A Season of Change

From the Director, Kim Tripp

The past growing season has been an exciting and challenging one for both plants and people here at the Botanic Garden. It is perhaps best characterized as a season of change. We were elated to have the Smith College Board of Trustees approve the full restoration and development project for Lyman Conservatory, and we reveled in the completion of important landscape projects on campus, but we regretted that Susan McGlew, Curator and Assistant to the Director since 1990, left Smith to join Sinauer Associates, an academic publisher in Sunderland, Massachusetts. In this edition, we are pleased to include a letter from Susan and further discussion of spring 1998 projects.

Farewell and best of luck to Susan McGlew

Susan devoted seven years to the Botanic Garden, and we will miss her many important contributions. She worked to enhance and maintain the plant records database, she was a stalwart foundation for the creation of the Friends organization and outreach education at the Garden, and she was an enthusiastic, tireless teacher-extraordinaire for myriad programs and groups. At a Botanic Garden farewell party for Susan this past spring, we presented her with a flowering plant of *Rhododendron* ‘Great Expectations.’ Of course, we have nothing less than great expectations for Susan’s future success. The Botanic Garden will be hard pressed to replace Susan, but we will be working to fill the position of Assistant Director in the near future.

Lyman Restoration and Development

The Botanic Garden of Smith College consists of a campus-wide arboretum and the Lyman Conservatory. The Plant House is a familiar feature of the Botanic Garden for all who visit and study at Smith College. It is, in fact, the true heart of the Botanic Garden.

Lyman Conservatory is an historic complex of glasshouses designed and built starting in the 1890s by the noted firm of Lord and Burnham. This historic structure houses the nonhardy living plant collections and functions as the core complex of working glasshouses, science laboratories and classrooms, student and faculty teaching and research areas, horticultural work areas, Botanic Garden offices, and public horticultural displays. The Conservatory is a key resource for many academic programs, particularly Biological Sciences and Environmental Science. This historic, heavily used structure has never received a comprehensive restoration in its entire, 100-year plus history. Unique technical expertise is required to assess, prescribe, and manage restoration of such a conservatory. Therefore, the expert firm of Rough Brothers, Inc.: Conservatory Restoration Specialists, was hired to complete a Feasibility and Order of Magnitude Study for Restoration and Development of Lyman Conservatory. In their November 1997 report, Rough Brothers strongly recommended that restoration begin in the near future.

In May 1998, the Smith College Board of Trustees generously approved a comprehensive (Continued on page 2)
From the Director

(Continued from page 1)

restoration and development project for the Conservatory. This ambitious project will provide us with the opportunity to completely refurbish the structural elements, glass envelope, environmental controls, irrigation, and benching systems of the glasshouses. It will also enable us to make modest changes to the entry area that will allow visitor entry and orientation to be streamlined and improved. We will be able to expand the area available for student projects and begin to address storage space shortages. This project will also create a tremendous opportunity to refresh the collections under glass as we restore the priceless glasshouses themselves.

I was encouraged and excited to consider the possibilities ahead of us with the Lyman project while on a recent visit to the Royal Botanic Gardens, Kew. I was there to meet with our students and with host scientists in Kew’s Jodrell Laboratory, who generously and thoroughly train the two Smith summer interns in cutting edge molecular biology techniques for plant conservation research. I wish you could have been there with me to experience the energy and excitement of the students, the world-class caliber of the scientists, and the realization of what an extraordinary opportunity these Smith students have landed. Some years ago, Kew undertook comprehensive restoration of their famous Palm House—the structure after which our own Palm House is modeled on a more modest scale. The revitalization which that project has brought to their glasshouse collections and work is a clear indication of the value of such endeavors for all botanic gardens, and was a marvelous inspiration to forge ahead with restoration of our own Lyman Conservatory.

I would like to extend my personal invitation to all of our friends and colleagues to learn more about becoming involved with this most inspiring and crucial project at the Botanic Garden of Smith College. I would be pleased to talk with you about Lyman Conservatory Restoration and Development at any time. I look forward to seeing you in the garden and at our autumn events.
The Asian Autumn Festival

Rob Nicholson

The Eastern United States and Eastern Asia share many common genera of plants, and the forests of these regions often seem to be mirror images of each other. This has led biologists, biogeographers, and paleobotanists to postulate that these two regions once shared a common flora, and that shift in continental positions led to the evolution of two separate but similar floras. The Five Colleges have long had a connections with Asia. William Clark of UMass (then the Massachusetts Agricultural College) was one of the first Western agricultural experts to visit and teach in Sapporo in the newly accessible Japan in 1877. Exceptionally old trees of Japanese origin dot the UMass campus and the Pioneer Valley, a living legacy of his travels.

Smith botanists continue this Asian collecting tradition, having in this decade done field work in Taiwan, the Phillipines, the People's Republic of China, and South Korea. Hardier material from these collecting trips will join other plants of Asian origin that thrive so well on the Smith campus.

