A Note from the Executive Director

BILL CULLINA, The F. Otto Haas Executive Director

Recently, I attended the annual Penn Class Tree Planting during homecoming weekend at the University of Pennsylvania. Thanks to the generosity of Arboretum board member Bill Hohns and his wife Kathie, this endowed program funds the annual planting and care of a tree on College Green to honor each freshman class. The ceremony was especially meaningful to me as my son, Liam, is in the freshman class this year. The class of 2023 chose the venerable American beech (*Fagus grandifolia*) from a short list of possibilities. As I was standing next to it, shoveling in hand, I started thinking. Trees, like all living things, are mostly carbon; carbon that they sequester from the air through photosynthesis. As this grows, from a sapling beech to mature tree, it will remove about 7-8 tons of CO2 out of the atmosphere and sequester it in its silver trunk and roots. That seems like a lot, but according to a recent MIT study, even the most carbon-conscious, plant-based dieting, bicycle riding, solar-powered American citizen cannot get below 8.5 tons of carbon emissions output per year. It stands to reason then, that in addition to doing everything we can to reduce our carbon footprint, each of us would really need to plant a tree—one tree, each year, for the rest of our lives.

I am sure you are aware that we have been losing our rainforests, but closer to home our forest is disappearing, too. We are losing about 1% of our eastern forests to disease, agriculture, and urbanization each decade. That may not seem like much, but 1% represents about 7 million acres or 3.5 billion trees! After returning from the planting ceremony, I opened my inbox and saw a link to a story about a new disease—Beech Leaf Disease—that is devastating *Fagus* species and particularly American beech stands in parts of Ohio, New York, and western Pennsylvania. Discovered recently in Lake County near Cleveland, the disease is so new that researchers are still unsure of the causal agent. It has been linked to the presence of a foliar nematode (nearly microscopic roundworms that feed on and destroy leaf tissue) recently described in Japan. Where the parasitic roundworms came from is a mystery, but since Lake County is Ohio’s nursery capital, it’s possible that if indeed this organism is the culprit, it came in on infected stock from Japan.

This disease is yet the most recent threat in a century-long onslaught. First chestnuts, then elms, hemlocks, ash, and now beeches are being systematically wiped out by pests and diseases against which the trees have no natural resistance. However, as with any epidemic, rare individuals with natural resistance do survive. Certainly, that has been the case with American chestnut, elms, and hemlock. I have heard anecdotal reports from New York that some beeches seem to be surviving the initial outbreak. The challenge for isolated survivor trees is finding others to mate with. Researchers are using these promising trees as part of breeding programs to help further develop resistant strains.

When a key forest species is lost, not only is the tree itself gone, but it likely leaves a host of other organisms—from bacteria, fungi, and protozoans to insects, birds, and mammals that depend on it for one thing or another, at risk. Time, my friends, is very much of the essence. Fortunately, we are at the confluence of two exciting areas of emerging research that I believe can identify resistance, and disseminate that resistance in the population before it is too late. I will have more information on these in the future, but suffice to say that with the Morris Arboretum’s expertise in botany, plant exploration, and propagation, combined with the University’s expertise in molecular genetics and drone and robotic technology, we are uniquely qualified to help save these stalwarts of our forests. Yes, it will take time and resources, but together I believe we can look forward to a time in the near future when stories of restoration are more common than tales of extinction, and an American beech planted by the class of 2023 will be thriving on College Green a hundred years from now.

With deep appreciation,

[Signature]

Cover Photo: Judy Miller
Support provided by:
**Winter Pruning Techniques**

BILL CULLINA, The F. Otto Heas Executive Director

This piece is adapted from an article that originally appeared in a 2013 issue of *Garden Design* magazine.

Flowering shrubs and small trees are certainly a staple of most garden designs, as they provide height, structure, screening, and year-round interest. However, integrating these woody plants with perennials and annuals can be challenging because over time, they often overtake their herbaceous neighbors. One technique that can be used is to manage smaller woody plants much as we do perennials; cutting them back severely every 1-5 years depending on the particular variety. The result is plants with more of a multi-stemmed, “perennial” gestalt that do not overtake their neighbors, and which often produce more flowers and better foliage.

Though the practice of cutting back certain woody plants such as roses, butterfly bushes, lilacs, and lavender is widespread and familiar, I think many folks are a bit intimidated when pruning stems on other shrubs and trees to within 6 to 18 inches of the ground. The process, however, is relatively straightforward and foolproof if you follow a few basic rules.

**Adventitious Buds**

When you cut a rose for a bouquet, a dormant bud just below the cut will soon begin to grow and eventually develop a new bloom. Light pruning such as this, where you cut back younger stems (less than two years old) is very safe and can be done more or less at any time of the year (except late summer) on just about any woody plant. However, when more severe pruning is required, timing and technique are more critical. Without getting deep into plant physiology, suffice it to say that most woody plants can form spontaneous “adventitious” buds and shoots from tissue in their inner bark. If you have ever cut down a tree and had the stump respout, the new shoots arose from these buds. With a few exceptions, needle-bearing or coniferous trees lack the ability to form these adventitious buds so they will not recover from hard pruning. However, almost all broadleaf shrubs and trees can form them and will sprout again as long as they were healthy to begin with and provided you time pruning correctly.

