



TENNESSEE NATIVE PLANT SOCIETY NEWSLETTER

Volume 15, Number 1

February 1992

SAVE THE WILDFLOWERS

You might consider this the second article in a series (of how many is uncertain) about the impact of commercial collection of plants in the wild. While the practice has been underway for decades, commercial collecting has reached such a level that it is devastating populations of several species and threatens the state's biodiversity, especially in combination with other types of human incursion. In the last issue, an article by J. Laurie Byrne gave us some idea of the extent of the problem. Now Patti Hagan, the gardening columnist for the Wall Street Journal, provides more detail about the industry that believes wildflowers are a crop waiting for harvest.

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By Patti Hagan

In the go-go '80s it never occurred to me, or the gardeners I dug, to question the origin of species of native plants we coveted. I pledged allegiance to The Three Laurels: Wild Native Flowering Plants catalog out of Appalachia. The prices were botanical bargain basement: Hardy Native Orchids, pink lady-slipper—six for \$3; trailing arbutus—six for \$3; trillium—six for \$1.50. Ordinary plant lust made me order greedily—in sextuplets. When the orchids and arbutus inevitably died, I didn't wonder if sudden death had to do with the trauma of being dug out of their ecosystems *propres* and plunked down in hostile environments like Brooklyn. These wildlings were so cheap—and I was so American—I just ordered more.

Then came the bonfire of our plant vanities. After the '81 Wall Street crash, the word ETHICS crept back into the American vocabulary: into biz school, law school, Wall Street and even gardening. The New England Wild Flower Society stated its intention "to make the ethical business of native plant propagation-conservation *more profitable* than the destructive practice of wild-collection." Ethical Gardening arrived. Ethical gardeners did not dig wildflowers from the wild, nor knowingly buy wild-collected plants. They sought out nurseries that propagated the plants they sold. Gardeners of conscience were scrupulous to buy only from catalogs listing "nursery-grown" wildflowers.

By 1989, The Three Laurels had ceased "due to

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JOIN THE TNPS ANNUAL MEETING MARCH 27-29

Time is drawing near for the 1992 TNPS Annual Meeting, which this year is being held jointly with the American Association of Field Botanists.

The dates are March 27-29 at Indian Creek Camp on Center Hill Lake just off Highway 96 between I-40 and Highway 70—south of Center Hill Dam.

Please register by writing to Kay Jones, P.O. Box 193, Hampshire, TN 38461 (Phone 615/285-2777).

Tell Kay (1) which meals you plan to eat at Indian Creek Camp, (2) which nights you will stay overnight, and (3) with whom (if any others) you would like to share a cabin. All meals will cost \$4, and cabin accommodations will cost \$5 per person, per night. Bills may be paid at the meeting.

The annual meeting is a perfect time to exchange stories and share

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February 1992
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This Newsletter is a publication of the Tennessee Native Plant Society and is published six times a year, generally in February, April, June, August, October, and December.

The Tennessee Native Plant Society (TNPS) was founded in 1978. Its purposes are to assist in the exchange of information and encourage fellowship among Tennessee's botanists, both amateur and professional; to promote education of the public about Tennessee flora, and wild plants in general; to provide, through publication of a newsletter or journal, a formal means of documenting information on Tennessee flora and of informing the public about wild plants; and to promote the protection and enhancement of Tennessee's wild plant communities.

Dues are \$15 for the calendar year (\$10 for students and senior citizens, \$20 for institutions, and \$150 for life memberships). Membership privileges include a subscription to the TNPS Newsletter. Dues may be sent to the Tennessee Native Plant Society, Department of Botany, the University of Tennessee, Knoxville, TN 37996-1100.

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Letters to the editor or correspondence about the Newsletter should be addressed to: TNPS Newsletter, P.O. Box 856, Sewanee, TN 37375.

From the Editor's Notebook

TENNESSEE FLORA 2001— WHERE DO WE GO FROM HERE?

Being still a small society, TNPS does not organize many projects. Sponsoring a few field trips each year and encouraging education about flora and habitat protection are about as far as we go.

We do have before us, however, an opportunity to accomplish something that will attract plenty of attention in Tennessee and earn the society praise for decades to come.

For many months a few TNPS members have been trying to promote the Tennessee Flora 2001 project, the initial stage of which is the publication of a photographic guide to Tennessee wildflowers.

No comprehensive guide to this state's flora has been published in 100 years—not since Augustin Gattinger published his *Flora of Tennessee* (a revised edition being issued in 1901). There have been a few nice books published since, but these have been limited in their scope, often concentrating on particular regions. Guides have been published in neighboring states, and some are useful to us in Tennessee. Nevertheless, with its location and geographic diversity, this state provides habitats for a particularly large number of species—some not found in Kentucky, Alabama, North Carolina, or Arkansas.

Also it is not just a matter of providing a list and descriptions of wildflowers. We have an opportunity with Flora 2001 to describe and illustrate interesting and unusual plant sites and populations that are part of Tennessee's history and heritage. Sites and species are being lost at a rapid rate, and many may be gone before another publishing effort can be organized.

Furthermore, a successful Flora 2001 project could stimulate both public and private efforts to protect the rich flora heritage of Tennessee.

What better project could TNPS have?

On January 11, TNPS board members, including members of the Flora 2001 Committee, met at the Lichterman Nature Center in Memphis.

Ostensibly the purpose of the meeting was to confer and consult with John Hunter, who is the author and virtual self-publisher of a beautiful guide to Arkansas wildflowers, which he followed with an equally successful guide to Arkansas trees and shrubs. During the meeting, John provided some important insights into book production and financing.

Perhaps most important, with some of John Hunter's ideas in mind, the Flora 2001 Committee reorganized its efforts. Before the meeting, enthusiasm had been dampened by the uncertainty of ever getting funds from the Tennessee Legislature. In Memphis the committee decided that funding from private and public sources would eventually be available. What needed to be done first was to give new life to the process of collecting and organizing text and photographs for the wildflower book.

TNPS President Mary Schaffner appointed a subcommittee on "selection and organization of species" (to include J. I. Bus Jones, Paul Somers, Larry Wilson, and Dennis Horn) and a subcommittee on "photography" (including initially Jack Carman and David Duhl).

Mary added, however, that her main message is that anyone wishing to participate in these efforts is invited and welcome to join in. She said knowledgeable TNPS members would be consulted.

In future issues of the TNPS Newsletter, we will continue to publish information about Flora 2001. I hope we can have details of the work being done and who is involved and specifics about what kind of help is needed.

Collective efforts like this have their disadvantages. But a successful effort for Flora 2001 would be a valuable achievement for us all.

—Latham Davis

GROWING THREAT TO BIODIVERSITY

Recent Conferences on Invasive Exotics

This past fall, two conferences provided forums on the issue of invasive exotic species. A state conference on the "Disturbance and Restoration of the Kentucky Landscape," sponsored by the Kentucky Native Plant Society and the Kentucky Natural Preserves System, occurred October 3-5 near Lake Cumberland, Kentucky. Then a national symposium on "Biological Pollution: the Control and Impact of Invasive Exotic Species," sponsored by the Indiana Academy of Science, met October 25-26 in Indianapolis.

Although the Kentucky conference was regional in its scope, there were many informative presentations. A few of the resounding themes were: (1) disturbance (caused by human impact) as the prevalent condition of the Kentucky landscape, (2) opportunistic invading exotics like garlic mustard, exotic honeysuckles, and Kudzu that thrive in disturbed conditions, and (3) invasive exotics in the landscape as a serious threat to native plant communities. In her overview of restoration efforts on state preserves, Joyce Bender of the Kentucky Natural Preserves Commission, cited eradication and control of exotics as a significant part of their restoration efforts.

The discussion of eradication and control figured prominently at the national symposium in Indianapolis. For example, Jeffery Schardt with the Bureau of Aquatic Plant Management and Exotic Pest Plant Council in Florida presented the stark facts about the aquatic weed Hydrilla introduced in Tampa for aquaculture purposes in 1930 and found today in 182 of Florida's 300 lakes surveyed. He reported that Hydrilla presently occupies 10,000 acres in Lake Okeechobee. Schardt claimed that the state was able to keep current population sizes from expanding at a cost of \$5 million annually and that expenditures of \$7-8 million annually reduced populations.

A seemingly endless number of horror stories were told about feral goats, zebra mussels, and the Asian tiger mosquito (a vector for a new strain of encephalitis). The well-documented catastrophic effects of wild boars, balsam woolly aphids (adelgids), and gypsy moths on native plants were reiterated. Margery Daughtery of Cornell University made a compelling case that dogwood anthracnose disease is caused by an introduced fungus that arrived with the Korean dogwood. Daughtery suggested that this occurrence is similar to the introduction of the fungus that arrived with the Chinese Chestnut causing the American Chestnut blight.

Raising public awareness and effecting public policy were given high priority by most speakers including George Raab of the World Conservation Union. Dr. Raab reported that more than 20 percent of extinctions are resulting from the introductions of exotics. A representative of the Natural Resources Defense Council indicated that NRDC would be working on the issue of exotic introductions as a priority while pushing for federal initiatives. Other discussions focused on a significant report that was being completed by the U.S. Office of Technology Assessment on exotic species in the United States. The report will be sent to Congress for legislative consideration.

The symposium in Indianapolis attracted nearly 300 concerned individuals representing a diversity of organizations from thirty-four states and three countries. Although the conference in Kentucky was much smaller in its scope and magnitude, both conferences represent a growing awareness regarding a very serious and urgent problem.

