Bamboo, Chrysanthemums, and Poetry

Madelaine Zadik

Bamboos are members of the highly evolved grass family, Poaceae, some of which are among the fastest growing plants on Earth. There are 1000 different species in over 90 genera, which range from under 1 foot to over 100 feet tall, and grow in different climates, from jungles to high on mountainsides. Having great economic and cultural significance in Asia, bamboo provides housing and food for over 2 billion people. Its many uses include soil conservation, medicine, ornamental and landscape plantings, construction material, basketry, paper, boats, bridges, clothing, cooking utensils, fencing, furniture, tools, musical instruments, paper, flooring, and roofing.

This fall Sujane Wu, Assistant Professor of East Asian Languages and Literature, participated in the Botanic Garden’s Curricular Enhancement Program, which provides support to faculty in utilizing the Botanic Garden in their teaching. Professor Wu redesigned her course, The Culture of the Lyric in Traditional China: Plants and Poetry (EAL 231), so that her students would develop a deeper understanding of the plants that are so integral to the literature. As we were working with her, the idea for the theme for this year’s Chrysanthemum Show began to emerge. It was a natural outgrowth for us to incorporate bamboo and poetry into the Show.

Through readings of folk songs, lyric poems, prose, and excerpts from a novel and a drama, students in the class explored the historical development of images and symbolism of three plants in Chinese literature: chrysanthemum, bamboo, and lotus. The students selected Chinese poems about chrysanthemums to display with the mums in the Show, and they presented the poetry in a public reading.

We invited Nancy Moore Bess, master basket maker and internationally known bamboo expert, and artist Harry Bower, to create bamboo sculptures to complement the chrysanthemum displays. The sculptures were installed in the Chrysanthemum Show, the Church Exhibition Gallery, and just outside the Lyman Plant House.
March of the Clones

Rob Nicholson

Nonprofit institutions with curated collections have varying ways to make these collections available for public consumption. Art museums do a profitable business in posters and reproductions of both two- and three-dimensional pieces of their collections. Zoos might sell stuffed plush approximations of the animals. Only botanical gardens can readily make large numbers of their holdings available by means of sexual or asexual propagation. The idea of slicing a Monet or Gauguin into smaller pieces and selling them off is unimaginable, but this concept is hardly a scary one to us.

The Smith College Botanic Garden occasionally holds plant sales, although they are not a high priority within our mission. Many other botanical gardens do count heavily on revenues from plant sales, and annual events can generate income in the five to six figure range.

Our orchid collection has had substantial expansion in the last decade in terms of quality and numbers of specimens. But the plants themselves expand, getting bigger and demanding more bench space as the years add up. So this year, in an effort to supplement contracting budgets, we decided to divide our specimens down to a more manageable size, and then divide (clone) and pot up the leftovers for a sale. Proceeds from the sale will be used to buy new plants for our indoor and outdoor collections.

Student interns Rachel Rock-Blake ’09 and Caitlin Bumpas ’10 were immersed in a monthlong process of dividing, potting, labeling, and producing a catalog. All their work came to fruition in May when 1300 orchid plants were offered for sale during commencement and reunion weekends, on May 30 at 9–11:00 am to Friends of the Botanic Garden, and lastly to the general public from 11:00 onward.

The results were as good as we could have hoped, with 250 people scouring over 1300 plants of 150 different species and cultivars and leaving only 75 behind. Many people joined the Friends group just to gain early entry. Two volunteers in particular weathered the Saturday morning crush, Diana Souza and Mary Lou Splain, while the more sane afternoon sales tables were managed by Sue Gerstle and Leslie Fisette. One of our summer interns, Dana Egan-Sherry, also helped out.

The majority of our new orchid material was donations from Dr. Wilford Neptune of Newton, Massachusetts, and the estate of Pamela Copeland of Greenville, Delaware. While we always keep one fine specimen of each plant they gave us, the divisions we sold allow us a small degree of budgetary flexibility. These plants quite literally have become the gift that keeps on giving.

Corrections

A couple of corrections of items that appeared in the Spring 2009 issue of Botanic Garden News:

The article about The Huntington (page 11) stated that it is now owned by the state of California, when in fact the garden is owned by a private foundation. Also, to clarify, the original size of the estate was 600 acres, of which 207 now remain.

In the article on daylilies (page 9), we incorrectly labeled the photo of Hemerocallis ‘Venus Fly Trap’ as an unusual form daylily. This cultivar is, in fact, a standard tetraploid with teeth and is not classified in the unusual form category.
Raising the Roof for the Butterfly Agave

Plants have to be continually pruned and shaped to fit the confines of the glass boxes we call the Lyman Conservatory. But once in a great while you have to bend the rules and alter the box to fit the plant. This summer brought yet another flowering first and one that was remarkable to watch.

Our specimen of Agave potatorum was planted in the newly renovated Succulent House in 2001. In the center bed we constructed a series of rock outcrops and planted within this naturalistic landscape a number of interesting succulents and cacti. The bed was divided into New World and Old World halves, and the agave was planted at the base of a huge ponytail palm, Beaucarnea recurvata, which we maintained in a box during renovation. All the new plantings settled in nicely and seemed to demonstrate clearly that desert plants love their roots to be able to dive deep, as all the inground plantings seemed more vigorous than our potted plants.

