On The Fringe

Journal of the Native Plant Society of Northeastern Ohio

ANNUAL DINNER

Friday, September 26, 2008
At the Cleveland Museum of Natural History
Social Hour: 5:30 p.m.
Dinner: 6:15 p.m.
Lecture by Dr. Joan Nassauer at 7:30 p.m.
"Ecological Design Across the Changing Metropolis"
This speaker is co-sponsored by the Cleveland Museum of Natural History Explorer Series.
Tickets: Dinner and lecture: $28.00
Send checks to Kathryn Hanratty, PO Box 1064, Chardon, Ohio 44024; 440-477-5468
Tickets for the lecture only: $10.00, purchased through the Museum
TICKETS ARE LIMITED, SO MAKE YOUR RESERVATIONS EARLY

Annual Dinner Speaker

Our speaker this year will be **Joan Nassauer,** Fellow of the American Society of Landscape Architects (1992), Professor of Landscape Architecture in the school of Natural Resources and Environment at the University of Michigan, Ann Arbor. Her teaching focuses on landscape ecology and landscape perception, with applications in design and planning of agricultural and urban watersheds. Her current research includes retrofitting cities, particularly brown fields, for ecological function and water quality, perception of ecologically innovative exurban development patterns, using alternative policy scenarios and futures to monitor landscape change.

She will speak about the perception of native/sustainable landscaping and how to increase public acceptance. A very clear and engaging speaker, she is also an author. She will have her books available that night, ***Placing Nature: Culture and Landscape Ecology*** (1997)**,** and possibly her new one, ***From the Corn Belt to the Gulf: Societal and Environmental Implications of Alternative Agricultural Futures*** (2007).

An Appreciation of the Work of Art Herrick

Tom Cooperrider

"*Our concern with natural areas is not about to fade.*" ---- Art Herrick, 1974

James Arthur Herrick was born on July 5, 1908; he died on July 20, 2008. The following account is not a comprehensive biography. It is, rather, a personal tribute to Art, and a few recollections of Art as a colleague, neighbor, and friend.

Early Days

Art Herrick was the son of an orchardist. He took pride in this heritage and mentioned it frequently. A few years ago, when I was preparing a thumbnail sketch of Art's life, I asked him about the orchard. Located in Twinsburg, Ohio, the orchard was a family operation. Work that now is mechanized was then, in the 1910s and 1920s, done by hand. It was a sizeable orchard. In a typical year, they might have five acres in cherry trees, five in plum trees, five in peach trees, five in berries, and about 50 acres in apple trees. The orchard required a considerable amount of labor, enough to keep all six children busy. The four oldest children were boys, the two youngest girls. Art was the fourth child, the youngest son. [*continued on next page*]

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[***Art Herrick**, continued from p.1*]

Art learned how to trim the orchard's trees and shrubs when he was young. Good trimming of woody plants is partly an art, partly a science. It was a skill that Art practiced throughout his life, and one that gave him great satisfaction and pleasure.

Art once told me a story from his childhood that sticks in my mind to this day. It concerns his grandfather, whom Art described as "a frugal man." It is a story of work, reward, conservation, thrift, and botany.

Art's grandfather raised sheep. I know something of sheep from my own childhood on our family farm. Sheep are surprisingly fragile animals, with a tenuous hold on life. They sometimes wander off and die or get killed and, if part of a flock, their absence may go unnoticed for several days. Unless they have recently been shorn, however, they have a coat of wool that can be harvested and sold for good money. After the body begins to decompose, the wool comes off easily, but still — someone has the task of collecting and bagging the wool. His grandfather would pay Art and a cousin twenty-five cents for collecting the wool from a dead sheep. Bag in hand, the boys would set off to do the necessary work. Along the way, they stopped to collect a few mint leaves to stuff in their nostrils.

Early Years

I met Art Herrick in the spring of 1958. He was a Professor in the Biology Department at Kent State University. My wife, Miwako (Mix), and I had driven from Iowa City to Kent, and Art was our host. I was interviewing for a position at Kent State in floristic botany. I later accepted the job offer and joined the Biology Department in September. Art was 50 years old at the time, and about to start on the great conservation adventure of his life, a survey of Ohio's natural areas.

Years later, Art gave me reprints of papers he had co-authored in the early 1940s, while he was an instructor in the medical school at the University of Michigan. One paper (Kempf and Herrick, 1945) was entitled: "Effect of penicillin on experimental staphylococcus osteomyelitis in rats". A handwritten note from Art attached to the reprint read: "This was the first bone infection cured by antibiotics!" The work was done during World War II when penicillin was new on the medical scene and had already proved invaluable for military doctors. The research was of great value to society, but Art's major life work would be in a different field. He left Michigan in 1946 and returned to Ohio.

Natural Areas

[The quotations below and most of the information in this section come from Art Herrick's 1974 book, *The Natural Areas Project. A Summary of Data to Date*.]

Art Herrick was a native Ohioan; he loved nature; and he believed in conservation. These three elements of his life all came together in 1958. In December of that year, Art began work on the "Natural Areas Project" sponsored by the Ohio Biological Survey.

The purpose of the project was to "assemble and evaluate data on natural areas of interest to biologists, naturalists, teachers and conservationists." The goal was, in short, to make the first comprehensive survey of all the natural areas remaining in the state. This was about 150 years after European settlers had set out to clear the forests and make the state ready for farming and the other activities of civilized society. Each of the natural areas provided a glimpse of primeval Ohio.

The areas ranged from well-known sites to the secret haunts of Ohio's nature lovers. Art spread the word far and wide.

"During the early years of this project I personally addressed many groups throughout Ohio to explain our aim and our methods. Forms for reporting areas were made available. As reports came in and time allowed, I personally inspected many areas. In a majority of cases, I did the inspection with the guidance of the local naturalists who had sent in the original report."

Another of Art's virtues, his love of people, came into play. "On many inspection trips I enjoyed the hospitality, food, lodging, transportation, and guide service of local naturalists."

When the project ended, Art had assembled data on nearly 600 natural areas in the state and had personally inspected some 200 of them. By then he was known, and admired, by nearly every naturalist in Ohio. He loved talking to people about the work, and he did this in an engaging manner that aroused their interest and enlisted their support.

The Natural Areas Project was a personal triumph for Art. It came at a time when interest in conservation was increasing throughout Ohio and throughout the nation.

Art's 1974 publication on Ohio's natural areas, like the mimeographed drafts that had preceded it in 1962 and 1965, came to be called simply "Herrick's List." It was widely distributed and used to guide the work of the Ohio Chapter of The Nature Conservancy and the work of the Ohio Department of Natural Resources' Division of Natural Areas and Preserves in their establishment of nature preserves throughout the state. Art became personally involved in establishing some of these natural areas as dedicated nature preserves, notably Herrick Fen in Portage County, a few miles north of Kent. Herrick's List is still used today. His work inspired others to become involved in conservation.

Simple Gifts

Art liked giving people young trees to plant around their homes. Around his own home, he had developed an arboretum of about 1½ acres in size. In it were 400 species of plants he had collected during his travels in the eastern United States. As these plants matured and shed seeds, he would mark the seedlings for protection with a stick placed in the ground beside each one. When the seedlings were older they were moved to a better site or to a container. He nursed the seedlings into saplings, and they made gifts that he gave freely to anyone who wanted them. With the least encouragement, Art would deliver the plant, select the best location, and put it in the ground.

We have two of Art's gifts in our yard. One is a fringe-tree (*Chionanthus virginicus*) grown from southern Ohio seeds. It blooms profusely each spring, filling the evening air with a sweet tropical fragrance.

On one occasion I told Art I was looking for a Fraser fir (*Abies fraseri*) to plant on the well-drained slope behind our house. He immediately said, "I have one I'll give you." Art lived around the corner, about a block away. A few days later, he showed up at the door carrying an old, crumbling basket filled with soil. Looking carefully, I could see that there was a speck of green in the center. It was a Fraser fir, at most half an inch tall. Art said, "Just plant the basket and all." There was a slight twinkle in his eye when he saw my reaction. But I was not about to let him think I had expected anything other than this miniature seedling. I thanked him for such a handsome tree and planted it "basket and all." Now, 15 or 20 years later, the seedling has grown to over three feet in height. I have lately seen birds sitting on its low branches.

Art gave us also a couple of his handmade tree-of-heaven walking sticks. Tree-of-heaven (*Ailanthus altissima*) is a weedy tree of Asian origin, naturalized in disturbed areas throughout northeastern Ohio. The tree produces smooth sturdy basal shoots that can grow more than 10 feet in a single summer. At the end of summer, Art would cut from the shoot a straight section of walking-stick length. After a little seasoning, the stick was ready for use. This was the summer model.

The winter model required an additional step. In one end of the stick, Art would pound a nail, allowing it to protrude about an inch. The nail head was then cut off, leaving the end sharp, and sometimes a little jagged. This stick was useful when there was ice on the walkway. It worked on ice, and could also be used in summer on a grassy lawn or field. We have our walking sticks outside the back door and use them every day, especially when climbing the hill where the Fraser fir grows. That they were made by hand with essentially no expense pleased Art, and us as well.

Parting Gifts

Art Herrick left Ohioans a priceless original gift, an annotated inventory of the state's natural areas. Each area is a stronghold for native Ohio plants.

At age 66, when he finished the project, thinking back on the effort that had gone into the collection of the basic data and the composition of the report, Art wrote (in 1974): "The past fifteen years have been productive, pleasant and very rewarding in terms of

personal satisfaction, as this work has been a major part of my way of life."