—Brian Bowen
Warner Park Nature Center

ANNUAL MEETING

— Continued

knowledge. Professional and amateur botanists alike welcome information about plant sites and experiences.

There will be opportunities to chat during and after supper on March 27, which may lead to some sharing of slides. TNPS President Mary Schaffner has asked a few members to be ready to show some of their photography but urges everyone who wishes to join in.

Business meetings are expected to begin about 9 a.m. Saturday. The afternoon will be spent exploring Indian Creek flora, said to be abundant. Otto Hirsch and Herb White will utilize canoes and a pontoon boat to guide the group to less accessible wildflower areas adjacent to Center Hill Lake. Expect to see harbinger-of-spring, toothwort, rock cress mustards, yellow corydalis, toadshade trilliums, and others.

There may also be opportunities to explore the bluffs along the Caney Fork River below the dam.

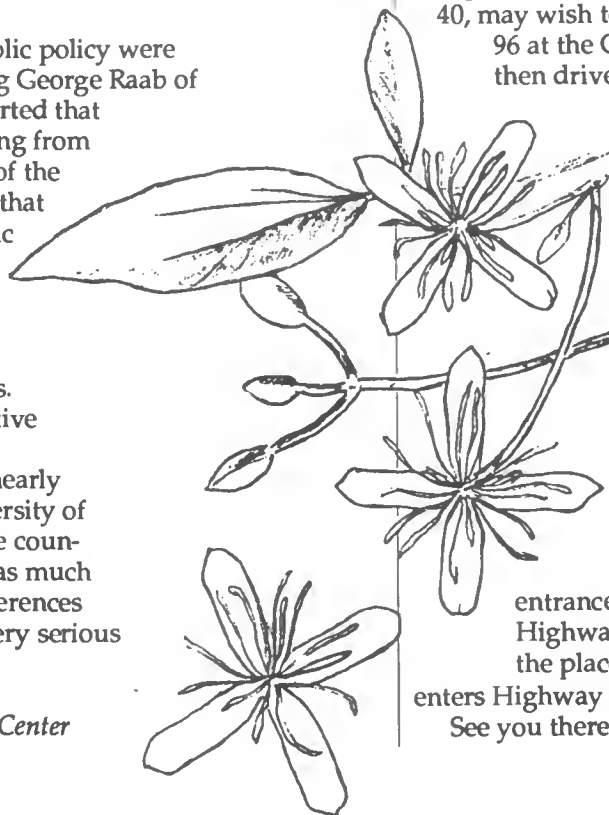
The program that evening will center on Dr. Hal Horwitz of Richmond, Virginia, a naturalist and photographer, who will present a multi-media slide show titled "In Praise of Native Orchids."

Further directions to Indian Creek Camp: Members approaching on I-40, may wish to exit on Highway 96 at the Center Hill Dam Exit, then drive across the dam and

begin watching from the Indian Creek entrance on the left. Those traveling from the west may wish to exit at Watertown onto Highway 70, then drive about 29 miles to Highway 96. The camp entrance is approximately four miles north of Highway 70.

An Indian Creek entrance sign is located on Highway 96 almost opposite the place that Highway 264

enters Highway 96.
See you there. □



CHEEKWOOD'S WILDFLOWER FAIR

Cheekwood Botanical Gardens in Nashville will hold its annual Wildflower Fair April 10-12.

Individual events will include a sale of native-plants and garden related items and guided tours of the Howe Garden of Native Plants. The tours will begin at 10 and 2 o'clock Friday and Saturday and 2 p.m. Sunday.

Cheekwood's hours are 9 a.m. to 5 p.m. weekdays and Saturdays and noon to 5 p.m. Sundays. A fee is collected at the gate.

The wildflower garden at Cheekwood is named for Mrs. Cora Howe, whose wildflower garden in East Nashville, known as "Wildings," was a popular spring attraction, beginning in the 1920s. Upon Mrs. Howe's death in 1967, the garden was moved to Cheekwood. The garden has continued to be developed and, while particularly beautiful in the spring, has flowers in bloom during summer and fall and plants with winter interest as well.

For more information contact Cheekwood's wildflower horticulturist Jenny Andrews. □

ALASKA TRIPS

John Wenger, past president of the Alaska Native Plant Society and University of Alaska naturalist, has notified us of four backpacking and raft trips he plans to lead this summer into the Alaska wilderness. He is extending a special invitation to TNPS members.

The two week trips include natural history studies of the Denali Parks, the Yukon River, and the Arctic National Wildlife Refuge. College credit is offered. Fees range from \$465 to \$865.

For more information write directly to John Wenger, 6038 E. 12th Ave., No. 10., Anchorage, AK 99504 or call 907/337-0608 (6:30-8:30 a.m. Tuesday and Friday Anchorage time). □

SAVE THE WILDFLOWERS—Continued

murder in our family & many other reasons, including . . . sickness, deaths and loss of areas of collection beyond our control," and I, in good conscience, ordered my American wildflowers from the giant Spring Hill Nurseries catalog.

I was taken by its green-marketing pitch: "Protecting Nature's Heritage: Nursery-Grown Wildflowers."

This neo-con gardener was won over by Spring Hill's earnest policy declaration: "Many wildflowers are becoming endangered species as they're removed from their natural habitats or their environments are destroyed. To help maintain our nation's floral heritage, Spring Hill offers a special selection of wildflowers so you and future generations can continue to enjoy their charm and beauty. None of the wildflowers offered by Spring Hill have been collected from the wild. All have been specially cultivated in our nursery so they can readily adjust to garden planting."

Spring Hill's floral-heritage maintenance policy covered "#1 nursery-grown" pink lady-slippers (*Cypripedium acaule*) and yellow lady-slippers (*C. calceolus*). "You don't have to disturb natural plantings to bring the enchantment of rare Yellow Lady's Slipper to your shade garden. We'll provide fully guaranteed nursery-grown plants of this endangered Moccasin Flower." How reassuring.



But then, from the July, 1989 meeting of the budding Eastern Native Plant Alliance, came the really bad news: "No nursery in the world is propagating *Cypripedium* . . . no commercial propagation of terrestrial orchids has as yet been possible. All plants of *Cypripedium acaule* offered for sale come from the wild, and [are] dying in customers' gardens." (Through the '80s, Wayside Gardens carried "native hardy" lady-slipper orchids, among its North American Wildflowers: "serving to bring you closer to your natural environment . . . chosen for their beauty, permanence and outstanding performance." It omitted claims of origin.)

Spring Hill touted "fully guaranteed top quality nursery grown" *Trillium grandiflorum*. But the ENPA wasn't having any of it: "Trillium propagation is slow, generally inefficient, and consequently expensive [needing] between five and seven years to reach flowering size when grown from seed . . . commercial propagation on a large scale is not feasible . . . Therefore, any nursery selling large quantities of this plant for low prices must be obtaining these plants from the wild." (Wayside sells them still.)

The Natural Resources Defense Council's Plant Conservation Project came to similar conclusions about modestly priced jack-in-the-pulpit, Dutchman's-breeches, crested iris, shooting star (all in the Spring Hill Wildflower Collection)—"almost always collected from the wild when . . . sold by mass merchandisers."

By so shilling its "nursery-grown" wildflowers, Spring Hill was being legally deceptive, perfectly unethical, and fully in accord with U.S. law. Spring Hill had simply availed itself of the Federal Trade Commission's Guides for the Nursery Industry (Federal Register 1979, Title 16, Chapter 1, Part 18), whereby "nursery-grown stock" is defined as "Plants propagated and grown under cultivation, or plants transplanted from the wild and grown under cultivation for at least one full growing season."

The FTC definition allows wild-collected plants to be nursery-laundered via a brief layover in a nursery bed. Cowboy diggers in Third World economies such as Appalachia's dig on commission and sell their wild digs for pennies to wholesalers in, say, the Tennessee wildflower laundry town of

Continued Next Page

McMinnville. The McMinnville cartel then brokers the wildflowers by the thousands, marked up a few pennies, to retail nurseries. Recent McMinnville order forms list pink lady-slippers in quantities of "199-UP" at 30 cents each; trillium, trout lily, jack-in-the-pulpit, shooting star "199-UP" at 25 cents each, Dutchman's breeches by the hundreds at 19 cents each, etc. (The Tennessee Dept. of Conservation knows of at least 600,000 wild-collected trilliums shipped out of state in 1989, plus an order for 20,000 pink lady-slippers.)

So that the nurseries' wild-collected cop-out makes perfect nonsense, FTC Guide 6 decrees: "It is an unfair trade practice to sell, offer for sale, or distribute industry products collected from the wild state without disclosing that they were collected from the wild state: *Provided, however,* that if collected plants are grown in the nursery row for at least one growing season before being marketed, such disclosure is not required."

In 1990, under fire from plant conservationists, Spring Hill dropped its U.S. government-sanctioned claims—but kept right on selling the pink lady-slippers, the trilliums, etc. They all became, simply, "#1 plants." This year the lady-slippers and the trilliums are gone, but not the rest of the suspects—the trout lilies, jack-in-the-pulpits, crested irises, shooting stars—plants about which the presumption of wild collection is strong—and about whose origins Spring Hill won't comment.