**Put on Your Snowshoes and Grab the Pruning Saw**

One of the best times of year to accomplish hard pruning is in late winter and early spring before the sap rises. At this time of the year, most of the plant’s energy reserves are in the roots, ready to fuel a surge of new shoots come spring. On the contrary, undertaking radical surgery early in the growing season when reserves are low may kill the shrub or tree, while pruning late in the growing season will result in new shoots that may fail to harden off properly for winter.

**New Wood or Old?**

There are woody plants that we cut back every year, and others we cut back only every three to seven years. This latter group includes broadleaf evergreens and small trees, individuals growing in shade, as well as flowering species that bloom on “old wood.” Like roses and butterfly bushes, spireas, some hydrangeas, and elderberries flower on the current year’s twigs, while other species such as forsythias, azaleas, serviceberries, and magnolias flower on wood from the previous year (see next page). As a rule, species that bloom on new wood tend to flower in summer, whereas those that flower on old wood bloom in spring from flower buds that have overwintered from the previous year. Though you can technically cut back the latter every year, you will never see them flower.

**Graft and Corruption**

Some woody plants are most easily propagated by stem grafting, where a shoot or bud (scion) from a superior individual is spliced on to a rootstock from an unremarkable but resilient relative. Apples, crabapples, flowering cherries, dogwoods, Japanese maples, witchhazels and a number of others, are routinely propagated in this way. The danger comes when you cut grafted plants back, as chances are good that the weedy rootstock and not the scion will sprout back and your beautiful shrub will quickly go from gentleman to cad. If you wish to cut back grafted varieties, be sure to cut at least a few inches above the graft (visible as a swelling or scar near the base of the trunk), and prune off any sprouts that grow from below it.
Ornamental Cherries – The Highlight of Spring

ANTHONY S. AIELLO, The Gayle E. Maloney Director of Horticulture and Curator

Philadelphia has a rich history of ornamental flowering cherries. In the early 1900s, there was a well-known nursery in Narberth that provided a wide assortment of selections. As part of the Sesquicentennial celebration of 1926, the Japanese government gifted flowering cherry trees to the city of Philadelphia and some of these original trees can still be seen in Fairmount Park. In addition to these original plantings, since 1998 the Japan America Society of Greater Philadelphia has planted more than 1,000 cherry trees throughout the city. The most impressive of these plantings are near Memorial Hall (the Please Touch Museum), Shofuso Japanese House, and the Horticulture Center in Fairmount Park, as well as along both River Drives.

Flowering cherry trees are small to medium-sized plants and are one of the most diverse groups of ornamental trees in our area. They are members of the rose family, and like all its members, they require full sun and good drainage. Their small delicate petals come in colors ranging from white to light pink, and even some darker pink-reds. While in flower, cherries have a very fine texture and in autumn they reward gardeners with excellent fall color. There are an immense number of varieties but the main ones for gardeners to consider are:

- **Prunus ‘Okame’**: The Okame cherry is one of the most commonly planted cherries and the first to bloom in Philadelphia, usually in late March or early April. It has dark pink flowers that fade to pale pink as they open. Okame was introduced to the United States through the Morris Arboretum in the 1940s. It was propagated and distributed widely in the early 1980s. In our area, Okame cherries make their first appearance at the Philadelphia Flower Show before coming into full bloom throughout the city.
- **Prunus subhirtella ‘Pendula’**: the weeping Higan cherry is the most common of the weeping cherries and is one of the most graceful garden trees. Its small, April-blooming flowers are pale pink and cover the branches, giving the plants a beautiful overall look.
- **Prunus x yedoensis**: the Yoshino cherry is probably the best known flowering cherry, famous for the display surrounding the Tidal Basin in Washington, D.C. This is one of my favorite plants and is a medium-sized tree that grow to 40 feet. It blooms in April with flowers that are pink in bud, opening to a pale pink-white at full flower.
- **Prunus sargentii**: Sargent cherry is native to northern Japan and is among the hardest and largest of the flowering cherries. Its single rose-pink flowers emerge in mid April before the foliage and at the same time as the Yoshino cherries. The deep red-brown lustrous bark of Sargent cherry adds interest throughout the year. It also has the most reliable red fall color of any of the flowering cherries.

The second wave of flowering cherries occurs in late April, when a large number of varieties come into bloom (these are variously listed as Prunus serrulata or Prunus cultivars). There is an endless variety of these, with flowers ranging from whites through darker pinks, and single, semi-double, and double forms of flowers. Many of these are quite well-known such as ‘Kanzan’ or ‘Kwanzan’ (Sekiyama), ‘Okame’, or ‘Kanzan’ (Sekiyama), the ubiquitous tree with its brilliant pink double-flowers.

Visiting and admiring flowering cherries is a wonderful way to enjoy the numerous gardens of Philadelphia. Other displays of flowering cherries can be found at many of the members of Greater Philadelphia Gardens (americasongardencapital.org), with some of the larger displays at the Scott Arboretum, Longwood Gardens, Chanticleer, the Tyler Arboretum, and the Morris Arboretum.

It is with great sadness that the Morris Arboretum marked the passing of Jane Korman, Advisory Board Member Emerita, in October 2019. Jane was well-known for her kindness, for her creative vision, and for her generosity. Her inimitable style, her grace, and her humor and fun-loving spirit endeared her to anyone who was fortunate enough to share her company.

Jane was a member of the Arboretum’s Advisory Board of Managers for more than 20 years. She was a gracious hostess for Arboretum events, a generous donor, a contributing sponsor of art in the garden projects, and a tireless fan of the Arboretum’s programs and projects. She was adored by Arboretum staff, volunteers, and board members, and her kindnesses—both large and small—will forever be remembered and appreciated.

