



The Landis Arboretum Newsletter

Lape Road

Esperance, New York

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Vol. 16, No. 4

New Director Joins Landis Arboretum

Patricia Rush, whose background is in fundraising and development, education, higher education and museums, began work as Director of the Landis Arboretum on November 3.

Pat came to Landis from the Doane Stuart School in Albany where she was Director of Development and responsible for fund raising, alumni relations and editing the quarterly school magazine. Prior to her employment at Doane Stuart, Pat served as Director of Development, New York State Museum Institute, Albany where she initiated a successful membership development campaign and set a record for the Institute's Annual Fund. Pat has also served as Director of Corporate and Foundation Relations at Binghamton University, and from 1982 to 1992 she served in a similar position at Union College in Schenectady. In both positions she researched and wrote university-wide grant proposals to foundations and corporations. Before 1982 she taught in high school and college (Elmira College, Cornell University).

Pat earned a B.S. and M.A. at St. Louis University and a Ph.D at Washington University, both in St. Louis, Missouri.

She says, "I am a passionate gardener, both in my own yard in Schenectady, and in the city-wide volunteer program to beautify our neighborhoods with gardens on the islands that run down the middle of our streets.gardens, arboreta and plants are my enduring interest."

We do hope you will drop in to welcome Pat as she becomes familiar with arboretum projects and volunteers.

News from the Garden

The arboretum grounds have received a lot of **care and attention** this year, largely due to **Donna Gueli** who has worked as our part-time, temporary horticulturist since last May. In addition to directing overall clean-up of trails and collections, Donna has been responsible for replacing many plant labels, most of which will be finished by winter. Renovation of the holding bed behind the greenhouse is under way, including addition of the new deer fencing donated by Benner's Gardens.



Currently Donna is developing a maintenance program for the arboretum and writing instructions for the care of various areas. This will enable individuals or groups to "adopt" and become caretakers for specific collections or locations.

Donna is a Plant Science major at SUNY Cobleskill and has completed her course work. Funding for her position here at the arboretum, made possible by a grant from Zoos, Botanical Gardens and Aquariums, a program administered by the NYS Office of Parks, Recreation and Historical Preservation, ends in November. **We thank Donna for her considerable efforts on behalf of the arboretum.** She will be greatly missed.

The arboretum has re-applied for the grant in 1998 to enable us to hire a horticulturist next season.

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The arboretum received a donation from Kaye Abbuhl for the purchase of plants to revitalize the peony collection. The peony bed, located on the hill behind the barn, has been about half filled since Spring of 1996. Many peonies were lost due to flooding and over-saturated soil. Work was done this summer to prepare the beds to prevent the problem, and nineteen new peonies arrived and were planted in mid-October. We are most grateful to Kaye for her contributions.

Two dozen classic daylily varieties chosen to broaden the range of blooming time in the Van Loveland garden were donated by Linda Rosen of the Flower Garden in Carlyle, NY. Among them are 'Stella de'Oro' (everblooming), 'Kindly Light' (spider-type), 'Pardon Me' and 'Bertie Ferris' (both miniatures). Linda also helped to identify unlabeled daylilies in the arboretum collection. We thank Linda for her contributions.

Landis Arboretum was awarded a line item appropriation of \$10,000 in the NYS budget, thanks to the efforts of Senator James Seward and Assemblyman John Faso. The money is designated for the purchase of two new computers, printers, and software to provide membership database services and to support educational programming.

From the Board of Directors - Michael R. Durante, a volunteer with the arboretum's finance committee for the past year, has become a member of the Board of Directors. He is a certified public accountant for Dorfman-Robbie, CPAs, Albany, and is an account executive with Dean Witter Reynolds, Inc. The board has regretfully accepted the resignation of two trustees, Wanda Burch and Dave Vincent, whose personal commitments no longer allow active participation on the arboretum's board.

The arboretum is dependant on its volunteers to preserve the beauty of this Schoharie County gem. Management of our buildings, grounds, and educational programs requires extensive volunteer involvement and support. Arboretum projects require hours and hours of volunteer help. Become involved through committee work or as a board member. We need carpenters, electricians, mechanics, painters, gift shop workers, weeders, pruners, telephone callers. Many, many of you have been generous with your time. Won't others of you share your skills with us?! Give Carolyn Edwards, our volunteer coordinator, a call at the office (875-6935) and discuss your particular interest, expertise and time commitments. We are flexible.

Wish List

An arboretum Wish List can be endless. Machines and equipment wear out. Often they can be fixed - but we need parts, pieces and people! If you have unused or extra items like those that are listed here, give us a call for details. You are right! - it is a long list....