Agave potatorum has had a long association with humans. The Aztecs knew the plant by the name of papalometl or butterfly agave. Whether this refers to a pollinator or some other meaning is long lost but does leave us with an attractive common name. The species is native to the states of Puebla and Oaxaca in Mexico, and is found in dry pine/oak forests at 4,000 to 7,500 feet in elevation. In the wild, flowering stalks are usually seen in the autumn season; they can reach 18 feet tall, with up to 30 flower clusters.

A number of years have passed since the renovation, and the plant must have longed for a little chaos as it now demanded some building changes. Beginning in May the central rosette of spiny azure leaves began to shift as a flowering stalk started growing from the middle. To say it grew fast is an understatement as it was one of the fastest growth spurts of any plant we have ever cultivated. By July 4 the stalk had stretched to 13 feet above the foliage. The speed at which it grew was startling and it quickly reached the peak of the roof, necessitating the removal of one pane of glass so the stalk could continue onward and upward. After it topped out, it began to send out branched clusters of flowers forming a paniculate flowering stalk. As impressive as the plant is to us, a literature search showed that other species of agave send up flowering spikes 9–10 meters (29–33 feet) above the ground, treelike spires from a rosette of leaves.

Flowers began to open and be “ready for business” on August 1, and it was a matter of some speculation about what pollinator this non-native honeypot on a stick would attract in North America. In their native range, Arizona and Texas to Costa Rica, approximately 200 different species of agaves are known to attract a variety of pollinators, primarily nectar-lapping and pollen-feeding bats but also hummingbirds, flickers, doves, pigeons, wrens, ravens, parrots, bees, wasps, flies, and beetles. New England bats seem wholly adapted to insect hunting rather than nectar lapping so we did not anticipate any nocturnal visits.

In late August, by which time the flower stalk had reached 16.5 feet, two different species of wasps were observed foraging for nectar within the tubular blossoms, but no bees or birds were seen visiting the foreign flowers. As we were not certain pollination was being consummated, the tricky operation of climbing out to the flowers and hand-pollinating became necessary. If the species is self-compatible (able to pollinate itself), then this would allow us to spread the seed of this species to other botanical gardens worldwide by means of our (Continued on page 4)
Agave continued

(Continued from page 3)

Index Seminum. However, despite our efforts, in the end it did not produce any seeds.

As the weather began to get cooler, we needed to replace the pane of glass we had removed from the roof of the Succulent House. On October 14, we cut down the stalk and took a picture of it. Kate Glossner, one of our work-study students, agreed to provide a sense of scale for the photograph of the flowering stalk.

The plant holds a particularly vivid memory for me as I collected a small division from its mother plant in the pine and oak forests in the mountains above Oaxaca City, Oaxaca, Mexico. Along with my son Charles, my collecting partner Dr. Melvin Shemluck, and our guide Concepcion Gomez, I was navigating our way up to high elevations in search of Chiranthodendron pentadactylon, the curious monkey hand flower tree (at right). It grows more in the cloud forest zone, and Concepcion knew right where to bring us. As a heavy thunderstorm rumbled down the mountain ridge toward us I scrambled up the 80 foot trees in search of seed pods. A branch snapped beneath my foot and I spun through the air 20 feet and landed hard. After I regained consciousness we limped back the 10 miles to town, empty-handed but for a few agaves and salvias. That the tree species carries an Aztec curse against those who gather seed, and that it was the only tree I have fallen from in 35 years of plant collecting, gave me a good yarn to go along with myriad bruises.

That night I dulled the pain with some fine mezcal, a strong spirit made with agave species such as Agave potatorum, rather than the species A. tequilana, used for making tequila. Both spirits use the stem and leaf base of agave species as the base material for fermentation and distillation. Once plants are mature enough, the spiny leaves are pruned off, the resulting short broad stem or “cabeza,” weighing up to 120 pounds, is harvested. This is then steamed, breaking down the starches into sugars, then macerated, fermented, and distilled. Tequila production is centered in the state of Jalisco and is a worldwide product. Mezcal is made from about ten different species of agave, depending upon the state and range of species, and is much more poorly known outside of Mexico. In Oaxaca, many small farmers collect plant material such as Agave potatorum from the wild and distill their own in primitive set-ups. The few common commercial brands of mezcal available in the United States are generally less interesting and complex than some of the small distillers’ runs, which can rival a fine single-malt Scotch whiskey in impact and complexity. Mezcal is finally catching on in the United States in connoisseur circles, and bottles can now be had online from such vendors as Del Maguey Limited Company (www.mezcal.com).

One remarkable feature of flowering agaves is that so much of the stored carbohydrates within the stem and leaves get used up during the development of this flowering edifice, that the giant rosette of leaves withers and dies after the formation of seeds. As the plant had outgrown its space in the greenhouse, it is, in effect, self-regulating for us and we will start again from seed.