It was only natural that Jane and her husband, Leonard, would become involved with the Morris Arboretum more than three decades ago. Located not far from their home in Fort Washington, the Arboretum was one of Jane and Leonard’s favorite places to take a stroll together, often with their children or grandchildren. As a lover of art, beauty, and gardens, Jane would often remark that the Arboretum was her “happy place.” It is no overstatement to acknowledge that Jane’s thoughtful vision and strong leadership ensured that the Arboretum would continue to be a happy place for countless other visitors of all ages.

Jane was passionate about creating a space at the Arboretum where families could experience the beauty and awe of nature together. It was Jane’s vision—along with her purposeful philanthropy—that resulted in the creation of Out on a Limb: A Tree Exhibit, which created the most popular and transformative feature. Jane and Leonard later established a generous endowment for the exhibition, ensuring that Out on a Limb—and the Morris Arboretum—will continue to be a place of inspiration and exploration for families and other visitors for generations to come.

Today, more than a decade since its opening, Out on a Limb continues to be a happy place for so many, and stands as a lasting testament to Jane Korman and her incomparable spirit. Many gifts have been received in her memory (see page 21). The Arboretum is most grateful to these donors.

“Jane was the the ideal board member every director dreams of having—always creative and positive. Most important, she was willing to pitch in and help make sure dreams were achieved. She was truly a joy to work with.” – Paul W. Meyer, The F. Otto Haas Executive Director (Retired)
The Fountain in the Park

BOB GUTOWSKI, Director of Education and Visitor Experience

The Step Fountain in the English Park was commissioned by Lydia T. Morris in 1916, following the death of John T. Morris in 1915. It provided a connecting visual link between the newly developed Park (purchased 1910) and the Compton Mansion (1888) towards which it faced. Seven Arches (1912) and the Overlook (1912) share this mansion-facing aspect. Water features are a central theme in Compton’s landscape with the Step Fountain being the final, and most exuberant, component. Each of the fountains and water features (Seven Arches, Overlook, Step Fountain, Loggia, Ravine Garden, and Key Fountain) were linked in the Park, fed by the water system housed in Seven Arches. The Step Fountain (a.k.a. Water Stairs, Lion Fountain, Italian Water Stairs, Fountain in the Park) also reflects the Morris interest in gardens and locations they visited during their world tours. A journey around the Park can be experienced as a travelogue in garden architecture embracing their trips in North America, Europe, and Asia. Among the images in their travel albums is the Water Stairs at the Tsar’s palace in St. Petersburg.

Restoring the Step Fountain

MARIE INGEGNERI, Marketing Coordinator

A
ge and weather have resulted in significant wear to the 103-year-old Step Fountain. With recent funding, restoration plans are now underway to return the water feature to its original grandeur.

The scope of work involved in this project, scheduled to begin in early spring, includes dismantling and reassembling the fountain, fabricating all stones, restoring where needed, and adding a new mechanical water system. To maintain historical accuracy of this iconic structure, the restoration is being completed with assistance from historic preservationist and project manager T. Scott Kreilick.

Both the bluestone main fountain steps onto which the water flows, and the fountain cheek walls, also known as side walls, are severely cracked and need to be replaced. As a temporary fix, an epoxy coating was applied to the fountain steps to hold water. Now both types of stone are being cut to mimic the original artistic look using the same high-end materials. The new bluestone steps will reflect the “bull nose” style—an overhanging edge with a rounded profile. The cheek walls will be recreated with Indiana limestone, known in the industry as the premier quality quarried limestone in the United States. “One of the major challenges of this project is finding craftsmen who can cut and detail the stone with 19th century quality and specifications,” stated Thomas Wilson, The Moses Feldman Family Director of Physical Facilities and Project Manager at the Arboretum.

On the right and left side of the bluestone fountain steps are the pedestrian steps that will be refurbished and re-installed. The original limestone balustrade, lion’s heads, and urns will be cleaned, re-grouted and the stonework repointed.

While preparing for this project, the Arboretum’s Facilities department uncovered the original Step Fountain plumbing line that utilized gravity to move water from the Overlook Garden to the Step Fountain, continuing to the Key Fountain, and finally emptying out in the East Brook. This method is no longer in use, however the current plumbing system continues to run 24/7 with a recirculating pump to avoid overflow at the bottom basin that would flood out the hill below the structure. The restoration will improve this process with new plumbing lines installed within the fountain along with a 500-gallon holding cistern that will collect water when the plumbing system is turned off.

The innovative circulation system planned will utilize high efficiency centrifugal pumps that are programmable for energy conservation. Made up of a cartridge filter, ionizer, and UV sterilizer, the water filtration that is to be installed will help keep the water clear and vibrant, which will greatly reduce or eliminate the use of abrasive chemicals.

Although the physical dismantling of the Step Fountain won’t begin until early spring 2020, the materials will be gathered and prepared throughout the winter. The restoration should be finalized by early summer 2020, complete with fresh landscaping to accompany the “new,” historic fountain.
Foundation and Corporate Philanthropy Support Morris Arboretum

Local and national foundations and corporations are investing in the Morris Arboretum’s Ever Green campaign priorities, making significant commitments to cultivating the garden, to research initiatives, and to improving public access and inclusion. The Morris Arboretum gratefully acknowledges recent grants from the following foundations and corporations for their philanthropic gifts to the Morris Arboretum:

The William B. Dietrich Foundation is widely recognized for its commitment to historic preservation throughout the greater Philadelphia region. Through the Foundation’s extraordinary generosity, dozens of the region’s most treasured historic and cultural sites have been conserved for the benefit of our communities. The Morris Arboretum was honored, therefore, to be awarded a $360,000 grant from the Foundation, designated to support the restoration of the Arboretum’s iconic Step Fountain. For more information on this fascinating water feature and the conservation work made possible through the investment of the William B. Dietrich Foundation, please see the article on the previous page.

