variety of learning opportunities for adults. Below is a partial list of our fall/winter classes and lectures followed by descriptions of featured programs. In an effort to conserve resources, we are now listing only a sampling of our programs in print. To view all programs by month, please visit our online registration system at my.arboretum.harvard.edu. For additional assistance, call Pamela Thompson at 617.384.5277.

### Schedule of Classes and Lectures

**September**
- 10+ Botanical Printing on Fabric
- 19 More Ticks in More Places
- 18 Fabulous Fungi of New England
- 20+ Introduction to Botany
- 30 Invasive Plants: Identification, Ecology, and Control

**October**
- 1+ The Art of Photographing Trees
- 2 Identifying the 25 Most Common Trees in Boston
- 4 Places for the Spirit: Traditional African American Gardens
- 19+ Garden Design with Rosemary Alexander
- 22 Wicked Bugs
- 24 Wild Food: Foraging for Edible Plants and Mushrooms
- 25 Autumn Colors: A Mystery Revealed
- 27 Wood Decay Fungi Common to Northeast Urban Trees
- 29+ Propagating Trees and Shrubs from Cuttings and Seeds

**November**
- 5+ Chainsaw Use and Safety
- 10 Winter Gardening: Challenges and Rewards
- 16 Botany of Thanksgiving
- 29 American Eden: What Our Gardens Tell Us about Who We Are

**December**
- 3+ Introduction to Winter Tree Identification
- 7 The Deadly Nightshades: From Potatoes to Poisons

### Key to Symbols and Abbreviations

| + | Indicates a multisession class |
| DG | Arnold Arboretum, Dana Greenhouses, 1050 Centre Street, Boston |
| ES | Eliot School of Fine & Applied Arts, 24 Eliot Street, Jamaica Plain |
| HB | Arnold Arboretum, Hunnewell Building, 125 Arborway, Boston |
| NEWFS | Garden in the Woods, 180 Hemenway Road, Framingham |
| TC | Trinity Church, Copley Square, 206 Clarendon Street, Boston |
| WH | Weld Hill Research Building, 1300 Centre Street, Roslindale |

### Contact

Pamela Thompson  
Manager of Adult Education  
Arnold Arboretum  
125 Arborway  
Boston, MA 02130  
617.384.5277  
adulted@arnarb.harvard.edu  
my.arboretum.harvard.edu
Botanical Printing on Fabric
Leonore Alaniz, Textile Designer
Sat Sep 10 & Sun Sep 11 10:00am–4:00pm [ES]
Transfer images and anatomical details of plants onto fabric by inking them with textile paints and thickened dyes. Learn how tools, plants, textiles, inks, composition and color can be applied to produce diverse results, from exquisitely detailed to boldly expressionist. Limit 12 students.
Fee $150; $25 material fee payable in class
Offered with the Eliot School of Fine and Applied Arts

More Ticks in More Places: Changing Ecology of Tick-borne Diseases in the Northeast
Thomas N. Mather, Ph.D., Director, The University of Rhode Island TickEncounter Resource Center
Mon Sep 19 6:30–8:00pm [HB]
Occurrences of Lyme disease and related tick-transmitted illnesses have reached near-epidemic proportions in some areas of New England. In Massachusetts, however, there was a statewide decrease of 35.6% in reported cases of Lyme disease from 2009 to 2010 according to the Massachusetts Department of Public Health. Don’t be fooled into thinking ticks and disease are going away, because 2011 has been an exceptionally “ticky” year so far. Dr. Thomas Mather will discuss current trends in tick encounter risk as well as his efforts to help individuals and communities prevent tick bites and Lyme disease.
Fee Free for members, $15 nonmember

Fabulous Fungi of New England
Lawrence Millman, Mycologist and Travel Writer
Sun Sep 18 1:00–3:00pm [WH]
Join avid mycologist Lawrence Millman on this talk and walk in search of New England fungi species. Be prepared to walk on and off trail, on uneven terrain and up steep slopes. Millman’s new book, Fascinating Fungi of New England, will be available for purchase and signing.
Fee $15 member, $20 nonmember

