



On The Fringe

Journal of the Native Plant Society of Northeastern Ohio

The Herricks Endow Chair at Kent State University

J. Arthur and Margaret Hatton Herrick created an endowed Chair in Plant Conservation Biology at Kent State University in 2005. With this gift, the Department of Biological Sciences will attract and support a top scientist in the field of plant conservation. It will be the focal point of a plant sciences program.

Through a lifetime of devotion and wise financial planning, the Herricks have established numerous gifts to Kent State University that benefit students in the Department of Biological Sciences. Soon after his retirement from Kent State University in 1974, Dr. Herrick established a Scholarship for Botany Students. In the mid-80's he established the Herrick Herbarium Fund, which supports a part-time collections manager as well as trains students in herbarium management. In 1996 they funded the J. Arthur Herrick Conservatory, Gardens and Arboretum, which provides not only an attractive arboretum setting but also examples of trees and shrubs that are used for advanced botany courses. In 2001 the Herricks made a considerable donation to the building of the annex of Cunningham Hall (the home of the Department of Biological Sciences).

In 2003 the Herricks moved from their house in Kent that Art had built himself to nearby Laurel Lake in Hudson. The proceeds from the sale of their home funded a maintenance facility for the KSU research wetlands, and established the Art and Margaret Herrick Aquatic Ecology Research Facility Student Research Grant.

Art and Margaret are native to Ohio. Margaret was born in Andover and Art in Twinsburg. Margaret was educated at Mount Union College and [Case] Western Reserve University. Art received his education at The Ohio State University. They both joined Kent State University where they were on the faculty. While associated with Kent State, they worked through the Nature Conservancy to preserve several natural areas, including Jennings Woods and Herrick Fen, both in Portage County. These areas are prime localities for biology class field trips.

Numerous awards have been given to Art and Margaret by The Nature Conservancy and other civic groups. For instance, Dr. Herrick was named one of 50 "Heroes," those who made a difference, when The Nature Conservancy celebrated its 50th anniversary.

In 2004 Dr. Carol Cartwright, President of Kent State University, awarded to Art and Margaret Kent State's first Lifetime Philanthropy Award for their years of giving to the Department of Biological Sciences.

---Barbara Andreas

Grant Announcement

The Native Plant Society of Northeastern Ohio hereby announces that it will consider applications and nominations for an Annual Grant to be awarded to a person or persons working in the field of botany or conservation that demonstrates excellence in research, conservation or education, including land trusts, organizations and causes that clearly support the Mission of the Ohio Native Plant Society. The mission includes:

- Conservation of all native plants and natural plant communities through habitat protection and other means
- Public education and appreciation of native plants
- Proper ethics and methods of natural landscaping
- Surveys and research on native plants and publication of the information
- Cooperation with other programs and organizations concerned with the conservation of natural resources.

The amount of the grant will be \$500.00. Deadline for submissions is September 1 and the grant will be awarded at the annual meeting in October.

Applications should include contact information, summary of the project, and how money will be used. Awardee will be asked to give a brief presentation on the project the following year at the Annual Meeting.

Please e-mail your request to bunchberry1@netzero.net or submit 3 copies to: Judy Barnhart, President, Native Plant Society of Northeastern Ohio, 10761 Pekin Road, Newbury, Ohio 44065

Annual Dinner – Friday, October 27. Details later.

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The Journal of the Native Plant Society of Northeastern Ohio is published 4 times a year at Novelty, Ohio. Questions or comments are welcome and may be addressed to Jane McCullam, 9880 Fairmount Road, Newbury, Ohio 44065, 440-338-3253; npsohio@hotmail.com; or to Ann Malmquist, 6 Louise Drive, Chagrin Falls, Ohio 44022; 440-338-6622, inky5@juno.com

Spring Program Schedule

Mar 26, Sun: NATIVE PLANTS OF CENTRAL AND SOUTH AMERICA – 2:00 PM. The West Woods Nature Center, Geauga County. Travel through Belize, Peru and Brazil with NPS Board Member Ami Horowitz as he shares the beautiful native flowers of these countries. Directions: Take St. Rt. 87 east from Rt. 306 approx. 2 miles to the park entrance on south side of the road.

April 29, Sat: BLACK HAND GORGE, Licking County – 11:00 AM. Greg Seymour, Preserve Manager, leads this trip through the narrow sandstone gorge cut by the Licking River. Lush spring flora abounds on the wooded slopes and ravines. Directions: Take St. Rt. 16 east out of Newark 8 miles, head southeast on St. Rt. 146 ¼ mile, then 1½ miles south on county road 273. Call Judy to register: **(H) 440-564-9151 or (W) 440-286-9516.**

May 18, Thu: PRESQUE ISLE, Erie, Pa. – 9:00 AM. Join the Niagara Frontier Botanical Society for a day of botanizing at Presque Isle State Park. Visit the Bicknell geranium site and assist with minimal restoration at the site. Puccoon and wild lupine occur here. Jim Bissell will lead this trip. Space is limited. Call Diane to register: **(H) 216-691-1929 (W) 440-603-7195.**

May 27, Sat: HADLOCK PRESERVE. – 9:00 AM Jim Bissell will lead this combined field trip with Northeast Ohio Naturalists (NEON). Located in Ashtabula County, the Hadlock Preserve is a 53-acre natural area with mature forest on the valley wall and floodplain, a diverse array of spring wildflowers, vernal pools and the endangered grape fern. Space is limited. Call Diane for directions and to register: **(H) 216-691-1929 (W) 440-603-7195.**

June 10, Sat: CHAGRIN RIVER LAND CONSERVANCY PLANT SURVEY – 9:00 AM. Assist the Chagrin River Land Conservancy in a plant survey of the 75-acre West Preserve in Waite Hill at the confluence of the Chagrin River and the East Branch. Call Judy for reservations and directions: **(H) 440-564-9151 or (W) 440-286-9516.**

2006 Membership Renewals

We have been very pleased at the timely and generous renewals from so many of you. Thank you very much for this heartening display of support of the efforts of all of us who have worked to make the Native Plant Society worthwhile. To those of you who do not belong in the aforementioned group, please send us your renewal so that you will not miss the next issue of *On The Fringe*.

Plan Now for the Prairie Weekend: August 5 & 6

On Saturday, Aug. 5, we will visit the Naturally Native Nursery south of Toledo, and in the afternoon Guy Denny will lead a tour of the Oak Openings. On Sunday one of the Toledo Metro Parks naturalists will lead a trip to Kitty Todd and Erie Sand Barrens, a closed scientific preserve. The June issue of *On The Fringe* will have all the details.

The Magnolias of Ohio

Guy Denny

Although we often think of flowering magnolia trees as being characteristic of the deep south, there are eight species of tree-size magnolias native to the United States, half of which occur in Ohio. Ohio's native magnolias include Tulip-tree, Cucumber-tree, Umbrella Magnolia, and Bigleaf Magnolia.

The magnolia family, *Magnoliaceae*, is represented by two genera in North America, *Magnolia* and *Liriodendron*. This family has a very ancient lineage in the broad-leaved group. Fossils of numerous, now extinct magnolia species have been found which date back about 60 million years to the upper Cretaceous Period. Many taxonomists consider the least specialized types of flora structure to be the most primitive. On this basis, the magnolias are considered to be among the world's most primitive flowering trees. They are thought to be the first plants to bear seeds in a protective ovary or fruit.



Tulip-tree

The Tulip-tree (*Liriodendron tulipifera* L.) is the most abundant and widespread magnolia in North America. It is also one of the tallest and most valuable hardwood trees in the eastern United States. Its characteristic straight, limbless trunk reaches a height of about 125 feet, but has been known to grow as tall as 198 feet.

Tulip-tree occurs in a region bounded by southern New England through New York to southern Michigan and then south to west central Louisiana and northern Florida. It also occurs in southern Ontario. It is most abundant and reaches its largest size in the Appalachian Mountains. In Ohio, some of the largest specimens can

be seen at Ohio University's Dysart Woods in Belmont County, about 11 miles southwest of St. Clairsville. The largest tree in this woods is a Tulip-tree with a diameter of 58 inches and a height of more than 130 feet.

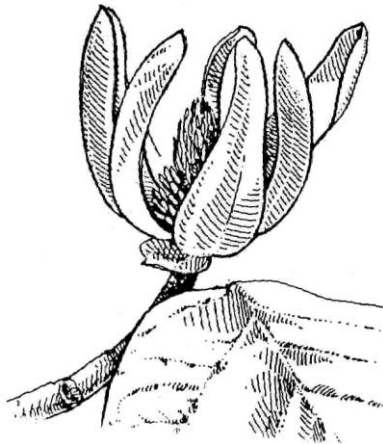
The genus *Liriodendron* comes from the Greek *Lirion*, "lily or tulip" and *dendron*, "Tree". The attractive, but not conspicuous, tulip-like flowers of this tree appear in mid-June after the new leaves unfold from the distinctive duck-billed buds. The specific name *tulipifera* is of Latin origin and refers to the tulip-like blossoms which are about tulip size and bear six greenish-yellow petals, each with a distinctive bright orange patch at its base.

Although the light-colored wood is marketed under the name yellow poplar, tulip-tree is a magnolia, not a poplar.

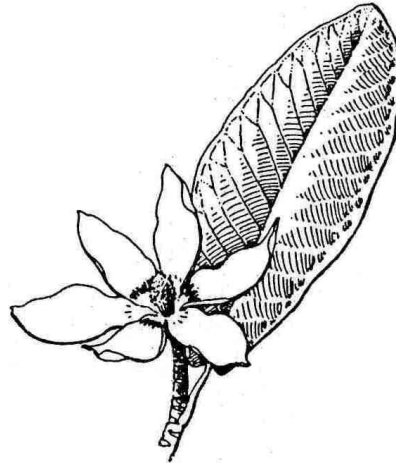
Although the Cucumber-tree (*Magnolia acuminata* L.) is a large tree attaining a height of about 80-90 feet, it is not abundant enough to be commercially important for its lumber. However, it is the most hardy of the magnolia trees in North America. Consequently, its seedlings are used as root stock on which several varieties of ornamental magnolias are grafted.

Cucumber-tree or Cucumber Magnolia is a tree of the Appalachian Mountains and Ozark regions and intervening portions of the Ohio and Mississippi Valley. Like tulip-tree, it also occurs in southern Ontario. Nowhere is it common. Rather, it is usually scattered throughout the forest with other species. In Ohio, Cucumber-tree occurs mostly in the unglaciated portion of our state and more frequently in the northeastern quarter of the state.