In 2016, the Morris Arboretum and the ACLAMO Family Center (Accion Comunal Latinoamericana de Montgomery County or the Latin American Community Action of Montgomery County) began to explore ways in which to work together to strengthen the educational outcomes for Norristown’s at-risk school children. The Explorar! Summer Bridge Program at the Morris Arboretum was developed to assist in addressing this critical issue. Through engaging and interactive summer programming at the Morris Arboretum, children from the Norristown community’s ACLAMO Family Center have enjoyed outdoor learning experiences that supplemented their in-school education.

The Arboretum is delighted to announce that grant awards have been received from The Anna-Maria Moggio Foundation and The Wells Fargo Foundation in support of the 2020 Explorar! Summer Bridge Program. These grants fortify the Arboretum’s summer outreach efforts to young people from ACLAMO, strengthening their interest in and excitement for learning, and bolstering their improvement and success in school.

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We are proud to welcome Ambler Savings Bank as our newest donor to the Arboretum’s EITC-approved Partners in Education Program (PINE). Through the PINE program, children from Title I schools are able to visit the Arboretum free of admission and transportation costs. For more information about making a donation to the program, please contact Leslie Crane at lcrane@upenn.edu or (215) 247-5777 ext. 152.

On November 9, 2019, Paul Meyer, the retired F. Otto Haas Executive Director of the Morris Arboretum led a tour along with Jessica Baumert, Executive Director of The Woodlands, for Penn alumni and friends participating in the 2019 Homecoming Weekend. The Woodlands offers a 54-acre pastoral oasis nestled in West Philadelphia and was the perfect place to showcase Paul’s expertise close to campus. All participants received a copy of his 2017 publication, co-authored with Catriona Bull Briger and Edward Sibley Barnard, Philadelphia Trees, which identifies The Woodlands as a “Great Place to See Trees.” Of course, Morris Arboretum is also featured! Pictured in the photo above right are Jessica Baumert, Paul, and Philip Price Jr. (far right), who is a former Morris Arboretum Advisory Board of Managers member and a board member of The Woodlands. Phil is also the great-grandson of Eli K. Price who was a founding member of The Woodlands Cemetery in 1840.
Winter Wellness Walks
November through March
Saturdays, 10:30–11:30am
Sundays, 1–2pm
Meet in front of the Widener Visitor Center. An expert will be available to answer all your questions about witchhazels. The 2pm guided tour will focus on the witchhazel collection.

Winter Witch Hazel Walk
Saturdays, February 8 & 22, 1pm
Discover many varieties of colorful and fragrant witchhazels. These winter beauties herald the arrival of spring and boast beautiful flowers in a range of colors.

“Witchhazel” is your Favorite?
Saturday, February 15, 1pm
Enjoy a day of outdoor fun and exploration. Follow the scavenger hunt to discover more than 70 varieties of colorful and fragrant witchhazels and create a witchhazel craft in the Visitor Center. An expert will be available to answer all your questions about witchhazels. The 2pm guided tour will focus on the witchhazel collection.

Storytime at the Arboretum
Friday, March 13, 10:30–11am
Join us for fun and engaging reading sessions with local librarians. Each session is tailored to the changing seasons and complements the natural setting of the Arboretum. Storytime is held outdoors in nice weather, at the Outdoor Children’s Classroom, next to the Widener Visitor Center. In the case of inclement weather, Storytime is held in the side tent or classroom at the Visitor Center.

Winter Witch Hazel Walk
Saturdays, March 14 & 28, 1pm
See February for details.

Building Philadelphia’s Science Capital – Lecture
Wednesday, March 18, 2pm
Philadelphia has some of the world’s best and most recognized science institutions, and an active nonprofit and philanthropic base that supports bold endeavors. The Franklin Institute has a longstanding history and mission dedicated to inspiring a passion for learning about science and technology, and places a high value on leveraging strategic partnerships to engage the Philadelphia community through informal science learning and engagement. It’s time to take this to the next level.

Spring Buds and Blooms Tour
Saturday, April 4, 11am
Join an experienced guide for our featured tour of the month. Celebrate spring and discover flowering trees and colorful blooms. Tour begins at Widener Visitor Center.

More Hidden Gems Tour
Saturdays, April 18 & 25, 11am
See March for details.

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More Hidden Gems Tour
Saturdays, May 9 & 23, 11am
See April for details.

A Celebration of Spring at Bloomfield Farm
Sunday, May 17
See page 18 for details.

Garden Railway Opening
Saturday, May 23, 10am
This miniature world with a quarter-mile track features loops and tunnels, bridges and trestles and all of the small-scale buildings are created entirely of natural materials. Open daily through Labor Day, Monday, September 7, and then on weekends only through Monday, October 12.

Irish Day
Sunday, May 3, 11am–3pm
Enjoy performances of traditional Irish music at various locations throughout the garden. Meet historians and brothers William E. and J. Francis Watson and learn about the infamous Duffy’s Cut tragedy.