Just say nothing and gardeners will assume the best. Until the FTC gets around to deep-sixing its Alice in Wonderland guidelines on plants "collected from the wild state," EG aspirants should either take a vow of abstinence from wildflowers (as did Burpee in 1988) or subject suppliers to a rigorous inquisition. How does the nursery propagate the plants: seed, cutting, offset, tissue culture or act of God? They should also put their horticultural throw-weight behind the Oct. 15 Petition to the Federal Trade Commission Requesting Amendment of Labeling Guideline for the Nursery Industry, filed under the Natural Resources Defense Council leadership of Faith Campbell. (Among the signatories: Garden Club of America, California Native Plant Society, Mt. Cuba Center for the Study of Piedmont Flora, Environmental Defense Fund, Native Plant Society of Oregon, New England Wild Flower Society, Niche Gardens and Montrose nurseries, World Wildlife Fund's TRAFFIC (USA).) The petition says "current labeling guidelines encourage sellers to make deceptive claims about the origin of their products," and that Guide 6 "allows plants which originated in the wild to be disguised as 'nursery grown,' thereby confusing or misleading the environmentally concerned consumer . . . 'nursery grown' means only that the plant has been 'established' in a nursery for as little as a few weeks."

While lobbying the FTC for truth in plant labeling, one hopes impatient gardeners will not be led astray by well-meaning native-plant enthusiasts such as Jim Wilson, the "Southern Host" of PBS's "Victory Garden." In a recent *Carolina Gardener* magazine profile he confided that the "most satisfactory of all . . . ways to acquire [wild] plants [is] through the 'dig-it-yourself' approach. Just carry a shovel at all times plus a jug of water and a plastic bag, and be prepared to dig up a sample whenever you spot something interesting" Ethical gardeners *en garde!* □

In a recent letter to the TNPS Newsletter, Patti Hagan mentioned that when preparing this article she had valuable cooperation from Paul Somers and Dan Eagar, both in the Department of Environment and Conservation. She also said she has a continuing interest in the problem of "wild-collecting," and would like to write more on the subject, particularly about carnivorous plants (*Sarracenia oreophila*, the *Droseraceae*, etc.) and ginseng.

SUING FOR THE ENDANGERED SPECIES

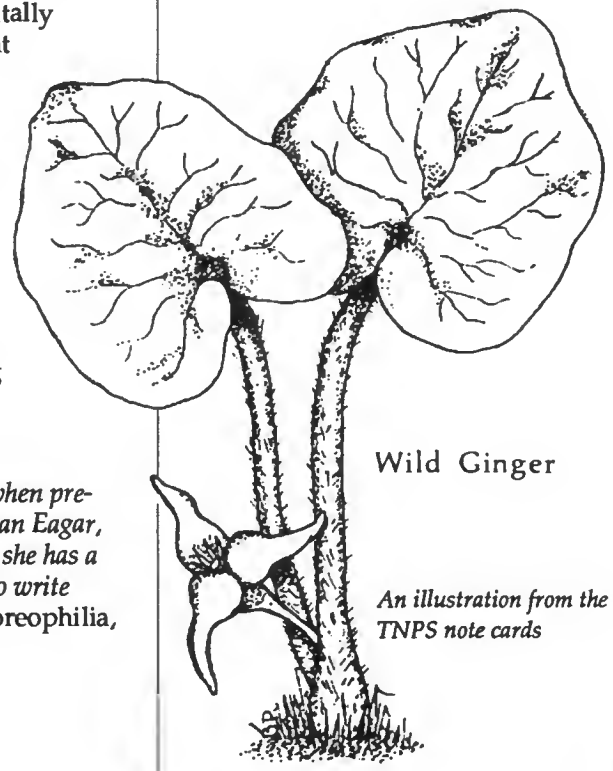
Last year the California Native Plant Society filed suit against the U.S. Fish and Wildlife Service for not listing plants on the federal Category I list of endangered plants.

That suit has been settled, and under the agreement the Wildlife Service will list 159 Category I candidates by March 31, 1996. Prior to the lawsuit, the Wildlife Service had listed 33 plant species in the 17 years since the enactment of the Endangered Species Act. At that rate, listing of the Category I candidates would have taken nearly 80 years.

Despite the suit, CNPS emphasized the spirit of cooperation between the society and the Wildlife Service. □

AN INDEPENDENT LIST OF ENDANGERED PLANTS

The Center for Plant Conservation, a consortium of botanical gardens and arboreta, has identified 330 plant species of the United States which are believed in danger of extinction within five years. □



Wild Ginger

An illustration from the TNPS note cards

FURTHER OBSERVATION OF NINE-ACRE GLADE

The following note was received in reference to the TNPS trip to Nine-Acre Glade and the story about the trip that appeared in the October issue of the TNPS Newsletter.

A population of *Prenanthes* observed and collected in the prairie remnant field adjacent to the Nine-Acre Glade/Barren area, tentatively identified as *P. aspera*, has been determined to be *P. barbata*.

The identity of the material became a point of interest because *P. aspera* is a state listed endangered plant, and *P. barbata* is not. *P. aspera*, according to the key and description in Cronquist (1980) and the illustration in Steyermark (1963) should have a strict cylindrical flowering stalk, with all flower heads on short peduncles. *P. barbata* has a more branching-type of inflorescence, like most other *Prenanthes*. *P. barbata* also favors calcareous areas, and has fewer hairs on the bracts than *P. aspera*, and the hairs tend to be arranged in lines on the central vein of the bracts of the heads.

—Milo Pyne and Paul Somers

References:

Cronquist, A. 1980. *Vascular Flora of the Southeastern United States*. Vol. I. Asteraceae. University of North Carolina Press, Chapel Hill.

Steyermark, J. 1963. *Flora of Missouri*. University of Iowa Press, Ames.

SUNLIGHT GARDENS CATALOGUE

Andrea Sessions at Sunlight Gardens informed us that their catalogue now costs \$3. The 1992 catalogue is full of interesting notes about wildflower gardening, as well as descriptions of the scores of species they propagate and offer for sale.

Sunlight Gardens
Rt. 1, Box 600-A, Hillvale Road
Andersonville, TN 37705

SKUNK CABBAGE *SYMPLOCARPUS FOETIDUS* NUTT.

In very early spring, in very mucky places, one may happen upon odd globular growths about 6 cm. high, striped lurid purple and green. The spathe, as this outer cover is called, enfolds a spherical yellowish nubbin within. This is the spadix, a ball of small crowded flowers. A cone-shaped spear of rolled-up young leaves is usually seen, along-side the floral structure, which will unfurl and spread out into a group of 2 dm long, smooth, roundish leaves. When crushed these leaves emit an odor reminding one of skunks rather than violets. Perhaps the stench drives away creatures that might want to eat it.

But some people have eaten the cabbage after boiling. I have chewed the leaves and find it less painful than Indian turnip, *Arisaema triphylla*, by far. Both contain calcium oxalate in the form of tiny, sharp, needle shaped crystals. These pierce cells of the lining of tongue and mouth. People, who have never tasted it, say it is hot like red pepper. Wrong! It is like a mouthful of finely ground glass.

The spadix has an odor much different from the leaf. It smells like old mouldering hair and hide.

In early spring, as snow melts, carcasses of frozen winter killed animals thaw and putrify. To greet them come early hatching flesh flies and carrion beetles. The skunk cabbage competes with the corpses for these insects so they will pollinate their flowers.

The plant advertises with the spathe, which has the lurid purple color of dried blood and muscle, and the carrion odor of the spadix. To make matters even more attractive for the insects, the flower produces heat, as do the bacteria growing in the dead animals. Warmth invigorates insects; cold bugs cannot move and are of no use to the plant. The heated spadix also intensifies the carrion stench which wafts about outside the spathe to attract insects from afar. When I warmed a spadix up, the putrid stench increased from mild to revolutive enough to gag a maggot.

Studies have shown that the fever of skunk cabbage comes from hydrolysis of salicylic acid stored in the plant. Salicylic acid, like aspirin, reduces fever in people.

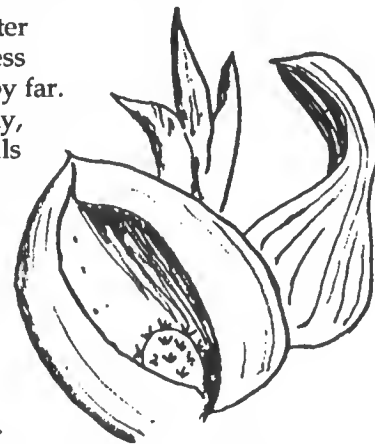
In the fall, where skunk cabbage bloomed in spring, one may find a dirty green oblong object 8x4x3 cm lopped over on top of the mucky soil. This is the fruit of skunk cabbage which remains after the leaves have rotted away.

Skunk cabbage could never win a beauty prize among flowers; its body odor can only be appreciated by denizens of dung and offal piles.

Skunk cabbage can only sit in the cold, wet mud, run a fever, and stink!

—John A. Churchill,
from *Plants Helpful or Harmful to People*

John Churchill mentioned in a letter: "In response to the query in last Newsletter about where have all the wildflowers gone?, miles of them have been and still are being chewed up by the bulldozers creating route I-181 up in Sams Gap. The commercial diggers should get up there and dig all those *Trilliums* and other rich hardwood plants, including ginseng."



THE 1992 TNPS FIELD TRIP SCHEDULE

Thanks largely to the efforts of Dennis Horn, the following array of field trips has been organized for 1992. Each trip will be described in more detail in the TNPS Newsletter as time for the trip approaches.

These field trips are one of the few ways TNPS members can meet each other, so for that reason everyone is welcome to join these gatherings whenever possible. Participants on these excursions always include novices with an interest in expanding their knowledge, as well as professionals (and other experts) out to see unusual plants and habitats.

