The Botanic Garden has come a long way technologically. It was a big step for us to computerize our plant records beginning in the 1970s, and in 1983 we requested our first “computer terminal” for the office. In 1996, we took another giant step forward and launched the Botanic Garden’s first website. Systems for website design and development were a lot more difficult then. You had to know HTML (the language in which web pages are written) and you couldn’t see what the page looked like as you were working on it. What could be presented on a web page was very limited. The first website was mostly text and didn’t have many graphics or photographs.

In 1997, we hired students Belinda Darcey ’00 and Pamela Davis ’98 to help create a more appealing website, and Director Kim Tripp hired Connie Parks ’83 to write text. By 1999, we had a much more pleasing look, with more photos. That format proved useful and served us well for many years. We were able to grow the website, adding plant images and access to our plant database, featuring our exhibitions online, and even adding a live webcam for the Fall Mum and Spring Bulb Shows.

Eventually, however, it was time for a makeover as our site was looking quite dated. We discussed it for several years, but the task seemed daunting. Finally, we took the plunge. The development process took over a year, but we are very pleased with the results and we think you will be too.

The new site debuted in September 2016 and provides much opportunity to explore and learn, all with dazzling images of our collection. You can search our collection and locate trees on campus, check on upcoming events, find out what’s in bloom, delve into Smith’s botanical history, read our newsletter, learn about the Friends of the Botanic Garden, explore student research, or apply to become a volunteer.

Generally, it is now much easier to find what you are looking for. Moreover, the site is fully responsive, so it automatically adjusts to fit the size of your computer screen (above), tablet, or phone, (right). It is a work in progress and ever-changing. Check it out at www.smith.edu/garden.
Robin Bennett Hunter ’08, 2007 Kew Intern, received her M.S. in environmental management from the University of San Francisco last year. Since leaving Smith, she has worked as a conservation and land management intern at the Great Basin Plant Materials Center in Nevada and as a teaching assistant and research assistant at the University of San Francisco. She taught field botany, environmental science, and ecology, and her research projects included studying trees along Redwood Creek in Muir Woods and a National Geographic-funded expedition documenting a critically endangered cypress tree in Laos. Currently, she is putting her experience with vegetation and environmental monitoring, plant identification, and geographic information systems to work in her position as an analyst at Horizon Water and Environment, a consulting firm specializing in water resource management.

After having been a Botanic Garden summer intern in 2007 and a work-study garden assistant at the Botanic Garden, Lesley Joplin ’09, worked as an intern at the Smithsonian’s Archives of American Gardens, as a horticulture intern at Longwood Gardens, and as a summer horticulture intern at the Missouri Botanical Garden. She wore a few different hats at the Iowa Arboretum: director of horticulture, project manager, and acting executive director for a short time. She served as grounds supervisor at Boeing Leadership Center outside of St. Louis before returning to the Missouri Botanic Garden, where she currently is a commemorative giving specialist.

2012 Botanic Garden Intern Scout Sheys ’13 teaches second and third grade at a school with a gardening program in Oakland, California. This year the students spent a few months learning about plants and pollinators in their science/social studies block. Scout created 24 “habitat crusaders,” who can identify what kinds of pollinators might pollinate a plant by looking at its flowers. They planted a pollinator garden in the park by the school. As Scout says, “It was incredibly awesome to share something I enjoy with the students. They loved getting to use the big shovel!” She also recently moved into a 130-year-old house in Berkeley with a huge, formerly neglected backyard. So, after work she goes home and gardens for a few hours almost every day. It includes a “vegetable garden that keeps getting bigger than planned; lots of native plants; lots of cool Australian plants; fruit trees; a big sad, old avocado tree; and piles of compost everywhere for now.”

Jen Rioux ’15 was a summer intern in 2012 and a work-study garden assistant at the Botanic Garden for three of her Smith years. During that time, she completed a summer horticulture internship the Polly Hill Arboretum in 2013, followed by a summer land stewardship internship the next year at the MacLeish Field Station in Whately, Massachusetts, while also working at Crimson & Clover Farm in Florence. After leaving Smith, she went to the Chicago Botanic Garden as assistant horticulturist for the heritage and rose gardens for a nine month position. Most recently, she has been at the Arnold Arboretum in Boston, working in plant production in the nursery. Jen has said that of all the gardens where she’s worked, the Smith Botanic Garden is her favorite! Right now, she’s deciding whether to go back to school for horticulture, landscape architecture, or city planning. She says she feels lucky that she had the opportunity to work here. It has opened up many doors for her.
“Does he know the difference between a tulip and a daffodil?” That was my son’s question to my wife upon learning that I had been appointed interim director of Smith’s Botanic Garden. My eventual answer was, “I know a tulip when I see one.” Replacing Michael Marcotrigiano, who knows more or less everything about plants, trees, and conservatories, was a daunting prospect for someone whose field of specialization is American Politics. But, with the support of Provost Katherine Rowe, I decided to take on this challenge in this, my 40th year at Smith College. I do have some relevant experience — I have been a member of every major committee at the College, served as dean for academic development from 1997-2000, and have been a part of numerous interdepartmental and interdisciplinary projects. This background is, no doubt, part of the reason the provost thought of me when a one-year replacement for Michael was needed.

So far, I have been very pleased with my experiences at the Botanic Garden (BG). Before I was named interim director, I was aware of several members of the BG’s outstanding staff, including Rob Nicholson (Conservatory Manager), Madelaine Zadik (Manager of Education and Outreach) and Sheri Peabody (Administrative Coordinator). Getting to know the rest of the group has been especially rewarding. The day-to-day operation of the BG is professional, sophisticated, and of vital importance to the educational mission of the College. Everyone contributes in ways that enhance the final product, and they do so with a friendly and positive attitude. Of course, all of this outstanding work makes my job that much more enjoyable.

One of my most important duties this year is to serve on the search committee for a new, more permanent, director. The committee is chaired by Katherine Rowe and includes a most impressive supporting cast: Roger Mosier (Associate Vice-President for Facilities Management), Jessica Nicoll (Director of the Museum of Art), Dano Weisbord (Director of Campus Sustainability and Space Management), Larry Hunt (Associate Vice-President for Human Resources), and Jesse Bellemare (Assistant Professor of Biological Sciences). We are now reviewing applications received from around the world. We expect to narrow the applicant pool in December and bring finalists to campus in February. This should enable the provost to name a new director by March or April; we hope that he/she will be in place by July 1, 2017.