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Enjoy performances of traditional Irish music at various locations throughout the garden. Meet historians and brothers William E. and J. Francis Watson and learn about the infamous Duffy’s Cut tragedy.

Storytime at the Arboretum
Friday, May 8, 10:30–11am
See April for details.
The Rarest of Cherries

ANTHONY S. AIELLO, The Gayle E. Maloney Director of Horticulture and Curator

Every year around February, I make sure to visit our ‘Medicinal House,’ a semi-submerged glasshouse that is not open to the public. This greenhouse is kept above 30 degrees in the winter, and it is here that we overwinter new cuttings and some of our most special or more tender plants. One of these is a horticulturally rare flowering cherry, *Prunus hirtipes*. This is the earliest-flowering of all the ornamental cherries in our living collections, and it is also one of the rarest flowering cherries in the U.S. It is so unusual in cultivation that it does not have common name; thus, we simply call it “flowering cherry.”

*P. hirtipes* is known in only nine collections globally, and until two years ago, the tree at the Brooklyn Botanic Garden (BBG) was the only known specimen in North America. Since then, we have successfully propagated that tree, and hope to grow more for further distribution.

Starting in 2009, we began a concerted effort to increase the length and diversity of our flowering cherry season by adding early and late varieties. At that time, I started to survey other botanic gardens along the East Coast to see what early and late-blooming flowering cherry varieties we could propagate and add to our collection. There were many varieties that were held uniquely at various gardens—that is, varieties represented by only one or two plants at one location. So what began as an effort to extend our season evolved into two things: first, backing up these unique cultivars so they were replicated at other gardens; and second, verifying our collection and those at other institutions.

Among those uncommon varieties was *P. hirtipes*, with the only verified plant growing at BBG. This species flowers in late winter or early spring, with small, delicate, and slightly fragrant pink flowers. The flowers are tender for our area, and are prone to opening during a winter warm spell. As a result, they are liable to get frosted; but all of this adds to the allure of the species.

I first saw *Prunus hirtipes* on a trip to England in early March 2011, where they had recently experienced these weather conditions—a hard frost that had followed milder weather. The next time I saw this species’ flowers was at BBG on a frigid day in early March 2017, after a freakishly warm February had caused many cherries to flower, followed by temperatures in the teens. Once again I was looking at frosted flowers.

How did we come to have this plant? My 2011 trip to England coincided with my explorations of other flowering cherry collections along the East Coast, and at that time I realized that there was only one verified location of *P. hirtipes* in the U.S.—Brooklyn Botanic Garden. We then set out to take cuttings to vegetatively propagate this tree. The goal was to clone it by rooting cuttings, as you might do with a houseplant on your window sill. Our first attempt in 2011 failed, so we tried again in 2012 and 2014. The tree resisted our efforts at rooting cuttings, even though we’ve been successful with other cherry species and cultivars.

With concern rising because of the potential impact of a construction project on BBG’s tree, we decided to try another propagation technique—grafting. In this technique, a shoot (scion) of the species to be propagated is grafted (or attached) to another plant (rootstock). Fortunately, one of the grafts took, and the plant currently flowering in the Medicinal House is from this grafting effort three years ago. It is growing so vigorously in cultivation that it does not have common name; thus, we simply call it “flowering cherry.”

The Gayle E. Maloney Director of Horticulture and Curator

Luke Hearon, Plant Protection Intern

Developments on the Spotted Lanternfly Front

LUKE HEARON, Plant Protection Intern

Though it may seem that spotted lanternfly (SLF) has been around for an eternity, there has been relatively little time for the formulation, execution, and publication of thorough research projects regarding the pest. With such a new issue, the first steps of research are slow and plodding as there is no precedent literature off which to build (or in the case of SLF, some literature exists, but must be translated). In recent months, this inertia has turned to momentum as long-term studies reach completion, and new peer-reviewed articles reach publication.

Promising research has been published by the Cooperative Lab of USDA APHIS (United States Department of Agriculture Animal and Plant Health Inspection Service) regarding lures for SLF trapping. To assist in locating food sources, SLF appears to home in on several volatile compounds released by its host trees. It may be possible to incorporate these volatiles into existing sticky banding procedures or to use them to create new trapping procedures altogether, increasing the catch of spotted lanternfly while potentially decreasing the bycatch of non-target arthropods. For more information on sticky banding bycatch, see the article “What’s the catch?” on the Morris Arboretum blog.

Last summer, two fungi (*Bouesveria busiana* and *Bacthura major*) made headlines when they were discovered to be lethal to SLF. This is indeed good news and could provide organic growers with a much needed tool to combat SLF. However, a vast amount of research stands between the discovery of a new insecticidal ingredient and its approval for use by the homeowner. In the case of these fungi, several factors should ameliorate the costs and expedite the process, including the urgency of addressing this emerging pest, the biological nature of the fungi, and the precedent of other *Bouesveria busiana* strains used in existing pesticides. Even still, these fungi won’t likely be in the homeowner arsenal for quite some time.