Garden Design with Rosemary Alexander
Rosemary Alexander, Garden Designer and Founder, The English Gardening School
Wed Oct 19 & Thu Oct 20 9:00am–4:00pm [WH]
Spend two days exploring principles of garden design with renowned garden designer Rosemary Alexander. With a combination of lectures and exercises you will learn processes for assessing a garden space, creating a design, and making a planting plan. Throughout the two days you will consider color combinations, structure, texture, and other aspects of design. The program is applicable to a wide range of applicants but assumes some experience in garden-making. Visit my.arboretum.harvard.edu for more details.
Fee $275 member, $325 nonmember

Wicked Bugs: The Louse that Conquered Napoleon’s Army and Other Insect Monstrosities
Amy Stewart, Author and Gardener
Sat Oct 22 2:00pm [WH]
In a follow up to her New York Times bestseller Wicked Plants, Amy Stewart tackles the insects, worms, and spiders that have tormented humankind for centuries. With wit and style, Stewart will reveal some of her discoveries. Books will be available for purchase and signing.
Fee $5 member, $15 nonmember
Offered with Roslindale Green and Clean and Wellesley College Friends of Horticulture

Wood Decay Fungi Common to Urban Living Trees in the Northeast
Christopher J. Luley, PhD, Urban Forestry LLC
Thu Oct 27 9:00am–4:00pm [WH]
In this workshop, Chris Luley of Urban Forestry LLC in Rochester, New York will introduce the wood decay fungi common to urban trees, their identifying characteristics and decay pathways, and methods and equipment available to test for decay. He will also present the results of a recent research study on visual assessment, sounding, and Resistograph testing for decay in urban trees. This program will take place in the classroom with some demonstrations in the landscape. Morning coffee is included; please bring your lunch.
Fee $90 member, $120 nonmember
Offered with the Ecological Landscaping Association

Autumn Colors: A Mystery Revealed
David Lee, Tropical Biologist, Florida International University
Tue Oct 25 7:00-8:30pm [WH]
Part of the magic of living in New England is the stunning display of autumn foliage. But how, exactly, does the shift from greens to crimsons, yellows, burgundies, and oranges...
take place? And why are we treated to such a display? David Lee, who has spent his career studying the intricacies of color in plants, will explain some of the biological processes that take place within a deciduous plant come fall and also the signals to humans and animals that are communicated through plant pigments.

Fee Free for members, $15 nonmember

**Botany of Thanksgiving**

Pamela Diggle, Evolutionary Biologist, University of Colorado

Wed Nov 16 7:00–8:30pm [WH]

Pumpkins, squash, peas, beans, turnips, carrots, potatoes, parsnip, spinach, corn, apples, pecans, cabbage, and more are common components of a Thanksgiving feast. But have you considered these fruits, tubers, nuts, and vegetables from a botanical perspective? In a novel analysis of this traditional meal, Professor Pamela Diggle will open your eyes to the plant anatomy and physiology that preceded the creation of, say, your grandmother’s sweet potato-marshmallow casserole or your uncle’s savory succotash.

Free, but registration requested

**Deadly Nightshades: From Potatoes to Poisons**

Gregory J. Anderson, Professor of Ecology and Evolutionary Biology, University of Connecticut

Wed Dec 7 7:00–8:30pm [HB]

Outside of the grasses and beans, few plant groups have contributed more to influence global cuisine and culture than the nightshade family (Solanaceae). Members like potatoes, tomatoes, peppers, and eggplants have figured prominently not only in human nutrition, but also in the history of New England and the world. At the same time, poisonous relatives like tobacco, mandrake, henbane, and belladonna have contributed to its other, more sinister reputation. Join us for a deeper look at both sides of the family line.

Fee Free for members; $15 nonmember

**GIS for Public Gardens, Managed Landscapes, and More: An Introductory Workshop**

Brian Morgan, Developer, ArcGIS Public Garden Data Model, and Founding Director, Alliance for Public Gardens GIS

Tue Jan 24 9:00-5:00pm; Snowdate: Wed Jan 25 [Harvard Science Center]

This full-day workshop will guide participants through the process of creating a Geographic Information System (GIS) for a public garden or similar landscape using Esri ArcGIS and the Alliance for Public Gardens GIS Public Garden Data Model on individual work stations. Participants will learn how to download and install the data model template, how to create and edit map features in ArcGIS, how to collect garden data, and how to create plant collection maps. Participants will also be provided with crucial concepts and background information about GIS, managing and presenting garden collections data, and additional resources available for creating a GIS for your own garden, park, nature center, zoo, cemetery, museum or other landscape.