Another major challenge the Botanic Garden faces, along with the rest of the campus community, is the Neilson Library renovation. This will be the single largest capital project the College has ever undertaken, and it will disrupt some trees and plantings around the library and in certain other locations. Fortunately, Chief Arborist John Berryhill has been working closely with the project managers in Smith’s Facilities Management Department, and we are confident that damage to the landscape and Campus Arboretum will be minimal. John’s work is another example of our staff going above and beyond the call of duty to manage our complex landscape.

As the readers of this newsletter know, our indoor and outdoor collections are of the highest quality and attract large numbers of students, faculty, staff, and community visitors every year. But, as impressed as I am with the collections, my thoughts keep coming back to the staff. Pamela Dods at the front desk is a multi-talented marvel; Jeff Rankin, Nate Saxe, and Monica Messer keep our main gardens (Systematics, Happy Chace ’28, and Capen) in immaculate shape; Dan Babineau has been extraordinary in helping Rob in the Conservatory with Steve Sojkowski out on medical leave; Polly Ryan (Special Projects) and Elaine Chittenden (Manager of Living Collections) have a couple of complex collaborative projects going that should yield very impressive results; Gaby Immerman (Lecturer, Lab Instructor and Internship Coordinator) works miracles, with and for students, every day.

I’ll be back with further reflections in the Spring 2017 newsletter.
Last summer, Nicholas Brazee, Extension Plant Pathologist at the Plant Diagnostic Laboratory at the University of Massachusetts, began a study of the elms on the Smith campus. He comes to this project with an expertise in wood-decaying fungal pathogens. Most of you know that populations of American elm, Ulmus americana, that once dominated the American landscape have been decimated by Dutch elm disease (DED). The disease is caused by a fungal pathogen that was introduced from Asia. The remaining American elms at Smith are regularly treated with prophylactic fungicide injections to prevent infection. The injections involve drilling multiple small holes into the lower tree trunk, going through the bark and into the xylem (the water-conducting tissue). The fungicide is then transported throughout the tree to the upper branches. This treatment is very effective, as evidenced by the number of stately old elm specimens still gracing the campus.

Brazee is studying the effects of decades of injecting elms. Wounds created by the drilling can allow wood-decaying pathogens to enter and invade the tree tissues, where they could cause severe decay. This internal decay would not necessarily be visible from the outside and could lead to structural failure of the wood. Additionally, phytotoxic effects of some of the fungicides used can cause damage to the xylem, thus reducing water conduction throughout the tree.

For his study, Brazee has been looking at American elms that have been regularly injected to control DED. To “see” any decay inside the tree trunk or xylem dysfunction, Brazee’s team uses methods that do not do any damage to the trees: sonic and electrical impedance tomography. Sonic tomography works by measuring sound wave velocities to estimate wood density. Sonic waves travel faster through healthy, intact wood in comparison to wood that is damaged by the actions of wood-decaying fungi. Electrical impedance tomography measures the electrical conductivity of wood. This detects any buildup of moisture in wood (a precursor to internal decay) and identifies any nonfunctional areas of the outer sapwood (xylem dysfunction). Wood undergoing decay will exhibit higher conductivity compared to healthy, surrounding wood tissue. The data from both tests can then be used to determine if wood-decaying fungi are present and if significant areas of the xylem have been irreparably injured from regular injection. Of all the minimally invasive techniques available to look at internal tree health, these methods are the most accurate and provide the highest resolution data.

Of the ten elms sampled on campus so far, only two have measurable decay. The worst is the Clark Hall elm, although the decay is not particularly severe. Brazee measured damage in 22% of the cross section (see the sonic tomogram above). The good news is that within the Clark Hall elm, there is still a lot of sound wood providing the tree with structural stability. Botanic Garden Chief Arborist John Berryhill is, of course, concerned with risk assessment and...
Adjacent to the president’s residence are gardens that have long been a part of an already beautiful landscape that sits atop a hill overlooking Paradise Pond. The view features the Mill River and, in the distance, Mount Tom. Students living in the Quad walk by the garden every day on their way to classes and hundreds of graduating Smithies have filed past on their way to commencement ceremonies.

After this year’s commencement, however, the bulldozers came in and the garden was completely razed. A fence that presented a visual barrier was torn down, replaced by an ornamental railing, and the entire garden was redesigned. The plan by Landscape Architects Brown, Richardson & Rowe aims to open up views of the garden to passers-by. New features include an accessible path, stone retaining walls on three sides, an open air pavilion, benches in the garden, curved stone seating along the upper walkway, and, of course, new plantings.

Chief Gardener Nate Saxe has been busy this fall, putting in some of the new plants, although much of the work to complete the planting plan will take place next spring. (Nate will provide more details about the planting design in the next issue of the newsletter.)

The garden was named the Happy Chace ’28 Garden to honor the late Beatrice “Happy” Oenslager Chace ’28, whose daughter and son-in-law, Eliot Chace Nolen ’54 and Roly Nolen, provided support for the renovation project.

The property, the former home of the Kneeland family, was purchased by Smith College in 1917. Frederick Kneeland (1849–1938) was a Northampton bank president, and his wife Adelaide was among Smith’s first graduates (class of 1879). Her sister, Harriet, helped found Historic Northampton and wrote many books about houses in the area. Adelaide’s garden journals, with her illustrations and photographs by Harriet, were found in the collection at Historic Northampton and were donated to the Smith College Archives in 1997 (see page 6 of Spring 1998 Botanic Garden News). Although these journals contain valuable information about the original garden, no attempt was made to recreate the Kneeland garden. The original house was torn down in 1918 and replaced in 1920 with the current President’s House, which was designed by Boston architect John W. Ames for the incoming Smith President William Allan Neilson. The President’s House and adjacent garden were featured in an issue of Better Homes and Gardens magazine the following year.

The gardens were added to over the years, a mix of different areas designed at separate times. A perennial border was established along the terrace on the back side of the house, with wisteria climbing up along the two sides of the doorway. On the slope below are a series of terraces, home to the Rose Garden in the 1970s through 2004. The Herb Garden was added in 1978, during Jill Ker Conway’s tenure, a design based on medieval herb gardens, including medicinal, culinary, fragrance, and dye plants. Although that garden was removed for the renovation, many traditional herb plants are featured in the new design, along brick walkways as in the old design. In 2000, a private patio garden, not accessible to the public, was created for President Ruth Simmons, for her to be able to work outside undisturbed.