First flowerings of our specimens are always nice but in the case of the butterfly agave it is a bit melancholic: a first and last flowering. ☹
Smith’s New Plant Ecologist: Jesse Bellemare

In 2007, after 36 years as Smith’s plant ecologist, John Burk announced his retirement. John is an ardent supporter of the Botanic Garden and our unofficial historian. He also used our facilities more than any other professor. John authored our wonderful exhibit, The World in a Garden, which taught us much about the domestication and global trade in plants. The exhibit was also very personal for him, having been inspired by National Geographic articles that influenced him in youth.

After searching long and far, sorting through dozens of applications and interviewing five talented finalists, Smith made an offer to Jesse Bellemare to become the new faculty member. We are excited to have a new supporter and someone who will act as a liaison between the Botanic Garden and the students in biological sciences. Before Jesse had enough seniority to say “No,” I decided I’d jump on the opportunity to interview him.

Michael Marcotrigiano

Michael: Most students interested in life sciences are unaware of the career opportunities with plants. What made you decide to concentrate your studies and career on the plant kingdom?

Jesse: I have really always been interested in natural history—plants, animals, and exploring different types of habitats. My parents are both avid birders and gardeners, plus they live in an area that is surrounded by protected natural lands, making access to the outdoors as easy as walking out the back door! At some point my general interest in natural history shifted more strongly toward plants, probably through interactions with a friend of my family who was involved with the New England Wild Flower Society (NEWFS). One vivid memory I have is of coming to the Lyman Conservatory with a family friend. It was during the Bulb Show, but I think I was most interested in the orchids! In any case, I joined NEWFS while I was still in junior high school and started taking part in their intro botany classes and field trips around New England. By the time I reached college, I was already looking to focus my studies on plants and plant ecology. In reality, I think the recognition that my interest and fascination with plants could be a career came many years after I was already hooked!

Tell us about your educational background prior to coming to Smith.

A large part of my education actually took place locally—I was a biology major at UMass Amherst and then went on to do a master’s at Harvard University’s Harvard Forest in Petersham, in central Massachusetts. I’ve been out of the area for the last several years working on my Ph.D. at Cornell University in Ithaca, NY, but I am really excited to be back now and teaching at Smith College.

Were you born and raised on the east coast?

I’m actually from right here in western Massachusetts—I grew up in West Whately, about 10-15 minutes north of Smith. So, I’ve already spent many years exploring and “botanizing” in the Berkshires and Connecticut River Valley. I am really looking forward to incorporating this local perspective on plants and plant communities into my teaching and field trips associated with my classes.

When you saw the position open up at Smith what was your reaction?

I was really amazed. In fact, it seemed a bit too good to be true. Most of my graduate student colleagues from Cornell have scattered across the country depending on where teaching or research positions were available. I expected to do the same, even though my wife Sarah and I were really hoping to settle back in New England. I feel very fortunate to have found such an exceptional position at a great college in exactly the location that I would have hoped to be.

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As a Ph.D. student you quickly learn that you need to specialize. What triggered your specialization in plant ecology?

Well, given my long-running interest in plant ecology and natural history, it was really the case that I was just waiting to specialize once I got through the introductory level biology courses in college! So, I think the interest was always there—I always knew that I wanted to work on plants—but the undergraduate and graduate-level training helped me to see what bigger picture questions or larger conceptual issues in ecology and evolution might be profitably addressed with plants or plant-related study systems.

Some plant researchers are not plant geeks. If you like plants outside of your career what kinds do you like and do you own or plan to collect any particular plant groups?

My family’s property in Whately has a fairly wide range of environmental conditions, from wetland to meadow to wooded areas, so I’ve been growing and propagating native plants in these different habitats for many years. In particular though, I am a big fan of woodland perennials, including species native to New England, but also species that are restricted in their natural distributions to the forests of the southern Appalachians Mountains or other parts of the Southeast. My gardening interests often complement or spill over into the questions I investigate in my

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research, for example, I’ve grown umbrella leaf, *Diphylleia cymosa*, in my garden for a number of years, but have now launched a large-scale research project investigating why this species’ natural distribution is so limited in the Southeast. It only grows at high elevations in the southern Appalachians, but co-occurs there with many plant species that are much more widespread in the eastern United States. The other plants that I am really fond of are the disjunct congers or relatives of eastern North American plants that occur in eastern Asia or Europe. I think these plants are pretty spectacular from a gardening perspective, but also embody a whole range of fascinating questions in ecology, biogeography, and evolution. Many of these disjunct species have been separated on opposite sides of the world for millions of years and yet still often retain extremely similar morphological appearances and ecological traits. This pattern raises some striking questions about evolution and the role that other organisms in an ecological community might play in constraining or limiting evolutionary change.

In simple terms what kinds of research do you do?