Like all of his friends, Mix and I were happy that Art lived to be a centenarian. We found a card to send for the occasion. On the outside was a photograph from northeastern Ohio of a beech-maple forest with a small creek running through it. Large white trilliums bloomed in the foreground. Inside, we wrote:

Dear Art,

Like this woodland stream, your work in the conservation of Ohio's natural areas will flow onward for years untold. Happy 100th Birthday, and thanks for everything.

References

Herrick, J. Arthur. 1974. *The Natural Areas Project. A Summary of Data to Date*. Informative Circular No. 1, Ohio Biological Survey, Columbus.

Kempf, J. Emerson, and J. Arthur Herrick. 1945. Effect of penicillin on experimental staphylococcus osteomyelitis in rats. Proceedings of the Society for Experimental Biology and Medicine. 58: 100-102.

Herrick Fen Nature Preserve

Main Feature: Fen communities

Herrick Fen is important for its tamarack and cinquefoil-sedge fen communities. The tamarack fen supports one of the few reproducing populations of tamarack in Ohio, the only native conifer in Ohio which sheds its needles each year. A beech-maple forest borders the wetland on the northeast side and mixed hardwood forest occurs on the southern edge.

The cinquefoil-sedge fen contains an extensive population of bayberry, a state endangered plant found in only three locations in Ohio. The preserve provides habitat for over two dozen state-listed species. Among them are the following:

- Five types of sedges, including Broad-winged, Bebb's, and yellow
- Reproducing populations tamarack
- Crinkled hairgrass
- Round-leaved sundew
- Small fringed gentian
- Tall St. John's-wort
- Butternut
- American water-pennywort
- Bunchflower
- Autumn willow
- Ohio goldenrod
- False asphodel
- Green cotton grass
- Wand-lily
- Water avens

The initial preserve tract was purchased by Dr. J. Arthur Herrick in 1969 and now comprises some 140 acres. It is owned by The Nature Conservancy and Kent State University, and managed by The Nature Conservancy as a dedicated state nature preserve.

The preserve lies within the Tinker's Creek watershed in the glaciated Allegheny Plateau region of northeastern Ohio. The site lies on a buried preglacial valley that was filled with 400-500 feet of glacial gravels during the advances of the Wisconsinan Glacier. The impermeable silt and clay layer of the buried valley floor covered with the glacial gravel allows for the rise of cold, calcium- and magnesium-rich springs which promote the presence of the fen communities.

Herrick Fen was created in 1953 when an earthen dam was built across a tributary of Tinker's Creek, impacting the original extent of the fen communities. The lake has produced a mosaic of wetland communities, providing habitat for a variety of aquatic species and opportunities for observing waterfowl and migratory bird species.

Location:

From Streetsboro, take State Rte 43 south for 0.2 miles from its intersection with State Rte 14. Turn right (southwest) on Seasons Rd (Township Rd

157) and follow it 2.2 miles to a gravel lane on the left (east) side just past a railroad crossing. This lane is a joint access which leads along the present north boundary of the preserve to a small parking lot on the right. A trail runs from the parking lot through a meadow.

Taken from the Ohio Department of Natural Resources, Division of Natural Areas and Preserves web site:
http://www.dnr.state.oh.us/dnap/location/herrickfen/tabid/939/Default.aspx
And The Nature Conservancy web site:
http://www.nature.org/wherewework/northamerica/states/ohio/preserves/art2130.html

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Kathy Hanratty: *TogetherGreen* Hero

TogetherGreen is described on its website as an "Audubon program funded by Toyota that aims to provide inspiration, leadership and opportunities that inspire people everywhere to take action at home, in their communities and beyond to improve the health of our environment."

This program named Kathy as one of its Featured Heroes, for her work on the Great Lakes Compact, and gave the following description of her and her work:

To say that Kathryn Hanratty is passionate about habitat protection is putting it mildly.

Her day job keeps her busy as a landscape designer specializing in native plants and sustainable landscape techniques, but it's her tireless dedication as an advocate for restoration of the Great Lakes that makes Kathy a *Together-Green* Hero.

Kathy saw firsthand the effects of pollution and overuse of the Great Lakes while growing up near Lake Erie in the 1960s. But her conservation work only really started in 2006 with an Audubon-sponsored Great Lakes training trip to Washington, D.C. There, she met with members of Congress and the Senate representing Ohio and learned about the importance and effectiveness of grassroots action.

In only two years, Kathy has become one of the foremost activists in the ratification process of the Great Lakes Compact, a voluntary agreement through which the Great Lakes states and Provinces cooperatively manage the waters of the Great Lakes.

A prolific writer, Kathy has had at least 15 letters to the editor published in the Cleveland Plain Dealer and other local newspapers helping to inform her community about the importance of the Compact. Never passing up even a small chance to spread the word, Kathy has made phone calls, sent e-mails, weighed in on blogs and made presentations on Great Lakes restoration and the Compact to a number of groups including the Cleveland Metroparks Zoo, the Lake County League of Women, the Grand River Sailing Club, Fairport Harbor Yacht Club, and the Design Network

"Remember that every big job can be broken down to a bunch of small jobs," Kathy says. "If you can get one little thing done – do it. And celebrate every step."

When the Compact was being heard by the Ohio Senate, Kathy traveled to Columbus twice to show support and to testify in front of the Senate committee. Kathy was a fixture at town hall meetings discussing Great Lakes issues. She even showed up to local anti-Compact meetings and debated Compact detractor Senator Timothy Grendell one-on-one to defend the Compact, surprising even herself with her own tenacity.

Kathy took the initiative to build grassroots support in her community and make her voice heard loud and clear—and thanks to her impassioned efforts, both public officials and other citizens recognize that the Great Lakes are an important natural resource and need strong public policy to protect them.

Kathy Hanratty is a board member of the Native Plant Society of Northeastern Ohio.

Botanizing 101

Make Your Own Dried Specimens

by Kay Yatskievych and Rebecca Dolan

Botanists dry and label specimens of living plant material for storage in an herbarium, but there's no reason a plant enthusiast can't make his or her own dried plant specimens to keep for decades at home. Some of the most valuable specimens in herbaria have come from home collectors.

Collecting

Obtain permission. If collecting on private property other than your own, you need to obtain the owner's permission. Most public lands require that you obtain a collecting permit.

Collect sensibly. To conserve the plant population, do not collect an entire plant if it is the only one in the area. If the plant is large enough, you can collect a small part of it to make a specimen, leaving enough so that the plant continues to thrive and set seed, but this should be done with great caution. Many botanists will not collect a plant unless there are at least 20 of them at the location. If you encounter a plant that you suspect is on the federal or your state's Endangered, Threatened, and Rare (ETR) List, do not collect it. Instead, photograph the plant and contact a botanist at your state Department of Natural Resources.

Number the specimens as you collect. This can be done in a field notebook, with information about the date, location, habitat, size of the plant, who's with you when you collect the specimen, etc. This information is essential for labeling the dried specimen later. The numbers on your collections make them unique so that when a specimen is cited, there's no doubt as to just which one is being referred to.

Store collected specimens properly. Pressing plants as soon as they're collected yields the best specimens, but storing them in a plastic bag in a cooler works almost as well. Keep them in the cooler or put the bag in the refrigerator when you get home until you're ready to press the plants.

Pressing

Position the specimen for best visibility. Inside a folded sheet of newspaper, place the plant material flat in the way that you want it to appear when dried. Turn some leaves up and some down so the character of both sides will be visible. Place flowers so they can be seen and, if possible, open one of the flowers to expose the inside. Arranging the plant while it's fresh may be difficult, but do the best you can. After being pressed for a day, the plant will turn limp and you can rearrange the parts as necessary.

Create the plant press. Put the folded newspaper between blotters and corrugated cardboard and place a heavy object of the same size on top. Blotters may be ordered from herbarium suppliers or cut from desk blotters sold at office supply stores. Small plants can often be pressed successfully in a used telephone book with weights on top but should be checked daily and moved to dry newspaper if not drying well.

If you plan to collect more than just a few specimens, you might want to make your own permanent plant press or purchase one from an herbarium supplier. To make a press, cut two 12x18 inch sheets from half-inch plywood. Use clothesline to tie these firmly together with the specimen and accompanying newspaper and blotters between them. Smaller presses (about 8x10 inches) are useful for pressing flowers separately and may be found at hobby stores.

Store the press somewhere warm and dry. Check daily and replace the newspapers and blotters if they become damp. This is especially important with fleshy plants that can mold quickly unless you keep them dry enough. Within a few days to a week, the specimen should be dry enough to mount.

Mounting

Use the proper mounting materials. It is important to use only acid-free paper. The standard herbarium sheet size, available from herbarium suppliers, is 11.5 by 16.5 inches. Paper with a high cotton or rag content purchased at an office supply store makes an acceptable substitute for making labels. Archival white glue (available at stores selling scrapbooking supplies) can be used for gluing down both the specimen and the label.

Prepare the label. Label sizes and contents vary greatly; a convenient size is one-eighth of an 8-1/2 x 11 inch sheet of paper (4-1/4 inches wide by 2-3/4 inches tall). For specimens not collected on behalf of a

specific institution, the title line, centered at the top, is usually something like “Flora of Indiana,” “Plants of Indiana,” or your own private label like "Herbarium of Caltha P. Lustris." The label should convey the name of the plant including the plant authorities, the county and location where collected, habitat, the name of the collector(s), the number of the collection, and the date collected. Be sure to note the color of the flowers, as this will not be apparent when the specimen has aged. For specimens that are only a part of the whole, note also the size of the entire plant.

Mount and label the specimen. Lay the dried plant material on a sheet of herbarium paper and arrange it in a pleasing way. Be sure to leave space at the bottom right-hand corner for your label. Dab white glue on the back of each piece of plant material and place it where you want it. Lay waxed paper over it and apply a light weight (such as telephone books) to keep it in position. Allow the glue to dry thoroughly.