Fee before December 15: $160 member, $195 nonmember; after December 15: $185 member, $220 nonmember

Offered by the Arnold Arboretum of Harvard University, the New England Wild Flower Society, Tower Hill Botanic Garden, and Wellesley College Friends of Horticulture with promotional support from Mount Auburn Cemetery

**Dwarf Conifer and Juniper Collections via Snowshoes**

Jen Kettell, Horticultural Technologist, Arnold Arboretum

Sat Feb 11 10:30am–12:30pm [HB]

Join Jen Kettell for a tromp through the dwarf conifer and juniper collections on snowshoe. She will help you identify common conifers, share the stories behind the plants, impart the history of the two collections, and describe the microclimate in this part of the Arnold Arboretum. Bring your own snowshoes, a travel mug for hot cocoa after the hike, and dress warmly! (Not appropriate for cross-country skis.)

Fee $25 member, $35 nonmember

**Syrup, Seeds, and Bees: Exploring Links in Maple Ecology**

Elizabeth Crone, Conservation Biologist

Mon Apr 23 7:00–8:30pm [WH]

Elizabeth Crone’s research focuses on the population ecology, life history, and conservation of plants and insects. Most recently, she has turned her attention to a signature “industry” of New England—maple syrup production. She is looking for links between pollinator populations and maple flowers, seeds, and sap flow. Join us to learn if each responds independently to the weather or if there are possibly complex interactions taking place in the sugar bush.

Free, but registration requested

Read additional class descriptions and register online at: my.arboretum.harvard.edu
Garden and Spirit: The Power of Landscape to Transform
A Series offered in partnership with Trinity Church in the City of Boston

Places for the Spirit: Traditional African American Gardens

Vaughn Sills, Photographer and Associate Professor of Photography, Simmons College;
Lowry Pei, Writer and Professor of English, Simmons College
Tue Oct 4 6:30–8:00pm [TC]
Vaughn Sills has been photographing African American gardeners and their gardens for more than twenty years. Her black and white images, taken throughout the Deep South, reveal cultural beliefs about living in the present and honoring the deceased, a practical creativity that transcends design, and a pride of place deeper than any roots in suburban America. Vaughn and her husband and collaborator, Lowry Pei, will talk about their extended journey to document the unique aesthetic and cultural significance of these disappearing gardens.
Fee $15 member, $20 nonmember

American Eden: What Our Gardens Tell Us about Who We Are

Wade Graham, Designer, Historian, Adjunct Professor of Public Policy, Pepperdine University
Tue Nov 29 7:00–8:30pm [TC]
In his book, American Eden, Wade Graham argues that how we design and garden shows more than simply how green are our thumbs. Gardens reveal information about who we are as a nation—where we have come from, and where we might be headed. From ethics to aesthetics, from politics to political correctness, Graham will speak about the history of gardening in America and how it has shaped and been shaped by daily life.
Fee $15 member, $20 nonmember

Growing Potential: Gardening Behind Bars

James Jiler, Founder, Urban GreenWorks and CEO, Native Splendor Designs
Tue Feb 28 7:00–8:30pm [TC]
Prisons by nature are bleak and barren places and are, in fact, a bio-physical metaphor for the 2.3 million lives warehoused in the US criminal justice system. James Jiler, former Director of the Greenhouse Project, a renowned horticultural job training program for inmates at New York City’s Rikers Island prison, former Director of Community Services for the Horticultural Society of New York, and author of Doing Time in the Garden, will speak of the harsh reality of our prison system and a unique approach to re-directing prisoners’ lives through horticulture. He will speak of his work with individuals, both inside and outside of prison walls and the human and landscape transformations he has witnessed.
Fee $15 member, $20 nonmember

Landscape as Urbanism

Charles Waldheim, John E. Irving Professor of Landscape Architecture and Chair, Department of Landscape Architecture, Harvard Graduate School of Design and Consulting Curator of Landscape, Isabella Stewart Gardner Museum
Wed Apr 11 7:00–8:30pm [WH]
Charles Waldheim will speak about the emerging thought that places landscape as the dominant building block for our cities, reflecting a shift from the historical model in which architecture and buildings came first. A leading scholar in the field of landscape architecture, Waldheim will speak about our ever-evolving relationship with the urban environment as we press its boundaries into the suburbs and the role of landscape in defining our communities.
Fee $15 member, $20 nonmember