- garden cart
- wheel barrow, 5 cu. ft. or larger
- submersible pump
- battery charger 10 amp
- small air compressor
- 6 ft. or 8 ft. step ladder
- sledge hammer
- axe
- grease gun
- pipe wrenches
- mechanic's tools
- tarp to cover the stack of barn beams
- chains for the arboretum tractor
- ~~blade for the arboretum tractor~~
- assorted nuts and bolts to fix equipment
- a tractor *garden tractor 15-16 horse power*



THE LANDIS ARBORETUM NEWSLETTER

is published quarterly for its members. The arboretum's mission is to provide natural history and horticultural education through its programs and through its plant collection.

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Another Successful Plant Sale

- Carol Wock

The arboretum's third annual Fall Plant Sale, held on September 13 and 14, was well attended. Shoppers and workers enjoyed a week-end of good weather, although to maintain a well-weathered tradition, so to speak, much of the set-up was done.....in the rain.

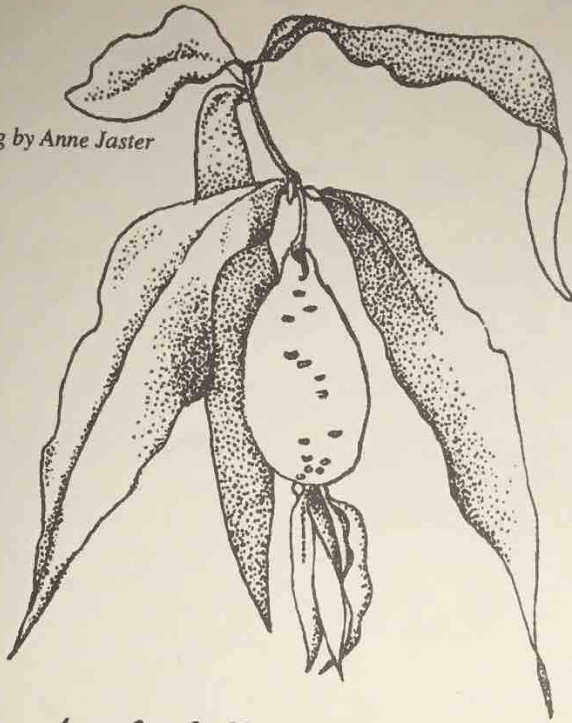
Again, thanks to our many volunteers, the sale ran smoothly. Gross receipts totaled \$8,000; a net profit of \$5,000 was realized. The donation of a large number of plants by members was responsible for the high profit margin. We are grateful to the volunteers who helped with all aspects of the sale, and to all those members who donated plants.

Plant sales have become a major source of income for the arboretum's general operating budget. In 1997, gross income from plant sales was about \$38,000 from which we realized a net of about \$19,000. It's gratifying to make money AND, at the same time, to provide members and the general public with new and interesting plants!

As the size of the sales grow, we become more and more dependant on volunteer help. If you would like to help out with these events, put the dates on your 1998 calendars now. Traditionally, the May sale is the weekend after Mothers Day which in 1998 puts the sale on May 15, 16 and 17. We do have lots of fun at the sales - one of the most enjoyable aspects is meeting members with similar interests. - Carol Wock



Drawing by Anne Jaster



Buckleya distichophylla

- Sapna Ramakrishnan & Gillian Cooper-Driver

In 1995 Sapna Ramakrishnan, a graduate student in biology at Boston University, contacted the Landis Arboretum regarding a rare plant in our collection. During the summer of 1996 she collected data from the arboretum's planting of *Buckleya*, and that information became a part of her Master's thesis. Sapna graciously shares part of her findings with us in this article.

Growing at the Landis Arboretum is an unusual shrub called *Buckleya distichophylla*, commonly known as the Piratebush. The shrub is branched, the bark is gray to green in color with conspicuous breathing pores. The leaves are pale green, simple, opposite and lance-shaped. This plant is rare and endangered and belongs to the Sandalwood Family, the Santalaceae. *Buckleya distichophylla* grows naturally in only one region in the United States, in the Southern Appalachians. Predicted to be in danger of extinction as early as 1933, it has now been listed under category two on the endangered and threatened species list of Virginia. Threats to the species appear to be mainly due to road construction, deer browsing and over-collection by enthusiasts.

Buckleya distichophylla is particularly interesting in that it is a parasitic shrub. Parasitic plants can be holoparasitic, in which they lack the green photosynthetic pigment chlorophyll and obtain all their nutrients from their plant hosts. Common dodder is an example of a holoparasite and it obtains its nutrients from a wide range of host plants. *Buckleya*, on the other hand, is a hemiparasite and has green leaves for photosynthesis, but relies on the host plant roots for water and mineral nutrients. *Buckleya* (and all other hemiparasites) attach to host roots by specialized structures called haustoria which form a bridge between the conducting tissue of the host and the conducting tissue of the parasite.

