

# NATIVE PLANT SOCIETY OF NORTHEASTERN OHIO

Founding Chapter Of

THE OHIO NATIVE PLANT SOCIETY

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Chagrin Falls, Ohio 44022  
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*On the Fringe*

THE JOURNAL OF THE OHIO NATIVE PLANT SOCIETY

Vol. 7

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No. 5

## ANNUAL DINNER

Friday, November 3, 1989  
Cleveland Museum of Natural History

Once again we return to the Dinosaur Room of the Cleveland Museum of Natural History for our Annual Dinner. This year's speaker is Dr. Larry E. Morse, Chief Botanist with the National Nature Conservancy. The title of his talk is "Computers, Cooperators and Rare Plant Conservation."

With limited resources and an increasing need, plant conservation activities need a careful focus to assure the available effort is placed on the best known occurrences of the species most in need. The Nature Conservancy identifies, protects, and manages populations of rare plant species with the assistance of complex database systems, information-sharing networks, scientific cooperators, and the State Natural Heritage Inventory Programs, a unique partnership between a non-profit conservation organization and the fifty state governments. Case histories from Appalachia, the Northeast, and elsewhere will be used to highlight the flow of information and the Conservancy's protection process. Our own Heritage Program, located in the Division of Natural Areas & Preserves, is Ohio's link with this National and International network.

Larry Morse, an Ohio native, is now Chief Botanist at The Nature Conservancy's headquarters office in Arlington, Va. He first learned botany and natural history through summer classes at the Dayton Museum of Natural History, then became interested in computer programming, pursuing both at Michigan State University, where he lead a research project on cumputer-based identification keys while completing a botany degree. Later, he worked at the Smithsonian Institution and the New York Botanical Garden, and completed a PhD in botany at Harvard University,

*increasing work with native plants of Latin America*

studying in sand heathers (**Hudsonia**). At the Conservancy, Larry first worked as the state botanist for the Maryland Natural Heritage Program, and later became the organization's Chief Botanist, providing a national and global perspective to plant conservation priorities and overseeing the Conservancy's extensive botanical databases.

*review of Native Plants of America to Clinical Chemist  
data analysis" negotiating K to do*

**ABOUT THE JOURNAL ...**

In a previous issue of the Journal we told you about how the Journal is typed and printed. We have had a letter asking who is the editor since no name appears on the masthead. This has been a deliberate omission, but this once I (Ann Malquist) will own up to being the villain. I have either had the job outright or overseen the Journal since its inception as a one-page flyer of programs and news in 1983.

Getting articles to print is the hardest part of the job. We are constantly soliciting material from our professional botanists in the state and/or the well-versed amateurs that we are so happily blessed with. However, our solicitations fall on very deaf ears with the usual reason for refusal being that the professionals are all too busy. The other facet of this problem is that the professionals often write in too scientific a manner for the majority of our readers to understand.

We have been criticized for reprinting too many articles and not having enough original material. Most of what we reprint we believe is not seen by most of our members. Much material comes through this office that would not normally be received in members' homes except for those who are professional botanists. We feel that we are doing a service by passing these articles on to you. Any publication has to target the area of membership to whom they are going to reach out, and in our case that is the average, highly interested layman. We feel that the professionals have their own very scientific journals and that it is our mission to educate the amateur.

This issue carries the second of two articles by Jim Burns, a PhD botanist with the Division of Natural Areas and Preserves. **These articles were unsolicited**, bless his soul, and are certainly understandable by all of our readers. This is true for Chuck Thomas' contributions. And everybody looks forward to anything that Dr. Barb Andreas writes.

**WE NEED MORE MATERIAL OF THIS KIND**

We are also criticized because that awful ogre, the typo, keeps rearing its ugly head. The copy is proof-read by both the typist and myself, but some typos do indeed slip by. If you cannot live with them, then please volunteer to proof-read for us! I do not get paid for putting out the Journal, and frankly, I am approaching total burn-out. I have given up vacations in order to meet deadlines. My typist has taken work home to do over the weekends.

Now you know who edits your Journal. And the operative word here is YOUR. We need help in the form of more articles and someone who will get ready to take over the editorship. It is not an easy job, gathering enough material each time, but it is very rewarding when you see the finished product go into the mail. Within the next year I will no longer be able to continue. Do we have any volunteers???

## **PROGRAM:**

- September 3 (Sunday) Natural Areas & Preserves (NAP) - 2:00 p.m.** - Prairie Road Fen State Nature Preserve, fen tour, meet at fen gate.
- September 8 (Friday) Cincinnati Chapter - 6:00 p.m.** - Picnic. 7:15 slides of summer, members' sharing program.
- September 9 (Saturday) Dayton Chapter - 10:00 a.m.** - Tour the Beavercreek Wetlands with Dave Nolin.
- September 9 (Saturday) Athens Chapter - 6:00 p.m.** - Hike at Lake Katherine. Reservations needed (614) 286-2487.
- September 10 (Sunday) Wilderness Center - 1:30 p.m.** - Prairie Wildflower Walk. The Botanizers will assist TWC staff in leading this field trip for the public.
- September 10 (Sunday) Lisbon Chapter - 2:00 p.m.** - A field trip to Sprucevale for composites. Meet at Sprucevale.
- September 16 & 17 (Sat & Sun) Lisbon Chapter** - This will be our second annual weekend trip to Hawk Mt. in Pa. We will camp near the Mt. Departure time will be announced later.
- September 16 (Saturday) Wilderness Center - 9:00 a.m. - 6:00 p.m.** - Field trip to Springville Marsh, located near Springville in Southwestern Seneca County just off US 23. Tentative plans are to carpool at OARDC, Wooster, at 10 a.m. Leader is Stan Watson.
- September 17 (Sunday) NAP - 2:00 p.m.** - Clifton Gorge State Nature Preserve. Nuts in the Woods (tree walk). Meet at Bear's Den Interpretive Area at the end of the trail from the parking lot located on SR 343 west of Clifton.
- September 18 (Monday) Columbus Chapter - 7:30 p.m.** - Members bring and share your slides from your summer field trips and vacations! This often provides us with an opportunity to see plants from other areas that are not native to Ohio.
- September 18 (Monday) Dayton Chapter - 7:30 p.m.** - Cox Arboretum. Restoration Effort and Progress with Dr. Don Geiger, Plant Physiologist. This program will be followed by a field trip at Bergamo on Patterson Road where there was a gravel pit for the construction of I-675.
- September 23 (Saturday) Athens Chapter - 10:00 a.m.** - Wildflower walk at Lake Katherine. Call for details.
- September 23 (Saturday) Cleveland Chapter - 9:00 a.m.** - Ashtabula County Sand Barrens. Jim Bissell will lead a trip to the Conneaut/Kingsville area to discover the botanical curiosities which abound on the dunes and beaches of ancient post-glacial shorelines. Limit 8. Call 338-6622 for registration and where to meet.
- September 23 (Saturday) NAP - 10:00 a.m.** - Rockbridge State Nature Preserve. Meet in parking lot for a summer wildflower hike and see the changing leaves.
- September 24 (Sunday) NAP - 2:00 p.m.** - Goll Woods State Nature Preserve. Meet in parking lot to hike and observe Buds, Bark and Leaves.