Please note that start times and locations vary for this series.
Visit the Arboretum

Visitor Parking & Driving Permits
Visitor parking is available around the Arboretum’s perimeter. No parking is allowed inside the Arboretum gates. Individuals with special needs may request a driving permit at the Hunnewell Visitor Center, weekdays only, from 10:00am to 2:30pm. For more information please call 617.384.5209.

Visitor Services
The Visitor Center, located in the Hunnewell Building, is open at the following times:

<table>
<thead>
<tr>
<th>Day</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday–Friday</td>
<td>9:00am to 4:00pm</td>
</tr>
<tr>
<td>Saturday</td>
<td>10:00am to 4:00pm</td>
</tr>
<tr>
<td>Sunday</td>
<td>Noon to 4:00pm</td>
</tr>
</tbody>
</table>

See our website for holiday closings.

Telephone: 617.384.5209

Services available in the Visitor Center include:
- Personal assistance to enrich your visit
- Maps and self-guided tour brochures
- Special exhibitions, including “Science in the Pleasure Ground” and seasonal art shows
- Bookshop, featuring a large selection of books and educational items for children and adults
- Restrooms
- Arnold Arboretum Horticultural Library, open Monday through Saturday 10:00am to 3:45pm.

For more information, call 617.522.1086 or email hortlib@arnarb.harvard.edu.

Adventures in the Explorers Garden
Follow the footsteps of Arboretum explorers on a self-guided tour through the Explorers Garden, near the top of Bussey Hill. Pick up a map at the Hunnewell Visitor Center, download it online, or use your cell phone to dial in for stories of rare finds, exciting journeys, and intrepid travelers on the quest for unusual or endangered plants.

Dial in for adventure!
Use your cell phone to explore the plants on the tour. When you spot this logo, dial 617.895.4085, then enter the tour stop number. (No extra charge, just your airtime.)

Family Fun
Foster a sense of wonder for nature in your child while exploring nature, science, and trees at the Arboretum. Free!

- Drop by the Visitor Center for a family activity. Offered the last Saturday of each month through October, 11:00am–1:00pm. Activities may include scavenger hunts, science investigations, craft activities, and more—discover something new each month! Appropriate for ages 4 and up. No registration required.

- Be on the lookout for volunteer Arboretum Interpreters. Weekends in September and October, 11:00am–3:00pm. Look for friendly faces in green aprons. Volunteers are stationed outdoors, ready to boost your visit with hands-on fun and learning. No registration required.

- Take a hike!
Family Hike: Saturday, November 12, 1:00–2:30pm
Explore the autumn landscape on a guided adventure. This hike is appropriate for children from age 8 to 12 with an accompanying adult. One adult may chaperone a maximum of four children. Registration is required. Register online at my.arboretum.harvard.edu.
Art Exhibitions in the Visitor Center

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 14 for Visitor Center hours.

Artists in the Arboretum:
A Juried Exhibit in Conjunction with Jamaica Plain Open Studios

September 21–October 23
Reception: Wednesday, September 21, 6:00–8:00pm
JPOS weekend: Saturday and Sunday, September 24–25, 11:00am–6:00pm

A juried exhibition featuring Arboretum-inspired works by local artists. Organized in conjunction with Jamaica Plain Open Studios, the premiere annual arts event in one of Boston’s most vibrant neighborhoods. For more information, and to preview artists’ work, visit the JPOS website: www.jpopenstudios.com.

Trees and Gardens
Photographs by Joseph Flack Weiler

October 29–December 18
Reception: Saturday, November 5, 1:00–3:00pm

For 45 years, photographer Joseph Weiler has been capturing trees, both in the wild and in parks and gardens. He accompanies his breathtaking black-and-white images with detailed descriptions, touching upon the many ways that trees and the landscapes they inhabit affect and enrich the lives of humans.