In general, I am interested in a range of questions that fall at the interface of ecology, biogeography, and evolution. For example, one topic that I’ve investigated concerns the factors that determine plant species’ geographic range edges. Traditionally, most ecologists have presumed that plant species’ ranges were in “equilibrium” with climate and the biotic environment; in other words, if you moved a species beyond its range edge it would fail due to some limiting factor in the environment, such as cold temperatures or attack by insects or pathogens. While this is undoubtedly accurate for many species, there is increasing evidence that some species may not disperse “fast” enough to attain this type of distributional equilibrium with the environment, given that the environment is always changing, as with long-term changes in climate. For example, might there be “slow” or poorly dispersed plant species whose geographic ranges still reflect the impacts of colder climatic conditions and glaciations of the last Ice Age? Although earlier approaches to these types of questions have typically been theoretical or descriptive in nature, I’ve employed some simple experimental techniques to directly test the nature of plant species’ range edges in the eastern United States. For example, I’ve sown seeds of forest plant species at sites within and beyond their natural range edges to test whether we see declines in survival and growth outside their geographic range, as would be predicted by standard ecological theories of range edges. Surprisingly, for some species there is no evidence of a decline in performance and, in fact, the plants appear to be doing quite well outside their natural distribution. This suggests that there may be areas of suitable, but uncolonized habitat, for these species in the north. One plausible explanation for this pattern is that the species are still migrating into the region from the south but have yet to fully colonize all the potential habitat that is available.

Overall, I think this type of research has fascinating implications for thinking about species’ responses to modern climate change. It raises the possibility that some species may be too slow to track rapid climate change on their own. Should we intervene and “assist” such vulnerable species in migrating north? Obviously this opens up a whole range of questions about appropriate conservation strategies, risk management, and ethical considerations, but I think that we need to start working on these types of questions now so that we have good empirical data in hand when we make these types of important decisions in the future.

Suddenly the relevance of ecology is becoming known by everyone. Overpopulation, global warming, and the threat of extinction are all in the news. Of course, it is polar bears rather than orchids that we see on the news. Do you feel that you have a responsibility to be an authority who provides sound arguments for decisions made at a political level?

I think ecologists have a very important role to play in helping policy makers make sound decisions regarding the environmental crisis and in helping the public to understand the scope and relevance of environmental issues. Interestingly, this role might be split between developing the best understanding and predictive capabilities that current ecological science permits, but also acknowledging that the complexity of many biological and ecological systems makes predicting their responses to novel conditions or new threats quite difficult. Ideally, this perspective might encourage both thoughtfulness and caution when confronting these environmental challenges.

Finally, if you had to tell a student why they should study plants what would you say?

Plants are fascinating organisms and there is still an incredible array of things waiting to be discovered about their ecological interactions and evolution. For students starting out in plant ecology, there are a whole range of opportunities for conducting new and exciting research—research that will have great relevance for our basic understanding of ecological systems as well as direct applications in solving the key environmental challenges confronting our society today. In my teaching and research at Smith, I will be sharing my enthusiasm for plants with students and hopefully encouraging or inspiring many of them to pursue their own interests in plant ecology or botany.
Exploring Yunnan, China
Janet S. Bissell

"There's one!" A cry goes up and we rush over to marvel at a diminutive, hot pink pleione orchid, *Pleione yunnanensis*. We snap pictures before scouting for other botanical treasures. The early spring hillsides are covered with rhododendrons in red, pink, white, yellow, and purple, many with long streamers of lichen, *Usnea longissima*, which swirl in a misty breeze. This is Laojun Mountain, one of fifteen conservation zones in the Three Parallel Rivers Protected Area in Yunnan Province, China.

It is easy to see why the New England Wild Flower Society (NEWFS) picked this province for their April 2008 tour. Yunnan is one of the most biodiverse regions of the world. Located in the most southwestern region of China, Yunnan is bordered by Myanmar, Tibet, Laos, and Vietnam. Massive forces that slammed the Indian subcontinent into Asia millions of years ago formed not only the Himalayas but also the Hengduan Mountains extending from northern Yunnan into the south of the province.

Towering, snow-covered mountain ranges and deep river gorges watered by monsoons from the Indian and Pacific oceans create geographical diversity that is home to a staggering number of plant species. The province has 15,000 species of higher plants. The northern mountains are home to 200 species of *Rhododendron*, 100 species of *Primula*, 110 species of *Gentiana*, 90 species of *Corydalis*, and the list goes on. The southern tropics of Yunnan boast 1500 flowering plants and over 500 indigenous plants important in Chinese medicine. Many of these plants as well as their habitats are endangered and Yunnan is home to numerous endangered animals as well. The Yunnan golden monkey, red panda, snow leopard, Asian elephant, and black neck crane are just a few examples.

Yunnan is known for its ethnic and cultural diversity. Of the 54 registered minorities in China, 24 reside in Yunnan. The most well known of these ethnic groups are the Yi, Bai, Naxi, Tibetan, and Dai peoples, all with their own language, music, dress, customs, and in some cases religion and writing. All of this biological, geological, and ethnic diversity is contained in an area the size of Montana.

The Three Parallel Rivers Protected Area is named for the Yangtze, Mekong, and Salween rivers, which run parallel from north to south in an area about the size of West Virginia. Set aside by the Chinese government starting in the 1980s, the area is a UNESCO World Heritage site. With the help of several nongovernmental organizations, most notably the Nature Conservancy, there are ongoing efforts to protect this biodiversity epicenter while helping the local people maintain their cultures and livelihoods.