**September 28 (Thursday) Cleveland Chapter - 7:30 p.m. - Holden Arboretum - Dr. Matt Hills from Hiram College studies plants in Central America and the western U.S. He will discuss his work including the morphological adaptations of Grease-wood and he will highlight his travels as he pursues botanical studies in the Americas.**

**October 7 (Saturday) Cleveland Chapter - 9:00 a.m. - Chagrin River Preserves**  
Two sparsely visited Nature Conservancy properties, Chagrin River Forest Preserve and the Upper Chagrin River Preserve, will be hiked on this trip. Muddy conditions and variable terrain will be encountered. **Limit 15.** Call 338-6622 for registration and where to meet.

**October 7 & 8 (Sat & Sun) Dayton Chapter -** A field trip with Don Geiger at Bergamo.

**October 7 (Saturday) Lisbon Chapter - 10:00 a.m. -** Walt Sturgeon will lead a mushroom walk. Meeting place to be decided.

**October 13 (Friday) Cincinnati Chapter - 7:30 p.m. -** Avon Woods - "Plant Communities of Ohio" by Walt Rankin, ODNR Ecologist.

**October 14 (Saturday) Wilderness Center - 1:00 p.m. -** Field trip to Tappan Reservoir. The exact time will depend on development of fall color. Leader is Virginia Sand.

**October 14 (Sunday) Athens Chapter - 10:00 a.m. -** Hike at Lake Katherine.

**October 14 (Saturday) NAP - 10:00 a.m. -** Lake Katherine State Nature Preserve. Meet in parking lot for Autumn hike.

**October 14 (Saturday) NAP - 10:00 a.m. -** Gahanna Woods State Nature Preserve. Meet in parking lot for Fall color hike.

**October 14 (Saturday) NAP - 1:00 p.m. -** Conkles Hollow State Nature Preserve. Meet in parking lot for "Autumn on the Rim."

**October 14 (Saturday) NAP -** Fall color canoe trip. Call 265-6453 for details.

**October 15 (Sunday) NAP - 2:00 p.m. -** Goll Woods State Nature Preserve, Autumn leaves walk.

**October 15 (Sunday) Cincinnati Chapter - 12 noon -** Lake Adams State Park picnic. 1:00 p.m. fall color tour of the wilderness and Lynx Prairie in Adams County.

**October 16 (Monday) Columbus Chapter - 7:30 p.m. -** Fred Sherlock of Bremen, Ohio will do a program on bog plants. His travels include Michigan and Maine, as well as Ohio.

**October 16 (Monday) Dayton Chapter - 7:30 p.m. -** Cox Arboretum - Emmie Guthrie with the Mead Corp. speaking about Woodland Reforestation.

**October 19 (Thursday) Cleveland Chapter - 7:30 p.m. - Holden Arboretum - Dr. George Wilder from Cleveland State University studies the flora of Ecuador, a country with one of the greatest diversities of plants in the world. He will discuss aspects of the morphology, anatomy, and taxonomy of the Cyclanthaceae (Monocotyledonae), the family which includes the Panama hat palm.**

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Ruth Fiscus, long-time member and generous donor was awarded the Ohio Conservation Achievement Award on August 2nd in Columbus. The award is granted to outstanding individuals or organizations who have put forth great effort in preserving our natural environment and resources.

## **Introduction**

In the last issue of this journal I wrote about the fact that Bigleaf and Umbrella Magnolias have survived severe climatic fluctuations in Ohio, presumably in deep narrow gorges that had a more favorable microclimate than surrounding areas. While conducting literature research for that project I read some current scientific and popular literature concerning global warming. This spurred speculation on my part. Most of the papers discussed the effects of global warming on things that did not seem to directly affect our everyday lives, such as ocean currents, African savannas, and polar bears. This paper will attempt to relate global warming to the Ohio landscape. It discusses a projected global temperature rise, its proposed effect on the native flora of Ohio, and the possibility that, once again, deep narrow gorges may come into play as climatic refugia for Ohio biota. For the purpose of this paper, a gorge will be defined as a deep narrow ravine with at least some areas of exposed bedrock walls.

## **Global Warming**

There has been much scientific speculation recently that the rising concentrations of carbon dioxide and other "greenhouse gases" will raise global average temperatures substantially. There seems to be a consensus that global warming is occurring and that a global average temperature rise of three degrees Celsius (5-6°F) may occur within the next 50 years. Scientists also seem to agree that warming at higher latitudes will be greater than the global average. This global warming will likely change global precipitation patterns. Although there is less agreement on this, some scientists have speculated that the American Midwest will be especially hard-hit by the double whammy of higher average temperatures and decreased precipitation.

This kind of climatic fluctuation is not new to the Ohio landscape. It has been estimated that, during several Pleistocene interglacials, average temperatures in North America were two to three degrees C. higher than they are now. A temperature rise similar in magnitude but with increased aridity, referred to as the Xerothermic Period, occurred about 7000 to 5000 years ago. On the other side of the coin, average temperatures were lower than they are now within a band in front of the ice sheets during each Pleistocene glaciation. The magnitude of the temperature decrease and the width of the band have been the subject of much debate, but an average temperature decrease of two or three degrees C. within 50 miles of the ice fronts seems well within the realm of probability. One of the biggest differences between the projected upcoming temperature rise and climatic fluctuations of the geologic past is the extreme rapidity of its onset. Natural warming or cooling in the past took on the order of thousands of years. The projected rise of three degrees C. within 50 years is an unprecedented climatic phenomenon.

## **Effects of Fluctuations on Vegetation**

The responses of vegetation to past climatic fluctuations can be inferred

from paleobotanical and palynological (fossil pollen) studies. From an extremely simplified point of view, rising temperatures have caused species ranges to shift northward, that is, to expand to the north and concurrently contract from the south. Another response by vegetation zones is to shift upward altitudinally, but since Ohio has no mountains, this is not a factor in our landscape. Climatic shifts of the past occurred slowly enough that most plants could disperse to new areas of suitable habitat in pace with the change. The temperature rise and associated increased aridity of the Xerothermic Period caused not only a north-south dislocation, but an eastward migration of drought-adapted prairie plants from the Great Plains that occupied portions of the landscape formerly covered by deciduous forest. Paleobotanists have also been inferring from studies of past climatic fluctuations that plant communities, as we know them today, do not shift as such, but rather as individual species. Thus, many of our familiar natural plant communities may be disrupted as their component species respond to a temperature rise in different ways. Another important point that has profound effects on the local distribution of flora and fauna in a landscape that has undergone severe climatic fluctuations is the presence of refugia. These are areas that, usually because of an ameliorated microclimate, contain out-of-range or edge-of-range species that may have flourished in the general landscape before the climatic change.