Student Projects

Smith students have been working hard to make significant contributions to many aspects of Botanic Garden-related work and projects. In addition to renovation of the Japanese Garden and Tea Hut, students developed interpretive materials and publications. Jennifer Woo '98 worked as an interdisciplinary Special Studies student. Using her knowledge and ideas in both computer graphics and biology, Jennifer created an engaging color-illustrated guide to the Fern House and fern collections. Ask for a copy on your next visit to the Conservatory. Brita Dempsey '00, Student Intern, developed interpretive signage for the conservatory, rock garden, and herbaceous garden. The signs are designed to provide information for visitors who are not part of a tour, and further enhance the educational aspect of the gardens and conservatory. They cover a wide range of topics from ethnobotany to the functions of xerophytic plants and include diagrams and photographs. The Fern House sign, which has been in place since February, has attracted many positive comments. Be sure to look for these new signs. Mary Hopkins '98 spent the spring semester as a Special Studies student investigating research into nitrogen cycling in orchard and other sylvan environments. This is an important area of work for managed landscapes of all sorts, both ornamental and agricultural, and will be even more critical as we face compounding water management issues in the next few decades. Mary's work was extremely interesting, and she has been accepted at Cornell University to pursue a Masters of Science degree with one of the top scientists in this field.

Lissa Harris '98 joined the staff of the Botanic Garden last fall as a curatorial intern and has brought all the records of new accessions up to date. Filling in on a temporary basis while the garden is without an Assistant Director/Curator, she has updated inventories of various collections and developed computerized maps of the President's gardens. Lissa has discovered, in her year at the Botanic Garden, that curation is a never-ending process, since the living landscape of a garden or arboretum (and even a glasshouse) is always shifting.

Emalu-Hina Dancil '01 of Hawaii was the summer assistant at the Lyman Conservatory. She quickly earned the respect of the staff for her industrious work habits and sunny demeanor. Emalu assisted staff with the production of chrysanthemums for the Fall Mum Show and rapidly learned the intricacies of plant propagation, producing seedlings and rooted cuttings for the Spring Plant Sale.

The Smith College summer internship program at the Royal Botanic Gardens, Kew continues successfully and energetically. This past May, Penelope Stranc '99 and Hannah Thornton '99 traveled to Kew to spend the summer working in conservation genetics research. This program allows the students to learn cutting edge techniques and make real contributions to breaking work in plant conservation genetics under the expert tutelage of Drs. Mark Chase and Michael Fay in the Jodrell Laboratory. We will look forward to their report to the Friends Committee on their individual projects.

This fall, the Botanic Garden is digging around its Asian roots and will feature a number of events that highlight the superb Asian flora and its usage by Asian peoples. We will continue to hold our annual Chrysanthemum Show, featuring mums trained in the Japanese style, but are planning to add a few new twists. The newly refurbished Japanese Garden and Tea House and surrounding garden will be the site of some special events, and our speakers will delve into floral subjects of the Far East. Check the calendar of events on page 15 to make sure you don't miss anything.
If all the campus is a garden, a sanctuary for students, alumnae, and dedicated college staff, then the Conservatory is the centerpiece of this garden. A favorite destination for all who enjoy its world flora display, it was also my daytime home for seven years. As Curator and Assistant to Directors Richard Munson and Kim Tripp, I saw thousands of new plants enter the college collections, computerized recordkeeping and label engraving come into use, and hundreds of students develop a deep affection for plant science. As an alumna, I have always felt the gardens at Smith were mine…not to own, but to enjoy. It was, therefore, with great personal satisfaction that I witnessed the launching of the Friends of the Botanic Garden just prior to the Lyman Conservatory’s centennial year. The Friends organization has broadened the mission of the garden to include a group of fabulous volunteers, including my classmate Constance Parks, who introduce thousands of visitors to the resources of the garden. Grant funding was obtained to bring Madelaine Zadik on board to coach volunteers and oversee group visits. The landscape master planning process was launched during my time at Smith, and student summer internships were established with the Royal Botanic Gardens at Kew. I had the great pleasure of introducing high school girls enrolled in the Summer Science Program to the plant collection for five consecutive summer sessions. Over the past seven years, the garden has become an even busier place—filled with growing plants and growing minds.

In my new endeavors with academic publishing, I will continue to consult with faculty members involved in plant science. Textbooks about plant physiology, plant taxonomy, and plant ecology will be my primary focus during the next few years. Visits to the many wonderful plants and horticulturists on the Smith campus, however, will always hold special meaning for me.

Thank you for all you have done, as friends, to help the garden grow.

All the best,
Susan

Notes from a Former Lyman Conservatory Inhabitant
Susan McGlew

Index Seminum
Maryjane Beach

The 1997–98 Index Seminum (Latin for seed list) of the Botanic Garden of Smith College listed 1,112 different species of seeds available for exchange. During the summer and fall of 1997 these seeds were collected by members of the Botanic Garden staff in the greenhouse, on campus, and in nearby habitats. The staff cleaned the seeds (a laborious process in many cases) and stored them in refrigerators. With the help of the volunteers, who spent one morning stuffing and labeling envelopes, the Botanic Garden seed lists were mailed to over 300 botanic gardens around the world.

In March, requests for seeds started to come pouring in. So far, we have heard from 155 botanic gardens, and still the requests for seeds keep trickling in. There has been great interest, especially among European and Asian botanic gardens, in seeds that have been collected in the wild. Trillium, maple, viburnum, gentian, and jack-in-the-pulpit are among the most popular.

The volunteers have provided much invaluable help in filling seed orders. Joyce Ketcham entered all the addresses into a computer database, which lets us update them more easily and prints them directly onto mailing labels. Anne Keppler came in to the office once a week to prepare seed envelopes for filling. And on Wednesday mornings, a small but dedicated group filled each envelope with seed. This help is very much appreciated and has enabled us to complete filling seed orders well before the deadline of October 1.