After the cloud forests at Laojun Mountain we visited the alpine slopes around Jade Dragon Snow Mountain. At over 18,000 feet, this mountain range dominates the landscape. We walked in the high yak meadows near Jade Dragon. A cable car took us through forests of spruce, pine, and hemlock up meadows where we discovered tiny gentians, edelweiss not yet in bloom, and purple primulas poking through a late spring snow. The rhododendrons here were of a type with small leaves and flowers that hugged the ground.

Further north near the Tibetan town of Zhongdian (renamed Shangri-La by the Chinese government) we spent an afternoon in a wet meadow at Napi Hai Lake. Here our plant list included *Iris ruthenica* var. *nana*, *Daphne aurantiaca*, *Stellaria*, *Euphorbia yunnanensis*, and more gentians. The treat of the afternoon was seeing thirteen black neck cranes that had not yet left for their breeding grounds in Tibet.

Our last stop in this region of Yunnan was Pudacuo National Park, China’s first national (Continued on page 8)
At elevations of 12,000 feet, the alpine meadows here literally and figuratively took our breath away. Raised boardwalks were in place to help us see the plants without trampling them as we moved along the shoreline of Bita Hai Lake and through old-growth forests, where a few huge Linzhi spruce, *Picea likiangensis* var. *linzhiensis*, still remain. The forest floor was covered with mats of small blue primulas, and rhododendrons again dotted the hillsides. Words cannot describe the beauty and tranquility of the area.

This area of the world was the epicenter for plant exploration and collecting since the late nineteenth century. Father Jean Marie Delavay, George Forrest, Joseph Rock, and Frank Kingdon Ward are just a few of the intrepid explorers who collected in Yunnan. Their discoveries still grace our gardens and include the dove tree (*Davidia involucrata*), the blue poppy (*Meconopsis* sp.), *Ginkgo, Pieris, Buddleia, Primula*, and dozens of rhododendrons.

After spending ten days in the Three Parallel Rivers Area we flew south to Xishuangbanna County. Although going from what felt like the roof of the world to monsoon weather in the tropical rainforest was a bit jarring, none of us seemed to have trouble acclimating to a tropical paradise. We visited China’s premiere botanical garden, the 2800-acre Xishuangbanna Tropical Botanic Garden (XTBG), situated on a peninsula in the Luosuo River, a tributary of the Mekong. The largest part of the garden, the eastern area, is dedicated to fieldwork and research and is not open to the public. The western part of the garden houses research facilities, offices, labs, and visitor services. The display gardens here comprise plant collections that include gardens for palms, bamboo, shade plants, and orchids, an ethnobotanical and cultural garden, arboretum, and rare and endangered plants. Founded in 1959 by Professor Cai Xitao, XTBG emphasizes plant conservation, ethnobotany, agroforestry, and economic plant development. The garden includes a wide range of natural vegetation types such as rainforest, tropical monsoon forest, and south subtropical evergreen broad-leafed forest. More than 3000 plant species are cultivated.

We spent three nights in a guest hotel situated in the heart of the XTBG display gardens. This made it possible for us to bird-watch or just enjoy the gardens in the early morning hours before the general public was admitted. One morning was spent on a tour led by one of the garden’s guides. All of the guides were young Dai women who wore their native dress of colorful sarongs and used parasols to keep off the sun or rain. Even though our guide spoke very little English we communicated in the time-honored way of smiles and pantomime. When in-depth explanation was needed our NEWFS guide Ted Elliman was able to translate.

For me, as a volunteer guide for Smith’s Botanic Garden, it was wonderful to see the plants that we talk about in the “Jungle Room” here at Smith. We try hard to convey to visitors the grandeur and importance of rainforest habitats. At the XTBG I did not have to “imagine” strangler figs, aerial roots, and the huge buttresses produced by emergent trees. All of the trees could grow to their expected heights and were often festooned with orchids, ferns, and other epiphytes. Interspersed among the various gardens were open-air pavilions that act as classrooms and places for reflection. The abundance of plant life was at times overwhelming. Our visit in tropical Yunnan was all too short and after three days we were on our way back to New England.

I came away from this trip with much more of an appreciation for the abundance and diversity of plant life. I am also struck by the important role botanic gardens play in conservation, research, and education. ☞

Janet S. Bissell lives in Northampton with her husband Bob. Aside from volunteering at the Botanic Garden, she is a Plant Conservation Volunteer with the New England Wild Flower Society and a long-time volunteer for Mass Audubon at Arcadia.
New Online Exhibitions

Botanical Architecture

Students in the studio class ARS 285, Introduction to Architecture: Language and Craft, taught by Jim Middlebrook, were asked to reinterpret the spatial language of a flower. Each student started by choosing one flower from the Botanic Garden during the first week of March. She photographed the flower and analyzed its spatial character in terms of certain organizational principles. The student then built a model to abstractly re-present the flower according to this visual “language.” Finally, these forms were integrated by the student into the design of a pavilion that would be used to display flowers next to Paradise Pond.