After your labeled specimens have thoroughly dried, store them in a sturdy cardboard or wood box. Check every few months to make sure they're not bug-infested or getting damp.

Reprinted from the INPAWS Journal, Summer 2008.

Book Review by Patricia Jonas

A Poet's Plant Treasury

Emily Dickinson’s Herbarium: A Facsimile Edition

By Richard B. Sewall, et al. Harvard University Press, 66 pp, 2007. $125.

Harvard University Press has produced an oversize, luxurious, slipcased facsimile of a small personal objects—a 19th-century poet's personal collection of pressed plants.

Botanizing and creating personal herbaria were quite fashionable among young ladies in the 19th century, but the plant collection featured in this book belonged to Emily Dickinson and is one of the treasures of Harvard's Houghton Library. It is a fragile, rarely seen part of the Dickinson Collection that is at last accessible to scholars and to fans and gardeners—at least to those with $125 to invest in this faithful and exquisite digital reproduction.

While a student at Amherst Academy, the young poet collected, pressed, and artfully arranged 424 plant specimens in a charming album. Her schooling in botany and horticulture is reflected in the care with which she assembled her herbarium: Most of the plants are identified in the poet's neat hand with scientific name and numbers that identify class and order according to the Linnaean system. The album's order, however, appears to be aesthetic rather than scientific; and data on where and when plants were collected is completely lacking, limiting its botanical value.

Nevertheless it is thrilling to turn the pages, knowing with what joy Dickinson picked the plants in her garden and in the fields and woods around Amherst; with what devotion to science she sat at her desk studying Amos Baton's *Manual of Botany for North America* to verify their identity; and with what wonder in the floral kingdom she pasted her specimens neatly on the 66 pages of her treasured herbarium. Dickinson scholar Richard Sewall provides context in a splendid introductory essay, "Science and the Poet," and Ray Angelo, associate of the Harvard University Herbaria, provides meticulous botanical scholarship.

Reprinted from *Plants & Gardens News,* Brooklyn Botanic Garden, Spring 2007

Cullina Book Takes Off

Native Ferns, Moss & Grasses – From Emerald Carpet to Amber Wave: Serene and Sensuous Plants for the Garden by William Cullina is a hit! Flying off bookshelves nationwide, this is the third book in the New England Wild Flower Society's award-winning native plant reference series published by Houghton Mifflin. Cullina, the Society's Director of Horticulture Research, brings a witty, playful approach to those plants too often thought of as mere background. "A garden without ferns," he writes, "is simply incomplete." And the critics have added to the excitement: "There is an elegance to the writing of Bill Cullina that is rarely found in reference books," says Dan Hinkley, author *of The Explorer's Garden.* Tracy DiSabato-Aust, author of *The Well-Tended Perennial Garden,* says, "His new book is an indispensable guide that I'll use while designing with these native beauties." "Bill Cullina has done it again ... an authoritative, readable, and enduring reference," observes *The American Gardener.*

Reprinted from *New England Wild*, Summer 2008.

Best Plant Finds of 2007

Species	Common Name	2006-07 Status	Found By	County
Arabis missouriensis	Missouri Rock Cress	Endangered	Jim McCormac & Cheryl Harner	Lucas
Arabis missouriensis	Missouri Rock Cress	Endangered	Kim High, W. Johnson, D. & J. Russeau	Lucas
Carex timida	Timid Sedge	Endangered	Dan Boone	Montgomery
Carex timida	Timid Sedge	Endangered	Rick Gardner & others	Miami
Castanea dentata	American Chestnut	Potentially Threatened	Mike Grote	Erie
Crataegus uniflora	Dwarf Hawthorn	Endangered	Rick Gardner	Vinton
Echinodorus berteroi	Burhead	Threatened	Denis Conover	Hamilton
Equisetum variegatum	Variegated Scouring-rush	Threatened	Rob Curtis & Dylan Stover	Summit
Gnaphalium viscosum	Winged Cudweed	Endangered	Jim Bissell & others	Ashtabula
Isoetes engelmannii	Appalachian Quillwort	Endangered	Rick Gardner & others	Scioto
Minuartia patula	Spreading Sandwort	Endangered	Rick Gardner & others	Adams
Oryzopsis asperifolia	Large-leaved Mountain-rice	Endangered	Rick Gardner & Megan Michael	Highland
Panicum yadkinense	Spotted Panic Grass	Endangered	Jim McCormac	Jackson
Panicum yadkinense	Spotted Panic Grass	Endangered	Rick Gardner & others	Adams
Panicum yadkinense	Spotted Panic Grass	Endangered	Rick Gardner & others	Hocking
Platanthera leucophaea	Eastern Prairie Fringed Orchid	Threatened	Sara Mason & Ron Huffman	Ottawa
Platanthera psycodes	Small Purple Fringed Orchid	Endangered	Dylan Stover	Summit
Platanthera psycodes	Small Purple Fringed Orchid	Endangered	Eric Durbin	Lucas
Poa paludigena	Marsh Spear Grass	Potentially Threatened	Dan Boone	Clark
Populus balsamifera	Balsam Poplar	Endangered	Len Mikles	Ashtabula
Prunus nigra	Canada Plum	Extirpated	Brian Riley	Lucas
Prunus nigra	Canada Plum	Extirpated	Brian Riley	Wood
Pycnanthemum verticillatum var. pilosum	Hairy Mountain-mint	Endangered	Rick Gardner & Tom Bain	Hocking
Rosa blanda	Smooth Rose	Threatened	Brian Riley	Wood
Sagittaria platyphylla	Elliptic-leaved Arrowhead	Extirpated	Marjie Becus	Hamilton
Schizachne purpurescens	False Melic	Endangered	Rick Gardner	Adams
Zizania aquatica	Wild Rice	Threatened	Tim Walters	Fulton

Source: Ohio Department of Natural Resources

http://www.ohiodnr.com/2007OhioBestPlantFinds/tabid/20357/Default.aspx

Bucking the Trend

by Darcie McKelvey

Wayne Buck is a long-standing donor to the North American Native Plant Society Seed Exchange, contributing seeds from his native perennials, trees and shrubs. This piqued our interest and a friend and I visited his property in August.

Wayne owns 2½ hectares (six acres) of rolling farmland west of New Hamburg, in Waterloo County, Ontario. He is fortunate to have diverse habitats. The soil is sandy loam, ideal for most plants. The area is hilly with moraines left by the last glacier. A stream runs through the property creating extensive wet meadows.

For the past eight years Wayne has been in the process of naturalizing. We found an unexpected adventure into several different habitats; each sported native herbs, shrubs and trees, including 15 species of oaks (11 are native to Ontario). Most of the plants were grown from seed including two 10-year-old bur oaks *(Quercus macrocarpa)* that produced their first crop of acorns last year. Wayne estimates the gardens host more than 300 species of plants. Included on his property are a tall-grass prairie, a sand prairie, an Appalachian shrub garden, a Carolinian floodplain, a wet meadow and pond area, and even a Great Lakes shoreline/alvar.

Wayne's mentor has been his son Graham. Graham began foraging in the countryside, taking on plant identification as a hobby after doing a course in plant taxonomy in his final year of university. When he visited a prairie in Brandon, Manitoba, Graham was given a bag of seeds and decided to grow them. But where? He was living in downtown Guelph, sans garden, so he spoke to his father about the possibility of using the farmland as a test plot. Wayne, who had been spending eight hours a week mowing two-thirds of his property "so that it looked like a park", was ready for a change.

They chose a six-metre by six-metre plot (20 feet by 20 feet) out by the road, in what had been a rough pasture. This was the beginning of the tallgrass prairie. Walking there today, along the mown pathway, reminds me of a pilgrimage into a labyrinth with over two-metre high (eight-foot) "walls" of blooming flowers.

Wayne and Graham started by pulling weeds by hand and burning the area in April. Gradually they extended the prairie, asking a local farmer to plough an adjoining section. Then, five years ago they decided to expand the prairie again into what had been a vegetable garden for 40 years! They grew buckwheat on the site in an attempt to control the seedbank firmly established by four decades of manure piles and weeds such as pigweed.

They sowed primarily Canada wild rye *(Elymus canadensis)* as a pioneer species. It became one of the kingpins of this prairie along with big bluestem *(Andropogon gerardii)* and Indian grass *(Sorghastrum nutans).* Many of the herbs were grown as plugs in an old colony house (a chicken house that Wayne converted into a greenhouse using salvaged windows). Some plants such as compass plant *(Silphium laciniatum)* and prairie dock *(Silphium terebinthinaceum)* were easy to grow. Some (butterfly milkweed or *Asclepias tuberosa)* were difficult. Others like colic-root *(Aletris farinosa)* were impossible. "It grew for two years in a flat but did not survive the outplanting. I have no regrets because I love to try everything once," says Graham.

Among the purple hyssop *(Agastache scrophularifolia),* sky blue aster *(Symphiotrichum oolentangiensis),* grey-headed coneflower *(Ratibida pinnata)* and seven species of native sunflowers (including Maximillian's, *Helianthus maximilliani)* are the plants that Graham is most proud of: yellow false indigo *(Baptisia tinctoria),* purple milkweed *(Asclepias purpurescens)* and great-plains grass-leaved goldenrod *(Euthamia gymnospermoides).* He grew them from seeds collected at tallgrass prairie remnants in the city of Windsor.

Still, local seed is always the first choice. Graham usually gathers seeds from genotypes as close to their home as possible since he is concerned with seed from the property passing into the surrounding countryside.