### A 300-Kilometer Shift?

Scientists have postulated that a three degree C. rise in temperature in the temperate zone is equivalent to a 300-kilometer (186 mile) shift northward in vegetation zones. Just for the sake of illustration, let's take this 300-kilometer shift northward on faith and see what it does to some species distributions in Ohio. Even



*Betula alleghanensis* Britton. Southern Yellow Birch.

in today's climate, the Ohio distributions of some species, such as hemlock and yellow birch, are generally restricted to gorges, or at least, deep ravines with north-facing slopes. We would very likely lose outright many northern species that are currently listed as Endangered, Threatened, or Potentially Threatened, possibly even from the gorge refugia, since these species are probably at the edge of their tolerance in the present climate. There could also be major problems with natural reproduction and seedling recruitment of some relatively common trees whose southern limit of distribution now passes through Ohio, such as speckled alder, red-osier dogwood, pussy willow, shining willow, nannyberry, and black ash. One study even postulates that, within a hundred years, the natural range of the ubiquitous beech may have shifted far north of Ohio. On a local level, this

shift would have its maximum effect on the flat Till Plains and Lake Plain of western Ohio. Unfortunately, this is also the area of Ohio that has the fewest deep narrow gorges. The more rugged topography of eastern Ohio would have some ameliorating effect, especially on steep northfacing slopes. Lake Erie would also have an ameliorating effect on the area immediately adjacent to its shoreline.

At first glance it might seem that if Ohio's new climate is no longer suitable for these northern elements, would it not now be that much more suitable for invasion and expansion of southern elements? Unfortunately, this is not the case since very few native species can naturally disperse fast enough to track the vegetation zone shift that will occur over the next 50 years. It has been postulated that even trees with light, windborn seeds disperse only at a rate of one to 20 kilometers per century. Even if trees could disperse at several times the optimum rate, there are now so many human-caused barriers to dispersal, such as vast agricultural and urban "deserts," that successful dispersal to suitable habitat is improbable. Thus, over the long term, Ohio will likely lose many of the northern elements of its flora with very few, if any gains from the south. The net effect will be impoverishment of Ohio's native flora. Natural point communities will likely be disrupted and stressed to the point of being even more susceptible to invasion by weedy aliens.

### **Refugia**

When we look at the present native flora of Ohio, we see only the survivors of several severe climatic fluctuations. It is likely that southern Ohio had many more elements of Southern Appalachian affinity prior to the Pleistocene. Spruce-fir forests and other associated northern elements occurred along a band in front of the advancing and retreating glaciers. It is also quite probable that many more Great Plains prairie elements were present during the height of the Xerothermic than are now, or even when the first settlers arrived. That several of these elements are no longer part of the Ohio flora attests to the power of climatic fluctuations on vegetation. The general Ohio landscape does not usually contain extreme southern or extreme northern elements. However, these elements do occur in scattered, isolated pockets of specialized habitat, including bogs, fens, prairies, and most notably for our discussion, deep narrow gorges. All of these specialized habitats, for different reasons, contain out-of-place plants because they provide conditions that no longer occur in the general surrounding landscape. The unique properties of these habitats create microclimatic conditions that simulate conditions that may have been present, for example, in the spruce-fir forests in front of an advancing or retreating glacier. Thus, many northern species may survive far south of their main range.

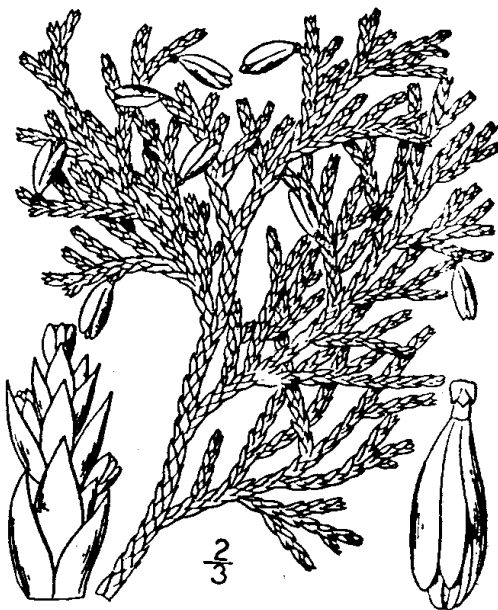
The three-dimensional topography of deep gorges has profound effects on the microclimates they contain. The microclimate studies of Wolfe and others have demonstrated that certain areas of deep narrow gorges have a longer frost-free season and higher average minimum and lower average maximum temperatures than the surrounding landscape. The structure of the deep, narrow gorges offers some protection from severe storms. The sandstone and conglomerate gorges of eastern Ohio usually contain springs that ensure a constant and abundant water

supply. Due to this, many of these gorges provide areas of relatively climatically-stable, mesic habitat when compared to the surrounding landscape. Although you probably wouldn't notice the slightly higher temperatures within a gorge on a cold January day (or night), most of us have felt the refreshing coolness of a deep shady gorge on a hot summer day and thus have firsthand qualitative knowledge of the ameliorated temperatures there. Because of their three-dimensional topography these same gorges also often contain areas of harsher climate compared to the surrounding landscape, such as frost pockets with lower minimum temperatures and a shorter frost-free period, or south- to west-facing exposed cliffs with extremely high maximum temperatures and evaporation rates. Thus, any single gorge may contain several different microhabitats, each with its own vastly different microclimate. This explains why some periglacial (near the glacial boundary) gorges were able to function as refugia both against the cold of the Pleistocene and the heat and aridity of the Xerothermic.

Ohio's current nature preserve system, or any preserve system in a human-dominated landscape, is essentially a series of "islands" of native vegetation within a sea of variously disturbed or degraded habitats. Deep narrow gorges are also islands of unique vegetation amidst a sea of variously dissimilar vegetation. However, gorges, with the structural protection of high sheer rock walls, can be likened to islands with fringing reefs. Protection from destructive wave action is afforded by the reef as protection from climatic extremes is afforded by the three-dimensional gorge structure. Areas that do not have the structural protection of high sheer rock walls may more easily succumb to the upcoming climatic change.

### Ohio Gorges

Several Ohio gorges have acted in the past as climatic refugia for plants of both northern and southern affinity. Examples from the Unglaciated Allegheny Plateau include White's Gulch and Rock Run (Lake Katharine) of Jackson County and several gorges in the Hocking Hills of Hocking and Fairfield counties. An example from the glaciated Till Plains is Clifton Gorge in Greene County, and one from the Bluegrass Region is Cedar Falls in Adams County. Northeastern Ohio has several, including those on the Cuyahoga River in Summit County, the Mohican River in Ashland County, and Tinker's Creek in Cuyahoga County.