Since this is a seed exchange, it should be noted that we have received seed lists from almost every botanic garden that has been sent our Index Seminum. So far this year, we have ordered and received seed from 54 of those gardens. In this way we are able to acquire rare and (in some cases) otherwise unobtainable plant material.
**Volunteer News**

*Madelaine Zadik*

During the 1997–98 academic year, volunteers once again contributed a tremendous amount of energy to the Botanic Garden. We rely heavily on their participation and offer our deepest thanks. The volunteers enable us to accomplish so much, and we are proud to have such a wonderful group associated with the Garden.

Volunteers worked on our Index Seminum, filling over 150 seed orders from other botanic gardens around the world. Don’t even ask how many seeds that might be! If you have come to the Bulb or Chrysanthemum Shows, Illumination Night, or other events, you’ve seen the volunteers serving as hosts and greeting you with smiling faces in the Conservatory. They offer a wealth of knowledge about the Conservatory and we are particularly indebted to the volunteer tour guides for the hours they devote to leading groups through the Conservatory and outdoor gardens. Over 2,400 children and adults received tours from our enthusiastic group this year. The response from teachers and students is always appreciative. Another important project in which we have engaged the volunteers is the counting and surveying of visitors to the Conservatory—no small task (see some of the statistics on page 15).

The plant sale is another event for which we rely on volunteers. The group will be gearing up for the sale coming in May 1999. Much planning and preparation takes place and volunteers will be working closely with Rob Nicholson in getting everything ready. We are also preparing for our annual volunteer training session, which will be held January 20–22, 1999.

If you are interested in joining this active and exciting group, or if you belong to a group that is interested in going on a tour with one of our guides, please call us at 585-7580.

**Education Programs**

*Madelaine Zadik*

The Botanic Garden is now into its third year of funding from the Stanley Smith Horticultural Trust. This third year enables us to refine our very successful education outreach programming while moving into long-range planning.

Our efforts are now focused on the development of an Educational Master Plan, one of three phases of our overall master planning for the Botanic Garden. Through this comprehensive planning process we will clarify our goals and priorities, and explore and evaluate program ideas. We aim to ensure the highest quality programming in support of the Botanic Garden’s mission.

The Botanic Garden is a hub of activity and in order to plan properly we need to better understand the ways the facilities are used by our various constituents. To that end, we are documenting the academic support we provide to the College community as well as the public visitation to the Conservatory. Will you help us in this effort and please fill out and return the enclosed questionnaire? Your input is important to us. Thank you.

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We sincerely appreciate the efforts of the following volunteers this past year:

- Linda Andermann
- Anne Beach
- Hut Beall
- Diane Birkel
- Janet S. Bissell
- Diane Bowman
- Deb Brown
- Eleanor Brown
- Anne Cann
- Robert Carey
- Addison Cate
- Betty Conway
- D. Elizabeth Cunningham
- Jean Duncan
- Lisa Ferree
- Stephen Fleury
- Ellice Gonzalez
- Mina M. Harrison
- Freda Houpt
- Cheryl Jones
- Anne Keppler
- Joyce Ketcham
- Dianne Klenotic
- Joyce Kras
- Carolyn Lawry
- Frances Lewis
- Susette Lyons
- Sigi Marrocco
- Irene Montague
- Louis Musante
- Fran Nichols
- Dee Dee Niswonger
- Connie Parks
- Carol V. Paul
- Virginia Rechtschaffen
- Samantha Rothman
- Loretta Selgelid
- Robin Silva
- Barbara Smith
- Diana Souza
- Ginny Sullivan
- Elizabeth Terp
- Claudia Zimmerman

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Hemlock woolly adelgid and Its Effect on Campus Trees

Bill Belden

Hemlock woolly adelgid, *Adelges tsugae*, has become a problem insect on campus, attacking several species of *Tsuga*, particularly *T. canadensis*. The woolly adelgid, a native of Asia, was introduced in North America in the 1920s. From northern California to southeastern Alaska it seems to be relatively innocuous on western hemlock, *T. heterophylla*, and mountain hemlock, *T. mertensiana*. In contrast, eastern North America has seen significant damage to forests and plantings of eastern hemlock and Carolina hemlock from Virginia (where the pest was first discovered 40 years ago) to New England.

We have undertaken an aggressive approach to maintaining control of this aphidlike insect. Not only can we act as a regional model on how to maintain control of this pest, but we have a particular responsibility because of our proximity to native stands of *T. canadensis*, where there is currently no effective method of control.

The hemlock woolly adelgid is hardly visible to the naked eye, “about the size of a period on this printed page,” according to Dr. Mark S. McClure of the Connecticut Agricultural Experiment Station. One of the signs of infestation is the presence of a dry, white woolly substance, most noticeably in the axils of needles on young twigs. According to McClure, “an egg mass resembles the tip of a cotton swab, although somewhat smaller.” Keep that magnifying lens handy!