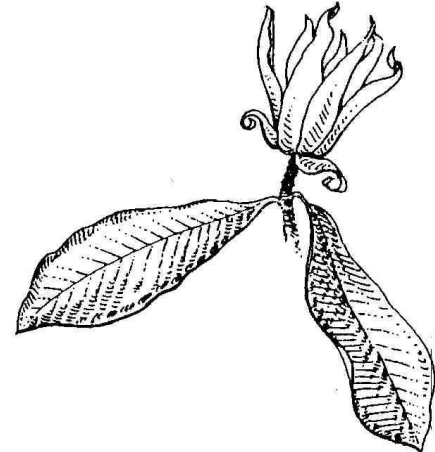
The genus *Magnolia* was named in honor of Pierre Magnal, an early eighteenth century professor of botany from Montpellier, France. The specific name *acuminata*, meaning "pointed", refers to the distinctive, abruptly acuminate or sharp-pointed leaves. The common name Cucumber-tree refers to the fleshy fruit which resembles a 2- to 4-inch-long cucumber. Although green at first, they eventually turn rose-colored when ripe and then release several one-half-inch-long, bright scarlet seeds which hang suspended by slender threads from the fruit for some time before falling to the ground. This mechanism for seed dispersal is also shared with both Umbrella and Bigleaf Magnolia, which have somewhat similar, but more stubby, conelike fruit.



Cucumber-tree



Bigleaf magnolia



Umbrella magnolia

The famous French naturalist and explorer, André Michaux, who botanized this country in the late 1700's, reported that in the Allegheny region, the early settlers collected the cone-like fruits in midsummer, steeped them in whiskey, and took a glass of this bitter liquor once a day to ward off "autumnal fever". It is likely that participants would have indulged in this practice even in the absence of the Cucumber-tree.

The bell-shaped flowers, which precede the small "cucumber" in late May, are only 1½ to 2 inches wide, smaller than those of the other magnolias. These flowers are also inconspicuous, since they are essentially the same greenish-yellow color as the spring foliage.

The Umbrella Magnolia (*Magnolia tripetala* L.) is a small tree which usually doesn't attain a height over 30 feet. This is also a tree of the Appalachian Mountains where it is rare and local from southern Pennsylvania, south to southern Alabama, west to central Kentucky and southwestern Arkansas. It is an endangered species in Ohio, known only from Scioto, Jackson, and, less frequently, Vinton County. There is a 1929 record for its having once occurred in Hocking County.

The specific name *tripetala* means "with three petals", referring to the three petal-like sepals. Actually, there are six or nine creamy-white petals. The not especially fragrant large flowers, which appear in late May, are about 6 to 11 inches in diameter. The large tropical looking leaves, which are 18 to 25 inches long, are often clustered near the ends of the branches in an umbrella-like manner, giving rise to the common name Umbrella Magnolia. Two excellent places to see and photograph this beautiful endangered species are along

the moist stream valleys of Shawnee State Forest in Scioto County and Lake Katharine State Nature Preserve in Jackson County.

The Bigleaf Magnolia (*Magnolia macrophylla* Michx.) is the rarest and most spectacular of all our magnolias. When André Michaux named this species *macrophylla*, meaning large-leaved, he was making a reference to the fact that this species has the largest entire leaves of any tree in North America. Unlike the similar yet somewhat smaller leaves of the Umbrella Magnolia which are tapered at both ends, the leaves of the Bigleaf Magnolia are 20 to 30 inches long and distinctively narrowly cordate at the base.

No less spectacular than the giant leaves are the giant showy flowers of the Bigleaf Magnolia which appears in June after flowering of the Umbrella Magnolia. Each flower is 12 to 18 inches in diameter with six white petals, each of which has a distinctive rose-colored spot at the base.

Unlike the smaller Umbrella Magnolia, Bigleaf Magnolia can grow to a height of nearly 60 feet. It also tends to occupy the higher and drier areas of ravines. It is a relatively rare tree, widely scattered throughout the Piedmont region of North Carolina, south to Florida and west to Kentucky and Louisiana. In Ohio, this state endangered species is known only from the Rock Run area of Jackson County. The bulk of the Ohio population of Bigleaf Magnolia is protected within the boundaries of Lake Katharine State Nature Preserve, along with a large population of Umbrella Magnolias. Both of these species are considered to have reached Ohio millions of years ago by virtue of seeds being carried along the preglacial Teays River system which had its headwaters in the Piedmont region of North

Carolina. Although continental glaciation during the Ice Age subsequently buried the Teays System, gave rise to the present-day Ohio River system, and eliminated most of these Teays-age relicts from Ohio, some, like

the Umbrella and Bigleaf Magnolias, survived and remain today as a part of our diverse natural heritage.

Guy Denny is the Executive Director the Ohio Biological Survey. He is a former Chief of the Ohio Division of Natural Areas and Preserves.

Native Plants: Vital to the Web of Life

By Kathryn Hanratty

What does your yard look like to a bird? An odd question to ponder, but it is also more important than you may first consider. As open space disappears, it becomes increasingly necessary to look at our own landscapes as a refuge for wildlife. The multitude of native organisms, including plants, mammals, birds, insects and more, create an intricate web of life. Spring wild flowers like Skunk Cabbage (*Symplocarpus foetidus*), Wild Ginger (*Asarum canadense*) and Bloodroot (*Sanguinaria canadensis*) are pollinated by and provide nectar to tiny flies. These flies become food for the early spring birds. Before migrating in the fall, some of these birds switch to eating seeds and berries. It is no coincidence that the local endemic plants produce seeds and berries exactly when the birds need them. In addition to providing a form of food that allows the birds to build up a reserve of energy for their migration, the consumption of seeds and berries is also the best way to propagate the plants through bird droppings. This synergy illustrates how native fauna and flora have evolved together and depend upon each other for survival in this and many other ways.

A typical suburban residential lot contains only the same 5 to 10 species of plants, and most of them are usually alien to the site. Most lots are covered by an expanse of lawn which is generally a sterile monoculture that limits the prevalence and diversity of any plants. Popular garden plants that have big flashy flowers usually never produce seed and are therefore not a useful source of food for native animals. Trees from far off lands produce fruit at the wrong time or in a size the local creatures can not use.

Unfortunately, native plants, a vital part of the web are being lost at an alarming rate. Removing a certain endemic plant from the landscape will likely eliminate the insect that feeds on that plant, which in turn may eradicate the bird that feeds on that insect. And this is just a simplified example. The loss of a single species can quickly escalate to affect an entire ecosystem. Overall, the widespread implications of the loss of biodiversity in this complex system are dramatic. In

his book, "*Native Plants, Relationship of Biodiversity to the Function of the Biosphere*" Paul Ehrlich explains that removing indigenous species from an ecosystem is like taking rivets out of an airplane wing. It is impossible to know which one will be the last one that was holding the whole thing together.

What does that bird see in your yard? Protecting and planting native plants will make your yard far more appealing to that bird and a slew of other species. Using your own green space to promote biodiversity of endemic plants can possibly help hold the web together.

So, what is "Native"? The simplest explanation may be, "Plants that lived in this area (that is NE North America) before about 1800." But (as any NPS member can tell you) it gets much more complex. A Red Maple may be native to the entire eastern half of North America but a Red Maple from the south may not do as well in Northeast Ohio as a Red Maple originally from Northeast Ohio. Local ecotypes are native plants that developed in this area and are best suited to deal with the climate and conditions of the area. There is also the issue of botanical purity which was covered at length in the last issue. I think it is sufficient to say that whenever possible a local ecotype native plant should be your first choice.

Keep in mind that the right plant must still be planted in the right place. A local ecotype native that naturally grows in a shady swamp will not do well if planted high and dry in a sunny garden bed. Learn to respect the contours and idiosyncrasies of your space. If you have a low damp spot there are many native plants that will do just fine in those conditions. If you have a hot dry place in your yard, there are native plants that will thrive in that spot.

There is a native plant for any space in your garden. Look at your yard as a bird would see it and visualize a yard that is functional as well as beautiful. Native plants are beautiful and they are vital to the web of life, which ultimately supports us all.

Kathryn Hanratty is a Landscape Architect and a member of the Native Plant Society of Northeastern Ohio.

Manitoulin's Sand Dune Beaches

by Vida Bain

Well-known for its unusual alvar (limestone pavement) geology and accompanying flora, Manitoulin Island on Lake Huron is also notable for its lovely sand dune beaches. The dune beaches, on the south side of the island, comprise three dunes and the two dune slacks or interdunes between them (also known as sloughs or damp hollows).

Manitoulin, the largest freshwater island in the world, slopes gently from north to south. In spring, the melt-water gradually migrates to the southern shore, through creeks and rivulets, and also through underground passages. Snow melt in the immediate area and spring rains join the incoming melt water to create a large runoff on the southern shores, and a high water table in April and May. Until it can drain, much of this water collects in the second dune slack, then slowly drains through the sands, and through "springs" on the shore side of the dune, creating little rivulets. There maybe as much as 30 centimetres (one foot) of water in the interdune for much of the spring. This creates a unique environment for plants that like wet feet in the spring and lots of warm sun.

In early April, the first flower to greet us is the bird's eye primrose (*Primula mistassinica*). This tiny primrose has slightly notched leaves in a small rosette that emerges very early in the spring. A candelabra of five to six flowers rises above the leaves. The flowers that charm us for several weeks are lilac-coloured with a bright yellow centre. They are followed by small but bursting seed capsules. The leaves last through the summer and do not disappear until snow covers the ground.

In May, common arrowgrass (*Triglochin maritima*) rises from the sandy soil. It displays tiny white snowflakes all along the tall stalk. These are followed by hard seed capsules spiraling around the stem. False asphodel (*Tofieldia glutinosa*) offers a sticky head of tiny white globes on a short plant. Not blooming yet, but showing promise, are the common northern blue flag (*Iris versicolor*) and wood lily (*Lilium philadelphicum*).

In early June, the irises and lilies emerge in a beautiful palette of blue and orange, and continue through most of the month and sometimes into July. Indian paintbrush (*Castilleja coccinea*) shows itself along the dryer edges of the interdune, a mist of yellow, orange and red among many varieties of violets (*Viola* spp.). Twinflower's (*Linnaea borealis*) pair of pink bells is enchanting to find in the shady margins of the hollow. The bells seem to dance above

the creeping leaves. Swamp candles (*Lysimachia terrestris*) adds a touch of bright yellow in shadier spots.

From mid-June to mid-July, orchids reign in the drying dune slack. Yellow lady's slipper (*Cypripedium calceolus*) blooms in two varieties: *pubescens* and *parviflorum*. The former is much larger with yellow-green twisted petals. The latter is very small with purple petals. A large stand of showy lady's slipper (*C. reginae*) is outstanding. Several stalks rise at least one metre (three feet) and 20-30 blooms can be seen for up to two weeks unless the deer spot them first. I surround this stand with prickly dead spruce boughs to discourage the deer as much as possible.