Potentially the most promising method of control for spotted lanternfly is that of biocontrol—the use of a natural predator to control a pest. While it may seem that this is merely a substitution of one pest for another, properly executed biocontrol is a precise and formidable weapon in the arsenal of conservation. It’s true that past biocontrol programs have failed spectacularly (see: cane toads in Australia), but when the proper biocontrol agent is selected and thoroughly vetted, the potential for collateral damage is negligible. The best biocontrol agents are picky eaters—the more focused a predator’s prey selection, the more predictable its effects. Enter parasitoids, predators so hyper-specific in their prey selection that some feed exclusively on a single species. Two parasitoid wasps that target SLF have been identified in China, one (*Anastatus orientalis*) parasitizing juveniles. The wasps cannot sting and are miniscule, likely to be mistaken for a gnat, if seen at all. If the wasps can be shown to be effective, safe, and economically viable, they could provide control in ways that sticky bands and chemical applications never could. Parasitoids will seek SLF without human intervention—the wasps don’t need to be released at every infested tree. It’s also likely that once the wasps are established, SLF will not be able to escape them. In each new state where SLF crops up, the predators will follow. Finally, as living organisms, the parasitoid population will grow in response to the SLF population. Thus, an increase of SLF in a given area simply provides more prey for the parasitoids, and the wasp population increases until the SLF population is reduced to stable levels.

While necessarily laboring at first, the pace of spotted lanternfly research is steadily increasing. We hope that the continued support and engagement of the public will continue to spur on the scientific field to get a handle on this pest.

The Rarest of Cherries

Anthony S. Aiello, the Gayle E. Maloney Director of Horticulture and Curator

Developments on the Spotted Lanternfly Front

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Sensitive, plant species.

In the environment. With continued warming, and possible drying of our climate, plants such as slender rockbrake can be expected to decline, or disappear altogether, and can serve to warn us about the accumulating effects of climate change on other, perhaps less sensitive, plant species.

Much like those mine canaries of old, slender rockbrake (Cryptogramma tenera) is a plant species highly sensitive to even subtle changes in the environment. With continued warming, and possible drying of our climate, plants such as slender rockbrake can be expected to decline, or disappear altogether, and can serve to warn us about the accumulating effects of climate change on other, perhaps less sensitive, plant species.

Slender rockbrake grows to only about three inches tall and is naturally found on cool, shaded cliff faces where water seeps out of calcium-rich rock and competition from other plant species is limited. Most often, this small fern is found in association only with mosses and liverworts, other specialists on this kind of habitat. Slender rockbrake is found in many places in the northern parts of the Northern Hemisphere, but is nowhere common. It approaches the southern extent of its range in Pennsylvania where it is currently known from just four sites, making it already one of the most endangered plants in the Commonwealth.

In order to study the effects of climate change on our “canary” species, we need to find it, and quantify the current size and health of each population. Although somewhat rare, additional herbarium specimen collections that were made in the mid-19th century. Most, if not all, of these new historic sites appear to have been obliterated as a result of logging, mining, or other resource development activities in the late 19th and early 20th centuries.

How can a species with such a wide distribution be so rate? Is competition for space what drives slender rockbrake to live only in spots with such specific habitat characteristics? Are all of the populations of this fern worldwide really the same species? Are there pest or disease issues that might also affect this rate species? Very little is known about the reproduction, dispersal ability, life history, and other important traits of slender rockbrake, making further biological study critical. These kinds of holistic studies, on slender rockbrake and other plant species, are needed to build the base of knowledge necessary to correctly address the challenges posed by the changes in climate and forest ecology that we are facing today.

Since canaries are more sensitive than humans to odorless toxic gases such as methane and carbon monoxide and existed before sensitive gas-detecting equipment was developed, coal miners would take these caged birds into the mines to warn them of pending danger from gas build-up. If the canary became ill or died, the miners would know to evacuate.

A Little Fern with a Big Story

Canary in a Coal Mine—Slender Rockbrake:

TIMOTHY A. BLOCK, The Jane J. Williman Chair of Botany

Meet Our Urban Forestry Team

ELIZA NOBLES, Urban Forestry Intern

Jason Lubar, Associate Director of Urban Forestry, and Bob Wells, Associate Director of Arboriculture, lead Morris Arboretum’s Urban Forestry team. As International Society of Arboriculture (ISA) Board Certified Master Arborists, Jason and Bob wear many hats. The team spearheads the diverse consulting services offered to external clients by the urban forestry department, including tree inventory, natural resource mapping, risk assessment, disease diagnosis, tree protection, and more. The team also leads urban forestry activities at University of Pennsylvania’s main campus, supports arboricultural education and training, and assists with other special projects. As this year’s Urban Forestry Intern, I sat down with Jason to learn more about the Urban Forestry department’s role at Morris Arboretum.

Q: Can you describe the Urban Forestry department’s role here at the Arboretum? What types of jobs does the department usually do?

Jason: The four-person Urban Forestry Consulting team exemplifies the Arboretum’s educational mission by disseminating tree care knowledge and providing unbiased arboricultural consulting services and technical assistance to a wide range of clients including municipalities, institutions, universities, tree care companies, landscape architects, and businesses throughout the region. Our client diversity results in a diversity of tree and landscape-related assignments, such as tree risk management, tree and natural resource mapping, providing management plans, tree ordinances and budgets, protecting trees during development, testing soil, tree appraisal, and being an expert witness in tree-related cases. We also provide workshops and training when requested.

Q: Can you explain a little bit about the department’s role on the University of Pennsylvania campus?

Jason: The Consulting team has provided tree and landscape-related consulting to Penn’s Facilities and Real Estate Services Department (FRES) for many years. This relationship has created a uniform vision for the tree collection on campus, now called the Penn Campus Arboretum, which has achieved a Level II accreditation from ArborNet. The team annually assesses all campus trees, identifying arboricultural work that is completed by commercial arborists, and then updates Penn’s tree database which is accessible to the public through Penn’s Plant Explorer website. Other activities include participating in the numerous construction projects on campus to preserve trees, coordinating and installing tree identification tags, and creating tree policies and standards. These activities reduce tree-related risk and increase tree health and longevity on campus.