As the prairie has evolved, two plants came to predominate: false sunflower *(Heliopsis helianthoides)* and giant sunflower *(Helianthus giganteus),* which are truly "as high as an elephant's eye", as the song from the musical "Oklahoma" would have it. Many of the original plants like rattlesnake master *(Eryngium yuccifolium)* and blanket flower (*Gaillardia* spp.) have been overtaken by the taller species. Wayne calls it "succession in action".

Every April they burn the tallgrass prairie which now occupies almost a hectare (two acres). Wayne says, "I'll never forget the first time we attempted a burn. We had both taken courses, but I feared having a

fire get away and having to call the fire department. I had a hose hooked up. We had several shovels and rakes and other implements. I tilled up an area to act as a firebreak. I was really nervous. It turned out to be not much of a blaze."

The Bucks' Carolinian floodplain harbours woodland plants under a canopy of silver maple *(Acer saccharinum)*,white ash *(Fraxinus americana)* and black walnut *(Juglans nigra).* The latter produces six to seven wheelbarrow-loads of walnuts each fall; the squirrels spread them all over the property. Smaller trees, including the very rare cherry birch *(Betula lenta),* the endangered butternut *(Juglans cinerea)* and the rare and unusual pawpaw *(Asimina triloba)* were also planted. When a soft maple (silver maple) in this woodland died several years ago the Bucks decided not to cut it down. Woodpeckers have riddled it with holes. Several large limbs have fallen and were left to decompose naturally.

Also in the floodplain are fascinating herbaceous plants including green dragon, *Arisaema dracontium* (one of Ontario's species at risk), the unusual white trout lily *(Erythronium albidum),* twin-leaf *(Jeffersonia diphylla),* Virginia bluebells *(Mertensia virginica)* and hairy woodmint *(Blephilla ciliata).* This *Blephilla* grows in only one place in Ontario, along the Thames River. It was rediscovered after a 40-year absence by a friend of Graham's who gave him seed to plant in case it "disappeared" again. It is surprisingly easy to grow with hundreds popping, up on the floodplain. There are also swamp thistles *(Cirsium muticum)* which Wayne has taken some time to learn to identify. "I killed the first ones Graham grew here, thinking they were alien. He was peeved!"

Adjacent to the Carolinian floodplain is the shaded spring garden. It contains a typical woodland collection, including trilliums. The Bucks started in 1999 growing *Trillium grandiflorum* (white trillium) from seed. Although the plants are five years old now, they have yet to flower. There is also a small section dedicated to the flora of Pelee Island planted with the threatened blue ash *(Fraxinus quadrangulata),* the majestic Chinquapin oak *(Quercus muehlenbergii)* and the very rare hoptree *(Ptelea trifoliata).*

The pond and wet meadow gardens are only two years old, started when some plants were rescued from a local field about to be ploughed for the first time. To create the gardens Wayne blocked the culvert that shunted water under the driveway. Then he diverted rainwater from the barn roof and piped it to the wet meadow. Native plants such as winter-berry *(Ilex verticillata),* swamp milkweed *(Asclepias incarnata)* and the intensely-flowering blue vervain (*Verbena hastata)* share the space with a crabapple tree *(Malus* sp.*),* a gift from Wayne's father-in-law. "A great gardener, he was the one who got me interested in plants," says Wayne. His son Graham developed a love of Appalachian flora during a trip to Great Smoky Mountain National Park in 1999. Since then he has been collecting seeds in the southeastern United States and he has propagated Maryland wild senna *(Cassia marilandica),* mistflower *(Eupatorium coelestinium),* overcup oak *(Quercus lyrata)* and *Rhododendron* spp. They have found a home in his Appalachian shrub garden. Some of Ontario's rarest wildflowers are extremely common in Appalachia [hoary mountain mint *(Pycnanthemum incanum),* appendaged waterleaf *(Hydrophyllum appendiculatum),* white wood aster *(Eurybia divaricatus)* and wood poppy *(Stylophorum diphyllum)*] and, therefore, fit right in here. The Bucks have a strict rule about Ontario natives: unless they are extirpated in this province, the plants in their gardens are grown from seed collected in Ontario.

Graham also created an alvar garden in New Hamburg. He and Wayne trekked up to Manitoulin Island and loaded their pick-up trucks with rocks blasted along Highway 6 during road work. The flat rocks were laid on top of crushed stone and gravel to mimic the dry conditions found on alvars. The rocks were also placed around a white cedar (*Thuja occidentalis)* to provide shade for dwarf lake iris *(Iris lacustris).* Other plants growing in the garden are lakeside daisy *(Hymenoxis herbacea),* upland white goldenrod (*Solidago ptarmicoides)* and false pennyroyal (*Trichiostema brachiatum*), a small annual that seeds itself down every year. Death camas *(Zigedenous elegans),* like all lilies, took a long time to grow from seed to flower – in this case, four years.

The NANPS Seed Exchange is the source of many of the seeds planted in the Bucks' gardens. Wayne appreciates the opportunity it affords him and his son to add new species to their gardens while allowing them to share some of what they have grown with others. When you see seed donated by "wb" you'll now know something about the garden from which it came and the creative gardeners behind it.

Darcie McKelvey is a NANPS board member and last year's Seed Exchange Coordinator. Her own garden in Tottenham, Ontario boasts many Seed Exchange plants.

Reprinted from *The Blazing Star*, Newsletter of the North American Native Plant Society, Fall, 2004.

Rare Plants: Alders

by Linda Chafin

Alders, with 25 to 35 species in the genus *Alnus,* occur on every continent except Australia, reaching as far north as Greenland and Siberia, dipping into Africa along the Mediterranean coast, and following high mountains from Mexico down into South America. Most alder species are widespread – several, such as European black alder *(A. glutinosa)* and gray alder *(A. incana),* are circumboreal. A few are narrowly distributed – the Italian alder *(A. cordata)* is endemic to southern Italy and Corsica. But First Prize for "Weirdest Distribution" goes to our North American species, *Alnus maritima,* whose various common names – seaside or Delmarva alder, Georgia alder, and Oklahoma alder – point to its far flung locations.

From the first discovery of its extremely disjunct distribution there has been speculation about the cause. Widespread distribution by animals? Deliberate transport by Native Americans, who used alders in a variety of ways? Post-glacial retreat and restriction?

Current evidence seems to support the last hypothesis. There are three subgenera in *Alnus: Clethropsis, Alnobetula,* and *Alnus. Clethropsis* includes three species, two that occur in Asia and one in North America, *Alnus maritima.* It is likely that the ancestors of *Alnus maritima* crossed the Bering Straits land bridge into North America sometime during the Pleistocene. Once in North America, its ancestors may have spread across the continent, flourishing in the cold and wet Pleistocene climate. Pollen studies have shown that *Alnus* species were the most abundant tree genus in North America in the first few thousand years after the last glaciation; in the hotter, drier climate that followed, *Alnus* species retreated to wetland habitats. For *Alnus maritima,* all that remains of the Pleistocene glory days are three widely disjunct populations, separated by up to a thousand miles from one another, on the Delmarva Peninsula of eastern Maryland and southern Delaware, in south-central Oklahoma, and in northwestern Georgia.

Evidence supporting this theory includes the fossil remains of an alder, discovered in the Pacific Northwest, that appears to be intermediate between a south Asian species and *Alnus maritima.* Also, long-distance dispersal, whether by animals or humans, usually results in the disjunct populations being genetically and morphologically similar. In the case of *Alnus maritima,* plants from the three populations differ significantly with respect to leaf shape, infructescence size and shape, and growth form.

These differences suggest that, over several millennia of isolation from one another, the three groups of plants have evolved away from their common ancestor under the pressure of different environments. On the Delmarva Peninsula, where the species was first discovered, *Alnus maritima* grows in acidic soils along streams flowing into the Atlantic Ocean and Chesapeake and Delaware Bays. In Oklahoma, the plants occur in alkaline soils on stream banks of the upper Blue River and its tributaries. The lone population in northwest Georgia grows in acidic soils along a spring-run, in the partially wooded pond (Drummond Swamp) that it feeds, and in an adjacent pasture.

Alnus maritima is a tall shrub, 3.5 - 9.5 meters tall, superficially resembling the widespread North American alders such as tag alder *(A. serrulata)* and gray alder *(A. incana).* What sets it apart from other North American alders are several features related to its reproduction. *Alnus maritima,* like the other members of its subgenus but unlike any other alder in North America, produces its seed-bearing infructescences ("cones") singly in leaf axils; our other alders produce cones in clusters of 2-6 on short branchlets. *Alnus maritima* cones are big, up to 2.8 cm long x 2.2 cm wide, larger than the cones of other eastern North American alders. While other North American alders produce immature inflorescences in the fall and then flower early the following spring, *Alnus maritima* begins to develop inflorescences in the spring but does not actually flower until late summer or fall, a pattern found in alders only in the subgenus *Clethropsis.* For

A. maritima, the late flowering and subsequent winter seed dispersal may reduce seed germination and contribute to its limited distribution.

In each of the four states where it occurs, *Alnus maritima* is tracked by Natural Heritage Programs. Subspecies *georgiensis* is ranked as critically imperiled; subspecies *oklahomensis* is ranked as imperiled; and in Delaware and Maryland, subspecies *maritima* is ranked as uncommon. It seems to be one of those plants that is "rare but locally abundant" And who knows? There may well be other populations out there. Those of us who like to tramp around in wetlands should keep an eye out for a late-flowering, large-coned alder.

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Reprinted from *Chinquapin*, the newsletter of the Southern Appalachian Botanical Society, Vol. 16, No. 2, Summer 2008. Illustration by J.C.Putnam.