In addition to the dates and general locations, the following list also includes names of coordinators. A call to the coordinator before you attend each trip may prevent confusion if there should be a change in the schedule.

Date	Event/Location	Coordinator
Mar. 27-29	Annual Mtg/Indian Crk. Camp	
April 4	Shakerag Hollow/Sewanee	Latham Davis 615/598-5532
April 5	Short Springs/Tullahoma	Dennis Horn 615/455-5742
April 23-25 April 26	Wildflower Pilgrimage TNPS Hikes/Sugarlands	
May 9	Cumberland Co./Crossville	Margret Rhinehart 615/946-2381
May 23	AEDC Orchids/Tullahoma	Jack Carman 615/455-2585
June 6	Obed Junction/Morgan Co.	Margret Rhinehart 615/946-2381
June 13-14	Bluff Mt., N.C. and Blue Ridge Pkwy Sites	Bus Jones 615/892-3009 and Ed Schell
July 18	May Prairie/Manchester	Dennis Horn & Carman 615/455-5742
Aug. 29	Coffee County/Mancheser	Dennis Horn
Sept. 19-20	Wolf River/Memphis Meeman Shelby Forest	Larry Wilson 901/458-8724

SHORT SPRINGS FIELD TRIP APRIL 5

Short Springs, located northwest of Tullahoma on Short Springs Road, harbors a wealth of species that will delight any student of plants.

The contrast with Shakerag Hollow of the previous day should be especially interesting, for here the habitat is 1,000 feet lower, warmer, and wetter. Hikers will also enjoy the waterfalls.

Dennis Horn advises us that this is a local event, with hikes beginning at 11 a.m., 1 p.m. and 3 p.m. Dennis suggests that TNPS members meet him at 10:30 a.m. at the Dairy Queen, one block beyond the first traffic light when driving from I-24 at Manchester on Highway 55 (I-24 exit 111). □

SHAKERAG HOLLOW HIKE APRIL 4

While many TNPS members have previously hiked the picturesque trail off Green's View into Shakerag Hollow at Sewanee, no one has seen it quite the same any three or four trips in a row. As in settling down to re-read a good book, you always experience things you hadn't noticed before.

Likely for this reason, Dennis Horn was urged by several city members to put Shakerag on the list. And after all, few sites can match this Cumberland Plateau site for its abundance of early spring wildflowers—Dutchman's britches, trout lilly, blood root, trillium, and on and on—spread out along slopes under aging tulip poplars, hickory, white oak, and beech. All the Cumberlands should look so good.

An added bonus is that TNPS members will be joined by members of the American Association of Field Botanists.

The hike will begin at 10 a.m. Saturday April 4. After the hike enjoy a picnic lunch at the bluff or something inside at the Sewanee Inn. Those who wish may take an afternoon hike into nearby Dick Cove.

Except for a brief bout of steep climbing, the Shakerag trail is relatively gentle. The hike may last two to three hours down and back. That afternoon everyone will be invited to gather at the home of Mary and Latham Davis in Sewanee for refreshment and conversation about the plateau.

First drive to Sewanee, five miles south of Interstate 24, exiting at Monteagle (Hwy 64/41) and following the signs toward the University of the South (watch for "exit" to the right after passing the stone gates). Look for the Sewanee Inn and Restaurant across from the hospital. Green's View Road begins to the left of the Sewanee Inn and runs alongside the golf course before turning to gravel and reaching the bluff.

Those wishing to stay overnight will find motels nearby. Don't forget the Short Springs hike the next day near Tullahoma, which is forty-five minutes from Sewanee. □

HOW TO USE THIS MEMBERSHIP FORM

Once again we publish this membership form on the "cover." I apologize to those tired of seeing it, and I apologize to those who have asked me to locate the form where it can be cut out without marring the newsletter.

This time it's the worst. The field trip schedule is on the back. Some members want clip that out too. Alas, time and space limit our abilities.

If you cannot "xerox" the membership form, you may send clearly written instructions to the treasurer, Karen Yarbro, to renew your membership. Otherwise, go ahead and cut out the form. We can't save everything.



MEMBERSHIP RENEWAL TIME

It's time once again to renew your membership in TNPS, which asks that dues be paid by the calendar year.

In accordance with a motion passed at the annual meeting last March, dues are increasing for 1992. It is hoped that additional revenue will allow the society to undertake special projects for the study and protection of wildflowers and other plants indigenous to Tennessee.

Whether you are a professional botanist or an amateur with a fascination for wild plants, you are not only encouraged to join but welcome to participate in the Tennessee Native Plant Society. Thanks for joining us.

I am a new member renewing member

Name _____

Address _____

City/State/Zip _____

Membership Categories: Regular \$15, Student and Senior \$10; Institutional \$20; and Life \$150.

Mail to: Tennessee Native Plant Society, Department of Botany,
University of Tennessee, Knoxville, TN 37996-1100.

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TENNESSEE NATIVE PLANT SOCIETY NEWSLETTER

Volume 15, Number 2

April 1992

HELP NEEDED FOR ROADSIDE WILDFLOWER PROGRAM

The Tennessee Department of Transportation has agreed to choose areas along roadsides, within the right-of-way, to maintain as wildflower areas.

This is good news for everyone interested in native flora, but this good news has qualifications. Mainly, the transportation department will not act on the new policy until it is given information about wildflower sites. At this point TNPS members can play an important part in the effort.

Candy Swan at Tennessee Tech University has the contract with the transportation department for the Wildflower Research Program, mentioned previously in the *TNPS Newsletter*.

She desperately needs persons to scout out areas along interstates and state routes in Tennessee that have potential for preservation and maintenance as natural, native-wildflower habitats. She will be keeping data on these areas and will be making recommendations to the department of transportation.

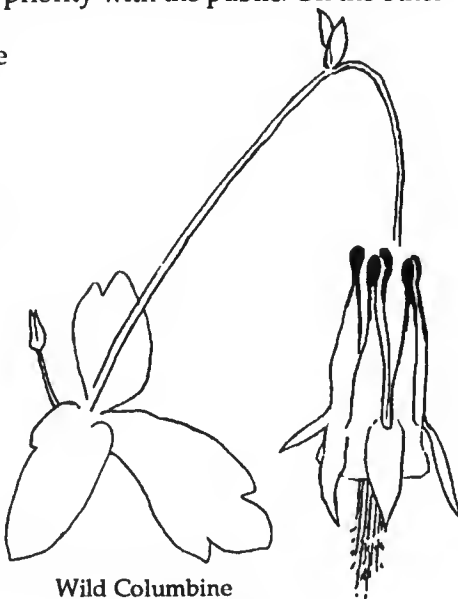
Andrea Shea, a staff botanist with the Department of Environment and Conservation and a TNPS member, emphasizes that one person alone cannot gather data for the entire state. She asks fellow members to help by making observations along highways and sending the information to Candy Swan.

"This is a trial program," said Andrea. The transportation department will be scrutinized but first must be provided with valid information.

If sites are not located and recommendations not forwarded in a timely way, then the failure will be another indication to state officials that wildflowers and other native plants have a low priority with the public. On the other hand, if Candy Swan is given strong support, transportation officials will be more inclined to limit the planting of exotic species and institute a real wildflower program.

According to Andrea, TNPS members can help even more by notifying Candy Swan of areas to collect wildflower seed. She is having trouble finding sources of seed to plant in roadside sites.

If you can help with either of these requests, write to Candy Swan, School of Agriculture, Tennessee Tech University, Cookeville, TN 38505 or call 615/372-3136 (office) or 839-3205. Andrea Shea also invites calls about the program to her office at 742-6550.



Wild Columbine
(*Aquilegia canadensis*)

FLORA 2001 FUNDING

The Tennessee General Assembly has approved financial support of a portion of the Tennessee Flora 2001 Project.

The new bill provides \$12,000 initially, with expectations that \$12,000-funding will be forthcoming for each of the next three years. The money will support the atlas, listing 2,700 species of vascular plants and their distribution by county. The funds are being provided to the Austin Peay State University Center for Excellence in Biology, which hopes to match the state funds.

The new appropriation is interest from a trust fund set up during the administration of Lamar Alexander and built with money from the sale of state property and natural resources, such as coal and gas.

The Flora 2001 Project consists of three parts, including the publication of a photographically illustrated wildflower book and a complete technical guide to the vascular flora of Tennessee, as well as the atlas. TNPS is the principal sponsor of the project.

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TENNESSEE NATIVE PLANT SOCIETY NEWSLETTER

April 1992
Volume 15, Number 2

This Newsletter is a publication of the Tennessee Native Plant Society and is published six times a year, generally in February, April, June, August, October, and December.

The Tennessee Native Plant Society (TNPS) was founded in 1978. Its purposes are to assist in the exchange of information and encourage fellowship among Tennessee's botanists, both amateur and professional; to promote education of the public about Tennessee flora, and wild plants in general; to provide, through publication of a newsletter or journal, a formal means of documenting information on Tennessee flora and of informing the public about wild plants; and to promote the protection and enhancement of Tennessee's wild plant communities.

Dues are \$15 for the calendar year (\$10 for students and senior citizens, \$20 for institutions, and \$150 for life memberships). Membership privileges include a subscription to the TNPS Newsletter. Dues may be sent to the Tennessee Native Plant Society, Department of Botany, the University of Tennessee, Knoxville, TN 37996-1100.

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Letters to the editor or correspondence about the Newsletter should be addressed to: TNPS Newsletter, P.O. Box 856, Sewanee, TN 37375.

Letters

. . . FROM McMinnville

Following is a letter sent to the editor of the Wall Street Journal, a copy of which was received by the TNPS Newsletter.