*Thuja occidentalis* L. White Cedar.

I have already described how Bigleaf and Umbrella Magnolias, two extreme southern elements, survived major climatic fluctuations in the ameliorated micro-



climates of White's Gulch and Rock Run. Further evidence that the Rock Run gorge of Lake Katharine State Nature Preserve acted as a climatic refugium for both northern and southern species was provided by a bryophyte study conducted by Dr. Jerry Snider of the University of Cincinnati and funded by the Division of Natural Areas and Preserves. On the ceilings of cool conglomerate overhangs he found a northern moss, **Tetrodontium brownianum**, the closest known population of which is in the Upper Peninsula of Michigan. He also found **Diphyscium cumberlandianum**, a moss endemic to the mountains of the southeastern United States, growing on conglomerate ledges here. The closest known population of this moss is in the Red River Gorge area of Kentucky, which, interestingly, also holds the nearest population of Bigleaf Magnolia.

The gorges of the Hocking Hills, many within the State Park, the State Forest, and various State Nature Preserves, apparently protected such southern elements as Appalachian filmy fern and southern monkshood from a colder climate when a lobe of the Illinoian glacier was less than ten miles away. They have also harbored northern elements that migrated southward before the advancing glacier and then were lost from the surrounding landscape as the climate warmed and dried following the glacier's retreat. These include Canada yew, cow-wheat, bunchberry, and pipsissewa.

Clifton Gorge, within Clifton Gorge State Nature Preserve and John Bryan State Park, is one of the most important gorge refugium in Ohio because of its isolation and its dissimilarity to the surrounding vegetation. It is a limestone and dolomite gorge in the flat Till Plains of southwestern Ohio that was gouged out by massive quantities of meltwater from the Wisconsin glacier. It harbors many northern species, several of them disjunct from their main range. These include white cedar, hemlock, Canada yew, red baneberry, and mountain maple. These elements survived in the ameliorated microclimate of the gorge while the general climate warmed and dried following glacial retreat. During the Xerothermic it is likely that the vegetation of most of the area surrounding the gorge was prairie. Further south, Cedar Falls in Adams County, within the Cedar Falls-Becker Nature Preserve, also holds a disjunct population of white cedar.

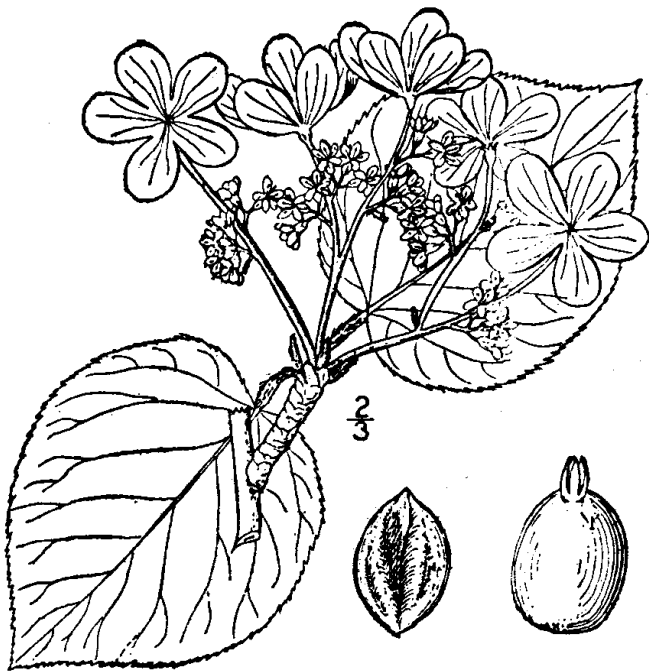
Northeastern Ohio has many gorges that hold rare northern elements within a landscape in which the general flora is largely of northern affinity. These northern rarities include northern monkshood, hobblebush, northern fly honeysuckle, round-leaved yellow violet, and starflower. It can be speculated that even the common northern elements of the northeastern Ohio flora may soon become restricted to these climatic refugia by the upcoming temperature rise.

### **Protecting Our Gorge Refugia**

Preservationists have been warned in the past to beware of the "hemlock gorge syndrome." This refers to the fact that many early natural areas projects were hemlock gorges, largely because of their human appeal. They often are beautiful, majestic, and awe-inspiring. It was feared that too many hemlock gorges

were being preserved at the expense of other less-appealing natural communities. However, in light of the projected temperature rise and its effects on the natural vegetation of the state, perhaps we should look more to protecting gorges, especially those that have served as climatic refugia in the past. For it may be that only in such gorges will survive many of the northern elements of the native Ohio flora that we take for granted today.

Fortunately, the rugged three-dimensional topography of many of Ohio's gorges has precluded extensive logging operations and other disturbances, and many have already been formally protected in parks and preserves. However, there are still some major threats to both protected and unprotected gorges. The following are some suggestions for improving our abilities to protect the most biologically significant of these areas. New biological surveys, updates of former surveys, and microclimate studies are needed for selected gorges. Those areas that currently harbor good populations of edge-of-range northern species or demonstrate high climate-buffering potential should receive priority protection. The integrity of those areas already protected should be enhanced by providing adequate buffer. The springs in a gorge are dependent on the absorption and percolation of rainwater that falls on the surrounding ridgetops. Trees within the gorge-valley are more susceptible to storm damage when forests along the rim are cleared. Thus, keeping gorge watersheds forested is important. Protection, patrolling, and cleanup of gorges on a local level should be encouraged. They are often favored trash dumping areas. In summary, Ohio's gorges may once again act as refugia for biota that cannot survive in a hotter, possibly drier, surrounding general landscape. We, as concerned citizens, can take steps now to ensure that the natural processes that take place within these gorges are allowed to continue unimpeded into the future.



*Viburnum alnifolium* Marsh. Hobble-bush.

James Burns is a botanist in the Heritage section of the Division of Natural Areas and Preserves, concentrating on inventorizing rare and endangered species of plants. Jim is an expert of the Flora of Northeastern Ohio.

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#### Further Reading:

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## Further Reading (Cont'd)

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- Wolfe, J.N. 1951. The possible role of microclimate. Oh. J. Sci. 51(3) 134-138.