The projects were on display in the Church Exhibition Gallery from June 15 to October 11, 2009, but you can still see them online at www.smith.edu/garden/exhibits/architecture.

Kindergarten Leaf Study and Bulb Show Paintings

We were so pleased that Professor Susan Etheredge used the Botanic Garden’s Curricular Enhancement Program to redesign her class, EDC 231 Foundations and Issues of Early Childhood Education.

In this course Smith students explored how young children think and learn. They also examined the teaching/learning relationship in the early childhood classroom. Using the Lyman Conservatory as a laboratory for a semester-long investigation of leaves and bulbs, students pursued an understanding of inquiry-based teaching and learning contexts for young children. They engaged with the Campus School kindergartners in this inquiry-based leaf study. Together they looked closely at leaves with hand lenses and microscopes, described them using scientific language, sketched them, traced them, painted them, made rubbings of them, photographed them, and generated metaphorical language to describe what they saw. They also read poetry and books about leaves and kept journals and field notebooks.

Additionally, inspired by their close observation of the Spring Bulb Show, the kindergartners created some extraordinary watercolors. You can see the entire exhibition in full color online at www.smith.edu/garden/exhibits/edc231.
As a Landscape Studies minor, I’m interested in creative and ecologically sound solutions to controversial landscape issues. So when I discovered Terra Vita Grazing and Consulting, an alternative weed management company based in Wyoming, I inquired about a summer internship with the owners, Brandon and Brandy Dalton. They were receptive to the idea, but funding was an issue. I applied for funding with Smith’s Praxis program, and one month later headed to Two Dot, Montana, where I began my job helping herd more than 900 doe and kid goats on a 20,000-acre ranch.

It’s hard to convince people that weeds aren’t necessarily bad. They are a natural part of biodiversity, after all, and completely eradicating them would be harmful. However, when invasive species compete with native species the landscape can be drastically altered, changing habitat and upsetting delicate ecosystems. In many parts of Wyoming and Montana, the constant drought and subsequent brittle conditions provide the exact environment that gives the harder invasive plants—such as many weeds—an advantage.

Fortunately, goats are perfect for managing weeds in these conditions. Plants such as death camas, *Zigadenus nuttallii*, which is fatal to domestic stock, and invasive species such as leafy spurge, *Euphorbia esula*, are no match for goats. Goats are able to tolerate toxic alkaloids and digest weed seeds so completely that the seeds are no longer able to germinate, halting weed spread. Goats also strip the bark of invasive shrubs and devour leaves, plant stalks, and flower heads, severely stressing undesirable plants.

There are several ways to maximize weed grazing. Loose grazing is best for large areas with low to moderate weed infestation. A working dog is essential for this method. From experience I learned it is impossible to direct a scattered herd of goats on foot without a dog’s help. After a day of loose grazing the herd is penned in a temporary electric fence for the night.

In addition to keeping the goats safe from predators, penning is also a grazing tool. Areas of dense weed infestation need more impact than loose grazing can provide. Concentrating the goats in a small area ensures that manure and organic material (such as trampled grass and weeds) get thoroughly worked into the soil. Over time, this changes the composition of the soil itself, allowing native species to compete with invasive weeds.

Every aspect of this job, from having to bottle-feed “bums” (orphaned kids) to troubleshooting job sites, has helped me appreciate the process that healthy, balanced land requires. Through the course of my job, I’ve changed my emphasis from focusing on weeds to focusing on soil. It’s most satisfying to see the weeds disappear, but building healthy soil is the critical contribution to renewing native biodiversity.

Herding goats taught me that healthy, weed-free land is possible. And it all starts from the ground up. ☺️
Marianne North
Kari Strickland ’09

As a final project in our horticulture class, my classmates and I were each given a topic related to what we had studied. I was assigned Marianne North, a botanical illustrator, about whom I had no previous knowledge. By the end of the project, I had developed a deep appreciation for the work she did and for the work of botanical illustration and botany in general. Studying this woman and her life was an inspiration as to what women can accomplish despite all obstacles.

Marianne North (1830–1890) was an oddity in the upper-class Victorian English society she was born into. Few women of her time were educated and even fewer were able to work professionally. Had she been content with a traditional life, Marianne North would have found herself educated in the so-called feminine arts: music, art, and sufficient botany to tend a garden but only enough to enjoy as a hobby. She would have married early and dedicated herself to tending her husband’s affairs. Fate and family, however, provided her an opportunity to expand beyond these assumptions. Marianne North never married, and never felt the desire to do so. Instead, the confirmed spinster committed herself to caring for her aging father who was in failing health after the death of her mother. Her relationship with her father not only provided Marianne North a socially acceptable reason to remain single, it also allowed her to enter a professional world, using her father’s contacts to train herself as a painter and to plan trips to far-off countries, both invaluable opportunities throughout her life.

It is no surprise then that upon the death of her father, ten years after they entered into their arrangement, Marianne North would not consent to finding a husband and accepting that traditional path she had spurned all her life. Having found both drawing and botany to be her favorite pastimes, she decided to find a way to make these hobbies into a profitable career, and set off to America.