This letter is in response to an article written by Patti Hagan, gardening columnist for the *Wall Street Journal*, regarding the collection of wildflowers. This article was reprinted in the February 1992 issue of the Tennessee Native Plant Society Newsletter. The article demeans McMinnville and is somewhat misleading. There are many inaccuracies within the article. The article was poorly researched, and the information presented was not verified. The inference is that 600,000 wild-collected trilliums and 20,000 pink lady slippers were shipped from McMinnville, when in fact our information reveals this occurred in another county.

Some 600 growers of nursery stock are located in Warren County, of which McMinnville is the county seat. These growers collectively own some 20,000 acres of land; and some do collecting of plants on their own land, which is a property owner's right. No government agency has offered to buy rights to plants located on private property; therefore, the property owner sees this as inventory which can be converted to cash to pay taxes, etc.

We agree some plants should not be taken from the wild, e.g. Lady Slippers, which most assuredly will die due to the lack of soil bacteria required for survival. There are species of plants, however, which will recover nicely after being thinned out.

There have been two meetings between the nurserymen of our county with the American Association of Field Botanists, and a suggestion was made to the group and Mr. Somers to do some education in the county where a large portion of the problem occurs. To my knowledge, they have yet to set up a meeting for this purpose. Is this being responsible?

The article was unkind to our fair city. We resent being called a "laundry town;" and certainly the term "cartel" does not fairly represent our area nurserymen. McMinnville and Warren County are not third world communities nor do we have third world economies. Please urge Ms Hagan to research her future articles more thoroughly.

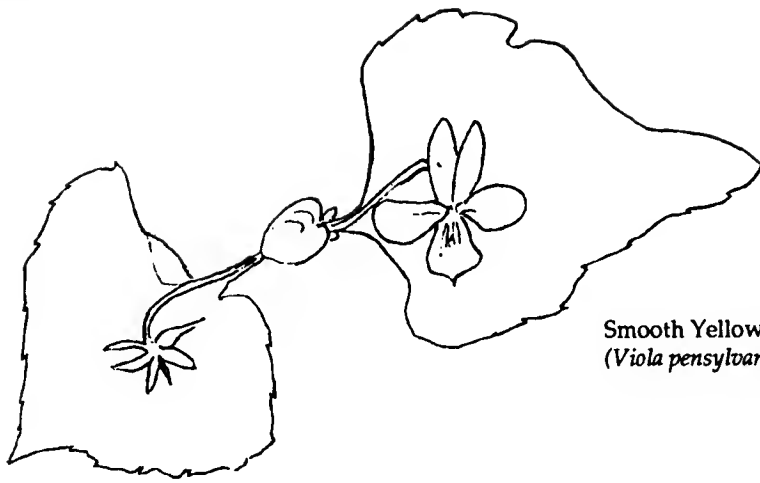
Edward S. Porter

President, McMinnville-Warren County Chamber of Commerce

Editor's Note: In reprinting the article from the Wall Street Journal, we had no desire to denigrate the name of McMinnville or the nurserymen of the area, the great majority of whom are propagators, not collectors. Most nurserymen recognize the value to their industry of protecting natural ecosystems or native plant communities.

*Another Note about Wild Collecting: Early this spring, while hiking along the Collins River Trail in Savage Gulf (a state protected area in Grundy County), my wife Mary and I observed where collectors had dug, not more than a day or two earlier, ferns from an entire bluff-side, concentrating on the common woodfern (*Dryopteris spinulosa*, var. *intermedia*, Muhl.), though some Christmas fern were also collected. Judging by the piles of last year's fronds and the root stocks left behind, they must have carried out many hundreds of plants. George Ramseur of Sewanee has observed several "digs" this spring in areas parallel to highway 41 north of Monteagle.*

We should acknowledge here that commercial collecting is a less critical threat to wildflowers than many other activities carried on by us human types. Indiscriminate real estate development, pollution, and poor logging and agricultural practices are each almost certainly of greater concern. Collecting becomes a particular threat when it affects areas that the public or property owners believe, or have a right to believe, are already protected.



Smooth Yellow Violet
(*Viola pensylvanica*)

... ON SKUNK CABBAGE FEVER

I enjoyed John Churchill's article about the skunk cabbage in the February *Newsletter*. I did want to correct and add to one aspect of his discussion of the heat generation in the spadix. The fever in the skunk cabbage is not due to the hydrolysis of salicylic acid, though that compound does play a role. For one thing, salicylic acid is not hydrolysable, although acetyl-salicylic acid or methyl acetyl salicylate (aspirin) is hydrolyzable to acetic and salicylic acids. The role that salicylic acid appears to play is that of a hormone-like substance which was called "calorigen" before its chemical identity was known. This stimulates a special kind of respiration (the alternative or cyanide-insensitive pathway) which leads to the production of heat because this pathway is uncoupled from the synthesis of ATP which occurs in the usual respiratory pathway. Thus ironically, while aspirin lowers body temperature in humans, it increases the temperature in this aroid spadices. I enclose photocopied pages from a recent plant physiology textbook (*Plant Physiology*, by L. Taiz and E. Zeiger, Benjamin/Cummings Publishing Company, Inc., 1991) which discusses the matter a bit more.

Raymond W. Holton
Professor, The University of Tennessee
Knoxville

Editor's Note: Referring to the skunk cabbage, *Symplocarpus foetidus*, Taiz and Zeiger note in *Plant Physiology* (page 278), "Just prior to pollination, tissue within a clublike organ on the developing floral apex (the spadix) undergoes high rates of respiration through the alternative pathway, causing the spadix to heat up by as much as 14°C above ambient temperature and to volatilize odiferous compounds that attract pollinating insects."

Acknowledging Professor Holton's letter, Dr. Churchill writes, "Thank you very much for your comments, which shed much more light on the heat made by skunk cabbages. I have already edited my file."

PINK LADY'S SLIPPER ADDED TO STATE ENDANGERED LIST

The pink lady's slipper (*Cypripedium acaula*) is being added to the state list of endangered species. The action will become official on June 11.

A fuller article about the lady's slipper and the endangered list will be prepared for the June issue of the TNPS Newsletter.

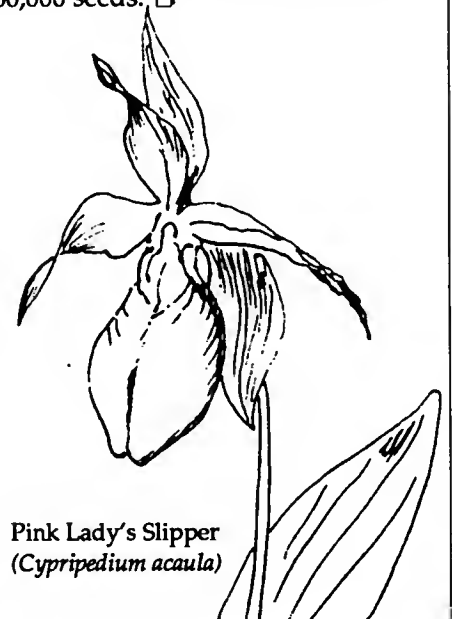
The state action comes slightly too late for thousands of pink lady's slippers observed being sold this spring at roadside nurseries of Tennessee (and who knows where else). Of course, approving a regulation is one thing; informing the public and enforcing the law are other matters entirely.

ONCE BITTEN, TWICE SHY

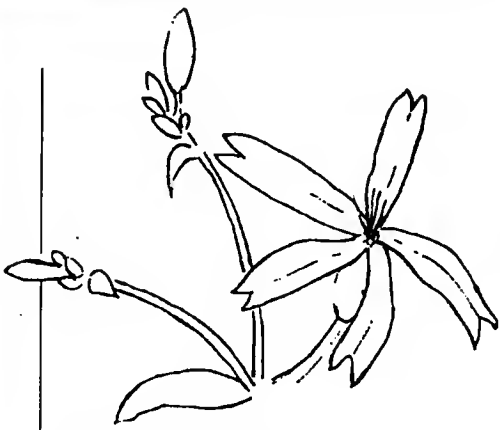
We'd like to share the following note taken, respectfully, from a recent newsletter of the Virginia Native Plant Society.

Pink lady's slippers are so unwelcoming to insects that the flowers are hardly ever pollinated, reports Douglas E. Gill, a University of Maryland zoologist, in the *Washington Post*, April 29, 1991. The balloon-like, lower petal of pink lady's slipper contains no nectar but if a bumblebee decides to check inside, the curled petal traps the bee, forcing it to slither up a circuitous passage at the back of the flower and squeeze under a pollen sac to escape. To complete pollination, the bee carrying pollen from the first flower would need to enter a second flower—something most bumblebees will not do.

Gill, who has spent sixteen years studying 3,000 pink lady's slipper plants in George Washington National Forest, has found that only about 1,000 of the long-lived plants have flowered during that period. Of those, just twenty-three have been successfully pollinated. How does the species survive? The average life span is about twenty-three years, and some of these hardy orchids may live as long as 150 years. Also in the plants' favor is the fact that once pollinated, a flower produces about 60,000 seeds. □



Pink Lady's Slipper
(*Cypripedium acaula*)



ARTHUR CRONQUIST: WE KNEW HIM FROM HIS BOOKS

Dr. Arthur Cronquist, creator of the Cronquist system of plant classification and author of many of our better known botany textbooks and manuals, died March 22.