Several methods to consider for prevention and/or control of the adelgid include improving tree health, mechanically removing adelgids, planting resistant species, and using pesticides. Watering a hemlock tree in periods of drought; pruning infested, dead, and dying branches; and “intentionally dislodging eggs and crawlers by directing a strong stream of water at infested branches,” according to McClure, may be of some value in helping to preserve a specimen. Generally, however, pesticide use is required, and there are two methods of control: horticultural oils and systemic insecticides. Horticultural oils are sprayed on the plant to suffocate the insect. Systemic insecticides are taken up by the tree and ingested by the adelgid, poisoning the insect but not the tree. In deciding to spray oils, the size and location of the specimen must be considered, as 100% coverage of the foliage and stems is necessary. Whatever the program, treatment must be consistent and continue until the danger has passed.

In the fall of 1997, Kim Tripp and I recorded the condition of all the hemlocks on campus. We looked at the importance of the plant to our collection, if it was infected, if it was of unusual size, and its location. This information helped us decide on a treatment program for each plant. We grouped all plants into eight categories: (1) irreparably infested/remove (including all hemlock hedges), (2) severely infested unimportant specimen/remove, (3) severely infested important specimen/treat systemically, (4) moderately infested unimportant specimen/remove, (5) moderately infested important specimen/treat with horticultural oil, (6) lightly infested important specimen/treat with horticultural oil, (7) lightly infested unimportant specimen/remove, and (8) uninfested/treat with horticultural oil, monitor twice annually and reassess treatment.

Into the first year of this program, we are looking for ways to improve it. Ideally all infested tissue should be burned following removal, but this is rarely possible. As a result, we are investigating alternative methods of dealing with infested chips and brush such as using the Mauget program with the systemic insecticide Imicide (Merit). For those of you unfamiliar with the Mauget technique, think of it as giving medicine to the tree intravenously. This program is environmentally friendly because the tree takes up all the pesticide. A small hole is drilled in the top of the root flare (ideally, holes are drilled every six inches), an injector tube is inserted, and the capsule installed on the tube. Uptake is quick; sometimes the first capsule is emptied by the time you finish installing the last capsule. To date, injected trees show good control of the adelgid and will be monitored very carefully. With luck we will be able to get a year’s control from this one injection.

Some of the trees slated for removal were taken down this past summer. Many people in the industry see the devastation caused by this pest as analogous to that of Dutch elm disease. We will continue to do our part to help preserve the hemlocks at the Botanic Garden so that future generations can enjoy these plants.
Landscape Master Plan Update

Kim Tripp

We continue working to implement projects recommended in the Landscape Master Plan (LMP) as appropriate to the larger campus context of capital projects and immediate needs. This past season we were fortunate to be able to complete several projects of moderate scope that are key to the campus and the Botanic Garden.

Lanning Fountain

For many years, Lanning Fountain was a quiescent feature at the intersection of the College lower quadrangle (Burton lawn) and the Rock Garden, Systematics Garden and Conservatory landscapes. The fountain was in need of repair, and the surrounding landscape had declined. Most of the large trees around the fountain had developed irreparable flaws in their architecture, leaving them vulnerable to serious damage and blowdown in our New England winters and summer storms. The LMP called for renovation of the fountain and sculpture, and renewal of the fountain landscape.

Working with Physical Plant and the Museum of Art, we undertook full repairs of the sculpture, fountain pool, and plumbing. The project included regrading the area to address drainage problems, reorienting and resurfacing walkways to improve pedestrian flow, and constructing the beautiful new plaza designed in the LMP to highlight the fountain and provide a functional and ornamental gathering space around the fountain. We first undertook the painful process of removing the flawed trees and planning for a new planting of shade trees that would allow for visual connections between the Conservatory landscape and the lower quadrangle.

The Museum did a spectacular restoration of the fountain sculpture. Physical Plant did an excellent job of restructuring and refinishing the fountain infrastructure and hardscape as well as building the lovely new plaza. It was a challenge to select trees to create the new glade around the fountain. We needed plants that would grow reasonably rapidly, would provide summer shade, would have attractive bark and architecture, would harmonize with existing plantings, and, most importantly, would thrive in the site (the soils in that area are poorly drained silty clays). We chose to plant European beech trees, *Fagus sylvatica*, around the fountain in keeping with the old established beech at one side of the fountain landscape.

Funding for several of the trees was generously provided by our own graduating class of 1998, by donors who wished to designate memorial trees around the fountain, and by individuals who were enthusiastic about the project. These beeches will provide beautiful shade and, as their trunks develop over the years, will be limbed up to reveal an arc of silvery columns through which the gardens beyond can be glimpsed as one approaches the fountain plaza.

In its short new life, the Lanning Fountain plaza has become a popular destination for students, faculty, staff and visitors to sit and stroll with the delightful sounds of the fountain in the background. We are pleased to announce completion of this latest LMP project.

Japanese Garden

The Japanese Garden and Tea Hut is a relatively new feature in our otherwise century-old botanic garden. The Japanese Garden was designed and built in the mid-1980s as an inspired liberal arts collaboration to provide a place for study and respite in the context of an East Asian cultural landscape. Its serene beauty and secluded location above the pond led to its becoming a much loved and visited area of the Botanic Garden over the years. It had, in fact, become loved to the point of desperation. Severe erosion, deterioration of plantings, and structural damage to fencing and walks combined to indicate a “now or never” need to repair and restore this garden feature. A particular problem was the chronic and totally inappropriate use of the slope in front of the Tea Hut as a “bike and hike” entertainment feature. You can imagine that repeated charging up and down that slope by bikers and hikers led to extreme wear and tear on the plants and ground. After studying the existing use of the site it was clear that only a physical barrier would successfully re-educate visitors and enforce a more appropriate use of the site. As a result, a new fence line was designed using sturdier materials that would withstand longer and heavier use.