On the side of the house is an unusually large silverbell, Halesia monticola, which blooms spectacularly in the spring. It will continue to stand tall over the new garden. Be sure to visit next spring.
Seven years ago, during summer 2008, we spent a part of June exploring Der neue Botanische Garten der Universität Hamburg, the University of Hamburg Botanic Garden in the suburb of Klein Flottbek (see Botanic Garden News, Fall 2008, page 9). In 1970, when that garden was first laid out, a systematics garden based on the evolutionary sequence proposed by the Russian botanist Armen Takhtajan was intended to be the central core, its very “heart.” This was to be surrounded by a series of fifteen or more recreated natural habitats representing different continents and biogeographic zones. In 2008, the natural habitats, among them a stand of western North American conifers, a stretch of Eurasian continental steppe, and a forest with southern beech, Nothofagus, and monkey puzzle, Araucaria araucana, were for the most part thriving, but the systematics garden, once filled with handsome beds of plants representing related plant families linked by intricately branched paths, had been abandoned, the beds grassed over and the entire area maintained as an open lawn. The reasons for this were complicated and included not only the costs of maintaining the beds but also the fact that Takhtajan’s work reflected mid-20th century views of plant evolution, and that, by the early 21st century, concepts of flowering plant evolution had greatly changed.

As botanic gardens go, the garden at Klein Flottbek is relatively young, and the years since our 2008 visit have seen substantial growth. We were pleased to see, on a walk through the gardens during June 2015, that the recreated natural habitats continue to fill out and mature, especially the American conifers, including, from the Northern Hemisphere, the big tree Sequoiadendron giganteum, and from the southern hemisphere, the monkey puzzle trees and southern beech. Although one recreated habitat, the salt marsh, was abandoned, it has been replaced by a more extensive sand dune complex, and the desert garden, newly constructed in 2008, is now well established. The most impressive change, however, is a remarkable new systematics garden created in the old one’s place.

This new Hamburg garden shares a number of features with the recently restructured Systematics Garden here at Smith. Both replace older gardens laid out according to concepts proposed by Takhtajan In Hamburg, and, at Smith, by the American botanist Arthur Cronquist. Both now reflect the views of the Angiosperm Phylogeny Group, an international team of botanists working to form a consensus on the evolutionary relationships of higher plants. However, the Smith garden is laid out in the form of a tree — or perhaps a rather sprawling shrub — and the visitor can trace its various branches to their tips, where in place of leaves, beds are filled with plants that are closely related to each other. The designer of the Hamburg garden has taken the same basic scheme and reconfigured it as a giant clock laid out in the center of the former lawn.

One enters the Hamburg garden just after noon (or midnight) at 12:00 at a point on the northeastern margin and turns left to find oneself, in the first quadrant, in the plant world of 300 to 100 million years ago. It is a realm of gymnosperms — ginkgoes, pine-like conifers, yews, and cycads — and ancient flowering plants — magnolias, water lilies in sunken pools, the curious lizard’s tail (Saururus) and Dutchman’s pipe vines. In the center are raised beds with simulated peaks.

At the beginning of the third hour, one enters a more recent assemblage, the monocotyledonous plants that appeared 160–80 million years ago, and from there to 6:00 one finds grasses, sweet flags, lilies, amaryllis, irises and orchids. There are also palms and gingrs, plants known primarily from tropical or subtropical areas, which in Hamburg’s north temperate climate must be brought out of the garden from the greenhouse every spring, as in the Systematics Garden here at Smith. At the sixth hour, on the far side of the garden opposite the entrance, the landscape changes abruptly and the visitor backtracks slightly and begins moving (Continued on page 8)
This past June, I visited Denver and Steamboat Springs in northwest Colorado. Since the Rocky Mountain chapter of the North American Rock Garden Society (NARGS) was hosting the annual meeting for the society, I had a great opportunity to see some of this country’s finest natural and cultivated rock gardens. The meeting began at the Denver Botanic Gardens (DBG), with attendees touring this fantastic facility. Staff and volunteers of DBG did a wonderful job coordinating events, which took place over five days in Steamboat Springs, a three-hour drive from Denver, over or through the Continental Divide. NARGS annual meetings typically focus on the native flora surrounding the hosting chapter, offering day hikes followed by evening presentations. Most of the hikes focused on the rich and varied steppe and meadow flora up into montane and subalpine habitats. The average elevation of Colorado is 6,800 feet, the highest of the fifty states, with Steamboat at 6,732 feet.

The Rocky Mountains are famous for their alpine plants, many of which are difficult or impossible for us to cultivate in New England due to our hot, humid summers. In contrast, Colorado is rich in steppe (the term is derived from the Russian степь, a biome of vast, semiarid, treeless grasslands. Those familiar with steppe in the United States may conjure images of shortgrass prairies in the Great Plains. Tallgrass prairies of the Midwest (now mostly converted to agriculture) receive a bit too much precipitation to be considered steppe. Steamboat Springs is within the eastern edge of the Intermountain North American Steppe. Here, shortgrass prairie is replaced by sagebrush steppe, a transitional zone generally below 8,500 feet in the foothills leading up into the montane zone, roughly 8,000–10,000 feet. Sagebrush steppe includes at least five species or subspecies of shrubby Artemisia, but any area with Artemisia tridentata, common sagebrush (which I could confidently identify), is steppe.