In 1968 Dr. Cronquist completed *The Evolution and Classification of Flowering Plants* (Scientific Publications, the New York Botanical Garden), one of his books outlining what became known as the Cronquist system. In his system, he organized some 350 families of plants by their evolutionary relationship, describing which families are very closely related and which are more distantly related. For twenty-five years the system has been the most widely used and accepted reference for botanists studying the evolution of plants.

Cronquist also wrote the *Manual of Vascular Plants of the Northeast United States and Adjacent Canada* (Scientific Publications, the New York Botanical Garden, 1963, 2nd edition 1991), which is known as the Green Bible. The manual is a key that allows a person to identify flowering plants or ferns from the region and is the basis for many popular field guides.

A favorite reference among TNPS members is Cronquist's *Vascular Flora of the Southeastern United States* (University of North Carolina Press, Chapel Hill, 1980).

He was also an expert on plants of the Western U.S. and when he died was at work on a six-volume series about the plants of the intermountain West. For years he was director of botany and finally senior scientist at the New York Botanical Garden. He was 73 years old. □

VEGETATION ECOLOGY

SEEING THE FOREST, AS WELL AS THE TREES

Some of us who join the Native Plant Society field trips may look as much at the landscape, landforms, rocks, soils, and overstory trees as we do the wildflowers. You may believe that the real show is the wildflowers—that they are the actors, but some of us are *stagebuffs*—we are at least equally interested in the *stage* itself. Not just the stage of today that we walk on but the stage as it has changed over time. And not just the changing stage but what environmental (including historical) factors make it (and have made it) the way it is today.

Species and factor oriented biologists we call ecologists. Those interested in the biotic communities that are the *stages* are vegetation ecologists. Vegetation ecologists have for generations looked at the various stages of plant or biotic communities and have found that they are distributed upon the landscape in accordance with natural laws acting within history.

The history of a community may have allowed the species to evolve in or migrate into that place; or history, as man's action, may have modified it greatly or eliminated it altogether and replaced it with another community.

Laws relating to species are Laws of Tolerance that permit, or do not permit, a species to survive and prosper under the environment there. These are enormously different among species and are genetically controlled and change only slowly. Laws relating to environment are those that involve such factors as light, temperature, moisture availability, and soil oxygen.

Focusing on Tennessee's landscape we must concentrate on the natural areas, chiefly modified natural communities—those dominated by vascular plants. Grasses and sedges dominate grassland, as they do barrens, parts of marshes, and grassy balds. Shrubs dominate marsh borders, and mountain

Wild Geranium
(*Geranium maculatum*)



shrub preponderate on balds or slicks. Forests may be dominated by gymnosperm (softwood) or angiosperm (hardwood) trees.

The array of responses by species to environment is bewildering. Both high and low elevation vegetation may be graminoid, shrub, softwood, or hardwood dominated.

Within these life forms the array of species is very large. They can be organized as species that withstand submersion or at least root submersion (with little oxygen)—hydrophytes. If the water is shallower or submersion is temporary, helophytes may be dominant as in marshes.

Mesophytes (middle plants) require moisture but good drainage on a slope or in the rooting medium. Xerophytes require oxygen through good drainage, but where the soil is dry because of climate or topography; they are drought tolerant. The most extreme forms of these are completely aquatic on the one

Continued Next Page

hand and are desert plants on the other.

Our aquatic plants on rivers and lakes, including those of their borders, are in all life forms; the communities are aquatic, marsh, marsh border, and swamp. Non-forested bogs with wet, organic soils, scarcely present in Tennessee today, once occupied some valley bottoms and spring-fed sites in the mountains and were dominated by graminoids, shrubs, and trees with much bryophyte cover (*Sphagnum* bogs).

Uplands may be graminoid (barren) or forest dominated, but mesic sites in natural vegetation are rare because of land use changes. Mesic grassland barrens are indeed rare. Mesic forests occur chiefly on slopes and rolling lands with deep soils. Our mesic ravine and cove forests are the best of these—the wildflower cover and species richness are highest there. Xeric grasslands (barrens) are more common but, like other barrens, resemble lands released from agriculture. Xeric forests occupy shallow soils, as at the borders of barrens and at cedar-pine glade borders, cliff edges, and very steep slopes where soil does not accumulate. Eastern red cedars and pines may be forest dominants, but xeric oaks are most important generally.

Given the more than 2,700 species of Tennessee flora separated into life forms and occupying a wide variety of sites, the result is hundreds of types of communities. Some of these are temporary and disappear with the invasion of different species and life forms. These communities are the stages where ground flora live or die, where their evolution occurs, and where thousands of kinds of animals live and die. These communities are the management units of forest and wildlife managers. For the early settlers here, these were the first quick sources of timber, food, fiber, fuel, clothes (hides), and grazing or browsing land for their livestock.

For us today the remaining, mostly managed, communities function the same way, though now we also think of them as sources of horticultural stock, chemicals, water from protected watersheds, and the carbon sink from which atmospheric CO₂ is extracted. Build-up of CO₂ levels, influencing world temperature, will change our lives completely if allowed to continue.

The classification, description, and historical and environmental interpretation of Tennessee's biotic communities have been underway for over sixty years. The importance of these studies parallels that of the Tennessee flora project, and funds to continue the work are being sought.

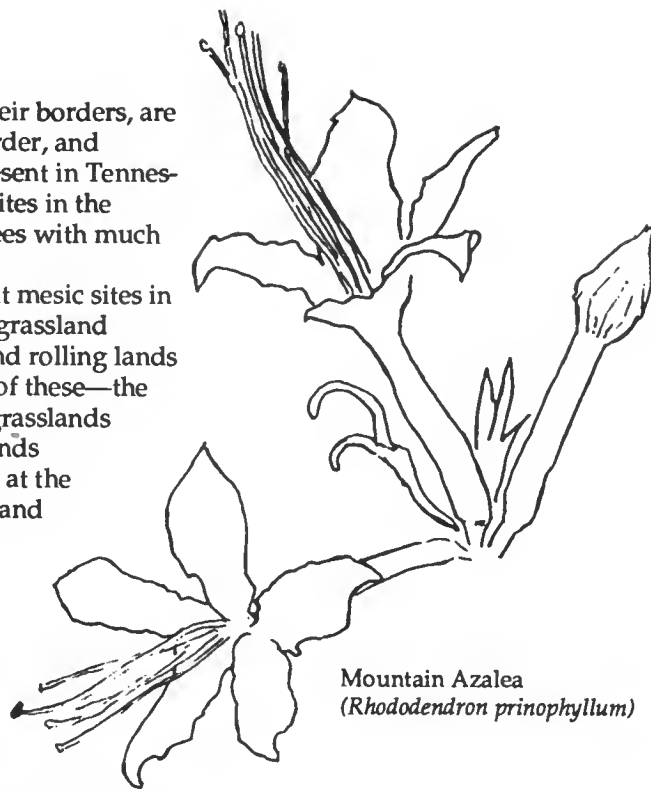
Hal DeSelm
Professor of Botany
The University of Tennessee

JOIN TNPS OBED HIKE JUNE 6

Dr. Margaret Rhinehart will lead a TNPS hike along the Obed River and Daddy's Creek in South Morgan County June 6. See a wild scenic river at its best.

Dr. Rhinehart said hikers should be able to see *Marshallia grandiflora*, tassellrue (*Trauentteria*), and unusual species of evening primrose. She asks members to bring old shoes to wade to an island. The hike is moderate, about a mile altogether.

Meet at 12:30 p.m. at Shoney's Restaurant in Crossville. To get to Shoney's travel I-40; exit at U.S. 127 (exit 317) and turn south toward Crossville. Shoney's is about a quarter mile on the left. To alert Dr. Rhinehart or get more information, call 615/946-2381.



Mountain Azalea
(*Rhododendron prinophyllum*)

POLLINATORS WANTED!

Anyone interested in volunteering a few days a week or a few hours a day to assist in discovering the Great Smoky Mountains rare plant pollinators? Natural Resources Management needs a nature enthusiast to spend time collecting much-needed information on many of the park's most unusual flowering plants. No experience is necessary, just eagerness to learn, ability to hike in the back-country, and patience.

Call Janet Rock (615/436-1254) or Keith Langdon (436-1250) for more information. Both are staff members with the National Park Service in Gatlinburg. □

BLUFF MOUNTAIN, BLUE RIDGE PARKWAY HIKES

TNPS members are invited to join members of the American Association of Field Botanists for a visit to Bluff Mountain, a Nature Conservancy preserve, and sites along the Blue Ridge Parkway June 13 and 14.

For more information, call J. I. (Bus) Jones at 615/892-3009.

AEDC ORCHID HIKE SET FOR MAY 23

All members are called to join the AEDC orchid trip May 23 near Tullahoma.

Jack Carman asks everyone to meet at 10 A.M. (Central) at the main gate parking lot of Arnold Engineering Development Center. The main gate is approximately 2.5 miles west of I-24 from exit 117.

The orchids are found mainly in powerline vistas, often in wet habitats, therefore be sure to bring waterproof shoes or boots.

Among the flowers Jack hopes to see are rose pogonia, spreading pogonia, death camas, grass pink, hyssop-leaf skullcap, and *iris prismatica*.

To alert Jack to your coming or to get more information, ring 455-2585.

TENNESSEE LOSES STATE BOTANIST PAUL SOMERS

The Tennessee Native Plant Society is losing a great friend and wonderful source of botanical information—for that matter, all of Tennessee is losing.

Paul Somers, state botanist for the past fifteen years, has resigned to take the position of state botanist in Massachusetts. Paul will be the botanist for the Massachusetts Natural Heritage Program, basically the same position he has held here.