Bog candles (*Platanthera dilatata*) flower on long stalks in the shadier parts of the slough, if it can escape the deer, and purple meadowrue (*Thalictrum dasycarpum*) adds a ferny aura to the shade. Kalm's lobelia (*Lobelia kalmii*) is found frequently along with other plants in the dune slack. It is very slender, about 15-20 centimetres (six-eight inches) tall and blooms most of the summer.

Two yellow-flowering shrubs come out in early summer: shrubby cinquefoil (*Potentilla fruticosa*), a low-growing bush with long-blooming potential, and Kalm's St. John's-wort (*Hypericum kalmianum*) with its bright flowers.

Late August brings the fringed gentians (*Gentianopsis virgata*). These four-petaled beauties are mostly biennial, as they seem to change locations regularly. We also see some bottle gentians (*Gentiana andrewsii*) of the deep blue pleated-bud shape. Bumblebees are the only insects strong enough to force their way into the flowers in their search for nectar. As they repeat the exercise with each bottle gentian, the plants are pollinated. A third gentian, the spurred variety (*Halenia deflexa*), prefers the shady parts of the edge of the dune slack.

It is always exciting when the cardinal flowers (*Lobelia cardinalis*) begin to bloom. If the year has been a damp one, one whole end of the interdune is filled with these beauties, most red, with one or two pink here and there for added excitement. They last for about two weeks, enticing us all to bring out our cameras.

By now it is September, and the pitcher plants (*Sarracenia purpurea*) are sending up bloom stalks and making seed pods. The flowers are every bit as odd as the pitcher-shaped leaves at the bottom of the plant. Everywhere in the slough, grass of Parnassus

(*Parnassia glauca*) is blooming. It has pale green thick leaves at the base, and a bright white flower.

Goldenrods (*Solidago* spp.), asters (*Aster* spp.) of different colours add sparkle to the dunes. Just about the last thing we see before leaving for the winter might be a stand of tall blue lettuce (*Lactuca biennis*) whose fuzzy blue blooms flop over on the long stalk.

Fall rains then refill the second interdune. Freezing weather turns its bottom into a long frozen canal. Deer browse the leftover stalks and seeds, and seek shelter

in the cedars at the sides. Lady's slipper stalks collapse and release their seeds into the ground or onto the ice. Chipmunks and squirrels have departed with their collection of fruits and seeds. Winter is here.

Vida Bain is an amateur "flower-stalker" on Manitoulin Island in the summer. The rest of the year she is an archivist with the Puslinch Historical Society.

Reprinted from *The Blazing Star*, newsletter of the North American Native Plant Society, Fall 2005.

Botany 101-21: Common Plant Families in Indiana

Ranunculaceae = Buttercup Family

by Dr. Rebecca Dolan

Worldwide: ca. 50 genera and 1900 species, mostly in the temperate northern hemisphere

Indiana: 17 genera and 45 species

Characteristics

Mostly annual and perennial herbs, usually with rhizomes or tubers

Numerous stamens and carpels, spirally arranged

Leaves mostly alternate, palmately compound or deeply lobed, with sheathing bases

Calyx and corolla often look the same

Petals 5 to many

Fruits variable

Economically important members of the family

Ornamentals include columbine, larkspur and buttercup.

Roots of goldenseal are used as a medicinal.

Black cohosh (*Cimicifuga racemosa*), which grows in Indiana, is a highly studied herbal remedy for menopause symptoms. Some members make poisonous alkaloids, e.g., wolfbane.

Common Indiana plants in the family

Lots of native spring wildflowers, mostly woodland, are in the buttercup family, including:

Actaea pachypoda - White baneberry or Doll's eyes

Anemone canadensis - Canada anemone

Aquilegia canadensis - Columbine

Caltha palustris - Marsh-marigold

Delphinium tricorne - Larkspur

Enemion biternatum - False rue-anemone

Hepatica nobilis - Hepatica or Liver-leaf

Hydrastis canadensis - Goldenseal

Ranunculus abortivus - Kidney-leaved buttercup

Thalictrum dioica - Early meadow-rue

Thalictrum thalictroides - Rue-anemone

There are native species of the vine Clematis.

There are many species of *Ranunculus*, the buttercups.

Some buttercups are introduced, including Lesser celandine (*Ranunculus ficaria*), which is becoming invasive in some places.

Becky Dolan is the Director of Friesner Herbarium at Butler University.

Illustration of buttercup by Jan Glimn Lacy from her book *Botany Illustrated*.



White Baneberry, Doll's eyes
Actaea pachypoda



Buttercup
Ranunculus pensylvanicus

Rain Gardens

What is a Rain Garden?

A rain garden is an attractive landscaped area planted with perennial native plants which don't mind getting "wet feet". They are beautiful and hard working gardens, built in a depression, designed to capture and slow storm-water runoff so that it can be cleansed of pollution and absorbed into the ground as clean groundwater. The benefits of rain gardens are multiple and include the following:

- Help alleviate problems associated with flooding and drainage
- Enhance the beauty of individual yards and communities
- Provide habitat for birds and butterflies
- Recharge the groundwater supply
- Help keep water clean by intercepting stormwater runoff before it enters local waterways

Why do we need rain gardens?

As development increases, the ability of our environment to perform its natural processes decreases. This is because natural landscapes that are able to absorb and filter storm water are increasingly covered by impervious surfaces. Impervious surfaces such as rooftops, driveways, and roads, are surfaces that water is unable to penetrate. Highly compacted soils from development may also act as impervious surfaces.

Impervious surfaces can negatively affect our environment by increasing stormwater runoff. This increases the chance for pollution to enter our waterways through our storm sewer systems, including open ditches. The type of pollution that results from stormwater runoff is called nonpoint source (NPS) pollution. Some of the most common nonpoint source pollutants include fertilizer, pesticides, pet wastes, grass clippings, and yard debris. An easy way to help keep these pollutants out of our local waterways is to install a rain garden!

History of the Rain Garden

Rain gardens were first used in Maryland in the early 1990s to address pollution that was threatening the Chesapeake Bay. The rain garden was developed based on the idea of the bioretention basin. Bioretention basins were initially designed as a Best Management Practice (BMP) to minimize the impacts of development and stormwater runoff. Bioretention basins are depressions which collect and hold stormwater runoff. Slowing the flow of surface runoff allows time for pollution to settle out of the water before it continues its flow to the nearest river or lake. While bioretention basins are primarily used to contain water from a substantial drainage area, rain gardens are designed for use on smaller, residential lots, giving the homeowners the ability to reduce the amount of stormwater runoff that flows from their yards.

Installing Your Own Rain Garden

Installing a rain garden can be a fairly simple process, involving a shovel and a bit of physical energy. The size and style of your garden will depend on a number of factors including the amount of money you want to spend, the size of your yard, and whether or not you are trying to create a formal or informal looking garden. Remember, you can never have a rain garden that is too large or too small! Any size rain garden can contribute to solving local water quality problems!

If you are interested in installing a rain garden on your own property, we have created a Rain Garden Manual for homeowners which provides details on how to properly install a rain garden on your own property. Call the GeaugaSWCD office to reserve your copy today! In addition, at our annual tree seedling sale this year we are offering a rain garden packet of 32 potted plants which features native plants that are well adapted to having "wet feet". For more information and ordering, please call 440-834-1122. Deadline for ordering is March 31, 2006.

Reprinted from *The Geographer*, newsletter of the Geauga Soil and Water Conservation District, Winter 2006.

Environmentally Friendly Lawn and Garden Tour

Do you, or does someone you know, have a rain garden, green roof, or native plant perennial garden? Have you turned your boring turf into a butterfly oasis? Then GeaugaSWCD wants you! We are working on coordinating our 1st annual Gone Green: Environmentally Friendly Lawn and Garden Tour and are looking for homes and businesses to showcase within Geauga County. If you are interested in showing off your hard work and landscaping, please contact us before May 1, 2006!! We are looking for landscaped areas that meet the descriptions below:

Rain Gardens – Attractive landscaped areas usually positioned near a downspout or in a low-lying area of your yard designed to capture stormwater runoff.

Green Roofs – Roof top gardens. Since the hanging gardens of Babylon, humans have been growing plants on roofs. Are you?

Native Plant Gardens – Gardens or "lawns" teeming with native plant species.

If you are interested in participating in the Gone Green: Environmentally Friendly Lawn and Garden Tour, please contact Annie Rzepka, Natural Resources Specialist, 440-834-1122 x2, arzepka@geaugaswcd.com

Kyle Woods State Nature Preserve

Emliss Ricks

Significant Features: Large trees; excellent birding location for songbirds. Beech-Sugar Maple forest.

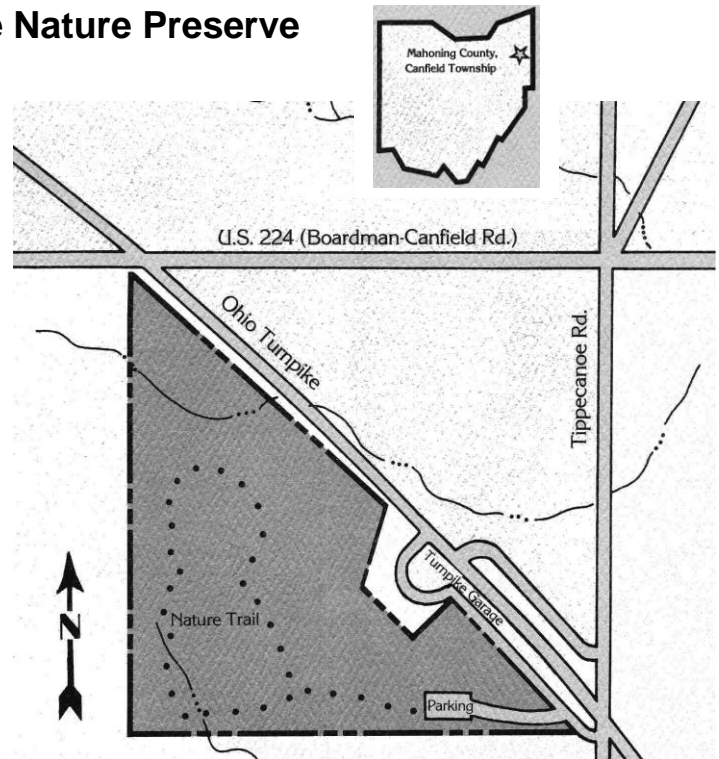
The Preserve

This 82-acre mixed hardwood forest was dedicated in 1977 through the generosity of Josephine Kyle of Canfield, in loving memory of her late father, Arthur Kyle. His stewardship throughout the twentieth century protected this remnant of Ohio's vast original forest. Overlooking the scenic Mill Creek Valley in southwestern Mahoning County, Kyle Woods is an island of natural beauty in an area of intensive suburban development. The preserve stands like a fortress above the surrounding farmland and complexes of new homes and businesses. Here a variety of wildlife finds refuge from the unrelenting encroachment of human activities. Whitetail deer still move freely along the tree lines, and red-tailed hawks and great horned owls nest in the massive trees that make up the core of the preserve. In the wet low areas the tracks of raccoons and opossums can be seen in the fresh mud. The song of the ovenbird bursts from the underbrush and in the distance the cry of a bluejay echoes from the treetops.