For the next twenty years, Marianne North traveled by boat, carriage and foot through the cities, towns and remote villages of fifteen countries, returning to England only to host gallery shows to supply herself with money for her next trip. She arrived in countries with no knowledge of what she would face, and no knowledge of the language, relying solely on the contacts her father’s name allowed her to call upon. Despite the language, culture, and gender hurdles, she not only survived but flourished in each country. At the end of her life she could call the rulers of all these countries good acquaintances, even receiving the King of Brazil in her apartment on his trip to England. On her trip to visit family in England, she met a man on the road who eventually introduced her to President Ulysses S. Grant. In Java, she met a man at a party being thrown by some local dignitaries and spent the evening talking with him, “only taking in slowly that my man was his Excellency.”

Almost more remarkable were the conditions in which Marianne North found herself on her travels. A woman from a society defined by repression and restraint, she was often surrounded by unknown men in situations that would certainly be deemed uncivilized by polite society. She was responsible for her own means of travel, walking days at a time, often through mud and difficult roads, as well as securing her lodging. She recalled sleeping in abandoned buildings on the floor, or sharing a room with pigs and madmen when there was nothing else to be found. Additionally, she suffered in other ways, succumbing regularly to pneumonia, rheumatism, and even temporary blindness. Through it all, however, she had nothing but a positive attitude and often remembered her hardships as the most rewarding part of her travels. She described having to wade through a river as her guide cut leeches off her with a sword as “exciting,” and mentioned one prize memory of her travels being aboard a boat heading to Australia while sharing quarters with a mischievous monkey.

Marianne North’s life is important not only for what it teaches us about the possibilities for women in Victorian England and the workings of the British empire, but also for what she offered to botanists then and today. Marianne North bucked conventions in the day’s botanical drawings. Not only did she insist on painting in oils rather than watercolor, which...
and giving clues to the environment in which the plant was growing. This allowed botanists to study flowers across the globe and infer certain things about them, such as how their seeds might be distributed and what sort of soil they were accustomed to. She brought the world back to England in a time when transportation of the actual plants was still a relatively new idea, and she did it in a way that effectively brought the researchers to the plants. Because of her attitude of adventure and her excitement at taking trips off the beaten track, she also came into contact with rare and even species unknown to scientists at the time. In her travels she found four new species that are now named after her—Areca northiana, Crinum northianum, Kniphofia northiae, Nepenthes northiana—and British botanist Joseph Hooker named the genus Northia, for her.

Despite her extraordinary story, Marianne North’s work was largely neglected in the public sphere until recently when renewed interest was given to her notes and paintings of flowers that are now extinct. Her gallery at Kew Gardens, which she created and funded at the end of her life and which holds all of her work, had been in serious decline until a major renovation a few years ago. It is purposely difficult to find, as was Marianne North’s wish, so that only those truly dedicated to plants would reach far enough into the gardens to find her. However, once found, her work provides a welcome sanctuary. Whether studied in person at Kew, through her biography, or through a study of her paintings, the work of Marianne North is sure to enrich and inspire anyone interested in the natural world.

References


News in Brief

Wood Remnants Silent Auction

Our permanent display Woods of the World continues to impress visitors from far and wide. For those who have seen the beautiful installation and wished you could take a piece home, you will soon have just such an opportunity. We will be holding a silent auction to sell the remnant pieces of 150 of the 178 woods in the collection. The auction will be held at the Church Exhibition Gallery in the Lyman Plant House on Friday February 12, 2010 (snow date February 19, same time, same place). Viewing will begin at 6:00 pm and bidding will start at 7:00 pm, ending at 8:00 pm (sorry, but we can accept only cash or checks).

Sizes of the remnants vary. In general they were either ripped along the length of a board, in the range of 12–24" long by ½–2" wide, or they were end pieces, ranging from 1 to 6" long and 3 to 12" wide. The thickness of the boards ranges from ½ to 2". All pieces are best suited either for small woodworking projects or for a collection. A full list of the species with exact sizes of the pieces for sale will be posted on our website (www.smith.edu/garden) as we get closer to the auction. This is a one-time event, so be sure to put the date on your calendar. Spread the word to your woodworking friends!

Dedication of Bench for Kathy O’Bryan Canaday ’57

October 6, 2009 was a classically lovely New England fall day. At 11:30 am that Tuesday morning, a group assembled at Capen Garden to dedicate a memorial bench for Kathy O’Bryan Canaday ’57 (bench contributors are listed on page 16). It was also Kathy’s birthday. The gatherers included classmates and family, and Madelaine Zadik from the Botanic Garden. Many of us remember how in 2007 Kathy gave our group of Botanic Garden Friends, volunteers, and staff a superb tour around the New York Botanical Garden, where Kathy served as a docent. The ceremony at Capen included remembrances of Kathy, a recitation of lines from the Wordsworth poem that Kathy loved, “When all at once I saw a crowd / A host, of golden daffodils,” a ribbon cutting by the grandchildren, and everyone singing “Happy Birthday.” Ed Canaday subsequently wrote, “My mother was beaming that sunny day and she still is.” Next spring daffodils will bloom around the bench.