The news about Paul's resignation comes almost simultaneously with news that the position of rare plant protection coordinator, which is held by Walt Jones, has been cut from the Ecological Services Division of the Department of Environment and Conservation. □

*Have You
Renewed Your
Membership?*

NEW OBSERVATIONS OF TRILLIUM PUSILLUM

Some TNPS members observed the dwarf trillium (*Trillium pusillum*, Michaux) this March at Indian Creek Camp during the annual meeting. Others will remember seeing the dwarf trillium last year at the home of Harry and Jean Yeatman near Sewanee.

These encounters provide an opportunity to give some attention to this intriguing little plant, and Dr. Yeatman has given us the information:

This dwarf trillium was found in two clumps and a single in our yard on 10 March 1990. They reappeared on 8 March 1991 and were observed and photographed by members of the society.

Again on 4 March 1992, they were blooming. One clump consisted of 27 plants, the other had 14 plants, and the single was still present. This makes a total of 42 plants.

The petals of *Trillium pusillum* are narrow, undulate at the edges, and the undersides show some light lavender or pinkish lavender, even in the early stages.

The leaves are narrow. Most leaves are three-veined as in variety *pusillum*, but some are five-veined as in variety *ozarkanum*. One plant shows both leaf types.

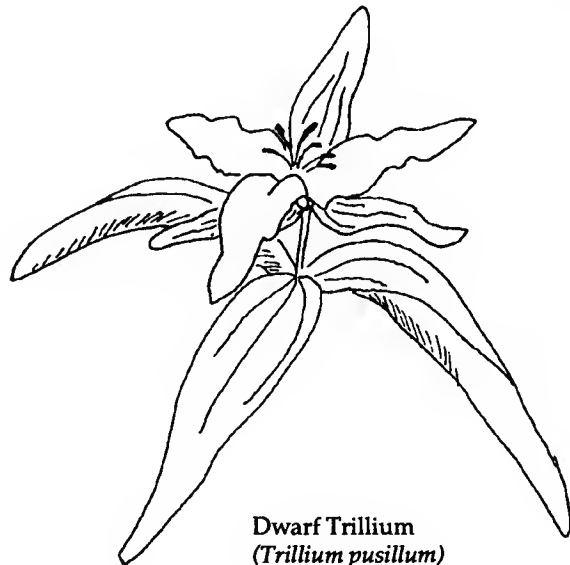
Previous to this Sewanee record, Jean and I found a clump of six plants on Bluebell Island in the Elk River, Franklin County, in the spring of 1973. It has not been found on that island since that date.

Harry's reference to the two varieties is of special interest, for though the plant is rare in Tennessee, both varieties are found in the state in distinct populations.

A note by Tom Patrick in the TNPS Newsletter (February, 1986) states that variety *pusillum* had been found in "low woods and floodplain terraces with beech in Coffee, Lincoln, Putnam, and, formerly, Franklin counties," and variety *ozarkanum* had been located in "rocky, dryish, white oak woods" in Cumberland and Sumner counties.

Additionally about the dwarf trillium: This wake robin, a name used for trilliums with a pedicellate (stalked) flower, looks like a miniature large-flowered trillium (*T. grandiflorum*) since its white petals also turn pink with age. But in dwarf trillium the three green sepals are as wide or wider than the three delicate, wavy-margined, white petals.

Patrick also noted that members of the Tennessee Native Plant Society have contributed to discovery and monitoring of dwarf trillium populations. □



Dwarf Trillium
(*Trillium pusillum*)

NOTES FROM THE ANNUAL MEETING

More than fifty people attended some portion of the TNPS Annual Meeting March 27-29 at the Indian Creek Camp on Center Hill Lake.

The meeting was held jointly with the American Association of Field Botanists. Many participants are members of both organizations. AAFBs traveled from as far away as Michigan. The principal speaker, Hal Horwitz, drove with his wife from, Richmond, Virginia.

The business meeting Saturday morning, May 26, was short and included approval of dues for the Environmental Action Fund and the Tennessee Environmental Council. The group discussed plans for the Smoky Mountains Wildflower Pilgrimage and the Tennessee Flora 2001 Project.

Dr. Horwitz, an M.D., presented a finely orchestrated audio/slide show about native orchids, which included some of his stunning photography. He explained he had become interested in the study of botany (first ferns, then orchids) only a few years ago. He is a good example of how high an amateur can climb once the bug bites (or the idea blooms). He and his show, by the way, received a standing ovation. Others who shared some excellent slides were Milo Pyne, George Bentley, and Kurt Emmanuele.

FLORA PROJECT

For the final activity of the weekend, more than twenty members gathered Sunday morning to discuss the Flora 2001 project and to hold sub-committee meetings to discuss plans for the Tennessee wildflower book.

The three sub-committees are:

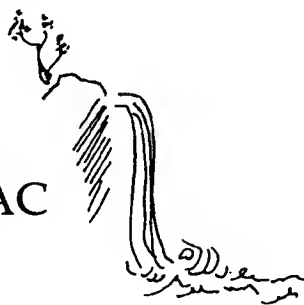
Plant selection—Paul Somers (chairman), Dennis Horn, Bus Jones, Milo Pyne, Andrea Shea, and Larry Wilson.

Photography selection—Jack Carman (chairman), David Duhl, Dorothy Carman, Janie Lancaster, Harold Scott, Ed Schell, and Miriam Weinstein.

Format—Kay Jones (chairwoman), Bill Jones, Ed Nicholson, Shirley Nicholson, Harold Scott, Nancy Scott, Orlan Yarbrow, Karen Yarbrow, and Latham Davis.

Mary Schaffner, TNPS president, expressed again her desire that anyone interested in helping with the flora project is welcome. Members may write to her at 300 James Robertson Parkway, Court Square Building, Nashville, Tennessee, 37201-1107. □

THE HIKE TO CARMAC FALLS



One of the hikes organized for members at the annual meeting was a trip and then a climb into a steep ravine to Carmac Falls.

Among the flora of this rich, damp site between steep slopes were trout lily (*Erythronium americanum*), harbinger-of-spring (*Erigenia bulbosa*), spring beauty (both *caroliniana* and *virginica*), and three species of *Dentaria* (*Cardamine*), *laciniata*, *diphylla*, and *heterophylla*.

The group identified four species of *Trillium*—*pusillum*, *cuneatum*, *decumbens*, and *sessile*.

There was so much to see that the hikers lingered for more than an hour. Paul Somers explained that the Department of Environment and Conservation has for years had cooperative agreements with the owners to protect the site, but the property had recently been sold and a new agreement would need to be negotiated. □

ABOUT MEMBERSHIP

Thanks to those of you who have renewed your membership in TNPS for 1992. Your support is keeping our society in good financial health.

Because it takes considerable effort in both Knoxville (where the checks are deposited) and Sewanee (where the *Newsletter* is mailed) to change the dates on the mailing labels, these dates were not changed for the February *Newsletter*. However, they have been updated for this issue.

Please check the mailing label on this issue now. If your check arrived by March 15, your label should have 1992 printed on the first line. If you haven't sent your check, you need to do so as soon as possible to insure that you will continue to receive the *Newsletter*.

Dues are \$15 (\$10 for students and senior citizens), \$20 for institutions, and \$150 for life memberships.

Karen Yarbrow
TNPS Treasurer

MISSING NEWSLETTERS

A few TNPS members have said they did not receive the February issue of the *Newsletter*, which leads us to fear that there are other lost copies unreported.

Issues are published for February, April, June, August, October, and December, though sometimes these are not posted until the following month. If you do not receive an issue, please notify the editor at P.O. Box 856, Sewanee, TN 37375-0856. We will mail another copy. □

Extra Copies

Extra copies of the *TNPS Newsletter* are available to members for 50 cents a copy, plus \$1 for postage.

On special occasions, as for wildflower programs, members may want to have copies available to give to participants, and at such times the per-copy fee may be waived. Write the editor in advance. □

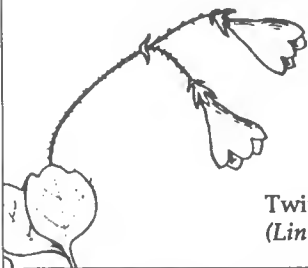
Notecards

Endangered Species
Line Drawings

Packet of 10
\$3.00 per packet,
plus \$1.25 postage

All proceeds go to the
Tennessee Native Plant Society

Orders may be sent to:
Helen Warren
105 Evans Lane
Oak Ridge, TN 37830



Twinflower
(*Linnaea borealis*)

A THANKS TO TNPS

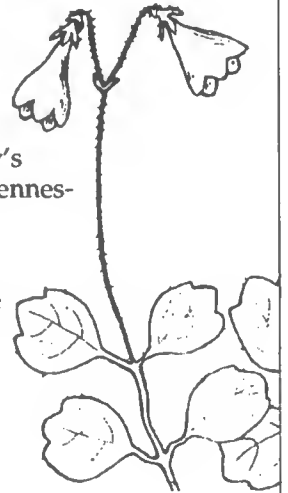
During a recent talk about Nature Conservancy projects, Jeff Sinks, director of the Conservancy's Tennessee chapter, paid a compliment to the Tennessee Native Plant Society.

Sinks was telling the story of how the Conservancy had finally been able to obtain a purchase option to the Sunnybell Glade near Nashville last year only to learn of plans in the Department of Transportation to route the Interstate 840 by-pass squarely through the glade.