Preserve History

Historically, this area was among the earliest parts of Ohio to be settled. Canfield was established just before the turn of the nineteenth century. Some of the massive trees of the preserve witnessed the passing of the first settlers and surveyors to this area. Agriculture was the dominant occupation until late in the 1800's when steel manufacturing found a home in the Mahoning Valley. Industry brought explosive population growth to Youngstown. Today very little remains of the vast forests in Mahoning County, but thanks to one farmer who loved his woods, some of those forest denizens survive to this day.

The "Big Woods" of the Kyle Farm served as a "sugarbush" and was an important aspect of the farming operation. The big sugar maple trees provided a wonderful family enterprise. Each late winter season until the 1950's the woods became the scene of human activity as the horse-drawn sled made its way from tree to tree and buckets of maple sap were poured into a tank. The tank was then emptied into the evaporator in the sugarhouse amid the steam and wood smoke that accompanied the process. Some years upwards of a hundred gallons of syrup were produced from the



grove of maple trees, or sugarbush. Today, the careful visitor can still see the remains of this bygone era; a brick or two here, some iron stove grating, part of the old tank, and several rusted buckets lying about the forest floor. The old sugar road crisscrossed the trail several times. With these exceptions, the woods retains much of its original character.

Plants of the Preserve

Deep and dark during the summer months, Kyle Woods boasts of an extraordinary diversity of hardwood species. Several types of maples, oaks, and hickories, as well as American beech, tuliptree, sourgum, and cucumber magnolia make up just a part of this woodland. Several white oaks are more than 300 years old. Over twenty-five species of broadleaf trees are found here at the preserve.

In the field area between the woods and the parking lot a new, younger forest is readily emerging from what were recently old farm fields. Tuliptree, white ash, sugar maple and wild black cherry trees are growing quickly among the goldenrods, asters, and milkweeds as plant succession proceeds. In just a few years the transition from field to forest will be complete.

Seasonal Changes

Each season has its special appeal to visitors at the preserve. Spring wildflowers form a colorful carpet

under the awakening forest. Trillium, spring beauties, Solomon's seal and trout lilies adorn the trails during late April and early May. Songs of courting birds echo through the trees. Summer closes the magnificent canopy over the forest floor, diminishing the sunlight. Autumn paints a madcap landscape, splashing blazing washes of red, orange and yellow from azure sky above to leaf-strewn forest trails below. Winter is blue, white, and gray, and silent save for the wind and the persistent tapping of a downy woodpecker in the tree branches. Fresh tracks in the snow bear silent witness to the passing of woodland creatures large and small.

Located in Mahoning County 1 1/2 miles east on U.S. Route 224 from Canfield; proceed 1/2 mile south on Tippecanoe Road, west on the Turnpike access road (just south of overpass on Tippecanoe Road). Parking and trail system available. Parking lot closed to vehicles during winter months.

Reprinted from an information sheet from the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, March 1989, and internet: http://www.ohiodnr.com/dnap/location/kyle_woods.html, February 2006.

Mayapple: An American Mandrake

Gordon Mitchell

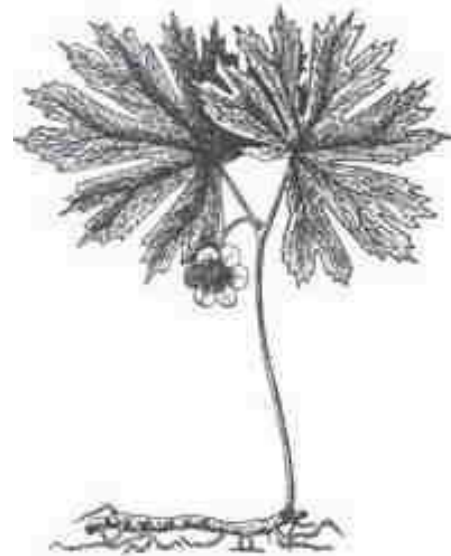
The early spring finds the woodlands filled with emerging wildflowers. One spring wildflower begins with its leaves erupting through the forest floor. Those erupting leaves of that wildflower species resemble a closed umbrella that is about ready to open. That wildflower species is the Mayapple (*Podophyllum peltatum* L.).

The Mayapple is a member of the Barberry Family (*Berberidaceae*). The generic name, *Podophyllum*, is Greek for "foot leaf." (*Podos* is "foot" and *phyllon* is "leaf.") The specific epithet, *peltatum*, is Greek for "shield-like".

At different times and places, other common names for this plant have been American Mandrake, Baher, Citron, *Citron sauvage*, Common Mayapple, Devil's Apple, Duck's Foot, Ground Lemon, Hog Apple, Indian Apple, Ipecacuana, Lang-tu, Mandagora, Mandrake, Mandrake Pear, Mayapple Rhizome, Mayapple Root, Maypop, Mug Apple, Parasols, Podoph, Podophyllum, *Pomme de mai*, Puck's, Foot, Raccoon Berry, Umbrella Leaf Mandrake, Umbrella Plant, Umbrella Root, Vegetable Calomel, Vegetable Mercury, Wild Duckfoot, Wild Jalap, Wild Lemon, Wild Mandrake, and Witches' Umbrella.

History

The Mayapple has played an important part in American history. The first European to record this plant was the English Captain John Smith, the leader of the Jamestown Colony in Virginia. In 1612, Captain Smith wrote, "A fruit that the Inhabitants call *Maracock's fruit much like a lemond*". In 1708, Dr. Michel Sarrazin, a French Canadian botanist and physician living in Quebec, observed Native Americans using the plant's poison to commit suicide and wrote, "*The root is a very effective poison which*



the Savages use when they cannot bear their troubles". In 1890, Hoosier poet James Whitcomb Riley wrote his poem, *Rhymes of Childhood*. In his poem he wrote:

*And will any poet sing
Of a lusher, richer thing
Than a ripe May-apple, rolled
Like a pulpy lump of gold
Under thumb and finger tips
And poured molten through the lips.*

Folklore

The Mayapple has played a part in American folklore as well. One mountain legend says that if a woman digs up this wild plant from its natural environment, she will soon become pregnant. Another legend says that witches used the plant as a source of poison. In the Cherokee Tribe, it is said that if someone consumes one of these plants, that person should not come near

the vines of any melons or squashes because that would cause the fruit to wither and die.

Edible

Only the ripe fruit is edible. Some people like it and some people don't. The fruit can be eaten raw or cooked. It can be made into jams, jellies, marmalades, pie fillings, or preserves. The fruit can be made into a drink but many prefer that it be added to other drinks for flavoring. Many species of animals also like this fruit. The seeds are toxic and should never be eaten. However, excessive consumption of this fruit may have a laxative effect upon some persons.

Toxicity

The unripe fruit is not edible. Small amounts of unripe fruit may cause stomach and intestinal troubles. Larger amount may cause dizziness, fevers, headaches, labored breathing, rapid pulse, hypotension, coma, and even death.

The leaves, roots, and seeds are also toxic. Most of the plant, especially the rootstocks, contain up to 15 biologically active chemicals. The most prevalent chemical is a pale yellow-brown resinoid, podophyllin. Podophyllin is bitter and can be a very strong cathartic (laxative). The rootstock's powder is hyper-allergenic and can cause eye irritations, such as conjunctivitis and keratitis, and skin irritations, such as dermatitis and ulcerative skin lesions.

Medicinal And Other Uses

Podophyllin contains lignans and other chemicals, such as podophyllotoxin and lesser chemicals, such as berberine, quercetin, kaempferol, isorhamnetin, peltatine, gallic acid, alpha-peltatin, and beta-peltatin. Podophyllotoxin has anti-malarial and anti-cancer properties. Two semi-synthetic derivatives of podophyllotoxin, etoposide and teniposide, have been used in chemotherapy. Podophyllotoxin is also a teratogen. A teratogen has anti-mitosis properties, which can cause genetic defects in unborn children.

Because of podophyllotoxin's effectiveness in treating cancer, pharmaceutical companies are actively seeking more of this chemical. Botanists, who have discovered some populations of Mayapple having more podophyllotoxin than others, are trying to cultivate more of those high-podophyllotoxin populations.

Despite the plant's toxicity, the Native Americans and early European settlers had some other medicinal uses for this plant. In a powdered form, podophyllin was used as a poultice for treating both tumors and warts. The roots were used as an antibilious, cathartic, a

cytostatic, a diuretic, an emetic, a febrifuge, a hydrogogue, a narcotic, a purgative, a liver cleanser, and as an antihelminthic (worm expellant). It was used for treating arthritis, biliousness, constipation, dropsy, dyspepsia, fevers, hepatitis, jaundice, kidney stones, and rheumatism. An extract from this plant was used for treating influenza and vaccinia (cowpox).

Mayapple was listed in the U.S. Pharmacopea (1820-1942, 1955-present).

Mayapple had other uses, too. It may also have been used as a yellow dye. The plant contains flavonols, toxic substances that are also yellow pigments. Native Americans sometimes boiled the entire plant and used it as an insecticide on their crops.

Mayapple Rust

Sometimes, the Mayapple may fall victim to the Mayapple Rust (*Puccinia podophylli* Schwein). This fungal disease is a foliar pathogen that is autoecious (lives its entire life cycles upon only one host).

The Mayapple Rust produces two generations of spores per year. The first generation, which is the more serious one, begins when the leaves erupt through the ground and picks up teliospores that have over-wintered upon the ground from the previous year. These teliospores form orange lesions (aecia) upon the undersides of the leaves within about two weeks. These orange lesions produce aeciospores that re-infect the leaves. The second generation, which is the less serious one, begins when black lesions (telia) appear on the older leaves. The black lesions produce the teliospores that over-winter in the ground until next year.

Description

Perennial

Height: 6-24 inches.

Stem: Simple. Smooth. Single. Short.

Leaves: Solitary or paired (rarely in three's). The second leaf usually arrives during the plant's second year. Smooth. Each leaf is about 4-15 inches wide, nearly circular, umbrella-like, and is deeply divided into about 5-9 lobes. Each of these individual lobes may be coarsely toothed. The leafstalk is usually attached to the center of the leaf blade. The high density of these leaves may shade out the ground and prevent the growth of other plant species. The leaves usually die by mid-summer.