Steppe regions occur in all hemispheres: Central and Western North America, South America (mostly in Argentina), South Africa, and Eurasia (from Hungary to China). Precipitation is low, ranging from 10 to 20 inches of rainfall annually, up to 30 inches some years. Steamboat Springs receives an average of around 14 feet of snow annually and 24 inches of rain. According to local gardeners, the growing season sometimes is limited to 60 days. This is supported by the Colorado State University Extension Service, which reports an average of 46 frost-free days! Other horticultural challenges include low...
Steppe Plants in the Botanic Garden’s Collection

<table>
<thead>
<tr>
<th>Plant Name</th>
<th>Common Name</th>
<th>Origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acer tataricum</td>
<td>Tatarian maple</td>
<td>SE Europe, western Asia</td>
</tr>
<tr>
<td>Aquilegia caerulea</td>
<td>Colorado blue columbine</td>
<td>western U.S.</td>
</tr>
<tr>
<td>Artemisia frigida</td>
<td>prairie sagewort</td>
<td>interspecies hybrid</td>
</tr>
<tr>
<td>Caragana × sophorifolia</td>
<td>hybrid peashrub</td>
<td>southern U.S. &amp; Mexico</td>
</tr>
<tr>
<td>Cylindropuntia imbricata</td>
<td>tree cholla</td>
<td>SW U.S., Mexico</td>
</tr>
<tr>
<td>Echinocereus coccineus</td>
<td>rainbow hedgehog cactus</td>
<td>North America, Eurasia</td>
</tr>
<tr>
<td>Juniperus communis</td>
<td>common juniper</td>
<td>North America</td>
</tr>
<tr>
<td>Juniperus horizontalis</td>
<td>creeping juniper</td>
<td>South Africa</td>
</tr>
<tr>
<td>Kniphofia caulescens</td>
<td>red-hot poker</td>
<td>Siberia</td>
</tr>
<tr>
<td>Nepeta sibirica</td>
<td>catmint</td>
<td>SW U.S., Mexico</td>
</tr>
<tr>
<td>Opuntia basilaris</td>
<td>beavertail cactus</td>
<td>western North America</td>
</tr>
<tr>
<td>Opuntia fragilis</td>
<td>brittle prickly pear cactus</td>
<td>southern Canada to Mexico</td>
</tr>
<tr>
<td>Opuntia polyacantha</td>
<td>plains prickly pear</td>
<td>SE Europe to Caucasus</td>
</tr>
<tr>
<td>Panicum virgatum</td>
<td>switchgrass</td>
<td>North America</td>
</tr>
<tr>
<td>Pinus aristata</td>
<td>blue spruce</td>
<td>southern Rocky Mts.</td>
</tr>
<tr>
<td>Pinus flexilis</td>
<td>bristlecone pine</td>
<td>North America</td>
</tr>
<tr>
<td>Pinus sylvestris</td>
<td>lime pine</td>
<td>Southeastern U.S.</td>
</tr>
<tr>
<td>Populus tremuloides</td>
<td>quaking aspen</td>
<td>western U.S.</td>
</tr>
<tr>
<td>Salvia azurea var. grandiflora</td>
<td></td>
<td>western North America</td>
</tr>
<tr>
<td>Schizachyrium scoparium</td>
<td>blue sage</td>
<td>Eurasia</td>
</tr>
<tr>
<td>Tetraneuris acaulis</td>
<td>little bluestem</td>
<td>North America</td>
</tr>
<tr>
<td>Tulipa turkestanica</td>
<td>lakeside daisy</td>
<td>Northeastern Ontario</td>
</tr>
<tr>
<td>Viola pedata</td>
<td>Turkestan tulip</td>
<td>Ohio</td>
</tr>
<tr>
<td>Yucca nana</td>
<td>bird’s foot violet</td>
<td>Central Asia</td>
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<tr>
<td></td>
<td></td>
<td>E North America</td>
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<td></td>
<td></td>
<td>border of Utah &amp; Colorado</td>
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</tbody>
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humidity, fluctuating diurnal temperatures, alkaline clay soils, and drying winds. The latter often restricts plant growth more than low temperatures. Heavy, wet snows in the late spring or early autumn are common as well. The native plants at these various elevations have evolved with and adapted to these conditions.

Experiencing steppe vegetation firsthand and learning how these plants might provide opportunities for landscaping in water-conscious regions, I wondered how many types of steppe plants, if any, we cultivate at the Botanic Garden of Smith College. I was amazed to find dozens in our collection. Please note that not all of these are native to North America, but also represent other steppe regions around the world. The list at left offers a sampling, and you can also see where the plants call home.

Recommended reading to learn more about steppe regions of the world

Steppes: The Plants and Ecology of the World’s Semi-arid Regions, by Michael Bone, Dan Johnson, Panayoti Kelaidis, Mike Kintgen, and Larry G. Vickerman (all staff members of the Denver Botanic Gardens), published in 2015 by Timber Press. It provides comprehensive overview of the plants, climate, geology, and geography of the world’s steppes.

Hamburg cont’d

through the plant world of 150–100 million years ago, abandoning the monocots for a group of mostly broad-leaved plants: buttercups, anemones, roses, begonias, geraniums, various legumes, oaks, and birches. The pace increases at the ninth hour and as one moves on toward noon or midnight with more recent groups, plants that first appeared 100–50 million years ago: heathers and rhododendrons, gentians and pinks, mints, hollies, borages, asters, and members of the Solanaceae or nightshade family.

One might compare the twelve hours progress to a great social event, perhaps a New Year’s party with guests beginning to arrive shortly after noon, in different cliques and clans, increasing in number through the day until, when the New Year begins, the entire group is there.

When asked about the design, the director of the Hamburg garden, Carsten Schirarend (who was responsible for the layout of the new systematics beds) replied, “The idea to present this subject as a clock was mine and to my knowledge it is the first of its kind.”

Garden archeologists tell us that evidence of gardens persists long after the borders, beds and plantings have disappeared, and in the Systematics Gardens both at Hamburg and here at Smith College, the former earlier arrangements of beds according to the Takhtajan or Takhtajan/Cronquist systems can be traced. At Smith, indeed it is possible to see the outlines of the Engler and Prantl layout that was in place here even earlier, through the first two-thirds of the 20th century. Since the views of the Angiosperm Phylogeny Group have been regularly updated as APGI, APGII, APGIII, etc., it is difficult, if not impossible, to predict what arrangements the future holds in store. In an ever-evolving garden, only change is certain.
The botanically rich gardens at Smith College draw in a diverse mix of the natural world’s most efficient pollinators—bees. More than a hundred bee species have been found in the Botanic Garden over the last few years and there are probably dozens more yet to be discovered.