Aviflora: Plants and the Birds that Love Them
Images by Ted Bradford, Brooks Matthewson, and Eduardo del Solar

January 14–March 11
Reception: Saturday, February 18, 1:00–3:00pm
See our website for individual evening presentations by the artists

The quantity and diversity of trees and shrubs in our area provide shelter and food to a wide assortment of birds throughout the year. Three fantastic bird photographers have combed their portfolios for images that capture both floral and avian organisms in tandem. By giving a measure of parity to the plants, these images invite the viewer to consider the vital interactions between all living things.

Tree Rings
Ceramic Panoramas by Warren Mather

March 17–April 29
Reception: Saturday, March 17, 1:00–3:00pm
Artist Talk: Thursday, April 12, 6:30–8:00pm

Artist Warren Mather, a member of the faculty at the School of the Museum of Fine Arts, makes circular panoramas, presenting a simultaneous view of what is in front at the same time as what is behind. In this exhibit, he creates inverse panoramas of the bark of various trees. These images are formed into a ring and transferred to silk-screens, printed in ceramic pigments on clay, then fired and glazed.
Visit

Free Tours

Free general and theme tours begin in front of the Hunnewell Building unless otherwise noted, last approximately 90 minutes, and are geared towards adults. Free tours are for individuals, not organized groups. Private group tours are also available; see my.arboretum.harvard.edu. For more information, or cancellations due to inclement weather, call 617.384.5209.

General Tours

General tours offer a window into Arboretum history, special collections, seasonal highlights, and current programs. No need to register. The tour season continues through November 13:

- Every Saturday at 10:30am
- Every Sunday at 1:00pm
- Every Wednesday at 12:15pm
- Select Fridays at 6:00pm: September 9

Theme Tours

Theme tours delve into a specific subject or area of the collection. Registration is required; go to my.arboretum.harvard.edu for descriptions and registration information.

From Seed to Tree
Dana Greenhouses staff
Tue Sep 6 [Bonsai House Gate] 1:00–2:00pm

Fall into Health
Rhoda Kubrick, Arboretum Docent
Sat Sep 10, Oct 8 [Peters Hill Gate], Nov 12
10:00–11:30am

From Our House to Yours: Arnold Arboretum Plant Introductions for Your Garden
Anne Serrell-Jones, Arboretum Docent
Sat Sep 10 1:00–2:30pm

Bird Walks
Bob Mayer, Arboretum Docent & Marc Devokaitis, Visitor Education Assistant
Sat Oct 1, Oct 8 [Bussey Street Gate], Oct 15, Oct 22 [Bussey Street Gate] 8:00–9:30am

The Common Trees of Boston
Ajay Sequeira, Arboretum Docent
Sat Oct 1 1:00–2:30pm

A Treasure Trove of Maples
Nancy Rose, Editor, Arnoldia
Thu Oct 20 1:00–2:30pm

Volunteer Spotlight

Chris McArdle,
Arboretum Docent

Sheryl White, Visitor Education Assistant

Docents share their love of the Arnold Arboretum with visitors from every part of the world. They may climb aboard buses to explore seasonal highlights with seniors or stroll with a garden club to the Leventritt Garden for an up-close look. Docent Chris McArdle guides every kind of tour, engaging visitors with her considerable knowledge and enthusiasm. One of the Arboretum’s longest serving docents, Chris has led explorations of the landscape and collections for 27 years.

In 1984, Chris joined a walking tour with the late Al Bussewitz, Arboretum volunteer, naturalist, and photographer. Enthralled with his knowledge of plants and his affinity for the landscape, Chris decided—with Al’s encouragement—to train to be a docent herself. “I started with a bad case of tree blindness,” Chris admits. “I could recognize that a tree was a tree, but little more.” Docent training filled many of the gaps, but much of her education has come from the generous help of staff and her docent colleagues. “With all the talks and walks that are offered to volunteers, I feel I get much more than I give.” Even after more than a quarter century, Chris still welcomes every Arboretum invitation for special programs: “Most offerings turn the spotlight on something I never noticed before.”