Continuing the liberal arts collaborative precedent with which the Japanese Garden was established, the renewal project was initiated as a student Special Studies in Landscape project. Nicole Davignon AC worked in the garden during the fall semester and used the spring semester to develop a refreshed planting and materials plan for the

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Japanese Garden

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garden. Nicole worked with David Slawson (who designed the original
garden), Professor Taitetsu Unno of East Asian Studies, Smith College
Landscape Architect Shavaun Towers ’71, and the Botanic Garden staff.

The refreshed design shows greater sensitivity to the limitations of the
site conditions and to visitor usage issues, while honoring the original
design intent of this lovely garden. The plants selected for the renewed
planting are a thoughtful combination of eastern U.S. and Japanese plants
chosen to reflect the spirit and aesthetic of a Japanese garden in a New
England setting.

Memorial Trees

The Botanic Garden has been the recipient of
many memorial trees and plantings over the
years. We do our best to maintain these trees
and help them flourish so that they will remain
living honorials for family and friends. With
continuous additions of such trees have come
continuous additions of maintenance issues and
concerns for how to carry this responsibility
forward effectively. How can we ensure that
memorial trees will survive and thrive through
LMP implementation and the ongoing daily
challenges of maintaining the collections as part
of a dynamic and growing college campus?
How do we protect our trees from the stresses of
diseases, pests, droughts and storms, and repairs
to campus infrastructure? How can we ensure
that a tree variety with a normal life span of 40
years will live to be 100 years old? In fact, we
cannot ensure any of these things. We can do
our best to select trees and site them where they
will thrive, and where we do not expect
disturbance. We can do our best to inform donors of the issues associated
with using a live organism as a memorial. We can contact donors about
damaged and lost memorial plantings and plans for replacement. We cannot,
however, ensure that a given tree will live in perpetuity.

A college campus is a dynamic landscape with diverse and constantly
changing demands and conditions—as is the New England climate! We were
reminded of this by last year’s storm on April 1, which destroyed or damaged
many memorial trees along with hundreds of other trees in the gardens.
Nature was indiscriminate in her punishment during that storm and it will
take us many years to replace and repair those trees.

In light of these issues, we have instituted a new policy for the
establishment of new memorial plantings on campus. Existing memorial
plantings will continue to be maintained, as always, to the best of our ability.
The new policy calls for a minimum donation that is necessary for us to
ensure long-term maintenance of the planting. It also calls for extensive
consultation with the Botanic Garden Director in coordination with College
Advancement prior to any arrangements for donations or plantings. Please
feel free to contact Kim Tripp directly if you have any questions about
existing or proposed memorial plantings at Smith College.

Wildflower Garden

Parking is an increasingly pressing issue at
Smith. The College is continually growing and
more and more students are bringing cars to
campus, yet the boundaries of campus remain
fixed. The result is fewer available parking
places. The LMP calls for construction of a
parking garage to relieve some of the parking
pressures on campus, and to minimize the area
of campus devoted to parking lots. The Board of
Trustees recently approved construction of a
parking garage adjacent to central campus. The
approved location on West Street is a practical
site that will allow for ready access by the Smith
community, help preclude new traffic flow
problems, have minimum impact on the Botanic
Garden collections, and be consistent with the LMP.

The Botanic Garden continues to be very involved with this project—
particularly as it will have a major impact on the Edith Bramwell Reilly
Hand Wildflower Garden. When it was announced that this area was being
considered as a site for the new parking garage, the Botanic Garden viewed
this as an opportunity to move the Wildflower Garden to a more auspicious
and worthy location and to develop the plans and plantings for the
Wildflower Garden in a new and revitalized incarnation.

We have selected a wonderful new site for the garden. A moist woodland
glen near the pathway that runs between the Pond and the Japanese Garden
and Tea Hut will provide an exceptional habitat, easier access for viewing
and use, and the appropriate naturalistic, reflective environment for the
Wildflower Garden. We are planning on moving plants and stonework from
the existing Wildflower Garden in stages over the next year in coordination
with parking garage work.
It is a cool, sunny afternoon in late May. I am standing in a freshwater marsh in Conway, Massachusetts, about 15 miles north of Northampton, my boots sinking slowly into the murky brown water. As the water level approaches my boot tops, I move a step or two to where the mat of mosses and cattail roots is slightly above water level. Soon I am sinking again.

Such an environment may seem hostile to me or to most living things, but it is home to the tiny, green shoots that are just emerging from the saturated soil around me. They are the first of this season’s northern adder’s-tongue ferns (Ophioglossum pusillum, formerly Ophioglossum vulgatum var. pseudopodum), and this former beaver pond, now a soggy cattail marsh of about 1.5 acres, supports nearly 900 of these unusual plants.

By most measures this population of the northern adder’s-tongue fern is thriving. Nonetheless, it is the largest of only seven populations known in Massachusetts today, reason enough for this species to be included on the state’s official list of threatened species. The apparent decline of the northern adder’s-tongue fern in Massachusetts whetted my curiosity about this odd little plant in 1991 and led me as a Smith graduate student to investigate its reproductive biology and ecology. My work on the northern adder’s-tongue fern is one of a number of studies of native plant populations in situ (that is, in their native habitat) that have been carried out in recent years by Smith faculty, graduate students, and undergraduates using the resources of the Department of Biological Sciences and the Botanic Garden to better understand and promote preservation of New England’s native plants.