It’s likely that most visitors to the Botanic Garden have heard the news that bees are in trouble, but the reports almost always concern domesticated honey bees and refer to such things as colony collapse disorder, mite infestations, diseases, and the overuse of pesticides. Although it’s true that the honey bee, a nonnative species brought here centuries ago from Europe, is suffering from an assortment of threats, the reporting usually puts the focus on honey bees alone and leaves out the lesser-known wild bees. Nearly 400 bee species have been found in Massachusetts. A few of these wild bee species are also in deep trouble, having experienced dramatic population declines, and all the rest are potential candidates for future problems, usually related to a variety of human impacts on the environment. That’s worrisome, considering the free pollination services that bees provide. Although quite a lot of the food we eat, corn, wheat, rice, and soybeans, for example, is from plants that are wind-pollinated or self-pollinated, it’s estimated that at least one-quarter of our food comes directly or indirectly from plants that are bee-pollinated.

Butterflies, moths, and many other insects have some capacity for pollination, but by far the most successful pollinators are bees, which are actually highly evolved wasps, having long ago traded a carnivorous life for a life of feeding on pollen and nectar, their main source of protein and sugar. In addition to a change in their food preferences, bees have also evolved the capacity for efficiently harvesting and carrying pollen that they collect for their young. Among the adaptations that a bee has for life as a pollen specialist is a body loaded with tiny branched hairs that are particularly good at holding pollen. A bee covered with pollen will groom herself, moving the pollen grains to her hind legs or her lower abdomen before she flies off to her nest. Plant pollination by bees, involving the transfer of pollen grains from the anther to the stigma of a flower, is actually an accidental side effect of the somewhat messy foraging behavior of these insects. In order to produce fruit and viable seeds, many plants depend on cross-pollination, which is just what happens as bees fly from flower to flower.

Nearly all our wild bees have very different lifestyles compared to honey bees. Rather than living a highly social life in hives of hundreds or even thousands of individuals, most bees are solitary. Soon after mating, and depending on the species, a female might choose to nest in a preexisting nest cavity such as a hollow twig, an old beetle hole in a tree stump, a hole in masonry, or she might dig a tunnel in the ground. Then she visits flowers, gathering pollen and nectar that she carries back to her nest to be fashioned into a small loaf. She lays an egg on the food packet, seals the cell-like compartment, and starts the process again until her nest cavity is filled. The female dies after all this work, and her offspring emerge as new adults about a year later.

Here are some of the bees that you’re most likely to spot at Smith:

**Apidae** Honey bees and bumble bees both belong to this family of long-tongued bees. These bees are particularly abundant on flowers at the Botanic Garden, and both have modified rear legs with pollen baskets often filled with yellow or orange pollen. Although there are about a dozen species of bumble bee that could show up in the gardens, the most likely to be seen is the common eastern bumble bee, *Bombus impatiens*. Another member of this family that’s easy to find is the eastern carpenter bee, *Xylocopa virginica*, the largest bee species found in the garden. Unlike fuzzy bumble bees, this giant has a shiny, black, mostly hairless abdomen. Carpenter bees nest in wood, and this large species is commonly seen flying around dime-sized holes that they’ve bored into the wood soffits of houses and outbuildings.
**Bees continued**

(Continued from page 9)

**Megachilidae** These are the leafcutter bees, mason bees, and wool-carding bees. The females in this group (about 75 species in Massachusetts) carry their pollen loads packed in the stiff hairs on the underside of their abdomens. Leafcutter bees line and seal their nest cavities with small disks of leaf material that they cut out with their toothy mandibles. The alfalfa leafcutter bee, *Megachile rotundata*, a nonnative bee originally from Eurasia, is very common here.

Shiny blue mason bees (various species of *Osmia*) use clay to make partitions and seal the entrance to their nest cavity. This unique mud-building behavior is what gives them their common name. Mason bees are also called orchard bees because they’re particularly effective at pollinating fruit trees.

Wool-carder bee females line their nests with hairs they scrape from fuzzy plant leaves. Wool-carder bee males, especially the largest species in the gardens, *Anthidium manicatum*, which look like chubby wasps, are easy to spot because they’re territorial and tend to hover and guard patches of flowers. It’s common to see them attack and even kill other bees that get too close. (By the way, even if you get very close to a foraging bee to take a good look, you won’t get stung. They’re much too preoccupied with gathering pollen for food or nectar for fuel to pay any attention to you.)

**Andrenidae** These bees, commonly called sand or mining bees, are ground nesters. Worldwide this is the largest of the bee families with almost 100 species found in Massachusetts. One of the first bees to appear each year in the very early spring, sometimes when there’s still snow on the ground, is *Andrena frigida*, an apt name for this early flyer.

**Halictidae** This large group (about 100 species in Massachusetts) includes many very small species, most of which have a fondness for sweat and will land on you just to get a little salt from your perspiration. The easiest members of this family to identify are a subgroup of several species lumped together as “green bees.” They’re bright metallic green, fairly small, and some have yellow and black striped abdomens, such as *Agapostemon virescens.*

About one-quarter of Massachusetts bees are cleptoparasites, those that feed on other insects’ food sources. Instead of collecting pollen for their young, these so-called cuckoo bees sneak into the nest cavities of other bees, lay an egg on or near the pollen provisions of the host bee species, and then leave. Their egg hatches into a larva that eats the host bee egg and then feeds on the pollen packet.

In the summer of 2014 a small population of a nonnative bee, *Coelioxys coturnix*, was discovered at the Botanic Garden. Although a few had been caught previously in Pennsylvania, Maryland, and Virginia, the bees at Smith College were the first of this species detected in New England. In its home range of North Africa, Western Europe, and the Near East, *Coelioxys coturnix* is known to parasitize a tiny leafcutter bee, *Megachile minutissima*, but that species has never been found in North America. It appears that this nonnative brood parasite is taking advantage of another host bee species. The question is, which one? Sounds like a good biology project. ☛
A Donor’s Kindness, E. H. R. Lyman

In the 1890s, President L. Clark Seelye’s innovation of having the Smith College campus be a botanical garden organized for scientific study of plants attracted more than the attention of scholarly journals—it also attracted a donation of a range of glasshouses built by Lord and Burnham and erected in the fall of 1895 (see Botanic Garden News, Spring 2007, page 3).

At first, the donor of the spacious addition to a circa-1893 potting shed and two-house, cypress-framed range was anonymous. In 1896, E.H.R. Lyman, of Brooklyn, dedicated the conservatory to the memory of his mother, Anne Jean Lyman (1789–1867). Lyman Plant House grew with time, but at its core was Lyman’s capture of an opportunity to do kindness for others.