Her favorite tour destination is the Explorers Garden, with highlights like the Davidia (dove tree) in May, Franklinia (Franklin tree) in October, and all-year marvels like the paperbark maple, Japanese stewartia, and Chinese fringe tree. When she visits the Arboretum on her own, she enjoys sitting by the brook along the Linda J. Davidson Rhododendron Path, “looking up at the timeless, rocky crags.” For Chris, it is like sitting in a private room, bounded by the stream and hemlock woods. “And that,” she says, “is really magical.”
Members' Plant Giveaway

at the Arnold Arboretum
Saturday, September 17 at 10:00am

In addition to making plant material available to researchers and other botanical institutions, the Arboretum honors a long tradition of distributing remarkable plants to members of the Friends of the Arnold Arboretum through the Members' Plant Giveaway. This September’s event provides members with the opportunity to select free Arboretum-grown plants, obtain knowledge from the woody plant experts on our staff, and enjoy the beauty of the late summer landscape.

The event will be held at 10:00am on Saturday, September 17 on the Arboretum grounds and is open to current members (expiration date of September 2011 or later) at all levels. Detailed information including event schedule, directions, and parking instructions will be mailed to members in advance of the Plant Giveaway, along with a list of plant offerings, admission ticket(s), and coupon(s) for free plants. In addition to this year’s featured selections, there will also be a special bonus drawing for some exceptional plants from the Arboretum greenhouses.

Staff and volunteers will be on hand to answer questions about woody plants and share their advice for planting and maintaining healthy trees, shrubs, and vines. For those interested in exploring the grounds, members may choose to visit mature specimens of the Plant Giveaway offerings in the Arboretum collection.

If you are not a member, you may join on the day of the event to attend and receive the free plant benefit. The Plant Giveaway is a rain or shine event. If you are unable to attend, you may send a proxy with your free plant coupon to pick up your free plants at the Giveaway. If you have any questions, or would like to join the Friends of the Arnold Arboretum, please contact membership coordinator Wendy Krauss at 617.384.5766 or membership@arnarb.harvard.edu.

We hope you enjoy your Arboretum membership and the experiences it offers. Share your enthusiasm and help support the Arboretum’s mission by giving a gift membership to a family member or friend. To learn more, please contact the membership office at 617.384.5766 or membership@arnarb.harvard.edu, or visit our website at arboretum.harvard.edu/get-involved/membership.

Members Make a Difference

Your support keeps us growing! Members of the Friends of the Arnold Arboretum provide essential support for the care of our landscape and living collections, research initiatives, education programs for adults, children, as well as professionals. Your annual membership contribution and involvement provides the foundation of all of this important work.
In our Collection

Wilson's "Passports"
Sheila Connor, Archivist

The Arnold Arboretum's collection of materials connected to plant explorer Ernest Henry Wilson includes his early work and education records, diaries, field and plant notes, account books, shipping lists, maps, news clippings, several hundred letters (see story on page 9), and an extensive collection of photographs, lantern slides, and glass plate negatives. Many of these holdings have been digitized through a number of grants from the Harvard University Library and are available online through the Arboretum's website.

Among the Arboretum’s Wilsoniania is a series of 14 legal documents issued by the Chinese government that provided official sanction for Wilson’s travel to and through the country’s various Provinces. With these large (18” by 20”) and ornate “passports” in hand, Wilson could “rent boats, porters, and all kinds of transportation facilities,” proceed on his expeditions “without obstruction,” have confidence that his “luggage and goods should go through without hindrance,” and be assured of “safe passage of the said Wilson upon the inspection of this paper.”

The earliest of these papers dates from his first expedition in 1899 and allowed him to collect plants in Canton for London’s Veitch Nursery. Some permits were issued for a Chinese assistant to accompany him, and others—like the one shown here—were granted for more specific purposes. The last, granted on March 19, 1910, enabled Wilson to travel via the Peking-Wuhan Railway. All are inscribed on the most delicate rice paper, are embellished by colorful stamps and imposing seals, and are valued as historical documents from the golden age of plant exploration. They are also, quite simply, beautiful and evocative objects in their own right.

At top, this document permitted Wilson (right, on expedition with Harvard colleague Walter Reaves Zappey) to carry guns and ammunition on an expedition in 1908. Translated by Mingwang Liu, it reads: “Emperor Guangxu ordered the second highest rank official Mr. Chen in Hubei province to issue passes of all outposts for a British Mr. Wilson to purchase and carry guns and bullets for self protection after paying taxes. In 1908 or the 34th year of Emperor Guangxu.”