The shrubs of *Buckleya distichophylla* at the Landis Arboretum are a result of a few seedlings planted in 1952 by Fred Lape. The seeds were sent to Lape by F.M. Crayton of Biltmore, North Caro-

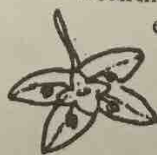
lina. Lape planted these seeds along the path which leads to the quarry, near the present parking area. The area where Lape planted the original seeds is now a growth of mixed vegetation, consisting of conifers - pines, larch and hemlock, and broad leafed trees - oak, hickory and maple, native and exotic shrubs and annual herbs. In 1968 Lape reported to arboriculturists at the Arnold Arboretum of Harvard University that the plants were well established. He sent a large number of seeds and a few seedlings to the Arnold Arboretum but these plants did not survive despite careful monitoring by botanists. So why is *Buckleya distichophylla* growing so successfully at the Landis Arboretum? One of the reasons may be the ideal growing conditions. *Buckleya* prefers to grow on slopes, in the shade and on well drained soils. Such an environment is provided at the Landis Arboretum as seen by the large number of young plants near the slope of the quarry.

I first heard of *Buckleya distichophylla*'s successful establishment at the Landis Arboretum through an article written by Richard A. Howard in 1977 in the journal *Arnoldia*. Having worked with other members of the Santalaceae in India and having an interest in parasitic plants, I at once became fascinated with the idea of finding out more about *Buckleya*. The work described constitutes the major part of my Masters thesis and was carried out between May and November 1996.

The first objective of the study was to locate and map all the *Buckleya distichophylla* plants at the Arboretum and to determine how the species had increased in numbers and spread since Lape planted his seven original seedlings in 1952. *Buckleya distichophylla* now covers an area of 81,754.7 square centimeters at the Landis Arboretum. The seven plants planted by Fred Lape in 1952 have now increased to 55 plants. Many of the older plants are found growing along the path on the side of the open field while the younger plants tend to spread along the slope towards the quarry.

The second objective was to study the host range of *Buckleya distichophylla* by investigating the roots. Traditionally, *Buckleya* has been believed to be parasitic only on hemlock (*Tsuga* sp.) and other conifers. Through tracing the root systems, it was found that *Buckleya* is associated with a number of different hosts, including herbs. The haustorial connections were mainly with young host roots.

We were also interested in understanding the life-history of *Buckleya*. *Buckleya* is dioecious, with distinct male and female flowers on different shrubs. We found 22 male shrubs, 15 female shrubs and 18 immature shrubs that had no flowers. We also determined the ratio of male and female plants, methods of pollination, fruit formation and mode of seed dispersal. The plants flower the last week in May and last until the second week in June. The flowers are pale green, unisexual, small and have no scent. The male flowers opened first (Figure: The male inflorescence has 8-15 flowers per umbel and each flower has four distinct sepals, no petals and four stamens inserted on a disc, surrounded by four small bracts.) and a week after the anthers dehisce (releasing pollen), the female flowers open glistening with nectar (Figure, p. 5: These flowers are solitary, with no petals, four sepals and the carpel consisting of a short style with a four-lobed stigma inserted on a



(Continued on the next page)

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disc surrounded by persistent bracts. The bracts are elongated and are at the summit of the ovary.). Of the 37 plants counted with flowers, a total of 30,435 male inflorescences and 3,101 female flowers were counted (ratio of male: female flowers 9.8 : 1). The female plants produce fewer flowers, devoting more resources and energy to fruit and seed production.

Approximately 75% of the female flowers were pollinated and developed fruits in early July, one month following pollination. The shrubs are most attractive at this stage when the fruits hang down like jade pendants from the branches (See Jaster drawing, p. 4: *The fruit is technically a fleshy drupe, the type of fruit characteristic of a peach or a plum. It is one-seeded with a single embryo and rich endosperm, yellow-green in color, ellipsoidal in shape, two to three cms. long and one to four cms. wide with the bracts persisting to maturity.*). Out of a total of 2,324 fruits counted in 15 plants) 1,465 (63%) remained on the tree until October (three months later). The fruits increase in weight over this time period from an average of 0.2 gms. to 3.4 gms. and change in color from green to a golden brown as they mature.