Botanists have long collected plants in the field and raised them in greenhouses to understand and better protect native species. But in the latter half of the twentieth century, there has been increasing interest in the study of wild plants in situ. Many wild plants have special requirements of temperature, sunlight, moisture, and nutrients that can never be replicated precisely in the lab. A population of wild orchids, for example, can seldom be isolated from the soil in which it grows due to the intimate relationship between these plants and soil fungi.

Another reason to study plants in the wild is the decline of many of our native plant species. In fact 668 plant species are currently listed as threatened or endangered nationally according to the U.S. Fish and Wildlife Service; the Massachusetts Natural Heritage Program lists 197 threatened or endangered plant species in Massachusetts alone. For these rarest of species, collecting is often prohibited, and research can only be carried out in the field.

The decline of many plant and animal species is often attributed to human activities such as habitat destruction, collecting, or introduction of competing exotic species. One of the factors in the decline of the northern adder’s-tongue fern, for example, is undoubtedly the filling, draining, or altering of freshwater wetlands for development purposes.

Another native species threatened by human activity is the unusual green dragon (Arisaema dracontium), a relative of the more common jack-in-the-pulpit (Arisaema triphyllum). While nine populations of green dragon were once known in Hampshire County, by 1988 only one was still in existence, the others probably destroyed by cultivation of the rich floodplain soils they prefer. Following her senior year at Smith, Laurie L. Sanders ’88 undertook a search for this threatened species in Hampshire County. After carefully observing the conditions around a known population of the green dragon, Sanders set out with topographic maps in hand to find other populations in Hampshire County. She

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Rare Native Plants

located seven populations in Hatfield, Hadley, and Northampton, five of which had not previously been known. During her search, she made an even more surprising discovery, the first known population of hybrids between jack-in-the-pulpit and green dragon. Interspecific hybridization sometimes occurs in new or marginal habitat and eventually may lead to the development of new species.

While human activity is often a factor in the decline or extinction of native plant species, some species appear to be inherently “extinction-prone.” Former Smith biology professor Alan H. Bornbusch and two of his students, Lesley A. Swender ’93 and Deborah L. Hoogerwerf ’93, examined genetic variation in one of Massachusetts’ rarest native plants, the ram’s head lady’s slipper (Cypripedium arietinum), and its more common relative, the pink lady’s slipper (Cypripedium acaule). In populations of both orchid species they found extremely low levels of genetic variation, a condition that often leads to the decline of a species. But while human impacts such as habitat destruction and collecting may have led to fragmentation of populations and loss of genetic variation in the ram’s head lady’s slipper, Bornbusch, Swender, and Hoogerwerf believe that certain aspects of the species’ reproductive biology such as low flowering success and lack of nectar to reward pollinators may also be factors in the decline of this species. Even isolation of populations during long periods of glaciation may have led to the loss of genetic variability in both species long before the arrival of humans in North America.

While field botanists often study rare species in hopes of preserving or restoring declining populations, documenting rare plant populations can have broader implications. Sometimes studying such rare species can aid biologists in identifying unusual habitats and ecosystem types. In 1993 Smith graduate student Sarah Cooper-Ellis MA ’94 examined the bryophyte flora in four tracts of old-growth forest in western Massachusetts. Her study included mosses and liverworts growing on the ground or on rock outcrops, as well as on the bark of old trees. She identified 74 moss and 18 liverwort species in the study plots and produced a list of 24 bryophyte species she determined to be useful indicators of old-growth forest, information that will be useful in further efforts to identify old-growth stands around New England and elsewhere.

Smith College faculty have played central roles in teaching about plant conservation and in directing and conducting research related to the subject. For example, Professor C. John Burk has taught plant ecology, plant systematics, conservation of natural resources, and biogeography at Smith for over 30 years, integrating into his courses research in the Lyman Conservatory and field trips to local natural sites where students learn to identify native plant species and appreciate the variety of native flora. The staff of the Botanic Garden has long been involved in growing, propagating, and distributing plant species that are threatened to varying degrees in their natural habitats, and other members of the Department of Biological Sciences have for many years taught courses that stress the function, structure, ecology, and diversity of plants.

Although I am experiencing a sinking sensation standing here in this Conway marsh, I am nevertheless optimistic about the prospects for the northern adder’s-tongue fern and for many other endangered plant species that grow wild in New England and elsewhere. While they are often tiny and occupy seemingly insignificant niches in the biosphere, they have much to teach us about how natural communities work and how easily they may be disrupted.

Perhaps the single greatest challenge to humankind in the new century will be to slow or reverse the decline of species on Planet Earth that we have witnessed in recent decades. Whether in the laboratory, in the greenhouse, or in the wild, the students, faculty, and staff of the Botanic Garden of Smith College will continue to play a role in that effort.

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The Botanic Garden of Smith College is grateful to our supporters who help make our work possible. We wish to express our sincerest thanks to the following contributors who have given so generously in the last two years, from July 1, 1996 through June 30, 1998.