Art Contest

For over 100 years the Botanic Garden has been exchanging plant material with other botanical institutions from around the world. In fact, we can trace many prize plants in our collection to this program. Our annual list of available seed (Index Seminum) is sent to over 300 botanical gardens and arboreta. The list is in the form of a booklet that features original artwork on the cover.

In the past we have used a variety of artwork for the cover. This year we ran a contest for students to submit artwork. Since we wanted to feature a plant that grows locally or is in our collection, we provided students with a list of plants to be used as subjects. Thus students could chose from among 50 different plants to portray.

We were very impressed by the submissions and selected two winners, one that we will use in 2010 and one in 2011. For 2010 we will be using an ink drawing of a pitcher plant, Sarracenia purpurea, by Maisie Sibbison-Alves, class of 2009, and in 2011 we will use a graphite pencil drawing of a sassafras flower, Sassafras albidum, by Madelyn Sundberg, class of 2011.
November 4, 2009, marked the 100 year anniversary of composer and pianist Sergei Rachmaninoff’s United States debut performance at Smith College. The College put together a centennial celebration to honor the event. Connections to the Botanic Garden are twofold. The 1909 report of the concert in the Daily Hampshire Gazette (see the reprint at right) just happened to be placed next to a notice of the Chrysanthemum Show at the Botanic Garden. Also, Sophie Satin, Rachmaninoff’s cousin and sister-in-law, came to Smith in 1942 as a research associate with geneticist Albert Blakeslee and also served as associate professor of botany from 1945 to 1955. (Alumnae reminiscences of Satin, Blakeslee, and the Smith College Genetics Experiment Station appeared in the Fall 2003 and Spring 2004 issues of Botanic Garden News, available online at smith.edu/garden).

The Botanic Garden participated in this centennial celebration, hosting a reception after a concert on November 7, 2009, by pianist Vladimir Tropp, Gnessin Russian Academy of Music and Moscow Conservatory, and presenting a small exhibition about Sophie Satin and the Genetics Experiment Station.
Following the renovation and restoration of the Lyman Conservatory complex in 2002, the next step for the Botanic Garden was to turn a critical eye toward the campus arboretum and gardens. Our goal is to bring them to the level of the Conservatory with regard to conservation, planning, maintenance, and image. We obtained a Conservation Assessment Program grant this year from the Institute of Museum and Library Services, which enabled us to carry out an evaluation of our collections, including an examination of the policies and procedures relating to collections care, with a focus on the outdoor collections. We also wanted to determine the steps we might take to ensure the preservation of the remaining features of the Olmsted landscape in accordance with the 1996 Landscape Master Plan. At the same time it is crucial for us to take into account the value of our woody plant collection and to assess whether current practices will preserve our old trees.

The grant paid for two experts to serve as peer reviewers and conduct an assessment of our operations. On July 14 and 15 of this year, landscape architect Thomas J. Elmore, ASLA, with a specialty in historic preservation, and arborist A. William Graham, with experience working at a public arboretum and managing trees in mature landscapes, visited the Botanic Garden. As part of the process, we conducted a self-evaluation in advance of their visit. We compiled a thorough picture of our operations for them to review. During their visit the assessors spent time looking at the campus arboretum collections and meeting with our staff to learn all about the various aspects of the Botanic Garden. They each produced a report that gave an overall evaluation of our collections and operations and then highlighted particular issues they uncovered, each making specific recommendations. The full reports were shared with the College administration.

Both assessors were clearly impressed with our campus landscape and collections and our educational efforts. William Graham observed, “The Botanic Garden of Smith College in Northampton, Massachusetts, is an outstanding resource that is worthy of its international reputation while it serves functions of display, education, research, and conservation.” He also expressed concern that, “The Botanic Garden’s collections, landscapes, and programs be preserved and encouraged as a high College priority.” Thomas Elmore noted that we are a highly regarded historic landscape, but also expressed concern that “large trees on campus are disappearing. … If this trend continues the historic and intimate character of the campus will be completely lost.”

Specific suggestions the assessors made include a review and updating of the 1996 Landscape Master Plan, with particular attention to maintaining the Olmsted vision, especially with all the changes taking place on campus, e.g., the addition of new buildings and the many renovation projects. They also suggested improved coordination and communications with Facility Management and outside contractors working on campus, in order to protect existing trees and planting sites from construction impacts. Another recommendation was to commission a historic landscape study to document the history, changes, and current conditions of the landscape and make recommendations for its preservation, restoration, and/or rehabilitation. Additionally they proposed the development of a conservation plan for the maintenance of our collections and developing criteria for judging the importance of particular trees to the collection and landscape. Specific trees being designated as signature trees, specimen trees, general trees, or cull trees, would allow us to prioritize care and protection based on a set of established guidelines.

While some of the assessors’ suggestions require additional staffing and budget allocations that are just not possible with today’s economy, their reports have provided us with an enlightening outside perspective on the work that we do on a daily basis and gives us a starting point for making improvements.
Botanic Garden News

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