Edward Hutchinson Robbins Lyman (1819–1899) grew up on Main Street in the center Northampton. His father, Judge Joseph Lyman (1767–1847), was a widower with six children when he met Anne Jean Robbins of Milton while both were visiting acquaintances at Mrs. Murray’s in Greenfield Hills, Connecticut. Judge Joseph and Anne Jean were married in 1811 and had six children. Edward was the fourth, and Catherine, the sixth, was the maternal grandmother of Franklin Delano Roosevelt.

Edward was named for his maternal grandfather, Edward Hutchinson Robbins (1758–1829), himself the grandson of Nathaniel Robbins, who served as Milton’s first minister for 37 years, and the great-great grandson of Anne Hutchinson, the Puritan refugee famously expelled from Massachusetts Bay Colony for preaching. In 1789, after the War of Revolution, the elder Edward took several Milton families to present-day Maine and established the township of Robbinstown and a shipbuilding enterprise. He was elected speaker of the Massachusetts legislature in 1793, later serving long terms as lieutenant governor and judge of probate as well.

When Edward the younger donated the plant house to Smith in 1895, he was retired from Seamans Savings Bank of Brooklyn, where he had lived for nearly 50 years. Given the few career opportunities in his hometown and lacking money for college, Edward set out at age 14 to Blake Bros., a Boston dry goods firm, working five years as a clerk before being appointed its foreign buyer and spending nine years abroad prior to taking over as import–export manager at the New York branch. He settled in Brooklyn Heights, marrying Sarah Elizabeth Low of Brooklyn in 1847. In 1852, Lyman became a partner in A. A. Low & Brothers, a major importer of all kinds of Asian goods, and was later involved in insurance and banking as well.

When Judge Samuel Fowler Lyman, Edward’s half-brother, sold his property to Smith College in 1866 (the neighboring Dewey lot would also later become part of the}

(Continued on page 12)
“Female College”), Edward purchased the old Whitmarsh homestead off South Street and continued to summer in Northampton until and after his retirement in 1875. The Lyman estate—known as Fort Hill—became part of the Smith campus in 1946, providing housing for 30 graduate students as well as greenhouses and summer planting plots for Albert Blakeslee’s Smith College Experimental Genetics Station from 1948 to 1955 (see Fall 2003 Botanic Garden News, page 7). Today it houses Fort Hill, the Center for Early Childhood Education, faculty housing, and the main nursery for the Botanic Garden.

Many have raised successful children, but few mothers are honored with a range of sparkling glasshouses dedicated to affording women a science education equal to that in a men’s college. There’s a deeper story about Anne Jean Lyman, perhaps for a future article, but there is no doubt that she inspired her children to do good by, among other things, her bedtime asks, “Show me your monuments,” to which Edward and siblings scrambled to show what project or sewing item they had produced that day. Yet, pleasing his mother cannot fully explain the glass monument Edward gifted to Smith or even the municipal theater, the Northampton Academy of Music, which he gave to his hometown, in 1891.

What motivated Lyman to donate? Was it a belief that women needed a college education? Anne Jean may have disagreed, it a belief that women needed a college education? Anne Jean may have disagreed, as she lived up to the Robbins family motto, Non sibi, sed toti—not for oneself but for all. or

Edinburgh (1858) and Copenhagen (1874) conservatories, and even the Lyman estate in Waltham, Massachusetts (see box above). Was the donation a way for Edward to memorialize not just his mother but many family and friends who had died? Death was closer to everyday life in the 19th century than today. His mother took particularly hard the death of her eldest daughter Anne Jean (Annie) in 1837 at age 21 and also noted that half of her contemporaries had died in childbirth. Edward and his wife lost two of their five children in infancy, Edward in 1848 and E.H.R. Lyman in 1859. Another son, Joseph, predeceased him in 1883, and a grandson, E.H.R. Lyman, died in 1893 aged seven years.

Although we may never know the exact motivation, the reason Lyman gave to Smith College was clarified by documents at the Smith College Archives: he was asked. Director William F. Ganong articulated to President Seelye the facilities he envisioned to be needed to support botanical studies, and in 1895 Seelye asked Lyman for $5,000 to fund the project and pay for the existing greenhouses. A request for another $5,000 the next year was granted and the dedication made to Anne Jean Lyman. In 1902, 1904, and 1913/14, Edward’s son Frank Lyman and his daughter and son-in-law Annie and Alfred Tredway White made further gifts to fund the Physiology Laboratory and other improvements, so that the entire complex was underwritten by the Lyman family.

Good ideas tend to be widely shared. Lyman’s gift to Northampton of the Academy of Music was inspired by Brooklyn’s eponymous municipal theater founded in 1861. In return, Smith’s Botanic Garden inspired Alfred T. White’s gifts to help found the Brooklyn Botanic Garden in 1910. It is hoped that Lyman was able to witness the joy and wonder of children who visited the conservatory as he lived up to the Robbins family motto, Non sibi, sed toti—not for oneself but for all.

References
52. Academic Departments Box 1241 Department of Botany. Smith College Archives.
What becomes a garden most? There are, I suppose, as many answers as there are gardeners, for gardening is as idiosyncratic and personal as applying oil to canvas. At one end of the spectrum are those who claim design is paramount. The last twenty-five years have spawned an overabundance of landscape designers and landscape architects, so it can seem at times the majority of gardening in this country is done on paper, designs often specializing in bad plant choices.

At the opposite end of the spectrum are the plant addicts, scouring new nursery catalogs as reverently as fashionistas hunt the latest trends. The nursery industry, taking their cues from haute couture (or at least the mall version) offer “new and improved” cultivars each year, a constant treadmill of increasingly loud and overwrought plants getting stuffed into the packed and mishmashed gardens of the plant-addled.

Which plants we place in our gardens are as personal a statement as the art we put on our walls but are oftentimes more encoded and personal: repositories of experience, memory, and transition. What becomes a garden most? For me, legend and memory. The most important parts of my garden concern themselves with specific people (some long dead and unmet by me) and specific experiences that track the course of my family’s history.

I have interesting rocks and stones gathered from various vacations and journeys placed around the garden, talismans of remembrance, steady and enduring as my aging muscles weed around them. Plants I collected and have propagated from seed or cuttings now demand division or pruning to keep to scale. As I have lived in three houses during my adult life, moving days invariably include a set of plant divisions, seeds, and, if small enough to dig up, some cherished trees and shrubs.