Flowers: White (rarely pink). Solitary. Nodding. The flowers are usually present when there are two leaves and are usually located in the fork between the stalks of the two flowers. Each flower is radially

symmetrical, is about 1 to 2½ inches wide and has about 6-9 waxy petals. The flower also has about 6 shiny green sepals, about 12-18 bright yellow stamens that are arranged in 2 separate circles, and a sessile ruffled stigma. These flowers may be fragrant but have an unpleasant fragrance. Flowering season is usually March to June.

The flower may be autogamous (self-pollinating) or may be pollinated by insects. Because these flowers have no nectar, they must rely upon their bright colors to attract the insects.

Fruit: Berry. Yellow-green (sometimes red). Globular or ovate. It is about 1-2 inches wide. Soft. Fleshy. Many seeded. Only the ripe fruit is edible to both humans and animals. Fruiting season is usually July to September.

Seeds: Toxic.

Rootstock: Rhizomes are dark brown, thick, stout, fleshy, jointed, and horizontally spreading. These rhizomes may extend up to 6 feet or more. Roots are fibrous and are spaced every few inches along the

rhizome. These rhizomes may be harvested in the spring or in the fall.

These rhizomes will sprout several plants, which may form dense colonies of Mayapples in the woods. Some of these colonies are large and may exceed an area of ½ acre. All of the Mayapples in single colony may originate from only one single genetically homogenous plant. These cloned plants may live up to 45 years.

Habitat: Woodlands, pastures, open fields, and roadsides.

Range: Eastern United States and Japan. It is believed that the Mayapple migrated to North America from Asia during the Ice Ages, via the Bering Land Bridge (Beringia).

Gordon Mitchell is the Editor of *The Catchfly*, the newsletter of the Central Ohio Chapter of the Ohio Native Plant Society. He works for the Columbus Metroparks. He is a member of the NPSNEO. Reprinted from *The Catchfly*, Vol. 19, No. 3.

The First 250 Years of Natural History in North America Part 1 of 2

George Beatty

In order to divide the chronology of early natural history in North America into periods, primitive and advanced, for instance, it is necessary to choose a significant event to mark a time when a whole array of new attitudes and values were emerging and coming into focus. I have chosen 1824, the publication date of the first volume of Thomas Say's *American Entomology*.

Thomas Say was born in Philadelphia in 1787, and died at New Harmony, Indiana, in 1834 – only 47 years old. According to his biographers, Harry B. Weiss and Grace M. Ziegler, he was reputed to have been the "father of American conchology," the "father of American entomology," the "father of American zoology," and the "father of American descriptive entomology" — the last with a nod to Frederick Melsheimer, who did not describe. Biologically, Say had no children, but he did publish original descriptions of 1,575 new species of insects, as well as mollusks, mammals, birds, reptiles, amphibians and crustaceans, and he was also a pioneer paleontologist. Most of his species-names are still valid. He was a founder of one of America's oldest, and leading, natural history museums, and he figured prominently in several exploration expeditions to the South and far West. His rather short life contained enough

experience for several careers. Say's work marks both the end of natural history pioneering and the beginning of what can be called enlightened natural science in America.

Over the roughly 250 years preceding 1824, only about 400 separate publications appeared dealing with the natural history of North America – on botany, zoology, geology, paleontology and so forth. In the early nineteenth century some comparatively advanced work was already being done by the likes of Thomas Nuttall, Andre Michaux, Constantine Rafinesque, Jacob Bigelow and T. W. Harris, so the 400 comprises works with a tremendous range of background, thoroughness and competence. The bibliographer Max Meisel has listed almost all of these, so it is really not terribly difficult to become broadly acquainted with them.

Few of the early naturalists were as wise and learned as Thomas Jefferson, whose *Notes on the State of Virginia* was privately printed around 1780, and published some time later. It is an excellent compilation of accurate information about Virginia, including soil, climate, animals, geology, agriculture and so forth. Far from being a sedate indoor statesman and scholar, meditating in his library at Monticello, Jefferson was really an astute, accurate observer of

natural history facts, and his book on Virginia contains innumerable first-hand observations and careful comparisons between his experiences and the work of others.

Jefferson refers repeatedly to a famous book published 40 years earlier, Mark Catesby's *Natural History of Carolina*, which may have been the most influential work on American natural history of the eighteenth century.

Mark Catesby, born in England in 1682, spent 10 years in Virginia and the Carolinas collecting flora and fauna and drawing and painting pictures of plants and animals. He went back to England and produced his book almost single-handed — he was his own engraver and colorist. Catesby's influence touched nearly every eighteenth century naturalist. Peter Kalm visited him before coming to America in 1747, and was much impressed. Catesby's book was relied upon by Kalm, Johann David Schoepf, John Bartram, William Bartram, Jefferson, Alexander Wilson and many other prominent naturalists of the time. They did not consider Catesby's work inadequate even though scale was not of overriding importance to Catesby. Scientific standards of accuracy had not yet been formulated. The study of nature was not sponsored by government agencies, museums and universities as it is now. Nature study was often more literary and artistic than scientific, though some pioneer workers, among them Catesby and John Abbot and James Edward Smith, stand out for their objectivity and greater accuracy and integrity. As accurate biological illustrations Catesby's far exceed those of his predecessors and contemporaries, and the work done by Abbot in Georgia sixty years later, and published in the exquisite book by Abbot and Smith, is so fine that every plant and insect can be identified just as readily as if actual specimens were before the viewer.

One of the tremendous events in history, comparable in its influence to the onset of Christianity or the introduction of printing, was the 1492 discovery of the New World. We may think of communication as primitive in sixteenth century Europe, but printing was already flourishing and the news traveled like wildfire. Among the earliest adventurers to make that terrifying voyage in the sixteenth century were quite a few with some interest in natural history, and later they returned to Europe with fantastic accounts and pictures of flora and fauna that they saw, or thought they saw, or were told about — all these mixed together indiscriminately. The combining of a map with illustrations of flora and fauna — deer, grapes, etc. — was not an uncommon

practice at that time. Much of this material was soon published, especially to promote investment and colonization, and more was buried in archives that have only recently been tapped.

One of the first books on New World plants, by Nicholas Monardes, of Seville, physician and botanist, was published in Spanish in 1574 and in English in 1577. Monardes' picture of tobacco was one of the first ever printed, and not outrageously inaccurate. In the text under the picture, though, Monardes says that the tobacco plant grows "taller than a lemon tree." I've seen twenty-foot lemon trees, so that's some tobacco. He goes on for 24 pages about tobacco, showing how great was the interest of Europeans in that newly discovered plant. All this was before Sir Walter Raleigh made tobacco well known in England.

Another influential sixteenth century book by Thomas Harlot was designed to promote colonization of Virginia. It is directed to "the adventurers, favorers and well-wishers of the action, for the inhabiting and planting there." A chief purpose of these books was to raise funds for outfitting ships and equipping colonists to go to Virginia or Carolina. And when they talked about planting they didn't mean planting crops — they meant people. Even less than 100 years ago, on the Labrador Coast where there never was any agriculture, promoters who dropped fishermen off to fish along the coast, and picked them up later with their catch, were called planters for the same reason.

Unprinted documents that have only recently come to light refer to John White, leader of the ill-fated Roanoke Colony in Virginia. This colony was planted in 1587 and White went back with ships to England for more supplies. When he returned to the colony everyone and everything had vanished without a trace, except for a cryptic sign on a tree. White was a pretty good water-colorist and painted pictures of the flora and fauna he observed. They are usually identifiable to species but have none of the polish of the pictures by Catesby and Abbot that came much later. White's water-colors were the basis of engravings in the *Grandes Voyages* of Johann Theodore De Bry, and woodcuts in the first book on insects in English, by Thomas Moffett, published in 1634.

The zeitgeist of the eighteenth century was "the Enlightenment," a powerful movement of great intellectual activity in the cause of general education and culture, that began in Germany and flourished in France under the leadership of Voltaire and Diderot, and in England under Locke and Newton. The Enlightenment led to many things, including the

American Revolution, the Industrial Revolution, and the Darwinian Revolution.

Charles Darwin's grandfather, Erasmus Darwin, whose influence on Charles Darwin's famous work was considerable, was a true child of the Enlightenment. He was an ardent follower of the immortal Linnaeus (Carl Von Linne), the archetypal classifier and virtual inventor of organized natural history, who was the prime exponent of the Enlightenment in Scandinavia. Erasmus Darwin's book, *The Botanic Garden*, one of the most remarkable English books of its time, included an attempt to turn Linnaeus' *Philosophia Botanica* into poetry. The structural diagrams follow Linnaeus birthworts, of the plant family to which our wild ginger belongs, and reputed to have great value in alleviating difficulties of childbirth. The woodcut in John Gerarde's discourse on tobacco resembles that of Monardes, but Gerarde doesn't claim that tobacco grows taller than a lemon tree. Here are potatoes, introduced into Europe about the same time as tobacco, and strawberries, of which there were both European and American species, now spontaneously hybridized in America and joyfully greeted by eighteenth century colonists and pioneers. Then, as now, a favorite fruit.

A new book, published in the 1740's, was De Reaumur's on insects, promptly added to Logan's wonderful library and studied by John Bartram. Reaumur was a versatile genius who developed steel-making, a new thermometer, and was an indefatigable investigator of insect biology, and a prominent member of the French Academy of Sciences for 50 years. Reaumur's work on insects was well known to Mark Catesby, who reviewed it for the Royal Society.

When young Ben Franklin, born in 1706 and therefore 7 years younger than Bartram, returned from London to take up printing in Philadelphia at the age of 20, he and Bartram became close friends, founded the American Philosophical Society together, and constantly exchanged ideas. Theirs was a lifelong friendship, on which Bartram fitted the cap-stone when he named the Franklin Tree (*Franklinia ultimaha*) for his illustrious colleague. Perhaps North America's rarest tree even when first discovered in 1770 by Bartram in Georgia, the Franklin Tree apparently became extinct in its natural habitat soon after, but not before cuttings had been brought back to Bartram's Garden where they were propagated to become the ancestors of thousands of Franklin Trees now growing all over the world. Many nurseries have *Franklinia* for sale at reasonable prices.

Another friend put Bartram in touch with Peter Collinson, an Englishman and Quaker like Bartram, who knew everyone worth knowing in the world of the botany boom and the gardening craze, from Governor Cadwallader Golden of New York and Mark Catesby, whose work he subsidized, to the great Linnaeus himself. Collinson sent Bartram many books, including some by Linnaeus, which gave him difficulty because they were in Latin.