Those Really Busy Bees

Tristram Seidler, Seed Ecologist

It is a still, warm, early spring morning at Garden in the Woods, and the sun glances off the first wildflowers of the season. I'm walking softly, almost creeping toward a large bed of blooms, watching intently and feeling a little silly. I'm not hunting marauding deer, hungry rabbits, or even a sleepy dormouse. I'm stalking the wild bees, butterfly net in hand. It's early for bees, but some are already flying: bumblebees and carpenter bees, Andrenid bees and mason bees, and various others, mostly small and inconspicuous.

By catching these and identifying them, I hope to establish a baseline on bee diversity in the Garden. The smaller bees are attracted to the yellow trout lilies today, bypassing the violet Virginia bluebells, the white dutchman's breeches, and the pink bleeding heart. Suddenly I hear the approaching drone of a bumblebee, which stops in a patch of wildflowers for a quick pick-me-up before flying to examine the bases of nearby trees for a hole that might serve as a nest to raise its brood. Farther on, a huge carpenter bee hovers inquisitively in front of the sunny wall of an old shed.

All bees visit flowers in their quest for nectar and pollen, and most will visit whatever is blooming. Although a few bees specialize in a single plant species, you can generally expect to see a variety of bees visiting a given plant. As they buzz around collecting food, they unintentionally act as a door-to-door pollen delivery service, providing the plant with a crucial step in its life cycle. If you have edible fruits in your garden, you may notice that good pollination will increase your yield of apples, blueberries, and many others. And although most plants have a backup plan against temporary pollinator failure—clonality, self-compatibility, or just longevity—in the long run, without pollinators a lot of plants would die out.

The soft humming noise warning you not to put your nose too close to that fragrant azalea blossom comes from the flight muscles of a bee. Her buzzing while still inside the flower tells you right away that she's not a visitor from your neighbor's honey bee hive. Instead, she's one of many species of native bees, those humble bumblers and underappreciated providers of sexual services to flowering plants. When a honey bee lands on a flower, it settles in for a moment and stops buzzing while it rummages for nectar and fills its leg pouches with pollen. But many native bees have another trick up their fuzzy sleeves: They're able to disengage their flight muscles from their wings, causing their whole body to vibrate. This "buzz pollination" shakes pollen right out of the anther like salt from a shaker. In plants with hard-to-reach stamens (cranberries, blueberries) or tubular stamens (tomatoes, peppers), buzz pollination is especially effective for increasing fruit yield.

For this and other reasons, native bees are vastly more efficient pollinators than honey bees. Sheer numbers and portability give the honey bee an advantage. But native bees emerge earlier in the spring, start work earlier in the morning, fly more quickly from flower to flower, and deliver more pollen to receptive stigmas.

Of course, bees are not the only native pollinators. Butterflies, hummingbirds, wasps, flies, bats, and beetles do their share, but bees are by far the most important, performing some 85% of animal-mediated pollination. And they have been around for a long time, at least 120 million years. Today there are over 4,000 species of native bees in North America. They include bumblebees, cuckoo bees and carpenter bees (family Apidae), mason bees and leafcutter bees (family Megachilidae), sweat bees (Halictidae), plasterer bees and yellow-faced bees (Colletidae), and Andrenid bees (Andrenidae). Every species of bee feeds on nectar pollen, so nearly all are pollinators, but otherwise they differ hugely from one another. For instance, only bees in the family Apidae are truly social (like honey bees), living in a hive with a queen and workers. The rest are "solitary," which means that each female, after being fertilized by a male, builds her own nest and lays her eggs in it. The eggs develop, with little or no parental care, and each new bee that hatches out goes off on its own.

No matter the size of your garden, you can do plenty of things to encourage native bees. As with any animal, a bee's main needs are food and shelter. To enhance food availability, plant a variety of flowering trees, shrubs, and perennials so that something is . always in flower, spring through fall. Shelter can be hard to come by and bee populations are often limited by housing rather than food. Different bees require different resources for shelter, so if you want to maximize diversity of native bees in your garden, try the following suggestions.

First, allow for some undisturbed habitat in a corner of your garden, where you don't mow, prune, or weed, as a lot of bees are sensitive to disturbance. Create a brush pile in an inconspicuous shady spot. To make nesting habitat for digger bees and other ground-dwelling solitary bees, remove the vegetation in a small sunny area, and if your soil isn't very sandy, dig a hole and fill it with a soil/sand mixture. Finally, if you have a snag (standing dead tree), remove some of the bark, and it will be used by carpenter and mason bees.

If you lack space to create these natural habitats, don't despair. You can build several types of native bee shelters that won't look out of place even in a small urban garden. Mason bees, leafcutting bees, and other solitary bees will use tunnels drilled into wood blocks, or hollow stems such as reeds, teasel, or bamboo. Cut these in six-inch lengths with one end closed, and put bundles of them in a sunny spot, protected from wind and rain. The more tunnels you can make available (in different diameters for different species), the more bees you will have the following year. A bumblebee nest can be made from a wood box with a ¾-inch diameter entrance tube and some cotton pillow-stuffing inside (they usually take over abandoned field-mouse nests). Place these boxes close to the ground in a shady spot. For instructions on building shelters for native bees, visit the Xerces Society for Invertebrate Conservation at www.xerces.org.

Even before you have enhanced your garden's bee habitats, you can enjoy the insect activity at blooming plants on a warm afternoon. You may be astonished at the variety of insects that will pay a visit. You can distinguish bees from wasps: most bees are fuzzy; most wasps, hairless. Some flies are impressively disguised as bees, but flies lack antennae (and have only two wings instead of four, though this can be harder to see). Honey bees may still be common, but you will see the larger bumblebees, the smaller (sometimes metallic green) sweat bees, and dozens of others ranging in length from an eighth of an inch to an inch or more.

As you watch them come and go, gathering nectar and pollen at your favorite blooms, you can delight in the knowledge that, just by gardening with native plants, you are increasing the abundance and maybe even the local diversity of our amazing native pollinators—those *really* busy bees.

Reprinted from *New England Wild*, Summer 2008.

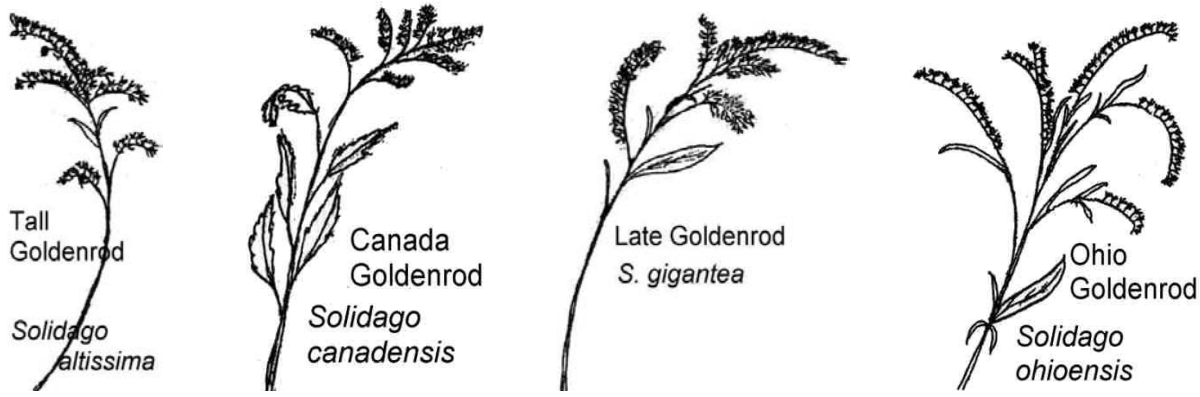
Bumble bee picture from the Warwick & Leamington Beekeepers web site:
www.warleambees.org/swarms.htm

Native Bees and the Honey Bee Crisis

The cause of the recent decline in honey bees *(Apis mellifera)* remains mysterious (viruses, mites, pesticides?). Honey bees are not native to North America, but they provide important services by making honey and pollinating many commercial crops, from almonds to watermelons. Hives are trucked from farm to farm and rented to commercial growers. Brought in just in time to fertilize cranberries or peaches so they set tons of fruit, the bees are then whisked off to the next farm, leaving the grower free to apply pesticides.

The honey bee decline is hurting the bee business and sending the cost of some crops soaring. In response, some growers are looking at alternative pollinators, especially native bees. A few species have been cultivated to replace honey bees for certain crops. But for most crops, the only alternative is wild native bees, which can be encouraged by reducing pesticide use and setting aside fallow areas and hedgerows for nest sites and alternative food sources (native flowering perennials).

In short, the honey bee decline may actually have a silver lining: It may lead to more sustainable farming practices and a greater appreciation for our native pollinators. As pollinators, native bees outperform honey bees on a bee-per-bee basis, but getting enough of those busy little natives happily buzzing around your orchard—that's the challenge.



Weeds or Fall Flowers?

Robert L. Tener

One asks sometimes, "what is a weed?" The answer seems obvious until one starts to cut in the fall a few blooming plants that have attracted admiration. Then suddenly what was once unfairly called a weed, becomes a flower. This is what has happened ever since we bought a small over-worked and run-down farm about 20 years ago, and I then had a chance to watch fall bloom on a few worn-out acres. While mowing our meadow to prevent the European Buckthorn from running rampant, I fell in love with the delicate beauty and rich flaming yellows of Goldenrods and Sun Tics that grew in dense tall clusters in the meadow.