Q: If you could tell the world one thing about urban forests, what would you want everyone to know?

Jason: Trees matter! Right now, the trees around us are silently providing essential environmental, social, and economic benefits. Many of these benefits from individual trees are imperceivable but taken collectively, their positive impact on us and the environment is substantial. Therefore, our region’s tree population should be conserved, protected, and increased.
Sustainable Practices Here and At Home
CHRISTINE PAPE, Editor

The Morris Arboretum is committed to sustaining our natural resources, using best practices to demonstrate stewardship, and in turn, encouraging our community to do the same. Our LEED Platinum certified Horticulture Center is a premier model of sustainability. Other measures we employ include the use of LED lighting throughout the garden and in our facilities, water conservation and reuse efforts, and offering classes in landscape management, horticulture, sustainability, and more. The Arboretum also continues to implement programs that encourage widespread recycling—aligning with the University’s overall efforts to minimize waste sent to landfills—while also promoting best office practices, as well as sustainable equipment and supplies purchasing.

By now most of us are also taking steps in our daily life to help conserve our planet’s resources. While this is an enormous and complicated global issue, there is still impact in what we can do as individuals. Here are a few sustainable ideas that you may already be practicing, and a few you may not have thought of:

• The Arboretum collects and reuses rainwater for irrigation and to flush toilets. Ground and well water also rejuvenate the wetlands. What can you do at home? Purchase a rain barrel to collect water for outside plants and save bath or cooking water for indoor plants.
• Plant a kitchen herb garden: little pots of herbs look lovely on the windowsill, are easy to grow, renewable, and pesticide-free!
• Reduce paper consumption: At the Arboretum, staff are encouraged to print documents double-sided and to be conscious of paper use. You can do your part by opting out of catalogs, going paperless with bills, or reading the newspaper online. Request to become an eco-friendly member of the Morris Arboretum. You’ll get our e-newsletter that will provide links to all our latest news, publications, and events, but you won’t receive any printed materials. Visit morrisarb.org/membership for details.
• Give green gifts: Make experiences and consumables your gifts of choice. Think of things such as homemade baked goods, natural bath products, candles, and gift cards—anything that gets used up and creates little or no waste. How about a Morris Arboretum membership? Of course, you can also plant a tree! Native trees that are well-adapted to our area are always the best choice. Healthy, happy trees reduce energy bills, and provide many other benefits such as reducing carbon dioxide, providing food and shelter for wildlife, and conserving water—just to name a few.

Aim to do just one additional thing each day toward being more sustainable and showing our environment a little love. Monitor energy use, try to create less waste, be mindful of packaging and how you dispose of it, and encourage your friends and neighbors to do the same. A little bit might go a long way.

Shop Sustainably

The Shop at Morris Arboretum offers many items to help you on your quest to “go green.” There are Morris Arboretum water bottles and travel mugs, herb and flower garden kits, and beautiful botanical tote bags you can take everywhere. You’ll also find birdhouses made from reclaimed wood and other fair trade and sustainably sourced products. The Shop is also a great resource for environmentally friendly and handcrafted items made from natural materials, as well as products from local artists and vendors.

Become a Volunteer Guide

LIZA HAWLEY, Assistant Director, Visitor Education and Youth Programs

Share your love of nature and the environment as a guide for children’s groups. Guide training consists of 39 hours of class and field work held each Tuesday, Thursday, and Saturday during the month of March. You will learn everything you need to become a successful guide, including: Arboretum history, botany, guiding techniques, and fundamentals of our children’s tours through hands-on practice opportunities. In addition, each new guide is paired with an experienced mentor who will provide encouragement and guidance throughout the training process and apprentice period following training.

Guides are a tremendous asset to the Arboretum, but the benefits flow both ways, as researchers have found that regular nature walks reduce stress and enhance mental health. Also, all actively serving guides are invited to monthly continuing education workshops, lectures, and field trips.

To be considered, complete the application on our website: morrisarb.org/volunteer. You can email your application to efhawley@upenn.edu or mail it to Liza Hawley, Morris Arboretum, 100 E. Northwestern Avenue, Philadelphia, PA 19118. Deadline for applications is January 31, 2020.

Summer Adventure Camp!

For ten years, Morris Arboretum been offering summer programming uniquely designed within the beautiful confines of the Arboretum’s landscape. Our goal is to inspire new generations of citizen scientists by tapping into their natural curiosity about our environment. We offer fun, immersive experiences that encourage scientific inquiry, inclusivity, and discovery about the natural world around them.

Summer Adventure Camp runs June 29th-August 7th
Here is a preview of our awesome themes this year:

Little Lightning Bugs ( Ages 4–6)
Backyard Bugs ( 6/29–7/3)
Sensing Nature ( 7/6–7/10)
Leaves & Limbs ( 7/13–7/17)
Nature Jams ( 7/20–7/24)
Hide & Seek ( 7/27-7/31)

Bloomfield Buddies ( Ages 7–11)
Pollinator Power ( 6/29–7/3)
Eco-Kids ( 7/6–7/10)
Garden Science ( 7/13–7/17)
Bird Bonanza ( 7/20–7/24)
Nature Ninjas ( 7/27-7/31)
Artists in the Garden ( 8/3-8/7)

ILANA GRUBIN, Education Specialist

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SEASONS Winter/Spring 2020 | 17
For more than 40 years, the annual Plant Sale was a tradition for Morris Arboretum members and friends. In recent years, like many other public gardens, our plant sale became less viable in this age of online and large-scale garden retailers. Although we must say goodbye to the Plant Sale, the Arboretum intends to sustain the joyful celebration of spring with a new event. The tradition of distributing plants to members and gathering at Bloomfield Farm will continue! Thanks to all our patrons and volunteers for so many great memories and for coming back year after year.