We know a great deal about the plants sent to Collinson by Bartram and others because Collinson's garden was catalogued, though this book was a privately issued printing, not a publication, and very seldom seen.

Peter Collinson sent John Bartram many useful books in exchange for plants and other specimens, and Bartram duly recorded this when he wrote his name in his books. An old newspaper article was found listing some of the books of John and William Bartram that were sold after the latter's death. Accounts like these make it possible to reconstruct the contents of John Bartram's library and to determine what literature resources served as background for his original work, enabling us to interpret his nomenclature and correlate his names of plants and animals with those in use today.

This article was adapted from a slide program narrative. Reprinted from *Notes of the Pennsylvania Native Plant Society*, Jan-Mar, 2006

Garlic Mustard

by Donald Musselman

All winter long you've seen them there
Thru ice and snow, their green leaves stare
Tempting you to pull too early
For if you try in February,
You'll get half a root and leaves so curly

For frozen ground will not let go
The lower half from which will grow
A purple-stemmed rosette which then
Will next year be a plant again

So wait till March—Spring's invitation
To start out with determination
And when the ground's as soft as custard
THEN you pull the Garlic Mustard.

Reprinted from the *Indiana Native Plant and Wildflower Society News*, Winter 2004

Butternut *Juglans cinerea*

by Keri Pidgen

The butternut tree or white walnut (*Juglans cinerea*) was listed as endangered in Canada in 2003 by COSEWIC (Committee on the Status of Endangered Wildlife in Canada). This means that the extinction or extirpation (extinction in a given geographic area) of this species is considered imminent.

Butternut is a mid-sized tree, rarely exceeding heights of 30 metres (100 feet), with a relatively short lifespan of up to 75 years. This eastern tree species grows rapidly in its preferred habitats: well-drained slopes and riparian areas. Butternut can also be found as a component of hardwood forests, fencerows and in rocky areas (particularly of limestone origin).

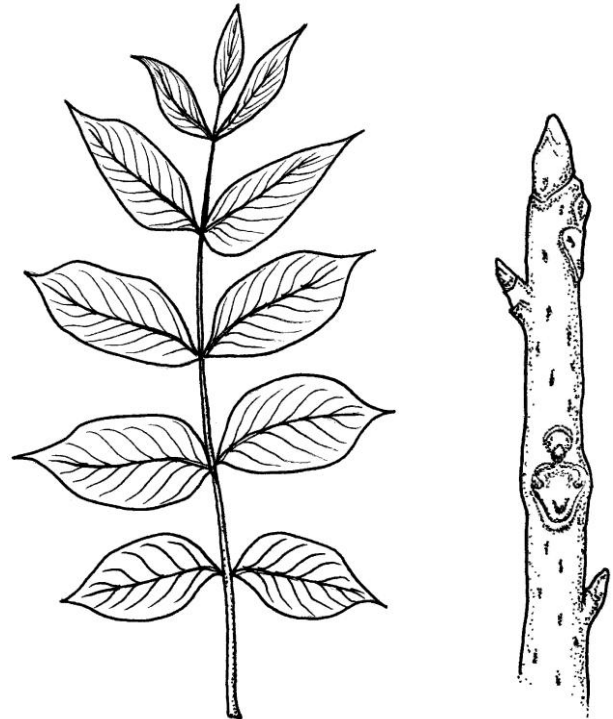
Butternut is a hard mast tree meaning that it produces edible nuts, in this case a quantity of sweet, nutritious, oil-rich nuts every two to three years. The nuts, which are high in omega-3 fatty acids, are prized by humans, squirrels and chipmunks, nuthatches, chickadees and other birds.

The soft coarse-grained wood works, stains, and finishes well. This wood is highly prized for carving. It is used less often for cabinetwork and furniture. The husk also provides a tan-coloured dye that was used in the American Civil War for dyeing Confederate uniforms.

A fungal disease known as butternut canker (*Sirococcus clavigignenti-juglandacearum*) is reported to have already eliminated butternut from North and South Carolina. Although this tree species is still relatively common throughout much of its range in eastern North America, it has been estimated that up to 90 percent of all individuals have contracted the disease.

Butternut canker was first reported in 1967 in Wisconsin, yet was not described until the year 1979. The origin of this fungus is as yet unknown, however there have been a few theories put forth to explain its sudden appearance.

The most commonly thought and most accepted possibility is that the fungus was introduced from Asia. There are a number of facts that support this theory, such as the low genetic diversity of the species of fungus, the lack of resistant butternut, and the sudden appearance of the canker in the latter half of the 20th century. Also, the closely related Asian walnut (*Juglans ailantifolia*) is susceptible to this



Butternut leaf

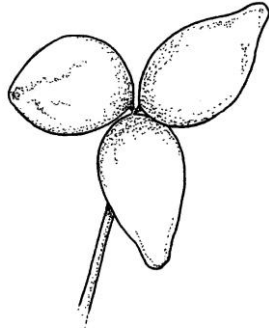
Butternut twig

pathogen. However, it is capable of survival in spite of infection.

Another theory is that this disease is in fact indigenous to North America and has recently experienced a population expansion, possibly due to differences in climate or any number of environmental and biological factors. A third possibility is the recent evolution of this species of fungus.

Symptoms of the disease include dying branches and stems. Initially, cankers develop on branches in the lower crown. Spores developing on these dying branches are spread by rainwater to tree stems. The resulting stem cankers typically develop 1-3 years after the initially infected branches die. Trees are killed by the formation of these cankers on the main stem, which impede nutrient flow. Large trees can withstand a number of cankers, although eventually cankers will form around the entire stem and effectively girdle the tree. Immature trees are much more susceptible and often perish in one season.

Although rainwater can move the disease around an individual tree, there are other means by which the spores are transferred from one individual to another.



Butternut fruit

The nut husks of butternut can be infected with butternut canker and there is the possibility for seedling infection upon germination. There are also a number of insect vectors that can transmit the disease amongst trees, such as the butternut curculio and other species that have been found to carry the sticky spores of butternut canker and frequent the trees.

Upon hearing about the butternut's plight, one might ask what can be done?

First, protect them. If you know the location of a butternut, try to preserve it. Prune off branches that have the butternut canker. Each individual is important to the continued existence of this species, for its production of nuts and its genetic diversity.

Second, spread the word. Tell people about the butternut. Most people have never heard of this beautiful tree. The more people who know, the greater the chances of protection for this species.

Third, grow them. The nuts can be collected in the early fall, although one must be prompt, as squirrels can strip a tree rather quickly. Before winter storage or planting, the husks should be removed. A relatively easy way of doing this is to allow the husk to rot and then use a pressure washer to remove the pulp. A word of caution: a pair of gloves is essential when handling the husks, as they contain a substance that can dye clothing and skin. It is a good idea to rasp the hard shell, as this will improve germination. The nuts can be pushed into the ground in fall, or stored in moist, cool conditions for the winter (1-4 degrees Celsius or 34-39 degrees Fahrenheit) and then planted in the spring. Be sure to transplant them early as they quickly grow an extensive taproot. It is important to carefully protect the seeds and young plants from rodents. Tree cages, netting or chicken wire should be used. I have lost many seedlings to determined squirrels and chipmunks.

Although the prognosis looks grim, we may be able to save the butternut with concerted efforts by tree lovers, conservationists and government. I encourage all of us to do our part.

Keri Pidgen is a biologist currently living in Sault Ste. Marie, Ontario. She co-founded the native plant nursery, Grow Wild!, based in Claremont (www.grow-wild.com). Contact them at (706) 738-5496.

Illustrations by Bridgette Granton.

Reprinted from The Blazing Star, newsletter of the North American Native Plant Society, Spring 2005.

Web-Based Resources For Ohio Flora

ODNR, DNAP, revised March 2005

NatureServe. Links to state heritage programs, state status information for plants and animals, and variety of other information on North American taxa. <http://Natureserve.org>

New York Botanical Garden. Features searchable database of American botanical literature. <http://www.nybg.org/bsci/iabl.html>

Ohio Department of Natural Resources. Provides links to different Divisions, maps of DNR lands, and a variety of environmental information, <http://www.dnr.state.oh.us/>

Ohio Division of Natural Areas and Preserves. Information on state nature preserves, rare plants, invasive plants and other botanical information, <http://www.dnr.state.oh.us/dnap/>

Ohio State University herbarium. <http://www.biosci.ohio-state.edu/~herb/herbarium.htm>

Rhodora. Journal of the New England Botanical Club. <http://www.huh.harvard.edu/nebc/Rhodora.html>

The Academy of Natural Sciences, Philadelphia. Features a searchable database of over 1.3 million plant specimens in their herbarium. <http://www.acnatsci.org/research/biodiv/botanystaff.html>

The Nature Conservancy, Ohio Chapter. Information on TNC preserves and TNC's role in Ohio. <http://nature.org/wherewework/northamerica/states/ohio/>

U.S. Dept of Agriculture Plants Database. Very useful site for researching plant distributions in North America, <http://plants.usda.gov/index.html>

University of Michigan herbarium. <http://herbarium.lsa.umich.edu/>

Travelin' Plants: What Makes Some Plants Better Movers than Others

By Katherine Gould

Ask most people, "Do plants travel?" and you're likely to get a strange look or a shake of the head. We mainly think of plants as stationary organisms, fixed to one spot, rooted to the ground. And compared to humans and other animals, they very much are. Plants use energy from the sun to manufacture their own food and, thus, are not compelled (like us) to move around constantly in search of a decent meal.

They grow, of course – in all different directions. And every now and then, plants put together little care packages for their offspring and send them off to seek their fortunes. By this I mean that they create, as part of their reproductive cycle, propagules called seeds that are borne away by wind, rain, birds, and other agents of travel. Still, the general impression one gets from plants is that they more or less like to stay put.

But then it's not quite that simple. Plants are constantly competing with one another for the raw materials of photosynthesis (water and carbon dioxide), for the minerals that enable their metabolism, and, most importantly, for access to sunlight. One way they do this is by moving. As gardeners, we're all aware that certain plants are capable of extensive movement, to the point that they need to be kept in check (or torn up and thrown on the compost heap). Plants do "travel," and some as if they have a true wanderlust.

Shoots Made for Walking

Many plants move about by means of specialized stems that elongate quickly in a horizontal direction without putting out leaves, essentially acting like walking legs. Such stems are termed stolons or runners. If you've ever tried to pull up English ivy (*Hedera helix*), for example, you've found that it has formidable (or, more precisely, invasive) runners that root along the ground as they extend. New shoots and leaves eventually arise vertically along the runners, allowing a single ivy plant to cover a vast area. Other plants that grow this way include strawberries (*Fragaria* species) and many common garden groundcovers.