When I worked at the Arnold Arboretum, we used to hunt beneath certain choice trees, a springtime scouring for freshly germinated seedlings, which we would carefully tease from the ground, pot up, and grow on for our plant sales. My home is bracketed by two trees of *Acer griseum*, paperbark maples, that were pulled from beneath the stately ancient tree that was originally teased from the ground in Hubei by the legendary plant explorer, E.H. Wilson, and brought back to the Arnold from China over a hundred years ago. That my trees have such a noble pedigree means everything to me; they are a connection to the legacy of plant hunters and explorers.

Plants that I have wild collected also find their way into our garden. An English yew, *Taxus baccata*, was grown from cuttings collected in Tofte, Norway, while I was collecting various yew species worldwide for the National Cancer Institute’s research efforts. My four-year-old son accompanied me, and I have a cherished photo of him, twenty years ago, standing next to the tree in a dour Norwegian winter. Memory begets memory and as our aged dachshund was failing and winter was setting in and sinking frost into the ground, my son and I had to prematurely dig his grave and cover it with boards until the inevitable demise. That he hung in with us until May was a typical dose of dachshund stubbornness. That his bones will feed the Tofte yew brings a small measure of comfort and the fortune to be afield with, fill these greenhouses with memories for me.

The most significant American plant collectors of the last 30 years, John Fairey and Carl Schoenfeld of Texas and Daniel Hinkley of Washington, never worked directly for a botanic garden but probably have more distinguished records of collection, the Texans in Mexico, Hinkley in Asia, which puts most modern American botanic gardens to shame. I count the time I spent out in the field collecting with these passionate plantmen as some of the best days of my life. Mr. Hinkley and I climbed Mt. Chiri in South Korea seeking *Stewartia pseudocamellia*, the outstanding small flowering tree that sits atop many top ten lists. It was on this mountain that E.H. Wilson first collected the species and brought it into cultivation via the Arnold Arboretum. I still smile when I remember the three tipsy Korean women, hiking with flasks, who refused to let Hinkley pass, enamored of the tall handsome American.

By an odd twist, I came to own the former home of E.H. Wilson in Boston. Wilson died in 1929, after all his Asian adventures, in a car accident on Route 9 on a rainy night in Massachusetts. His home, owned by the Arnold Arboretum, housed a succession of staff until my wife and I, both staffers at the time, bought it from Harvard. The deferred maintenance and shoestring repairs would take me years to correct, and only
Elms continued

(Continued from page 4)

management of all campus trees. He is constantly monitoring how our trees are doing. Many trees can have some decay without there being too much danger of their coming down. Some other factors to consider are whether there is a sound cylinder around any decay and whether there are other structural flaws. Often John will observe trees over time to see if any issues are progressing to the point of becoming worrisome. Naturally, he is especially conscious of trees in high traffic areas.

Nick Brazee has sampled over 90 elms in Massachusetts, Connecticut, Rhode Island, and New Hampshire. He is hoping to sample the same number next year. His results so far show that injected trees are not more likely to harbor internal decay than noninjected trees. However, the number of noninjected elms that he sampled is not adequate to make a firm conclusion. His focus next year will be increasing the sample size of noninjected trees for a more robust comparison. Springfield has become an important site for the study, having numerous very large American elms, none of which are injected. While the city has gone from thousands of elms to only dozens, there are still significant numbers of American elms throughout Massachusetts’ third-largest city.

According to Brazee, regardless of whether decay is present, injection comes at a cost to tree health. Many injected trees have injection site wounds that have killed the bark and outer sapwood tissues. Because elms are so tough, they seem able to resist that injury in most cases. Given that there is no other effective way to deliver the fungicides, the only other option would be to forgo injection and regularly scout the tree, removing any branches that exhibit the flagging symptoms of DED. This is generally viewed as risky, and most arborists would prefer to maintain a regular injection schedule. There are, however, a number of elms remaining in the landscape that do not receive regular injections and appear healthy overall. The question is whether they are somehow resistant or have simply escaped the pathogen.

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Becoming a Garden continued

now can I walk through it without a job/punch list hovering over my head like a gray cloud. One overhaul of the master bathroom brought the aged plumbing fixtures to the basement. How could I scrap the sink of one of the great plantsmen of all time? The very sink he scrubbed his hands in after gardening outside, planting lily bulbs and various other treasures that still remain. There is an E.H. Wilson memorial garden in Chipping Camden, England, and I shot an email to the town offices that administer the garden, offering up the sink as a donation. No reply. I pondered an eBay sale but who would ever search for E.H. Wilson memorabilia, let alone “celebrity sinks”?

It only seemed right to offer it up to Wilson’s spiritual heir, Dan Hinkley, as they had plied the same terrain in Asia, often collecting the same plants from the same mountain forests, a hundred years apart. I shot an email off to the West Coast. Dumbstruck that I was giving it away, Hinkley responded as though I was offering a painting from Monet’s garden. He promised that he would work it into his garden, a slop sink of cherished linkage, saved from the scraper’s pile.

I crated it up, and the 160 pound load got shipped out. Upon receiving it, Hinkley wrote back: “Just back from Europe and the Wilson sink was here to greet me. Makes me smile every time I see it. Now to decide how to employ it in the garden.”

What becomes a garden most? Legends, memories, and a good slop sink. Now if I can only get him to take the commode.
Capen Garden as an Enchanting Stage

Pamela Dods

On the evenings of Friday and Saturday, October 14 and 15, 2016, Capen Garden was transformed with the reading of a one-act play, Maurelle, written and directed by Zoe Rose Kriegler-Wenk ’18. Often referred to as the “hidden garden,” Capen Garden became an enchanted garden in the hour just before sundown.

For those not familiar with this garden space, it’s on Prospect Street, situated along the north side of Capen House, a student residence. The large formal garden, designed as a series of “rooms,” isn’t visible from the street because a tall arborvitae hedge encloses its east boundary. Visitors, including the Smith community, often discover it by chance. This garden is used in teaching horticulture students, is a popular site for guided tours, and is also often reserved by the public for wedding photography.

Zoe is the artistic director of the Smith College Student Theatre Committee (STC), an independent student organization that produces original work. STC stages an average of eight pieces a year, ranging from low-tech staged readings to full-scale productions. In this case, Capen Garden and Mother Nature provided all the staging necessary.