Last Fall you may have noticed wire meshes on the ground close to the *Buckleya*. These were set up as part of an experiment to determine how the fruits (and hence the seeds) were dispersed. The presence of the wire meshes prevents small mammals from moving the seeds once they have fallen on the ground. These exclusion experiments suggested that the seeds are dispersed by small rodents either for hoarding or for eating the rich nutrient endosperm present in the seeds. Fruits protected by wire meshes were not collected by animals, but all the fruits were missing at the exposed sites or under wire meshes close to rodent burrows.

Although *Buckleya* is able to thrive at the Landis Arboretum, it is still a plant of very limited geographic range and is threatened with extinction. Propagation is the best way to preserve this species. Controlled experiments carried out in growth chambers at Boston University suggest that the best way to germinate *Buckleya* seeds is to remove the fruit coat, the pericarp, provide the seeds

with a cold period in the refrigerator for four to six weeks, germinate initially in vermiculite containing nutrients and a fungicide. Germination under these conditions is about 50% and takes place within a week. Once the seeds have germinated, they should be planted in soil alongside a suitable host.

The authors are deeply indebted to the Landis Arboretum for providing an ideal environment in which to study this hemiparasitic member of the sandalwood family. We are most grateful to Gloria Van Duyn and her staff for their hospitality, generosity and for their cheerful enthusiasm in our project. This is also a small salute to Fred Lape who helped conserve so well a rare and endangered plant in his garden. This is a rare and interesting plant of great value to the Arboretum both because of its scientific interest and also its attractive appearance. - Sapna Ramakrishnan and Gillian Cooper-Driver



Sapna is shown in the foreground.

Barn Restoration Update - Herm Finkbeiner

There have been 97 member contributions made to the barn restoration fund. A total of just over \$34,000 is in hand for construction of the footings and foundation of the barn, the next phase of the work.

To date we have not been successful in getting firm bids from contractors, apparently in large measure due to the amount of work contractors have at this time. If you know a contractor with barn restoration experience that might be interested in the Arboretum barn work, please contact me at the Arboretum 875-6935.

With the initial grant, contributed materials and labor, and member contributions thus far, the fund drive has made good progress. - Herm Finkbeiner

Gift Matching

If the company you work for - or retired from - matches contributions that you make to particular organizations, please remember to notify your company's gift matching center.

One such employer is General Electric. They may be reached by phone at 1-800-462-8244. Have in hand your Social Security number, the date and amount of the gift, and the zip code of the recipient. (Our zip is 12066.)



"Skin" Replacement

Project: A new "skin" (plastic) for the arboretum greenhouse
Date and Time: 9 a.m., September 19 and 20, 1997
Weather: Favorable. Warm, little or no wind
Workers: Florence Grimm, Ron Neadle, Peter Rumora, Sam Yachup

By 10 a.m. the old skin was off the greenhouse and the new had arrived. Measurements were taken and checked, the cut was made. With ladders in place, the skin went up. Lattice strips were pre-drilled, making nailing in place relatively quick. Workers moved slowly across the greenhouse roof, careful always that the ladders were padded to protect the new skin. With abundant teamwork, by 5 p.m. one side had a new skin; the other side was left for the next day. Valleys in the roof were slow and tedious, but it got done.

A special Thank You and SALUTE! to Ron, Peter and Sam for a job well done. - *Florence Grimm, Reporter and Project Photographer*

How Does Our Garden Grow?



New Members - Please note that the names listed here are new members only. **We wish you welcome!** A complete list of members and contributors will be provided once each year. (A list of 1996 members is included in this newsletter.)

Benner's Gardens
 Ruth D. Brickman
 Bush Lumber Company
 Butternut Valley Garden Club
 Betty Carlin
 Dave Burnham's Auto Repair
 Linda Finkle
 Patricia Freund
 Carol Gates
 Lisa Glenn
 Ginger Ireton
 Janet Johnson

Marklyn Lane
 Richard Leighty
 Patrice Macaluso
 Fulton County Master Gardeners
 Linda Oskamp
 David T. Pollock
 Judy Prest
 Peg Robertson
 Elisabeth Rolf
 Mr. & Mrs. Charles C. Rush
 AAUW Varied Interests, Scotia-Glenville,
 Burnt Hills

Vicki Siegel
 Terrence Tessarik
 Mr. & Mrs. John P. Vallely



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small items

HOURS

Saturday 10-4, Sunday 11-4
 through December 14
 Or by appointment.

PROPAGATION, SPECIES STUDIES, AND SEED EXCHANGE PROGRAM

Mail to: The Landis Arboretum, PO Box 186, Lape Road, Esperance, NY 12066

Yes, I would like to participate in the following group(s):

_____ Propagation _____ Seed Exchange
_____ Species Study

The best time for me to attend meetings is:

Weekdays: _____ morning _____ afternoon _____ evening
Weekends: _____ a.m. _____ p.m.