Mill Day, Music, and Fun at Bloomfield Farm
11am–4pm
Free for Members or with Garden Admission

Join us at the first Mill Day of the season! Former plant sale partners, the Delaware Valley Rhododendron Society and the Allens Lane Art Center will be offering beautiful plants and original ceramics for sale. Look for pop-up activities including animal guests and products from Erdenheim Farm and specialty vendors. Take a tour of the historic mill and relax on the adjacent lawn listening to live music. Pack a picnic and invite your family and friends to join you for an enjoyable afternoon at Bloomfield Farm. Members may also pick up their Dividend Plant! See more information below.

A Celebration of Spring!
Sunday, May 17, 11am–4pm

What better way to connect kids with nature than to sign them up for a class at Morris Arboretum? The Growing Minds program offers children and their caregivers the opportunity to connect meaningfully with nature through a wide variety of creative and educational offerings. Visit morrisarb.org/growingminds to see the complete list of classes and to register, or call (215) 247-5777 ext. 125 for more information.

Join us for one of these fun, engaging classes, all held in the beautiful surroundings of the Morris Arboretum:

• Seeds to Sprouts: Spring Adventures (Ages 2–4)
• Bloomfield Farm Night Hike, Mill Demo and Campfire
• Make Your Own Slug Slime (Ages 6–10)
• Delicious Summer Frozen Treats (Ages 6–10)
• Kids’ Mother’s Day Fairy Garden

SEASONS Winter/Spring 2020 | 19

Spring Class Preview

Each spring and fall the Morris Arboretum offers more than 90 classes for adults and children. These fun and engaging courses cover topics ranging from horticulture and landscape design to cooking, creative expressions, and birding. Trips to a variety of regional historic and cultural sites are also available.

Look for your course brochure to arrive in the mail mid-January. A list of complete class offerings is also available at morrisarb.org/classes. Online registration opens on January 15.

Here are just a few classes coming this spring:

Culinary Adventures
• Quiche-Making Workshop
• Water Kefir, Kombucha’s Cousin

Behind the Scenes
• Mysteries of Compton
• Evening Wine and Cheese Wander

Sustainable Practices
• Tough Plants for Tricky Wet Sites
• Edible Landscaping and Backyard Food Production

New! Classes at Erdenheim Farm
• Spring Erdenheim Farm Tour
• Cooking with Chef Al Paris

Health & Wellness
• Shinrin Yoku: Forest Bathing for Health
• Fire Cider for Health and Vitality

Horticulture & Design
• Spotted Lanternfly – What You Need to Know
• Native Plants for Native Birds

Botany
• Winter Tree Identification
• Spring Botany at Lehigh Gorge State Park

Creative Expressions
• Embroidery Sampler Workshop
• Floral Wire Jewelry

Calling All Birders
• Birding at Dixon Meadow
• Birds and Wetlands: Beautiful and Critical Habitat
VIP registration is now open online at morrisarboretumgala.org. Opportunities are also available to sponsor a table, become a corporate sponsor, or to place an ad in the event program book. For more information or to request an invitation, please contact Kristen Casalenuovo at (215) 247-5777, ext. 418 or kcasal@upenn.edu.

The Morris Arboretum is also pleased to pay tribute to TreePhilly, a program of Philadelphia Parks & Recreation and Fairmount Park Conservancy, as our institutional honoree. TreePhilly was created in response to the Greenworks sustainability plan and the City of Philadelphia’s goal to increase tree canopy in the city to 30% in all neighborhoods. Through its Yard Tree Giveaway Program, TreePhilly has distributed more than 24,000 free yard trees in neighborhoods of highest need. TreePhilly also engages residents in the planting and care of Philadelphia’s public forests and street trees, hosts an annual Arbor Day celebration, and brings together urban forestry stakeholders across the city and region to connect and collaborate.

Chairing the 2020 Moonlight & Roses Planning Committee is Gabrielle Baugh. Gabrielle is a Philadelphia native and a longtime member of the Moonlight and Roses committee and the Arboretum’s development committee. She is also an active member of the Penn Towne Planning Committee. She has traveled widely in South America, Africa, and Asia on behalf of the Academy. The author of many articles and more than a dozen books, she has been honored by the Explorers Club and the Garden Club of America for his environmental writing.

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Reservations are required for Moonlight & Roses and space is limited. Invitations will be mailed in April to all Holly-level members and above, as well as to previous Moonlight & Roses attendees.

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Do you have your Garden Passport Yet?

Spring and summer are a great time to visit gardens near and far. Did you know that Philadelphia is America’s Garden Capital with more gardens in proximity than anywhere else in North America? On your next visit to the Arboretum or any of the other 35 gardens that are part of America’s Garden Capital, pick up your free passport. It is a handy, pocket-sized guide to the region’s gardens. Itineraries organized by geography are also available at americasgardencapital.com. How many gardens will you visit this year?