In talking about what brought this production to Capen Garden, Zoe said, “I always wanted to do a site specific production.” The script was written with the intention that the performance would be outside. In looking for a site on campus to stage the production, Zoe became aware of Capen Garden and, after visiting it for the first time, felt it would be the perfect location for the reading.

The one-act opens when a young girl, Evie, conjures a fairy princess but gets more than she bargained for with the energetic, opinionated Maurelle. From there, the story explores the potency of childhood enchantment and the ways in which it seeps into our adult lives.

The readings attracted around twenty audience members from the Smith community, many of whom were first time visitors to Capen Garden.

For more information about the Smith College Student Theater Committee contact stc@smith.edu.
Memorial Gifts

In memory of
Elsie Baskin Adams 1911
Elizabeth R. Maruska
Lila Roth Applebaum 1952
Alma Hix
In memory of Barbara Balfour 1964
Dale Claire Gibb
In memory of
Sarah Szold Boasberg 1958
Dorothy M. Woodcock
In memory of Knox Brand
Patricia Brand Ryan
In memory of Alan Brooks
Anne Brooks Perry
In memory of
Carol Brown 1911
Sheafe Satterthwaite
In memory of William Campbell
Jane Ross Moore
In memory of Edward & Gertude Charon
Miss Bootie Charon
In memory of
Lyn Judge Corbett 1974
Barbara E. Judge
In memory of Nancy Judge Wood, M.D
In memory of
Doles Wilson Coviello 1966
D. Rebecca Snow
In memory of
Edith Donahoe Dinneen 1927
Edith N. Dinneen
In memory of Nancy Gardner 1984
Virginia A. Sharpe
In memory of Martha Gray 1974
Florence B. Fowlkes
In memory of Charles and Ruth Hill
Katherine Hill Udall
In memory of
Roselle Hoffmaster 1998
Annette Zaytoun and Rick Reynolds
In memory of
Frances Hoke
Helen Wild Jennings 1934
Stephen O. Jennings
In memory of
Jeanne Silver Kirk 1963
Dale Claire Gibb
In memory of
Dorothy Miller Lewis 1939
Miss Bootie Charon
In memory of
Eunice Lilly 1919 and Dorothy Lilly Fowell 1924
Elvin M. Fowell
In memory of Cary MacRae McDaniel 1969
Ann Coulter Wiss
Catherine J. Wiss
In memory of
Constance Davison Mail 1930
Dr. Patricia D. Mail

In memory of Erin O'Neil 2011
Monica Duval
In memory of
Lydia Paglia
Lenora M. Paglia
In memory of
Gwendolen Pearce 1948
Catherine P. Seidenberg
In memory of
Muriel Kohn Pokross 1934
Joan Pokross Curhan
Deborah Wolfe Lievens
In memory of William Pokross and Muriel Kohn Pokross 1934
Shirley Stein Raymer
In memory of
Gordon Reid
Miss Bootie Charon
In memory of
Marion Rhodes
Eugene G. Rhodes
In memory of
E. Ann Scroggie Robinson 1922
Mrs. Jack B. Joyce
In memory of
Mary Mattison van Schaik 1931
Jacoba van Schaik
In memory of
Allison Ihm Schwartz 1998
Annette Zaytoun and Rick Reynolds
In memory of
Ann Ganong Seidler 1946
Jessie Bierwert
Barbara B. Buff
Judith A. Greene
Alice M. Greenwald
Douglas S. Jennings
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Jan Seidler Ramirez
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Kingsley Sullivan and Zeynep Somer
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Mary K. Shepherd
In memory of
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Susan M. Sherrerd
In memory of
Patton Ogden Tabors 1966
D. Rebecca Snow
In memory of
Sylvia Howe Thompson 1975
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In memory of Andrea Tissier
Devon Roll
In memory of
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Constance A. Parks
In memory of Beth Warren 1988
Marion S. Marcucelli
In memory of
Raye Simon Weenick 1959
Myra Wrubel
In memory of Cynthia Works 1972
Donna S. De Coursey

In memory of
Heather Sanchez Wrzesinski 1996
Emily Wang
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Joan E. Corbett
In honor of Donald Baumer
Jennifer C. Beachell
In honor of Brita Dempsey 2000
David and Jean Dempsey
In honor of
Betsy Brown Dietrich 1960
Rita Seplowitz Saltz
In honor of
Anne Atfield Hubbard 1955
Susan Cohen
Janice Oresman
In honor of Lindsey Kaghan 2012
Sarah Kelly
In honor of Laura Malecky 2013
Lawrence Malecky
In honor of Michael Marcotrigiano
Sue Ann L. Schiff
In honor of
Kate Dempsey Martinneau 2004
David and Jean Dempsey
In honor of
Danielle Kahn McKahn 2001
Laraine R. Ferguson
In honor of Denise McKahn
Laraine R. Ferguson
In honor of Richard Munson
Janice L. Shindel
In honor of
Miriam Camp Niederman 1948
and James Niederman
Nancy V. Ahern
In honor of Charles Robertson
Dr. Eszter Hargittai
In honor of Jan Yolen 1960
Rita Seplowitz Saltz

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Each year, over 1200 schoolchildren tour the Lyman Conservatory at the Botanic Garden, learning about different climates and geographic regions, plant adaptations to those climates, and why plants are so important to human life. They see living examples of important economic crops that provide us with oxygen, food, medicine, building materials, and much more. It is the community volunteers who bring alive our collection of plants from around the globe for the local students who come on field trips. Trained volunteers provide tours for K–12 classes, often working with teachers to connect the tours with what the students are learning in the classroom.

You too can make a difference!

We are currently recruiting new volunteers. We need folks who are interested in leading greenhouse and garden tours, as well as staffing our reception area on weekends, holidays, and during the Bulb and Chrysanthemum Shows. There are also opportunities to develop thematic tours, assist with exhibitions, and use your skills in other ways (sorry, no hands-on work with plants, however).

We will be offering a three-day intensive training session on January 18, 19, and 20, 2017. Preregistration and an application are required.

Please contact us (413-585-2742 or garden@smith.edu) if you are interested in volunteering. Information and applications are also online: https://www.smith.edu/garden/volunteers
You are invited to join
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