Another type of traveling stem is found on vines, which are capable of extensive vertical and horizontal movement by making use of supports like fences, trellises, or other plants. Vine stems either twine around objects or cling to them with specialized appendages called tendrils or suckers. Their ability to

clamber and climb, combined with their fast growth rates, really give vines a mobility advantage over non-climbing plants and makes them seasoned travelers.

In the South, spring-blooming and sweet-smelling wisteria vines can be seen draped over roadside trees, a single vine often covering five or more trees (this may be the native vine, *Wisteria frutescens*, which is common to that region, or an escaping non-native species). Once the vine reaches the crowns of the trees, it is perfectly positioned to receive all the sunlight it needs.

Under close supervision, wisteria can make a lovely addition to any garden. In the wild, however, some species of this peregrinating plant have great potential for disrupting native plant communities. Both Chinese wisteria (*W. sinensis*) and Japanese wisteria (*W. floribunda*) are becoming problematic for eastern forests. Interestingly, these two species are almost indistinguishable but for the direction of their twining. Chinese wisteria can be seen twining counterclockwise when viewed from above, while Japanese wisteria twines clockwise.

Darwin's Discovery

How do vines like wisteria actually twine up supports, and how do stolons avoid obstacles in their path? One scientist, better known for studying finches than plants, gave much thought to the question. Charles Darwin, something of a rover himself, was fascinated by plant travel. He even wrote two books on the subject, *The Power of Movement in Plants*, in 1881, and *The Movements and Habits of Climbing Plants*, in 1875.

Darwin derived an ingenious technique to watch the normally undetectable slow movement of over 100 species of vines and non-climbing plants. He covered plants in his greenhouse with large horizontal sheets of glass. Then he attached a thin glass needle to each growing shoot. The needle had a black dot on the end, which was easy to see through the horizontal glass plate. Every hour for 24 hours, Darwin inexhaustibly painted a dot on the glass wherever he saw the black dot on the needle. At the end of the one-day period, he connected the dots to see what kind of shape the plant shoot had traced in its movement.

He discovered that all growing plant parts – including shoot tips and roots – rotate slightly around a central axis. He even coined a word for this kind of movement: circumnutation. This subtle rotation allows

any growing tip to seek a better route-if it runs into an impediment, for example.

Darwin also found that vines use an exaggerated form of circumnutation, turning in the form of a circle or broad ellipse. This wide orbital path increases the likelihood of their finding a support. Moreover, when the vines hit a support, their revolving action tightens and enables them to twine up around it.

Among the vines Darwin studied were nasturtium (*Tropaeolum* species) and blackberry (*Rubus* species). He found that different plant species move in many varying patterns of ellipses and circles, often changing from large to small circles or doubling back in the opposite direction, basically making figure-eights.

Homebodies vs. Adventurers

Although this knowledge of plant circumnutation has been around now for over 120 years, its usefulness has not been exhausted. Recently, it has been applied in research seeking to determine the causes of plant invasiveness. There's no doubt that several factors are involved in giving some plants a leg up on other species, but a study by botanist Katherine Larson at the University of Central Arkansas has shown that differing circumnutation behavior is one of them.

Dr. Larson analyzed the circumnutation patterns of the exotic Japanese honeysuckle vine (*Lonicera japonica*) and that of its native relative, coral honeysuckle (*L. sempervirens*), to see if they contribute to a difference in the plants' mobility and thus invasiveness. Japanese honey-suckle is a growing threat to habitats throughout the East and Midwest because of its domineering tendencies. Coral honeysuckle, in contrast, does not overwhelm the vegetation where it grows. Both species produce erect shoots that twine up supports, as well as horizontal shoots that root when they come into contact with the ground and enable outward spread.

Dr. Larson's techniques for measuring the spread of both species were, understandably, a little different from Darwin's. She didn't have to skewer the honeysuckles with needles or connect any dots. Instead, she videotaped the growth of erect and horizontal shoots in order to observe their slow rotation patterns.

Surprisingly, Larson found that the difference between the two plants lay in the behavior of their horizontal shoots. Coral honeysuckle's horizontal shoots, like the vertical shoots, traced a circular pattern as they rotated, hitting the ground often and then springing off in a new direction or even turning back on themselves. But the horizontal shoots of Japanese honeysuckle, the invasive species, behaved more like stolons. They traced a narrower ellipse, moving up and down more than side-to-side. Because they made fewer turns, the shoots of Japanese honeysuckle made greater progress in one direction, maximizing their spread. They also rooted more frequently because they remained closer to the ground.

To put it figuratively, Dr. Larson found that the two honeysuckle vines represent two different kinds of traveler. Coral honeysuckle is a hometown kid, never straying too far from its own backyard. But Japanese honeysuckle is more of an adventurer – it takes the straight road out and doesn't look back.

Next time you see a vine growing in a garden, vacant lot, or roadside, think about whether it's the upward- or outward-growing kind, and imagine its growing stems twirling around in the slow-motion dance that enables their travel. Also remember Darwin and how, among his many achievements, he has deepened our understanding of plant movement and invasiveness. Thanks to him, we are better equipped to figure out which plants we can invite into our yards, and which rowdy ones we should put in quarantine or send packing altogether.

Reprinted from *Plants & Garden News*, the Brooklyn Botanic Garden, Summer 2001

Raising Native Understory Shrubs from Seed

by Bill Cullina

Growing anything from seed requires some commitment of time and space, but the rewards are great. Also it is usually the only way to obtain native plants from seed – plants truly indigenous to your own neighborhood or corner of the province. I have chosen to focus on a few of these, all common understory shrubs in our forests, but often difficult to obtain from commercial nurseries. I have limited myself to five so

that I can go into greater detail about their wants and idiosyncrasies, but much of the information can be applied to other trees, shrubs and wildflowers you might wish to grow. While I do propagate some plants from cuttings, I prefer seed both because it preserves more of the genetic diversity inherent in most wild populations and because it is frankly easier most of the time.

Hobblebush

Viburnum lantanoides or *alnifolium* is a familiar colonial shrub of the cool damp forests of New England and eastern Canada. Though in the wild it is usually a stoloniferous shrub spreading about in search of light gaps, in the garden it becomes a beautifully layered, rounded specimen producing charming cymes of creamy white flowers ringed with a skirt of large sterile petals like the lace cap hydrangeas. Six-inch oval leaves ridged like a crinkled potato chip frame berries that ripen from green to red and finally blue-black by autumn, when the foliage begins to turn an amazing mix of burgundy, lime green, and pink before falling. It is one of the most recognizable shrubs in the northern hardwood forests, yet few if any nurseries produce it. If you have some plants on your property, it is not difficult to dig a few rooted suckers and transplant them, but should you not be that lucky, seed is the next best option.

Many viburnums have embryos that are immature at the time the berries are ripe, and they need a few months of additional warm temperatures (after-ripening) once cleaned from the pulp to become developed enough to germinate. Since the fruits ripen naturally in the fall when temperatures have cooled too much to allow sufficient after-ripening, they will usually not germinate until the second spring. However, if you harvest the seeds as they just begin to flush red in late summer, clean and sow them outdoors, they will germinate the first spring. Another thing you must realize is that a large proportion of hobblebush seeds are non-viable. I imagine this is a ruse meant to discourage chipmunks and squirrels, who will eat the seeds. A squirrel will tend to pass on a plant that has many empty seeds in favor of one with more full ones. For the propagator, this means collecting 2-3 times more than you need in order to get enough good seed. Fortunately this is usually not a problem, as hobblebush produces copious berries.

My procedure is to pick the fruits as they blush red (mid-August in central New England), mash them up a bit to crack the skins, and drop the lot into a big bucket filled with water (if the seeds float too much, drop an old plate on top of them). Let the seeds soak for 10 days until they are a putrefying mass (don't leave the bucket in the house!) and then rinse off the rotted pulp over a screen using a garden hose. You may not be able to get every last bit off, but the chemical inhibitors in the pulp should be sufficiently destroyed. Sow the seed and place it outdoors where rodents cannot get at it (I like to screen off a cold frame with

hardware mesh to prevent their access). By fall, viable seeds will have sprouted a root, and these will send up cotyledons and a set of leaves the following spring. Young seedlings are best left in the flat for a year before moving them on, and they like the kind of cool, shaded spot you'd find them in naturally.

Alternatively, you can put the cleaned seed in a plastic bag mixed with some moist sand or vermiculite and leave it on the desk for three months, then store it in the refrigerator until you can sow it directly into your woods in spring.

Spicebush

Lindera benzoin is a broad-leaved understory shrub of wooded wetlands throughout the eastern U.S. and southern Ontario. It has a multi-stemmed, wide-spreading habit and pretty, dull blue-green, oval leaves. The leaves and especially the bark have a great, spicy aftershave scent that is one of my favorite woodland smells. This is a dioecious species, with both male and female plants producing yellow-green flowers all along their twigs in earliest spring before the leaves have emerged to obscure them. The flowers provide an early bit of nectar for precocious bees and flies when little else is in bloom, and the female plants set good crops of oily, nutritious berries (technically, drupes) that are relished by many birds. In order to beat the birds to a few fruits, I collect them in early fall when they are beginning to turn from green to yellow, then orange and red. The leaves begin to color a soft, luminous yellow about the time the berries are ripening, which helps remind me to collect them. You may have to search a few shrubs before you find a good berry-producing female. Collect the seeds and handle them like hobblebush. They are intolerant of drying out, so after cleaning, either sow them immediately or store them in a plastic bag filled with moist sand/vermiculite. If sown in fall and overwintered in a screened cold frame, the little seedlings will emerge vigorously in spring, and will need careful watering and a light dose of liquid fertilizer every few weeks (Miracle Gro or equivalent). They will be ready to move into individual pots or a seedling bed after a month or so.

This same technique works for most dogwoods, *Cornus* spp., as well as hollies like *Ilex verticillata*. Most hollies and summer-ripening dogwoods like pagoda dogwood *Cornus alternifolia* and gray dogwood *C. racemosa* need a period of warm after-ripening like hobblebush, while fall-ripening *Cornus* like flowering dogwood *C. florida*, need only a period of cold stratification after cleaning like spicebush.