With a little bit of reading in some of my books on plants, I discovered that of the different Goldenrods I had found on our land, the one that most caught my eyes was called "Rock Goldenrod" or "Yellow-Weed." Botanists call it *Solidago canadensis* Compositae. Some books referred to it unfairly as a coarse "weedy herb." Its dense lance-like leaves are toothed; its stalks can reach six feet and are slightly branched. Its yellow flowering top is also branched into swaying golden arches. The other goldenrods which I managed to identify among what I learned was probably over a hundred different kinds are Tall Goldenrod *(S. altissima*, 3-6 feet), Ohio Goldenrod (*S. ohioensis,* which has a flat flower top, very slender lance-like leaves, and reaches 2 to 3 feet), and Late Goldenrod (*S. gigantea.* with purple stems.) All four are magnificent when in full bloom between August and October with their full load of rayed flowerets.

Not only are these garden-beautiful blooms, especially when associated with other plants such as Asters or Buttercups, but I learned that in seventeenth century England when they were imported from their native America, they were "extolled... for the stopping of bloud in bleeding wounds." Clearly these are wonderful flower-herbs native to America; they should not be referred to as "weeds." They do have some economic value. Nor do they cause hay fever which is caused by ragweed (*Ambrosia* spp).

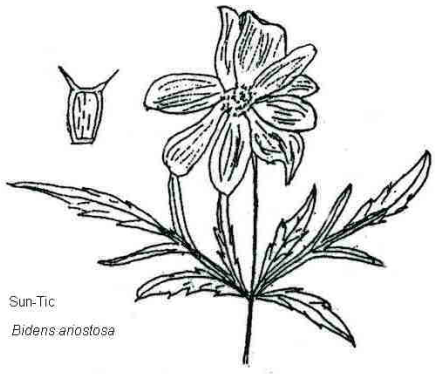
In general these four Goldenrods prefer to grow in open land, sometimes even worn out clay, close to woodlands or open thickets in soil that tends to retain some moisture. They like full sun or some shade and are very hardy perennials. Of the several that are commonly used to adorn gardens, the following cultivars are popular: Cloth of Gold (dense yellow), Crown of Rays (bright yellow), Goldenmosa (large yellow flowers), and Golden Thumb (fluffy yellow). The genus name *Solidago* comes from the Latin *solido* meaning to make whole or strengthen, referring to its medicinal properties.

The Tickseed-Sunflower or Bur-Marigold is a flaming yellow wild flower that blooms in early September. Native to Ohio, it has been unfairly called a weed, perhaps because it was called a Tickseed. I prefer to call it a Sun Tic, and I have kept a special place for it here at our High Hawk private arboretum.

Where a stream crosses under our lane to empty into our pond, the ground stays moist all summer. There the Sun Tics grow into a fine thicket of tall, slender green plants with sharply indented slim oval leaves. By early August the small Sun Tic buds start to form and then explode in a blazing gold-yellow cloud that catches the eye. I make sure that I do not mow that particular area from early June on as the flowers take almost three months to reach maturity.

We pick a few to put in an indoor vase filled with water. At night the petals tend to close slightly and then in the morning's sun they spread their rays to catch the light. They seem to me to be a breath of sun through the wind of our imagination. Botanists refer to them as *Bidens aristosa*, a member of the Compositae family. They are perennials with individual plants being 2 to 5 feet tall, having daisy-like flowerets. They are called *Bidens*, from Latin *bis* meaning twice and *dens* for tooth because of their tooth-like shape and the two horn-like awns or bristles at the wider end of their rectangular shape. Another species, though not as attractive, is called *B. polylepis*.

A few of the Sun Tics grow throughout our eastern and southern meadows where drainage shallows occur and which I mow only once a year in October. They are part of the lovely wild flowers that grace our land in autumn.



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Fall 2008 Program Schedule

Sun., Nov. 23, 1:30 pm. "Ohio's Natural Heritage." At the Cleveland Heights Main Library on Lee Road in Meeting Room A. From approximately 1:30 pm to 2:45 and followed by any questions, Tom Sampliner will present a pictorial survey of the plants, birds, animals, insects, fungi and habitats of our native state. It progresses through the season giving a naturalist's perspective of our heritage.

Planting a Prairie in Barrie, Ontario

by Peggy Wong

[Ed. Note: This tall grass prairie is now (2008) one of the Society's permanent theme gardens. See their web site at http://www.barriegardenclub.com/arboretum.html]

One Friday afternoon several years ago, Barrie Arboretum staff ran out of time to cut the grass in a small valley at the back of the site. A quick decision was made to mow a broad pathway down the center of the valley, following the lay of the land, and get back to it on Monday. As it turned out, though, the pathway through the long grass looked so inviting that we decided it should became a permanent feature of the Arboretum, and the valley was christened "The Meadow."

The meadow was left relatively undisturbed for two seasons. In the absence of mowing, the land was carpeted with grasses and flowering plants: dandelion, yarrow, hawkweed, plantain, goatsbeard, prunella, Queen Anne's lace, strawberries and thistles. The diversity of insects, butterflies and birds increased dramatically. The meadow hummed! Even our human visitors grew accustomed to the new 'habitat.' We felt it was a success... But was it?

Last fall, we looked more closely at the plants growing in the meadow and were disappointed by the lack of diversity. Moreover, with the exception of one goldenrod clump and some of the grasses, there were no native plants. The meadow was comprised of plants descended from seeds brought by the early European settlers.

Interested Barrie Horticultural Society (BHS) members formed a working committee to look at ways to introduce native plants to the meadow and research began. We learned that, historically, the southern Ontario tallgrass prairie/savanna plant communities extended north into our county and that in the mid-1980s an inventory of remnant tallgrass prairie plants had been prepared for the Ardagh Bluffs, several miles south of the Arboretum. We realized that it would be challenging, but not impossible, to obtain indigenous plants for our project.

Starting the meadow had been easy, as all it involved was not cutting the grass. But introducing native tallgrass prairie plants was another thing. Our BHS volunteers and staff were already stretched to the limit, so we started small with an area 3 meters by 6 meters (10 ft by 20 ft) and a budget of under $200.

We made lists of desirable plants, based on the Ardagh Bluffs report and *Planting the Seed: A Guide to Establishing Prairie and Meadow Communities in Southern Ontario*, published by Environment Canada. Then we went shopping at the NANPS spring plant sale and had no trouble at all spending our allocated funds. Although we couldn't get everything, our planting list included: big bluestem *(Andropogon gerardii),* New England aster (*Aster novae-angliae*), sky blue aster *(Aster oolentangiensis),* tall sunflower *(Helianthus giganteus*), common evening primrose *(Oenothera biennis*), wild bergamot (*Monarda fistulosa*), grey-headed coneflower (*Ratibida pinnata*), little bluestem *(Schizachyrium scoparium*), stiff goldenrod *(Solidago rigida*) and Indian grass (*Sorghastrum nutans*).

Planting the prairie plants within the meadow was a challenge because major digging was not an option. (Our working committee consisted of three middle-aged women and one expectant mother.) So we used the 'lasagna garden' technique, and it worked like a dream. The day before planting, the Arboretum staff cut down the meadow plants in the prairie site using a whipper snipper, and set out piles of compost, grass clippings and mulched leaves. On Saturday morning we arrived with a wagonload of newspapers. We covered the prairie site with a 2 cm (3/4inch) layer of newspapers, soaked thoroughly. Then we applied the organics in layers: 8 cm (3 inches) of compost, 2 cm (3/4 inch) of grass clippings and 8 cm (3 inches) of mulched leaves, watering well between layers. We repeated the organic layers and the watering, and planted the prairie plants directly into a deep bed of moist compost. Total time three hours!

We didn't have any funds in our very small budget for a cover crop to keep the weeds down. To our delight, though, we received a phone call from a BHS member who wondered if the Arboretum could use three flats of Canada wild rye (*Elymus canadensis*), the perfect cover crop.

Despite the mid-summer drought, the baby prairie was watered only once during its first season. Weeding was hardly an issue: the newspapers kept weeds from growing through, and stray seedlings were hand-pulled. Occasional edging with a sharp spade kept the yarrow, plantain and strawberries from encroaching around the edges .

Our tallgrass prairie project, initiated by a staff shortcut, has given BHS the opportunity to reintroduce indigenous flora to the Barrie Arboretum. We are making plans for expansion next summer using locally sourced plants and seeds, with guidance from Ministry

of Natural Resources specialists. As the prairie gathers its own momentum, we hope that it will provide habitat for insect, bird and animal species and demonstrate our unique tallgrass prairie heritage.

Peggy Wong is a Director of the Barrie HorticulturaI Society. As a volunteer, she coordinates the Barrie Arboretum, a joint project of the BHS and City of Barrie. The Barrie Arboretum is located within Sunnidale Park at the corner of Sunnidale Road and Cundles Road in northwest Barrie. Ontario

Reprinted from *The Blazing Star*, the newsletter of the North American Native Plant Society, Winter 2002

Shrubby Cinquefoil

Gordon Mitchell

Most people who are familiar with our local wildflowers will probably know of the local Cinquefoils: our native Common Cinquefoil (*Potentilla simplex* Michaux) and our non-native Rough-fruited Cinquefoil (*Potentilla recta* L.). Although both of those species are herbaceous plants, there is one native Cinquefoil species that is actually a shrub. That plant is the Shrubby Cinquefoil (*Dasiphora floribunda* [Pursh] Kartesz).

The Shrubby Cinquefoil is a member of the Rose Family (*Rosaceae*) and of the *Rosoideae* Subfamily. Previous scientific names for this plant have been *Dasiphora fruticosa* (L.) Rydberg, *Pentaphylloides floribunda* (Pursh) A. Love, *Pentaphylloides fruticosa* (L.) O. Schwarz, and *Potentilla fruticosa* L.