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- The Botanic Garden News, including a calendar of events, twice a year
- Invitations to plant show preview parties and receptions
- Invitations to members-only hours at plant sales
- Invitations to Botanic Garden symposia
- Invitations to Botanic Garden travel/study programs

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- Botanic Garden T-Shirts - $15
  Gold, Willow Green, Royal, Teal or Natural
  100% Cotton, S, M, L, XL

- Botanic Garden Sweatshirts - $25
  Teal or Natural
  100% Cotton, S, M, L, XL

- Botanic Garden Canvas Tote Bags
  Open Tote - 18"x19"x4½" Natural $10
  Zippered Tote - 22"x15"x5" Teal $15

- Botanic Garden Aprons - $15
  24"x28" with two pockets, Forest Green

- Botanic Print - $25
  Theobroma cacao (chocolate tree)
  from Lyman Plant House, 7" X 10"
  Limited signed edition by Pamela See '73

- Botanic Garden Mugs - $5
  White ceramic with black logo
  NEW

Name: ________________________
Address: _______________________
City/State: ____________________ Zip: ________

T-Shirts

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Tote Bags

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<tr>
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</tbody>
</table>

Aprons

| Aprons            | @$15      | $    |

Botanic Prints

| Botanic Prints    | @$25      | $    |

Mugs

| Mugs              | @$5       | $    |

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You may use the enclosed postage paid envelope to send your membership and gift orders along with your questionnaires. Thank you.
Plant Sale Preview

Rob Nicholson

Iris from Turkey, lilacs from Chosan, and pines from old Yunnan. No, not a couplet from a Cole Porter tune but a few of the botanical delicacies we will be serving at our Spring Plant Sale, coming May 8, 1999.

After begging off for a year, we quickly found out from gardeners in the valley how much they missed the chance to access not only the plants they see abloom in our gardens, but new material never before seen in New England. We will again offer a full slate of interesting hardy plants, both underused natives and plants from other regions. We also will have a few plants for the indoor gardener and some that will make interesting experiments for the more adventurous. Examples of these are a set of perennials that are from the high mountains of Turkey and whose hardiness is untested but worth a try. Three different columbines, an iris, and the rare Dianthus anatolicus are some of these Turkish natives. From South Africa we offer Kniphofia rooperi, a red-hot poker with a globose red and yellow flower cluster that may be hardy in a sheltered spot. Among the woody material, we will offer Acer griseum and Acer mandshuricum (two trifoliate maples that are always favorites), Clematis species from both Korea and China, the fragrant Daphne mezerum, and Ilex opaca, the American holly.

The Botanic Garden staff is still in a propagation frenzy so the sale is just beginning to take shape. But our sale is quickly becoming a must-event for the sophisticated gardener. Even Cole would get a kick out of us.

Answers to Trivia Questions from the back cover

1. First President Laurenus Clark Seelye

2. New York City's Central Park and the Boston Commons were both designed by Frederick Law Olmsted's landscape architecture firm in Brookline, Massachusetts.

3. 1,200

4. Mt. Tom

5. His daughter attended Smith.

6. Edward J. Canning, trained and employed by the Royal Botanic Gardens at Kew, became the head gardener at Smith in 1895. More than a century later, two Smith students pursue advanced research opportunities each year through summer internships at Kew.

7. 1900. Landscape gardening was offered beginning in 1914.

8. The dawn redwood (Metasequoia glyptostroboides) found behind the library. The seeds for this tree were presented to Smith by Harvard's Arnold Arboretum following a gift from Chinese botanists who discovered a grove of the trees in a remote region of China in 1941.

9. More than 60,000 mounted plant specimens housed in metal cases, many dating back to the nineteenth century.

10. The longest-serving head gardener and horticulturist at Smith was William I.P. Campbell. He was working in New York City on the new rooftop gardens of Rockefeller Center at the time of his appointment to Smith in 1937.