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## CHAPTER CONTACTS

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<b>Lisbon</b>	Carol Bretz, P.O. Box 375, New Waterford, OH 44445 H (216) 457-2385      W (216) 424-7221
<b>Toledo</b>	Peter Montion, 6950 Providence St., Whitehouse, OH 43571 H (419) 877-9261
<b>Wilderness Center</b>	Marvin Smith, 7236 Camp Road, West Salem, OH 44287 H (419) 869-7575

## BOOK REVIEW

### **The Dicotyledoneae of Ohio**

Part 3 Asteraceae

T. Richard Fisher - Original Drawings by Sharon Ames Glett

Ohio State University Press — \$65.00

Many August and September wildflowers can be most confusing to identify without accurate drawings and descriptions of the characteristics of each flower. This new book is the perfect answer (companion) for the fall "wildflower" to own in order to easily identify the various sunflowers, goldenrods and asters that fill our roadsides and ditches. This rather large 8x10 book would be best left in the car, or at home, and the specimen carried to it, to protect your investment. But because of the good sized, detailed, and artistic drawings which are such a pleasure to use, one can put up with the size.

Roadside and meadow watchers will be delighted to find all of Ohio's alien "weeds" included. These are familiar in the Fall parade but often difficult to identify due to lack of reference material.

The fascinating forward by Dr. Tom S. Cooperrider gives the history of the Ohio Flora Project and a careful overview of the compositae family.

The preface by the author contributes a great deal to the layman's understanding of the scope of the work by the individuals and institutions which made the study possible.

To quote Dr. Cooperrider, "The book opens with an excellent introduction to the unique features of flowers in the sunflower family. The book treats 276 species ranging from familiar ox-eye daisy the common dandelion, chicory, and black-eyed Susan to such rare plants as the ladeside daisy."

Dichotomous keys lead to the identification of each species and for each there is an Ohio distribution map showing the county in which it is found. This also helps the amateur to eliminate many 'bad' guesses. It is satisfying to find the common names and the scientific names side-by-side. The one paragraph description of the important morphological features will also explain habitat and the blooming time period, and the abundance of the flowers. This makes this book worth every penny of your investment.

MRL

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The National Wildlife Federation has published a "Citizens Guide to Protecting Wetlands." This 64-page manual is written in easily understood, no-nonsense language for use by individuals and groups fighting to protect wetlands in their communities. To order your postpaid copy, write a check for \$10.25 payable to the National Wildlife Federation, 1400 16th Street, NW, Washington, DC 20036-2266.

## A RETURN TO BEAVER CREEK STATE NATURE PRESERVE by Chuck Thomas

Twenty-one people representing diverse backgrounds and natural history interests met at Beaver Creek State Park on Saturday, May 6, 1989, for a return exploration of the gorge of Sheepskin Creek, a tributary of the North Fork of Little Beaver Creek in Columbiana County, Ohio. Sheepskin Creek gorge is an ODNR nature preserve that was visited last October, see the January/February issue (Volume 7, Number 1) of The Journal of the Native Plant Society.

It was a sunny morning at Gaston's Mill, and several members observed interesting plants at the roadside near the old 1910 vintage through-truss bridge over the river. White trilliums, wild geraniums and early saxifrage (**Saxifraga virginiensis**) covered the hillside with showy blooms down to the edge of the roadway. Bladdernut (**Staphylea trifoliata**) had new leaves and flower buds showing color, while stonecrop (**Sedum ternatum**) formed large masses of growth nearly concealing a fine specimen of the much dissected variety of the evergreen grapefern (**Botichium dissectum** variety **dissectum**).

As we congregated, we found that participants included representatives of the Mill Creek Park Hiking, Nature and Outdoor Club of Youngstown, members of the Northeast Ohio Sierra Club from Medina and Cleveland, and representatives of the Lisbon and Cleveland Chapters of the Native Plant Society. We were again honored with the presence of Nevada Laitsch of the Lisbon Chapter of the Native Plant Society. Nevada's thorough knowledge of the natural features of the area, its rich flora and fauna and history of the land uses of the gorge are inspirational to all those who traverse these interesting areas of Columbiana County.

As in October, the railroad trail was interesting in itself, being populated with numerous species of plants characteristic of an early successional stage of development. Here we found several species new to list of observations from last autumn. Barren strawberry (**Waldsteinia fragariodes**) covered the slopes with color next to contrasting growths of ebony spleenwort (**Asplenium platyneuron**). Rattlesnake ferns (**Botrichium virginianum**) showed new growths of bright green sterile and fertile frond development, while a nearby oblique variety of the evergreen grapefern (**Botrichium dissectum** variety **obliquum**) showed signs of a pending senescence. Roundlobe hepatica had finished flowering, while two cresses were tentatively identified as smooth rock cress (**Arabis laevigata**) and the non-native early winter cress (**Barbarea verna**) for lack of sufficient fruit development.

Others included the hairy Solomon's seal (**Polygonatum pubescens**), rue anemone, kidney-leaf buttercup (**Ranunculus abortivus**), wild geranium, blue phlox, red sessile trillium (**Trillium sessile**), white trillium, bluets (**Houstonia caerulea**), trailing arbutus (**Epigaea repens**), common blue violet, spurred violet (**Viola rostrata**), striate violet (**Viola striata**), and stonecrop. The white-flowered, goosefoot corn-salad (**Valerianella chenopodifolia**) was tentatively identified based on early leaf and flower development.

We observed white pine (**Pinus strobus**) seedlings near the trailing arbutus, and mountain laurel appeared more common than when we observed it last October,

a likely result of masking of the species by deciduous members of the area. Marginal fern (**Dryopteris marginalis**) was observed and identified based on last year's fertile fronds. Mayapples and sensitive ferns were common, and flowering trees included serviceberry, flowering dogwood, bigtooth aspen, quaking aspen, and smooth hornbeam (**Carpinus caroliniana**). Other woody plants included white oak, boxelder, sugar maple, American elm, hemlock, tuliptree, staghorn sumac, a hispid **Ribes** species, grape, and alternate leaf dogwood (**Cornus alternifolia**). The location is an excellent place to observe yellow birch (**Betula lutea**) reproduction, as well as its floral morphology. New growths of Christmas ferns, alumroot (**Heuchera** sp.), goatsbeard (**Aruncus dioicus**), blackberries and raspberries were observed, and the variable leaf development of an avens, possibly white avens (**Geum canadense**), provided us with a good source of study.

Also of interest, a large, mature autumn olive (**Eleagnus** sp.) grows near the trail, and seedling plants occur nearby. This non-native plant has been introduced for erosion control and wildlife enhancement as **E. umbellata** (Himalayas) and **E. multiflora** (Japan, China). While **E. multiflora** is naturalized in Ohio, it requires floral morphology to distinguish the species. Along the Ohio Turnpike and Route 11 north of the park area, extensive plantations of the autumn olive appear to have spread along ditches and fence rows. This plant should be removed from the nature preserve, and observations of other individual plants should be noted and similar action taken.