Leatherwood

The final berried shrub I'll cover is one of my favorites-leatherwood *Dirca palustris*. In damp, floodplain forests in southern Quebec, Ontario, and the eastern U.S., especially those with soil enriched by limestone, it grows as a rather scraggly, multi-stemmed plant, but like hobblebush, if you give it a place in the garden, it becomes a truly fine specimen. In such situations it will form a short trunk forking quickly into several limbs supporting a rounded crown. Its stems swell and thicken out of all proportion with their size, so the shrub takes on the same brawny thickened quality that makes bonsai so appealing. In early spring, about the time spicebush is flowering, dangling pale yellow flowers tassel every stout branch and fade just as the broadly oval to nearly rounded, 3-5 cm leaves swell large enough to notice. The foliage is a soft, glaucous green, and looks its best in dappled shade or morning sun. The problem with collecting leatherwood seeds is: a) they ripen in late spring, when I am madly rushing around with a thousand things to do, b) the seeds give little indication they are ripe other than a subtle shift from leaf green to yellow green; and c) they hide up amongst the leaves so thoroughly that I find, it easier to lie down underneath the bush and look up into it to find them. If you miss the seed by a day or two, it drops off into the leaf litter and is gone. Since such inconspicuous fruits hardly seem able to attract the attention of birds, especially at this time of year when most are busy gathering insects to nourish their young, I imagine they are dispersed by herculean ants, floodwaters, or simple gravity. (Many mature *Dirca* have a large crop of seedlings growing underneath them that obviously got no farther than the point where they landed.) Since they are not designed to pass through a digestive system, you don't need to clean off the thin flesh from around the seed, and in fact this is one of the rare cases where sowing the uncleaned seed will give better germination. They also need a long period of after-ripening and then an equally long winter and slow warm-up in spring that is easiest to provide by sowing them outdoors in flats or a prepared seedbed and waiting until the following spring for them to germinate. Seedlings emerge with a few leaves the first year, but are best left alone until the following spring.

Witchhazel

Hamamelis virginiana has forsaken the vagaries of wind, water or animal dispersal entirely, relying instead on sheer physics. The common name comes from its use as a dowsing rod (also called water-

witching) and its passing resemblance in leaf to the true hazels (*Corylus* spp.). These stems are good for dowsing because they fork widely at the tips, with new shoots coming most vigorously from the ends of last year's progress. Thus, they develop a characteristic flattened and vase-shaped form that makes them easy to spot in the woodlands of eastern Canada and the U.S. Witchhazel laughs in the face of winter, sending out its small yellow flowers with their four ribbon-like petals in fall, just as its leaves are coloring a striking apricot yellow. At this time of year, it has little competition for pollinators scrambling furiously to stock up for the winter or at least find the energy to lay eggs before they die, and many of the flowers develop two-chambered woody capsules. These swell a bit the first fall, then grow in earnest the following summer so that by the time the next crop of flowers is unrolling its petals, they are ready for launch. As the seeds mature, the capsules split open, revealing their cargo in all its shiny brown beauty. There is a membrane surrounding each of the four seeds that begins to dry and constrict on contact with the air, putting pressure on the lower side of the seed until it is forcibly ejected at great velocity. The seeds can travel up to 10 meters, hopefully to a spot conducive to their establishment and growth. To collect these miniature projectiles, you must gather them just as the capsules begin to open in fall and drop the lot into a paper bag closed tightly and left indoors. After a week or two, the popping will cease, and you can pick out the pointed oval seeds. These, too, need a few months of warm moist conditions to after-ripen, which at this time of year is best accomplished by putting them in a bag of moistened sand or vermiculite and transferring them to the refrigerator (not the freezer) around New Year's Eve for the duration of the winter.

Finally, there are a few woodland shrubs that rely on wind to disperse their seeds, but these are often so tiny that they need special conditions to germinate. The most familiar of these are many members of the **Rhododendron** tribe, including the sweetly scented rose azalea (*Rhododendron prinophyllum*, formerly *R. roseum*). The rhododendrons and indeed most of their relatives like *Kalmia* spp. (sheep, bog, and mountain laurel) and Labrador tea. (*Ledum* or now *Rhododendron groenlandicum*) are what I like to call moss germinators. Their tiny seeds germinate and grow best in the mossy carpets that form on stumps, logs, and boggy hummocks. They can grow in this sort of acidic, nutrient-poor environment because the seedlings quickly become infected by ericaceous endomycorrhizae, fungi that invade their fine roots and

aid in the uptake of nitrogen as well as other vital nutrients. The ever-moist moss provides these plants with a clear place to establish, and the fungi provide the rest. To raise these plants yourself, look for ripe capsules in fall, about the time of the first hard frosts. Collect these and mash them some to loosen the seed, then shake them through a kitchen strainer to separate the winged, rust-colored seed. you can take the natural approach and store the seed in a paper envelope in the refrigerator through the winter, then shake it into a patch of damp moss (the fernleaf moss, *Thuidium delicatulum*, works well for this), but I have more consistent results if I germinate the seed indoors. My usual procedure is to scatter the seed on a flat of dampened peat moss and seal the lot in a self-sealing, plastic bag, I put the bag under fluorescent lights set for 16 hours on, 8 off, as the seeds germinate best with light and long days. If you sow them in winter and

grow them under lights all winter, you will have nice little seedlings ready to move outdoors come spring. Be careful to watch the bags, and crack them open slightly should you see signs of mold. Regardless, it is better to open the bags to encourage air movement once the seed has fully sprouted. Dilute liquid fertilizer will speed things along, but you may have to water the seedlings with rainwater or distilled water if your tap water is hard. (I have to collect and melt snow because our water is very high in calcium and magnesium. The results of this extra effort have been well worth the trouble.)

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The Great Lakes Restoration Plan

By Kathryn Hanratty

The Great Lakes Restoration Plan is a blueprint for the clean up and restoration of the Great Lakes similar in scope and scale to the federal programs for the Chesapeake Bay and the Everglades.

This ambitious long term plan targets the following:

Remove Toxic Hot spots in lakes and rivers

Stop sewage dumping into lakes

Restore 550,000 acres of wetlands and 330,000 of buffer strips

Stop and Control Invasive Species

Unfortunately, implementation of this comprehensive, consensus plan is in danger due to lack of funding. As members of the Native Plant Society of Northeastern Ohio - why should we care about this huge program? Most of us live in the Lake Erie watershed. Many of us get our drinking water from the lake. In the last 2 or 3 generations Ohio has lost 90% of its wetlands, most of us can remember walking through swamps and meadows that are now gone - paved over and developed. We have the opportunity to make a difference. As wetlands are restored we can help stress the importance of using native plants in the restoration. As citizens we can push for prompt funding of this huge initiative. Our efforts now may pave the way for a clean, living lake for our children and grandchildren.

Restoring our Great Lakes will not be cheap or easy, very few important things are. Restoration is vital to our entire region and ultimately the entire nation.

Our own Lake Erie is the "Canary in the coalmine" of the Great Lakes. Because Lake Erie is shallower and warmer and its shores are more densely populated than the other lakes, it is in the most peril. This also means that we have the most to gain from a cleanup.

Scientists say we are near a tipping point. Restoration must be done. The longer we wait the more difficult and expensive it will be. As the saying goes... pay now or pay later. If we start now to restore our lakes we will begin to pay down a huge debt both environmental and financial. If we do not start now - the problems will get exponentially worse. Which legacy would you rather leave?

Kathryn Hanratty is a landscape architect in Chardon, Ohio, and a member of NPSNEO.

Tall Larkspur *Delphinium exaltatum*

by Gene Bush

English delphinium breeders produce hybrids of show-stopping exhibition-quality named plants. These are the hybrids produced from the species *Delphinium elatum*, growing to six feet or more in height. Semi and fully double blooms come in siren-song colors of “mulberry pink with contrasting bees of brown”, or dark royal blues with a contrasting bee of soft white. Delphinium flowers have five petal-like sepals joined at the base with the upper sepal spurred. The two to four petals in the calyx throat are furry-looking and referred to as a “bee”. (that fuzzy looking thing in the middle of a delphinium bloom).

Each spring American gardeners are a bit like deer staring into an on-coming car's headlights. The “better” gardening magazines will have feature articles filled with color photos of the hybrids. Garden centers and local nurseries will carry seedling plants with full color pot labels. Catalogs and web sites fill in any local lack of plants. As with the deer, we simply can not seem to see any other delphinium.

Each year we bring home plants or seeds for our gardens only to be disappointed. These lines of hybrids are bred for weather far different from that found here in the midwest. The *D. elatum* hybrids simply cannot stand up to our summer temperatures. Just as they come into bloom, here locally we go into hot and dry conditions with high humidity, and night-time temperatures that remain at a level where these hybrids cannot rest.

However, there are delphiniums native to the midwest. To the best of my knowledge no one has put a selective breeding program in place for our local natives. Thus there are no fully double or semi-double blooms, no highly contrasting bees, and named color lines. We are long overdue for someone to introduce named cultivars of our native *Delphinium exaltatum*, or tall larkspur. This species is a native ranging from Pennsylvania and Ohio into Alabama south. It can be found growing in open fields, woods and woodland

margins. It performs in sun or shade, differing soils and moisture needs, making for an easy-to-grow perennial in the native garden or more formal beds.

Mine are on the west and south of my woodland garden where they receive the setting sun. One site has heavy clay, the other classic humus-rich, well-drained, garden soil. Both sites produce plants three feet, or more, in height. The lavender-blue blooms are numerous at the top of stiffly upright, but slender and graceful, stems. In all the years I have grown this delphinium species, I have had no need to stake it. Whether in full bloom or in wet weather, the tall larkspur remains upright. When the summers turn hot and dry, the tall larkspur continues on unfazed in my garden. Foliage stays fresh and bloom period is not reduced. The foliage of *D. elatum* hybrids will often pick up mildew at this point, but not our native *D. exaltatum*. I have yet to see a case of mildew on my plants in either location. After each flush of blooms I cut back the bloom stems, deadheading the plant. Each time a bloom period has finished, if the plant is cut back, another period of bloom will occur. I have cut back my plants twice in a season having blooms in my garden into the middle of December during a mild fall and early winter. The blooms will take light frosts before shutting down for the season. I count on a reliable bloom period from July into winter of each year.

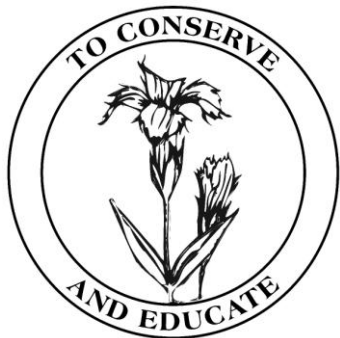
With such a long bloom period it is not hard to think of companions. Phlox is certainly one of the better companions. Tall

garden phlox (*P. maculata* or *P. paniculata*) are favorites, as is *Phlox glaberrima*.

Native Aster species and cultivars, Eupatorium or Mistflower and *Lilium superbum* or Turk's cap lily are just a few others coming to mind.

Gene Bush is owner of Munchkin Nursery & Gardens LLC and gardens on his hillside shade garden in Southern Indiana. His web site is: www.munchkinnursery.com Reprinted from the Indiana Native Plant and Wildflower Society News, Summer 2003.





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- Promote conservation of all native plants and natural plant communities through habitat protection and other means
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