The name Cinquefoil is French, meaning "5 fingers", because of its 5 leaflets. Some other common names for this plant are Bushy Cinquefoil, Five Finger, Fruiting Cinquefoil, Golden Hardhack, Widdy, and Woody Cinquefoil.

Uses

Both the Native Americans and the early European settlers had various uses for the Shrubby Cinquefoil. This plant's main use was in the form of a tea made from the leaves, the roots, and the stems. After steeping those plant parts for 5-10 minutes, the tea made a mild and pleasant summer beverage. This tea was also used as a mouthwash and as an astringent for treating colds and sore throats.

The Shrubby Cinquefoil had other uses as well. The leaves were used as a spice and as a deodorant. The leaves were also used as stuffing for mattresses and pillows. The bark was used as kindling. Finally, a few Native American tribes used various parts of the plant for ceremonial purposes.

People have differing opinions on the Shrubby Cinquefoil. Some people may see it as a nuisance plant. Even livestock will not eat this plant. However, other people may see it as an attractive landscape ornamental.

Description

A low-lying perennial shrub.
Height: 1-6½ feet.
Stem: Multi-stemmed. Woody. Red-brown. Young stems are hairy or velvety.
Bark: Red-brown or gray. Loose. Shreddy. Stringy.
Twigs: Brown to red. These twigs have hairless buds and have raised leaf scars with single bundle scars.
Leaves: Deciduous. Alternate. Pinnately compound with 5 (or 3-9) leaflets. The upper 3 leaflets may be united at their bases. Each leaflet is about ½-1½ inch long, is narrow, lanceolate, oblong, or oval, and is tapered at both ends. Its margins are entire and may curl inward. The leaf is olive-green and silky or smooth at the top and is white or pale green and downy on the bottom. The petioles are short and hairy. There are also 2 pointed papery stipules at the base of the petiole.
Flowers: Yellow (However, the insects' eyes may see them as purple). The flowers may be arranged solitarily or arranged in a small cluster at the branch tops. Each flower is radially symmetrical, about ¾-1 inch wide, and has 5 broadly rounded and separate petals, 5 pointed ovate green sepals, 5 long and narrow bracts that alternate with the sepals, several hairy pistils, and about 15-20 stamens. This flower is usually insect-pollinated, but can also be self-pollinated. Flowering season is usually June to October.
Fruit: A cluster of dry and hairy achenes. This fruit is pear-shaped and green when young, but turns brown with age. The persistent sepals usually enclose the fruit.
Habitat: Fens and other alkaline areas, wet meadows and pastures, steams, and shorelines.

Gordon Mitchell works for the Columbus, Ohio, Metroparks.

Ohio Prairie Plants

John Blakeman, Ohio Prairie Association

Species listed below are generally regarded as Ohio prairie "biggies"... species that are very commonly encountered in Ohio prairies. These selections are arbitrary and hold no special, ecological significance. This incomplete list (March 2007) is only intended to acquaint non-prairie people with common prairie plant species that flourish in Ohio. Many of these species are found in both prairie and non-prairie Ohio habitats. The complete listing of prairie species (and other helpful information) can be found at *http://www.ohioprairie.org/id31.htm* - the Web Page of The Ohio Prairie Association. [Ed note: The list has been considerably expanded by August 2008.]

Species for the Ohio Prairie Garden:

Allium cernuum - Nodding Onion
Andropogon gerardii - Big Bluestem Grass
Asclepias sullivantii - Sullivant's Milkweed
Baptisia leucantha - White Wild Indigo
Bouteloua curtipendula - Sideoats Gramma Grass
Cassia fasciculata (now *Chamaechrista* sp.) - Partridge Pea
Cicuta maculata - Water Hemlock
Coreopsis tripteris -Tall Coreopsis
Echinacea purpurea - Purple Coneflower
Eryngium yuccifolium - Rattlesnake-master
Euphorbia corollata - Flowering Spurge
Helianthus giganteus -Tall Sunflower
Helianthus grosseserratus- Sawtooth Sunflower
Helianthus hirsutus - Stiff-haired Sunflower
Helianthus mollis - Downy Sunflower
Lespedeza capitata - Roundheaded Bushclover
Liatris spicata - Dense Blazingstar
Lilium michiganense - Michigan Lily
Monarda fistulosa - Wild Burgamot
Panicum virgatum - Switchgrass
Penstemon digitalis - Foxglove Beardtongue
Pycnanthemum tenuifolium - Slender-leaved Mountain-mint
Pycnanthemum virginianum - Virginia Mountain-mint
Ratibida pinnata - Prairie (yellow) coneflower
Schizachyrium scoparium - Little Bluestem Grass
Silene regia - Royal Catchfly
Silphium terebinthinaceum - Prairie Dock
Silphium trifoliatum - Whorled Rosinweed
Solidago ohioensis - Ohio Goldenrod
Solidago riddellii - Riddell's Goldenrod
Solidago rigida - Stiff (Prairie) Goldenrod
Sorghastrum nutans - Indiangrass
Spartina pectinata - Prairie Cordgrass
Sporobolus heterolepis - Prairie (Northern) Dropseed
Tradescantia ohiensis - Ohio Spiderwort
Veronicastrum virginicum - Culver's-root
Zizia aureus - Golden Alexanders

Gentiana saponaria: The Soapwort Gentian

by Gene Bush

Walking the woodland edge in autumn could yield an experience never to be forgotten. With luck, you may have an opportunity to see *Gentiana saponaria,* or the soapwort gentian, in full bloom.

The soapwort gentian grows from about one to two feet in height. I have heard three feet in a garden, but not in mine. Stems begin the season upright, but as they get longer, the stems arch over to lie on the ground. As the buds form, stems arch back up to keep the blooms off of the forest floor, forming an 'S.' The 'S's radiate out to form a central root stock. Up to eight flowers are carried in clusters at or near the end of each stem.

Blooms are more toward the purple side of blue in color. As the blooms age, the veins darken to a violet-purple, giving the clusters a two-toned effect in color. Blooms are about one inch in length. Each bloom is shaped like an old-fashioned GE Christmas tree bulb in my mind's eye. Some call the blooms club-shaped. The blooms do not open so there is always an air of expectancy about the plants. Perhaps the appearance is of always a bud, but never a bloom.

Blooms have an amazing internal structure. The 'closed' end of the flower is not sealed, but overlapped. There are pleats, or folds, toward the top of the flower as in an accordion. Darwinism definitely at work here, for only the most fit need attempt to enter. It takes a rather large and strong bee to force the folds apart and make an entrance for the nectar at the bottom of the bloom. After feeding, the bee must then force its way back out. Occasionally they will spend overnight in the blooms. I have picked up trays of plants in bloom in the nursery in early morning hearing the flowers give a buzz-buzz as bloom stems sway to my steps.

Generally, the plants are found along the outside edge of a wood, or if inside, located in openings. They can also be found in woody thickets. Usually the areas will be in or near seepage areas, or lowlands that flood on occasion.

Success in the garden with soapwort gentian is dependent upon mimicking Mother Nature. Give your plants high open shade, preferably an eastern exposure. Too little light and bloom production is reduced. Too much sun causes the foliage to yellow and the blooms to wash out in color. Extra moisture is not an absolute if transplanted into a decent soil containing compost, mulching with chopped leaves or hardwood fines to retain moisture levels. Know your soil pH, for the soapwort gentian wants to be free of lime.

Most gardening literature ignores the range of this native plant when assigning a hardiness rating of zones 6 to 9. I know for certain it is hardy to zone 5 and probably well into zone 4.

In my garden I see the soapwort gentian come into bloom the latter part of August and it will still be flowering in mid-December. It is not unusual to see the blooms with snow on them. Imagine if you will, those intense blue gentian blooms with the fall colors of foliage drifting down to frame the plants in shades of red, yellow, and russet. Add companions such as the Great Blue Lobelia *(Lobelia siphilitica)* or Cardinal Flower *(L. cardinalis),* the Turtleheads, white *(Chelone glabra)* or pink *(C. lyonii),* Grass of Parnassus *(Parnassia glauca)* and ferns.

Soapwort Gentian
(Gentiana saponaria)

Gene Bush is owner of Munchkin Nursery & Gardens LLC *and gardens on his hillside shade garden in Southern Indiana. You can write to him at 323 Woodside Dr NW Depauw, IN 47115-9039 for a hard copy catalog ($4). His web site is:* *www.munchkinnursery.com/*

Reprinted from the *Indiana Native Plant and Wildflower Society News*, Winter 2003

The Old Gall Game

Larry Englander

If I may corrupt the first sentence from Caesar's *Gallic Wars*, "all *galls* are divided into *four* parts." Galls are fascinating plant excessive-developmental structures. They may be caused by (1) insects and mites, (2) fungi, (3) nematodes, or (4) bacteria, in intricate interactions that certainly favors the interloper yet, with a few notable exceptions, often does little or no harm to the host plant. In fact, on legumes the nitrogen-fixing nodule-producing bacterium, *Rhizobium,* is clearly beneficial to the plant host. In the opinion of this cultivator and observer, many plant galls provide added visual interest to the plant as well as a fascinating back-story.

Auxins (e.g., IAA) are plant growth regulators, and can cause proliferation of tissue. In the case of galls, they may be introduced by insect or microorganism secretions, or by their stimulating the plant itself to produce an additional amount, or through the inhibition of the plant's mechanism for degrading excess auxin. It is the overabundance of such substances that incite plants to form galls.

Plants, with their almost unique ability to harness energy from the sun, are frequently called upon to provide sustenance to other less endowed organisms, including ourselves. Aside from the more obvious brutal tactics of many parasitic pathogens, and phytophagous insects that chew holes or suck juice from plants, there are those which are less evident.