As we moved along the trail, horsetails (**Equisetum arvense**), trailing clubmoss (**Lycopodium complanatum** variety **flabelliforme**), common cinquefoil (**Potentilla simplex**), a **Spirea** species, a lettuce (**Lactuca** species), purple dead nettle (**Lamium alexicaule**), cutleaf dentaria, bloodroot, false mermaid (**Floerkea proserpinacoides**), several skunk cabbages, a persisting fruit-pod of an Indian hemp (**Apocynum cannabinum**), new growths of a St. Johnswort (**Hypericum** species), and a pussytoes (**Antennaria plantaginifolia**) provided clues that this area is transitional in its development. A native woodland bluegrass, possibly **Poa alsodes** and two thinleaf sedge species (**Carex**) were noted.

As we moved down-slope into the gorge, the sky became clouded as a coldfront approached from the west. We would later learn that a cold rain persisted all morning in northern and western Ohio; our explorations were favored by a small island of bright skies until now.

The soils were noticeably wet in the gorge, a sharp contrast to last year's dry conditions. Jewelweeds (**Impatiens** species) had developed their 3rd and 4th true leaves, and new fronds were developing on the spinulose shield ferns (**Dryopteris carthusiana**) and lady ferns (**Athyrium filix-femina**). Flowering plants included wild ginger, the purple form of the common jack in the pulpit, blue cohosh, smooth yellow violet (**Viola pubescens** variety **eriocarpa** or **V. pensylvanica**), bishops cap, and chokecherry (**Prunus virginiana**). Rich soils supported these and growths of stonecrop and what appeared to be appendaged-leaf or Canada waterleaf (**Hydrophyllum canadense**), the later possessing two small leaflets on the petiole of the large rounded leaf at the base of the plant. One mulberry (**Morus rubra**) was noted.

Moving upstream, both Dutchmans breeches and squirrel corn (**Dicentra cucularia** and **D. canadensis**) were still in flower. Maple-leaf viburnum and small basswoods sheltered large-flowered bellwort (**Uvularia grandiflora**) and the blue and white forms of the sharplobed hepatica, a few flowers persisting.

Canada white violets (**Viola canadensis**), white trilliums and the red form of the ill-scented trillium (**Trillium erectum**) dominated the floodplain aspect with luxuriant growths. This is an excellent place to view Ohio's state wildflower, the large flowered white trillium (**Trillium grandiflorum**). As it often occurs in steep-walled valleys, the white trilliums will favor the sunnier slopes while the red trilliums occupy cooler north-facing sites. The overall effect is one side of the valley painted in white, the other red.

A light mist began to fall, emphasizing the vivid green hues of this spring forest. Virginia waterleaf, tall meadowrue and green forms of the common jack in the pulpit increased in frequency. One persisting yellow troutlily flower near the base of a spicebush hinted of the drama of the earlier vernal color. Our eyes were keen for the smallest hint of something new.

The first waterfall cascading over sandstone with springtime flows was even more scenic without the leafy shade of deciduous trees, as with last October. Only the spring flowers and rich green hemlocks framed this special place. While many members returned at this point, eleven climbed upslope to enjoy a lunch at the top of the falls. Rebecca Walick, and Linda and Dennis Moranz discussed the memorable view of the valley from this top of the falls vista.

We viewed the saccate flowers of a large northern fly-honeysuckle (**Lonicera canadensis**). We climbed past another native honeysuckle, the northern vine honeysuckle (**Lonicera dioica**). Blue cohosh, red and white trilliums, and waterleaf growths increased in lush aspect, affording us the opportunity to view the layers of the early spring flora. Near the coal seam exposure, we observed the new and distinctive growths of the slender woodland grass **Brachyelytrum erectum**.

Braun (1950) described the short season of spring in the deciduous forest as follows:

"The vernal aspect prevails [as] renewed growth is everywhere apparent. The riot of brightly colored spring flowers, the vernal flora of our deciduous forest, appears.

and

"In rapid sequence, the growth of buds and the flowering of different trees takes place. The soft multicolor tones of early spring give way to various shades of green of later spring . . .

and

"Soon the uniform green of summer prevails, the 'summer green' which has given this forest one of its names . . . Green is the prevailing color, in canopy and in undergrowth."

The rich floodplains contained many of the species encountered before, but the lush growths made the scene most memorable. We hiked near ninebark, and the clubmoss known as ground-pine (*Lycopodium obscurum*) came into view. We paused for some photos at the upper falls, as the mist passed and the clouds lightened.

Our return trip was marked by the rediscovery of wholed smilax (*Smilax ecci-rata*), its new growth green and bright. Upward we climbed along an old haul road, following an old ridge of second generation regrowths dotted with many of the more xeric species seen earlier in the day. Mountain laurel, chestnut oak and hemlock gave way to an old apple orchard in a cut and filled are now subject to dump activity.

The fragility of the area was further contrasted by a nearby clearcut forest, which sharply violated the sense after being immersed in the cool greens and lush floral growths of the valley. We walked down hill along the road, viewing the steep slopes above the railroad trail.

At our return to the vehicles, some of us trekked a short distance to a small rock bridge in a stream valley near the clearcut forest. A sandstone arch had been undermined by the stream, forming quite a scenic area. It was a nice way to end a fine spring day.

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Chuck Thomas is the Environmental Affairs Officer for the Cuyahoga County Engineers in Cleveland.

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A short note regarding the Jay W. Beswick Wildflower Walk at Bedford Reservation on May 13, 1989: Thirteen participants gathered at the Egbert Picnic Area to retrace Jay's favorite wildflower trail in this reservation. Although the morning started with a heavy rainfall (what else has happened during this wet, very wet month of May), the clouds parted, and the walk was enhanced by seasonally cool temperatures.

Karl Smith, Senior Naturalist at the Brecksville Nature Center of Cleveland Metroparks, read a brief and memorable tribute to Jay, who died October 16, 1988 during an outing at Hinkley Reservation. Jay's role as a Volunteer Naturalist and his knowledge of the wildflowers and ferns of the area were remembered throughout the day. Since Jay introduced me to many new locations of unique plants, the hike was especially meaningful to me.

We observed roundleaf pyrola (**Pyrola rotundifolia**), the last persisting flower of the roundleaf violet (**Viola rotundifolia**), the seven-lobed form of the sharplobe hepatica, the halberd-leaf, common blue, downy yellow and smooth yellow violets, the sweet violet (**V. blanda**) and pale and Canada geraniums, large-flowered bellflower (**Uvularia grandiflora**), and numerous other spring ephemerals lined our way. The scene appeared almost staged for our visit!

We observed bluebells in flower, remembering Jay's caution to avoid walking on any. We passed by the double-flowering form of the rue anemone (**Anemonella thalictroides**), which was first discovered on one of Jay's walks. We remembered Jay's "26 Ferns of Brecksville" hike, which usually lead to near exhaustion as we sped through the park viewing bulblet ferns (**Cystopteris bulbifera**) and Ohio's protected long-beech ferns (**Phegopteris connectilis**) before lunch and seeking out the last bracken fern population before dinner. These were annual events of great memory to many of us.