## Calendar of Events — Fall 1998

<table>
<thead>
<tr>
<th>Date Range: September 3 – September 17</th>
<th>Event: Distribution of Ivy Plants to Incoming Students</th>
<th>Location: Burton Hall, Room 101</th>
<th>Description: An annual gift from the Friends of the Botanic Garden</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date: Wednesday, September 23</td>
<td>Event: Volunteer Training</td>
<td>Location: Lyman Conservatory</td>
<td>Description: Volunteers lead tours through the greenhouses and gardens, provide hospitality for events and assist with the international seed exchange and plant sale. Call 585-7580.</td>
</tr>
<tr>
<td>Date: Friday, October 9</td>
<td>Event: The Process of Restoring the Lanning Fountain</td>
<td>Location: Seelye 106</td>
<td>Description: A symposium exploring how architecture serves, both culturally and aesthetically, to enhance the lives of individuals and communities. Sponsored by the Smith College Museum of Art. Registration Fee. Call 413-585-2760.</td>
</tr>
<tr>
<td>Date: Saturday, October 17</td>
<td>Event: Speaking of Architecture: A World View</td>
<td>Location: Wright Hall Auditorium</td>
<td>Description: A symposium exploring how architecture serves, both culturally and aesthetically, to enhance the lives of individuals and communities. Sponsored by the Smith College Museum of Art. Registration Fee. Call 413-585-2760.</td>
</tr>
<tr>
<td>Date: Thursday, October 22</td>
<td>Event: Plant Introduction from Eastern Asia: An Abbreviated History</td>
<td>Location: Seelye 106</td>
<td>Description: A slide lecture by Stephen Spongberg, Ph.D., Executive Director, Polly Hill Arboretum. Reception following in Lyman Conservatory.</td>
</tr>
<tr>
<td>Date: Thursday, October 29</td>
<td>Event: History of Landscape Design</td>
<td>Location: Seelye 201</td>
<td>Description: Guest lecture in Horticulture class, by Susan Komroff Cohen ’62, ASLA, RLA, Principal, Susan Cohen Landscape Architecture and Coordinator, Landscape Design Program, New York Botanical Garden.</td>
</tr>
<tr>
<td>Date: Friday, November 6</td>
<td>Event: Fall Chrysanthemum Show Opening Lecture</td>
<td>Location: Seelye 106</td>
<td>Description: Celebrating the American Landscape: Lessons from Japanese Gardens. Claire Sawyers, Director, Scott Arboretum, Swarthmore College.</td>
</tr>
<tr>
<td>Date: Friday, November 6</td>
<td>Event: Fall Chrysanthemum Show Opening Reception</td>
<td>Location: Lyman Conservatory</td>
<td>Description: Illuminated Conservatory and Japanese Tea House. Special evening hours. Refreshments served.</td>
</tr>
<tr>
<td>Date: Tuesday, November 10</td>
<td>Event: DNA and Flowering Plant Classification: Problems and Solutions</td>
<td>Location: McConnell B05</td>
<td>Description: Mark Chase, Ph.D., Head of the Molecular Systematics Section of the Jodrell Laboratory, Royal Botanic Gardens, Kew.</td>
</tr>
<tr>
<td>Date: Saturday, December 12</td>
<td>Event: Workshop: An Introduction to Ikebana, The Art of Japanese Flower Arrangement</td>
<td>Location: Lyman Conservatory Classroom</td>
<td>Description: Alice T. Unno, Certified Master of Ikenobo and Ohara Schools of Ikebana. Learn to view flowers and appreciate nature in a different way. Create your own arrangement and experience the art first hand. The $25 fee includes all materials. Please pre-register.</td>
</tr>
<tr>
<td>Date: Thursday, October 29</td>
<td>Event: Volunteer Training</td>
<td>Location: Seelye 106</td>
<td>Description: Volunteers lead tours through the greenhouses and gardens, provide hospitality for events and assist with the international seed exchange and plant sale. Call 585-7580.</td>
</tr>
<tr>
<td>Date: Saturday, May 8, 1999</td>
<td>Event: Spring Plant Sale</td>
<td>Location: Burton Lawn</td>
<td>Description: Specially propagated plants from the Smith College Botanic Garden (see the article on page 14). Mark this date on your calendars now! Special early 9:00 am opening for members of the Friends of the Botanic Garden.</td>
</tr>
</tbody>
</table>

### 13,250 People Visit the 1998 Bulb Show!

**Madelaine Zadik**

Although we always knew that a lot of people stand in line to see our annual Bulb Show, without accurate data we had no conception of exactly how many people were in those crowds. We were thrilled to discover that the Bulb Show this year captured the attention of 13,250 people anxiously awaiting signs of spring. Volunteers diligently took shifts during the two weeks of the March show and counted the people as they came. We surveyed over 200 of those visitors and about a third of them were first timers. We are continuing the counting process using a sampling technique to ascertain the annual visitation to the Conservatory. We will be counting each visitor at the fall Chrysanthemum Show. We hope we can count you in. 

---

**Nadine Shapiro '00**
Welcome to Fall 1998 from the Friends

Noriko Sato and Rebecca Truelove

We are pleased to share in the excitement of the upcoming restoration of the Lyman Conservatory. The Conservatory is the heart of the Botanic Garden, a resource treasured by all associated with Smith College. Many of us have spent time in the Conservatory during horticulture and botany classes, family weekends, the Bulb and Chrysanthemum Shows, and Alumnae Weekends. Renovations are needed for these traditions to continue.

As we prepare for the renovations, we want to share some well-known facts and some unusual trivia associated with the Botanic Garden and the Conservatory. This will give you some new information about a very special part of the campus and open a window into some of your own memories.

As you read these questions, we hope you will think of sharing your recollections of the Botanic Garden and the Conservatory with us. Please e-mail us at nork129@aol.com or write to us care of the Botanic Garden with anecdotes of your times spent in the Botanic Garden (e.g., vignettes of study sessions, spontaneous photo shoots, marriage proposals). We will share your recollections in the Spring 1999 issue of the newsletter. Thank you.

Trivia Quiz

1. Which Smith President had the foresight to enrich our campus with the creation of the Botanic Garden?
2. Where can one go to visit public spaces designed by the same Landscape Architect who designed the Smith College Campus?
3. How many shrubs and trees were planted on the College grounds as part of the original landscape design?
4. What mountain did Olmsted incorporate into his landscape plan for Smith as a focal point from vantage points along Paradise Pond?
5. Following the sale of the Lyman Conservatory to Smith in 1895, how did the salesman from Lord and Burnham maintain ties to the college?
6. The Lyman Conservatory was built in a style prevalent among mid-nineteenth century English conservatories such as those at the Royal Botanic Gardens, Kew. How long has Smith enjoyed a connection with the Royal Botanic Gardens?
7. When was the first horticulture class offered at Smith?
8. What tree on the Smith campus holds a U.S. record for its size?
9. What is found in the college's herbarium?
10. How are the rooftop gardens at Rockefeller Center connected to Smith? (answers can be found on page 14)