Insects and mites

We all know leaf mining insects. These insect larvae protect themselves during their nefarious activities by remaining just under the surface of plant organs such as leaves, meticulously leaving the epidermal layers intact, and not emerging until they mature. However, as most of us have experienced, the evidence of leaf miner activity is obvious. Each summer, those intricate serpentine patterns on our columbine leaves or the blistered leaves of birch gives testimony to the activities of the insect larvae grazing inside.

Far more sophisticated and surreptitious are those insects which secrete auxins that instigate plants to proliferate cells locally, forming galls that physically protect and camouflage the larva's activities. There are numerous types of galls that, because it is the plant itself forming these structures, look like they belong to or are part of the normal plant. We plant-people often know better. A timely, deft slice with our handy pocket knife confirms the presence of the culprit(s) inside.

There are numerous species of wasps that have a requisite larval residency inside oak leaves, causing formation of one type or another gall (the smooth 'oak-apple', the hairy wool-sower, etc.). Many aphid species spend much of their lives proliferating their kind inside a gall they cause to form on various plants to which the insect species is specifically obligate, such as the leaves and petioles of cottonwood, and the branch tips of spruce (pineapple gall). Some even alternate their habitat to different locations or host types during their life cycle. Certain fly larvae cause galls to form on plants, one common example being found on goldenrod stems. Mites can also instigate galls to form on various parts of diverse plant species.

Lest you think that all galls are incited by insects and their mitey relatives, I emphatically point out that for many, there are other types of causal agents.

Fungi

Plants react to certain invaders by producing a localized overabundance of cells. In the case of crucifers infected with the Club-Root pathogen (recently reclassified as a protozoan), root cells can swell up to five times their normal size, and potato-like structures develop on the normally fibrous roots, but only in acidic soils. Azaleas may become infected with a fungus that causes showy leaf and flower galls to develop in the spring. Juniper/Eastern Redcedar frequently sport a woody, brown, spherical gall patterned like a soccer-ball, an inch or more in diameter. These galls look like they are a normal plant part, but in fact they were caused by the presence of a fungus that causes the disease, Cedar/Apple rust. During the first warm spring rains, the fungus in these Juniper galls bursts forth with long, orange, finger-like spore-bearing structures which release spores that blow to leaves of plants in the apple family, where they cause yellow pimples, then orange blisters. To complete its disease cycle, spores from apple infections must return to and infect Juniper, where new galls will form.

Nematodes

Certain root-inhabiting nematodes, such as the Cyst, and the Root knot nematodes, penetrate plant roots and stimulate cells right around their head to increase many times their normal size. These provide a long-term

feeding site for these sedentary nematodes. In the case of the Root knot nematode, root cells surrounding these gigantic cells are incited to proliferate wildly, forming visibly-large, protective root galls (the 'knots') around the nematodes.

Bacteria

Of the several bacteria that produce galls on plants, *Agrobacterium tumefaciens* stands apart as the *piece de resistance* of host modification by a pathogen. The disease it causes on woody and herbaceous hosts is Crown Gall, and just about any plant part may be afflicted.

The bacteria enter a fresh wound. In response to chemicals released by plants when wounded, the bacteria are inspired to inject, from their Ti (tumor inducing) plasmid a piece (called T-DNA, or tumor DNA) into the plant cell's nucleus where it inserts itself into the plant's DNA, where it then stimulates the synthesis of growth regulators that make those intruded plant cells into tumor-producing cells. These divide excessively, no longer under the control of the plant (or the originating bacteria). A rough-surfaced, often convoluted gall develops, and sometimes may enlarge to the size of one's fist.

As intriguing as this is, we need to avoid bringing plants with Crown Gall disease into our gardens and, if found there, they should be meticulously removed and discarded in the trash, not the compost pile. Nursery plants with Crown Gall are not permitted to be sold, and infested fields can be banned from further cultivation of plants or produce which might transport contaminated soil off-site.

A fascinating side story is the connection between this bacterium and genetic engineering, as it paved the way for inserting into plants the genetic material from diverse sources. Utilizing the ability of *A. tumefaciens* to insert functionally its nuclear material into a plant, scientists developed procedures to use its Ti plasmid by first removing the undesirable part that induces tumors, and attaching genes with desired traits from all sorts of other plants and even animals. The bacterium then does its magic and inserts this new genetic material into a host plant. In fact, now techniques allow the insertion of the genetically-engineered Ti plasmid directly into a plant cell, bypassing the need to use the bacterium as the vector.

So the ingenious mechanisms devised by parasites to live off the work of plants have now been used by humans, the ultimate parasite, in an attempt to enhance their health and society. This ability of various invaders to modify and take up residence in plant organs may give new meaning to Stephen Foster's words, "be it ever so humble, there is no place like home."

Reprinted from *Notes of the Pennsylvania Native Plant Society*, Oct-Dec, 2007

The Death of the Figwort Family is Greatly Exaggerated It's just been dismembered!

By Scott Ranger

During mid-2000 rumors abounded that the easily recognized figwort family (Scrophulariaceae) was about to be entirely dismantled and subsumed into other families of the mint order (Lamiales). With the general acceptance that the even easier recognized milkweed family (Asclepiadaceae) has been swallowed by the dogbane family (Apocynaceae), traditional field botanists cried out, "Not again!"

It takes little effort to demonstrate the ease with which this family can be recognized, both in the field and in the horticultural trade. Almost everyone looks at snapdragons *(Antirrhinum),* foxglove *(Digitalis),* speedwells *(Veronica),* figworts *(Scrophularia),* beard tongues *(Penstemon)* and sees structural (morphological) similarities that seem evidence of close relationship. When I met Linda Chafin (now of the Florida Natural Areas Inventory Program) at Rock and Shoals Outcrop near Athens where she first saw snorklewort *(Amphianthus pusilus),* she remarked, "Wow, it's a scroph!" I was impressed, as this little guy must be appreciated with a hand lens and usually while lying flat on the hard granite next to an outcrop pool. She clearly had in mind characters that define the figwort family.

Traditionally, and formally recognized in Bentham's seminal works of 1846 and 1876, figworts are recognized by having bilaterally symmetrical flowers, usually tubular; ovaries with axial placentation (seeds attached to the inner column of the ovary) and numerous ovules; fruits acapsule; and, seeds with endosperm. They are usually field-separated out from the mints (Lamiaceae) by lack of square stems, usually

lacking oil glands (no minty smell) and often having five stamens as in *Penstemon.* However, on close examination of the family as traditionally circumscribed, there is a notable lack of unique distinguishing traits. This has led to the suspicion that the traditional grouping is not natural, polyphyletic rather than monophyletic (of multiple family trees rather than a single family tree).

If you've been following our irregular articles on cladistics, you'll remember the primary rule is that all clades (a family line) must be monophyletic, each member on the same line of the family tree. Those characters used to describe the family line must be unique to that line and common to it. Any character common to other, unrelated lines cannot be used to determine ancestry. To greatly oversimplify, to share blue eyes does not mean you are directly related to all those with blue eyes as it is a general trait common to very many lines of ancestry (pleisomorphic). When we see a strong facial resemblance with a whole suite of characters common to two people, we suspect they are directly related to each other, the traits derived from common ancestry. The traditional scrophs share much of the former and little of the latter.

Recent research at the molecular level using DNA sequences of three plastid (specialized cytoplasmic bodies such as chloroplasts) genes, rbcL, ndhF and rps2, from 75 different species representing the wide range of the family, has been used to recognize and describe at least five distinct monophyletic lines in the traditional Scrophulariaceae. These are now considered as separate families:

1) Scrophulariaceae *(sensu strictu)* very much reduced in size with tribes Aptosimeae, Hemimeridae, Manuleae and Selagineae of the southern hemisphere; Myoporaceae of Australia; Buddleiaceae (butterfly bush) of South Africa and the near East; *Scrophularia,* Verbasceae (mullein) and Leucophylleae the only predominantly north temperate groups.

2) Veronicaceae contains most of the remaining non-parasitic scrophs with Digitaleae (foxglove), Antirrhineae (snapdragon), Cheloneae (turtle head), Gratioleae (hedge hyssop), Angelonieaea and several small families including the Plantaginaceae (plantains). It seems to lack a geographic focus.

3) Orobanchaceae are the parasitic scrophs (broom rape, beech drops, squaw root) with the exception of *Lindenbergia.*

4) Calceolariaceae, an entirely new family, formed from the large genera *Calceolaria,* slipperflower (over 300 species found from Mexico to Chile) along with *Jovellana* (Chile) and *Proditia* (a single species from Peru) noted for the its two stamens and two-lobed corolla.

5) Stilbaceae, a small group with the genera *Halleria, Stilbe, Retzia,* and *Nuxia,* predominantely from South Africa.

Each of these new families, and some of the clades found within them have a suite of traits that may indeed be derived from common ancestry, such as parasitism in the Orobanchaceae and wind pollination in the Plantaginaceae (now in the Veronicaceae). One extremely curious result of this research, the most in-depth to date, is that monkeyflower *(Mimulus)* doesn't fit well into any of the five clades. In fact is just as easily placed in the Lamiaceae!

Reference

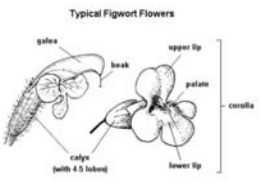
Olmstead, R.G., et al. 2001. Disintegration of the Scrophulariaceae. *American Journal of Botany* 88(2): 348-361.

Reprinted from *Chinquapin*, Newsletter of the Southern Appalachian Botanical Society, Summer 2001. This article originally appeared in *Bot Soc News* 75 [3]: 3,12.


Snapdragon


Foxglove


Speedwell



Figwort flower


Beard tongue

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