We viewed the showy orchid (**Orchis spectabilis**) discovered last year on Jay's last wildflower walk in Bedford. The tour ended with the viewing of one of Jay's favorites - the Confederate violet, **Viola papilionacea** forma **albidiflora** (see Fernald, p. 1033). I can still remember his "you mean you didn't know it was here in Bedford?" admonishment.

It was nice to remember Jay's gifts and inspiration on this special day in May.

— reported by Chuck Thomas

**The Common Cattail is Nature's Supermarket and Department Store Rolled Into One.**

The common, broad-leaved cattail is found across Canada. From Newfoundland to British Columbia, dense stands border marshes, lakes and streams, and boldly invade unsuspecting drainage ditches. Yet when asked to describe this familiar wetland resident, most people think only of the cattail's velvet-brown, sausage-shaped seedheads.

These dense "cigars" - seven to 15 centimeters long - are actually the species' female flower cylinders. Because the cattail is a monoecious plant, both male and female flowers form on it. This dynamic duo tops a straight pithy pipeline-stem that carries nutrients back and forth to the roots and leaves.

During the summer, both sexes of **Typha latifolia's** flower spikes are visible to the astute observer. The top yellowish staminate (male) flower houses the pollen; the bottom greenish carpellate (female) cluster compromises the "cat tail." In late summer, the male pollen-bearing flowers blow away leaving a bare spear. Below this empty shaft is the chocolate-brown, plush seedheads so many of us see in the fall.

Those showy cylinders have been used decoratively for many years. When treated with hairspray before bringing them indoors, they make attractive, long-lasting bouquets. Unsprayed, however, they're apt to produce thousands of hard-to-catch cottony seeds that drift through the house like open parachutes.

North American Indians once gathered those "parachutes" to stuff pillows and mattresses, fortify diapers, line slippers and cradles for extra warmth and insulate their winter dwellings. Leaves and plant fibre were woven or sewn together to make rugs, baskets, bags, mattress-pads and children's toys.

In ancient civilizations, the hardy cattail was used to fashion ropes, rush seats and clothes. In the natural world, muskrats build their expertly camouflaged, domed shelters with its spongy swordlike leaves. And marsh wrens, red-winged blackbirds and herons seek the security of the protected cattail compound with its cache of convenient nest-building materials.

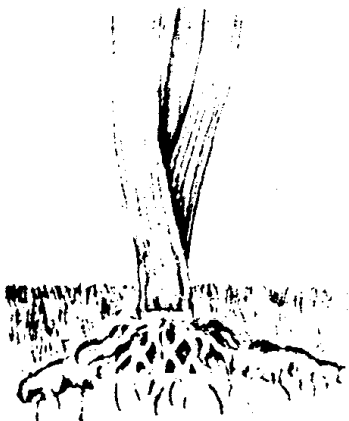
But the versatile cattail is more than nature's department store. It's also, as Euell Gibbons once described it, "the supermarket of the swamps." Each thick, horizontal underground stem provides a prodigious feast as the buds along the rhizome develop into new plants. Appreciative diners include muskrats, moose, elk and geese - and man.

Those "Euell Gibbons" among us who have been feasting on cattails for years know that each season brings its special culinary delights. But what is all this snacking likely to do to the delicate balance of nature? Apparently, not much.

Thanks to its prolific underground reproductive system, the cattail is unlikely to become an endangered species. It has been enhancing shorelines for centuries (remember the biblical story of Moses in the bulrushes?). And if we take good care of its environment this nutritious, versatile, ornamental wildflower should populate Canadian wetlands for centuries to come.

This article is reprinted from Nature Canada, Summer 1989.

### SEASONAL SNACKS



If cattail rootstocks are dug up fall or winter, the small white buds may be harvested and eaten raw. Or, if enough are gathered, they can be boiled or steamed and eaten as a gourmet vegetable. The rhizomes themselves are slightly sweet when chewed, and contain valuable carbohydrates.



When the spikes are green and still immature, both the male and female parts can also be eaten like corn on the cob. The "corn" is ready when the green covering starts to split apart. To avoid the tough central core of the male spike, simply shave off the boiled buds for kernel cattail.



In spring, fresh green shoots - sometimes called "Cossack asparagus" - appear among last year's spent foliage. Relished for hundreds of years by their Russian namesakes, in Canada the tender stalks are gathered in April and May.

Whether eaten raw, added to salads, cooked like asparagus or pickled, shoots should be between 30 and 50 centimeters tall when picked. For a succulent feast, remove the outer leaves and carefully wash the 15-centimeter-long white inner core, the "heart." (N.B.: It's important that the cattails come from a spot where the water is pollution-free.)



During July, the short flexible stamens of the male spike produce a yellow powdered pollen which can be rubbed off or shaken into a container. Mixed with real flour, the pollen creates baked goods that have a unique taste and a warm yellow glow.

For a special treat, use the protein-rich pollen flour mixture to make a thick biscuit dough. When camping, press a large blob around the end of a long sturdy stick and roast it over the campfire until the "biscuit" is fat, fluffy and golden brown. Then fill the hot hollow centre with jam - delicious!

## WILD-COLLECTED BULBS TO AVOID

Natural Resources Defense Council is working with the World Wildlife Fund, the Garden Club of America, and others to educate gardeners about the probable wild origin of certain types of plants, to put pressure on U.S. bulb dealers to describe plants' origin honestly, and to push the U.S. government to help protect exploited bulb species.

Unfortunately, wild-collected bulbs are often misleadingly labeled "Product of (or Grown in) Holland" despite their true origin in the wild in Turkey, Portugal, or even the U.S.! The concerned gardener must rely on alerts such as this one to avoid accidentally purchasing wild-collected plants.

In theory, it should be possible to develop a scientifically based program for harvesting wild plants at a sustainable level. So far, however, there are few effective controls over commercial collecting of plants in this country or abroad. Nor is there scientific research into the species' **life cycles and ecological needs**.

This information on origins of species bulbs is from two British colleagues, Mike Read and Sara Oldfield, who were able to visit The Netherlands, Iberia, Turkey and other European of the bulb trade.

### NRDC recommends that people avoid buying the following bulb species:

#### **Cyclamen**

Wild-collected **Cyclamen** are exported from Turkey without adequate controls to protect rare species or ensure that collecting does not reduce more widespread ones. U.S. nurseries sell corms imported through The Netherlands or occasionally directly from Turkey. These imports totaled over 140,000 plants in both 1986 and 1987.

Buy species or "hardy" **Cyclamen** only from those few dealers in the U.S. who propagate. One is Montrose Nursery, Box 957, Hillsborough, NC 27278.

#### **Eranthis**

The popular yellow-flowered **E. hyemalis** is taken from the wild in Turkey. U.S. imports have come primarily via The Netherlands (600,000 to 700,000 bulbs annually), but in some years additional bulbs are imported directly from Turkey.