I can't actively take part right now, but I have an idea that may be useful the Horticulture Committee _____

Name _____ Street address _____
Town _____ Zip _____ Phone _____

New! How to Become Gainfully Involved at the Landis Arboretum - Chris Cash

What's new in horticulture at Landis? Plans are underway for the creation of study groups in areas of horticulture that interest Landis Arboretum members. Chris Cash, Chairperson of the trustees' Horticulture Committee, is hoping to revive and start new groups involved with **propagation, species studies, and the International Seed Exchange**. In the next few months these groups will form with a goal of providing members with both the opportunity to learn and to have fun with old and new friends. Where do we start? We need ideas. Where are the ideas?

Propagation - Let's get together a group of people who have an interest in growing plants from seeds, cuttings, grafts, or tissue culture - and do just that. Facilities are available at the arboretum - and possibly at Cobleskill. For the novice, learn various propagation techniques and try them in the greenhouse. For the experienced, try something bold and new. Have regular meetings to discuss subjects of interest to the group. Invite experts and non-experts to discuss subjects of interest to all. Propagate plants for your own personal collections, for the Plant Sale, or as gifts for new members. Do something you haven't done before. Experience the frustrations of what went wrong and the discussion of how to do it better. We propose this group meet monthly and engage in year round activity.

Species Study Groups - Let's get together a group of people who have interests in studying specific plants. Landis Arboretum has many members who are experts in their own right. The idea for this group is to develop discussions around species of plants. Groups could develop, say, around plants found at the arboretum - oaks, or peonies, or rhododendrons, or lilacs, or clematis, or lilies

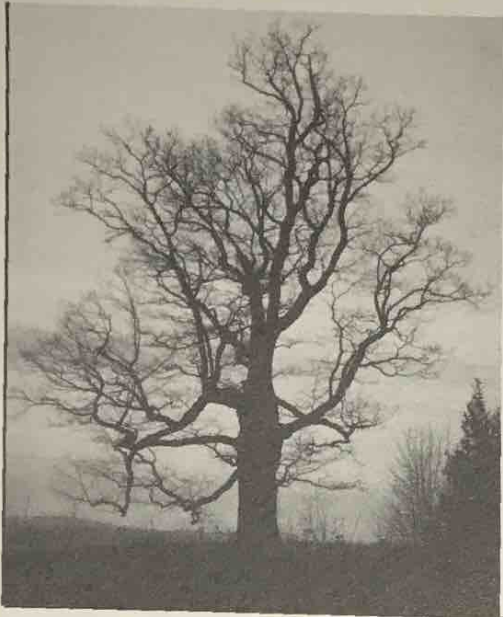
- a host of possibilities. An exchange between novice and expert, with questions answered and new questions evolving would result in shared information, knowledge gained and expanded horticultural horizons. Study groups could expand to educational programming for the general membership and the public. The study group might expand their efforts to developing a particular arboretum collection to its fullest extent and the arboretum could have a world class collection of plants that members themselves have developed and cared for. The rewards would be great.

International Seed Exchange - What is this? For many years the arboretum was part of the International Seed Exchange. Members collected seeds, cleaned, processed and catalogued them, and made them available to other arboretums around the world. The seed exchange was a very popular group project in the past and there is quite a lot of support to reactivate the exchange. So - let's get it going again! The International Seed Exchange is still in existence. Many of the east block countries once part of the Soviet Union are now separate countries and most of their arboretums are still active. Seeds are there for the asking. The proposed propagation group or individual members could take seeds from our own arboretum or from anywhere in the world and grow them.

Do these proposals sound interesting to you? Good. Get involved. Share your ideas. The groups will be started as soon as there is enough member involvement. Fill out the form below and mail it to the arboretum.

Contact Chris Cash at SUNY Cobleskill, Phone 518-234-5246 or e-mail at Cashc@www.cobleskill.edu.

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Orion in the Frosty Sky

I have banked the house and cleaned the flue.
I have brought in the white oak wood.
The days grow short, the nights are cold.
Come sit down by the fire and warm your feet.

Let the wind struggle at the window sills.
These walls have weathered many winds.
Let's listen to a fugue or two of Bach
to drown the storms men brew among themselves.

Man's race is young. Frustration waits
the eager ones who seek perfection soon.
One man can do but what lies at his hands
and never know the last far ripple he may make.

But each one in his own short time
fashions a few things to his own desire,
building a wall of private peace about him,
with room for a few others, here for you.

- Fred Lape
Along the Schoharie