#### **Galanthus**

Snowdrops are very popular because they promise that spring is coming before we dare to believe it. The U.S. imported 4 million bulbs in 1987. Unfortunately, many of them had been collected in Turkey. This country has exported over 175 million **Galanthus**, primarily **G. elwesii**, during the past 5 years. As wild populations of this species have declined because of this collecting pressure, exporters have turned to other species. The U.S. has proposed placing the genus in Appendix II

of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

The species ***Galanthus nivalis*** is "farmed" in various European countries, so you may buy that species. Please do not buy any other species, or any snowdrops for which you cannot determine the species name.

### **Leucojum**

The species ***L. aestivum*** is obtained primarily from the wild in Turkey. A second species, ***L. vernum***, is collected from the wild in Turkey.

### **Narcissus**

Do not buy the popular "Angel's Tears," ***N. triandrus***, ***N. asturiensis***, and ***N. cyclamineus***, which are wild-collected. Also be careful in buying ***N. bulbocodium conspicuus***, which is propagated to some extent in The Netherlands but is also collected in Portugal.

If you wish to plant the attractive miniature **Narcissus**, use the many propagated hybrids identified by fanciful names.

### **Sternbergia**

Turkey exports these plants against the recommendation of Turkish botanists. The United Kingdom has proposed placing the genus in Appendix II of CITES.

### **North American Wildflower (bulb) species:**

#### **Cypripedium**

The North American species of lady's slipper orchids are not propagated commercially — despite misleading claims by some sellers.

#### **Erythronium**

The North American species of this lily genus, except the hybrid, "Pagoda," are wild-collected. ***Erythronium japonicum*** is also probably of wild origin.

#### **Trillium**

Plants of this genus are certainly from the wild, whatever the seller may claim.

### **Apparently acceptable:**

Commonly grown **Crocus**, **Fritillaria**, and **Iris** are propagated, but be careful about more specialized species, which are probably collected. Avoid North American

**Fritillaria.** The "botanical" tulips are really small cultivars rather than true wild species. Several species tulips are propagated in small numbers by Dutch growers; avoid **T. praecox** which is rare in Turkey and apparently little cultivated in The Netherlands.

### Difficult decisions:

The daisy-like **Anemone blanda** is propagated in large quantities in The Netherlands, but Turkey continues to export up to 7.5 million wild-collected plants every year. These exports are within the quota suggested by a Turkish botanist, Dr. Ekim.

### Temperate Terrestrial Orchids:

Japan exports annually a few million "bulbs" of three genera, **Habenaria**, **Bletilla**, and **Pleione**. According to TRAFFIC Japan, these plants now are from propagated sources, although they were formerly collected in Japan or imported from Taiwan or elsewhere. Japan imported at least 250,000 **Pleione** from Taiwan and 78,000 **Bletilla** from China as recently as 1985.

Reported U.S. imports of **Bletilla** have fallen from 140,000 in 1986 to about 52,000 in 1988.

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### **DEALERS PROMISING THEY WON'T SELL WILD-COLLECTED PLANTS**

Dealers which have announced a policy of not selling wild-collected bulbs now include, in addition to Burpee's, Smith and Hawken, van Tubergen (The Netherlands) Hortico (a consortium of the four largest British mail-order companies), and Tesco (British).

We expect more companies to "take the pledge" in coming months.

\* \* \* \* \*

### **Letter to the Editor:**

Enclosed is my money order for my subscription renewal to 'On the Fringe'. You do have a high standard with your newsletter and I find every issue to be a source of enlightenment, as well as a catalyst for ideas for **Wildflower**. Your obvious conservation bias is appreciated, otherwise the whole game and all the players will go down the drain.

Botanically,

Jim Hodgins  
Editor, Wildflower

## ROOTS AND FUNGI: A VITAL PARTNERSHIP by Elinor Crank

The palmate, lacy leaves of the maple tree (*Acer* spp.) may be the most noticeable part of the tree, but the not-so-obvious roots may be the most important part. Roots not only anchor the tree but also act as a mouth, where nutrients and water enter. Because of the important role roots play in plant survival and vigor, anything that increases root growth or allows a plant to function more efficiently is a great benefit.

Maple trees, along with 90 percent of all flowering plant species, form an association between the plant roots and fungi. Those associations — called mycorrhizal associations — increase root growth and development, improve nutrient uptake, and increase disease resistance.

Mycorrhizal fungi develop **hyphae**, branch-like structures that increase the absorptive area of root hairs. Plants with few root hairs are often dependent on mycorrhizae for absorption of nutrients. Some species, including a number of orchids, cannot survive without the associations.

Mycorrhizal associations also increase tolerance to root pathogens, drought, and adverse soil pH. Transplant shock is greatly decreased for plants associated with mycorrhizae. Those benefits make using mycorrhizae important in reestablishing native plants in the environment.

Fungus-root associations have been noted since the end of the 19th century. In the 1920s, researchers began to study mycorrhizal fungi in the establishment of pine trees. Interest in mycorrhizae has grown tremendously over the years. Currently, there is a great interest in utilizing mycorrhizae in mine reclamation, where soils have been disturbed or destroyed. The Wildflower Center conducts research on the benefits of applying mycorrhizae to wildflowers and other native plants to help reestablish them.

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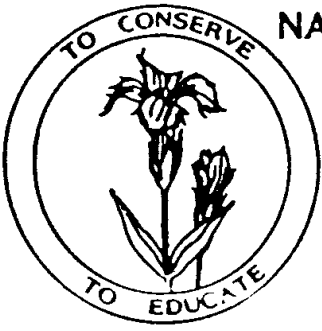
## A WEED MAY SAVE YOUR LIFE

A spiderwort, a wildflower, has become the darling of the anti-nuclear movement because it apparently can detect radiation. Geneticist Dr. Sadao Icikawa of Japan's Saitama University discovered that a cloned spiderwort's hair cells turned from blue to pink when exposed to as little as 150 millirems.

The Nuclear Hazards Resource and Information Center in East Quogue, New York is planting spiderworts near nuclear installations and checking for mutations. Ichikawa supplies plants cloned from his original example. The versatile spiderwort can also detect pesticides, auto exhaust and sulfur dioxide.

\* \* \* \* \*

There is a very real racehorse running on Ohio courses named "Ohio Wildflower." Bet he's a real winner with a name like that!



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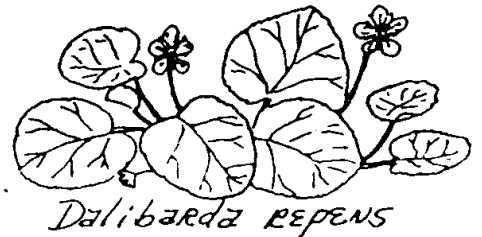
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