Sunnybell Glade is the site of the endangered sunnybell (*Schoenolirion croceum*), but state officials said there was no way they could reroute the by-pass. The situation seemed hopeless, Sinks said, until the Native Plant Society became involved.

"They were terrific," he said, "I went into the office one morning thinking the situation was hopeless and received a telephone call that the engineers had found another route for I-840."

A recent appeal from the Nature Conservancy reminds us that the Tennessee Chapter must raise more money to purchase Sunnybell Glade. Information about this and other projects of the Nature Conservancy may be obtained by writing to the Tennessee Field Office, 174 Second Avenue North, Suite 401, P.O. Box 3017, Nashville, Tennessee 37219. —Editor



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TENNESSEE NATIVE PLANT SOCIETY NEWSLETTER

Volume 15, Number 3

June 1992

PINK LADY'S-SLIPPER FIRST SPECIES IN SPECIAL RARE PLANT CATEGORY

When the pink lady's-slipper was officially added to the state list of rare plants on June 11, it became the first plant in Tennessee named to the list under a special rare-plant category.

That special listing is for "taxa considered to be endangered in Tennessee due to evidence of large numbers being taken from the wild and lack of commercial success with propagation or transplantation."

Protection is provided under the Tennessee Rare Plant Protection and Conservation Act of 1985. That law "requires persons to obtain written permission from a landowner or manager before knowingly removing or destroying state-listed endangered plant species, and requires nurserymen to be licensed in order to sell state-listed endangered species."

Andrea Shea, a staff botanist in the Division of Ecological Services, has taken over the duties of rare plant protection coordinator, a position held by Walt Jones before that position was eliminated in the Department of Environment and Conservation.

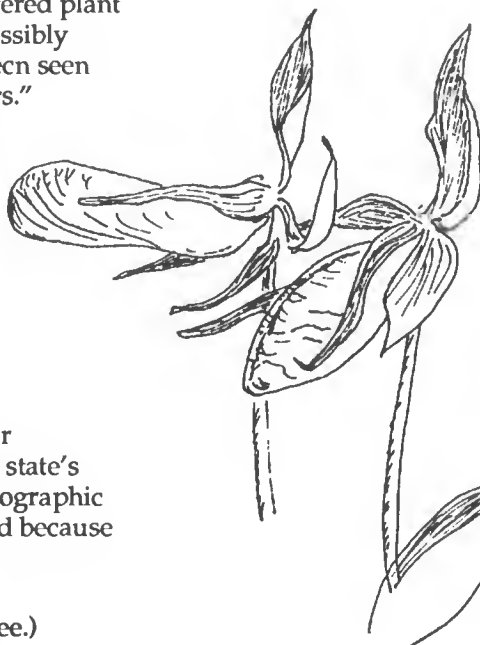
Andrea recognizes that law enforcement will have its limitations. She said she will likely focus on education, attempting first to notify nursery wholesalers and retailers that the pink lady's-slipper is now a rare plant in Tennessee.

In this regard, she asks that TNPS members notify her of any individual or business selling the pink lady's-slipper.

Tennessee currently has 124 endangered plant species. Another 49 are listed as "possibly extirpated—species that have not been seen in Tennessee within the past 20 years."

Altogether 421 species make up the state rare-plant list. These include the 124 species that are endangered and 173 classified as threatened (species likely to become endangered in the immediately foreseeable future as a result of rapid habitat destruction or commercial exploitation). The remaining 123 plants on the list are classified as "special concern"—their rarity in Tennessee is a result of the state's location at the limit of the plant's geographic range or their status is undetermined because of insufficient information.

(A related story appears on page three.)



ROADSIDE WILDFLOWER PROJECT GETS SUPPORT; MORE HELP NEEDED

Thanks to the response from several TNPS members, the Tennessee Wildflower Research Program will soon be able to expand the number of wildflower test sites being established along state and interstate highways.

Candy Swan, a staff member with the program, said she received several inquiries about the plans from persons who had read the "Roadside Wildflower" article in the April TNPS newsletter.

She reiterated that a strong response from the public now will convince State Department of Transportation officials they should employ roadside maintenance techniques to encourage native plants.

Candy Swan is asking everyone to participate in the program by notifying her of the locations along roadways where they have seen colonies of native flora.

"We want to know both about

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TENNESSEE NATIVE PLANT SOCIETY NEWSLETTER

June 1992

Volume 15, Number 3

This Newsletter is a publication of the Tennessee Native Plant Society and is published six times a year, generally in February, April, June, August, October, and December. © 1992

The Tennessee Native Plant Society (TNPS) was founded in 1978. Its purposes are to assist in the exchange of information and encourage fellowship among Tennessee's botanists, both amateur and professional; to promote education of the public about Tennessee flora, and wild plants in general; to provide, through publication of a newsletter or journal, a formal means of documenting information on Tennessee flora and of informing the public about wild plants; and to promote the protection and enhancement of Tennessee's wild plant communities.

Dues are \$15 for the calendar year (\$10 for students and senior citizens, \$20 for institutions, and \$150 for life memberships). Membership privileges include a subscription to the TNPS Newsletter. Dues may be sent to the Tennessee Native Plant Society, Department of Botany, the University of Tennessee, Knoxville, TN 37996-1100.

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Letters to the editor or correspondence about the Newsletter should be addressed to: TNPS Newsletter, P.O. Box 856, Sewanee, TN 37375.

WILDFLOWER ROADSIDE PROJECT—

Continued

specific species and about sites that have been mowed but where native plants have been observed in the past," she said. "We will seed areas where results seem promising, but first we need help locating those places."

If you send her suggestions about sites, your directions should include the number of the highway, the nearest exit, mile marker numbers, and the direction of traffic on the side where the site is located.

Address inquiries to Candy Swan, School of Agriculture, Tennessee Tech University, Cookeville, TN 38505 or call 615/372-3136.

Eight test sites have been established thus far and can be found in each region of the state. Candy Swan said one of the best is at the interchange of I-55 and I-240 in Memphis where *Rudbeckia hirta* and *Coreopsis tinctoria* have reached maturity. One of the largest test sites is in Williamson County on I-65 south just past exit 53. There more than 25 species have been seeded, including prairie coneflower (*Ratibida pinnata*), *Liatris spicata*, *Liatris squarrosa*, and species of *Echinacea* and *Rudbeckia*.

This fall the program staff plans to add more species. Seeds will be collected from plants propagated and brought to flower at Tennessee Tech University, where Candy Swan is a research assistant with the Tech School of Agriculture. She added, however, that they need the help of TNPS member in locating wildflower seed from wild plant populations on private land.

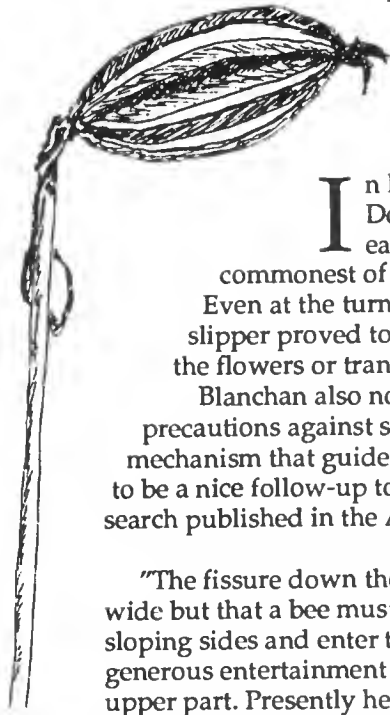
Once a roadside site is seeded, Department of Transportation officials are notified, and mowing crews are instructed to avoid those area. Swan said the mower operators in some areas, such as East Tennessee, seem to be avoiding wildflowers on their own. Otherwise, there seems to be a compulsion to mow.

"They get complaints from the public about roadsides that are overgrown and weedy," she said. "They need to hear from people who want to see wildflowers and other native plants."

Swan said that as the education process continues she hopes to have some roadside areas mowed only at times that will spread seed from established plants. She said the Tech staff is also trying to convince the transportation department to use natives, including native grasses and trees, in its own plantings. □



MORE OBSERVATIONS OF *CYPRIPEDIUM* ACAUL^EA



In her book, *Nature's Garden* (1901, Doubleday), Nellie Blanchan observed that each year *Cypripedium acaule*, "once the commonest of orchids," was becoming rarer every year. Even at the turn of the century the elegant pink lady's-slipper proved too tempting to people who wanted to pick the flowers or transplant them into their gardens.

Blanchan also noted the pink lady's-slipper's "elaborate precautions against self-pollination." Her description of the mechanism that guides the bees through their tortuous task seems to be a nice follow-up to the short piece about lady's-slipper research published in the April issue of the TNPS Newsletter.

"The fissure down the front of the pink lady's-slipper is not so wide but that a bee must use some force to push against its elastic sloping sides and enter the large banquet chamber where he finds generous entertainment secreted among the fine white hairs in the upper part. Presently he has feasted enough. Now one can hear him buzzing about inside, trying to find a way out of the trap. Toward the two little gleams of light through apertures at the end of a passage beyond the nectary hairs, he at length finds his way. Narrower and narrower grows the passage until it would seem as if he could never struggle through; nor can he until his back has rubbed along the sticky, overhanging stigma, which is furnished with minute, rigid, sharply pointed papillae, all directed forward, and placed there for the express purpose of combing out the pollen he has brought from another flower on his back or head. The imported pollen having been safely removed, he still has to struggle on toward freedom through one of the narrow openings, where an anther almost blocks his way.

"As he works outward, this anther, drawn downward on its hinge, plasters his back with yellow granular pollen as a parting gift, and away he flies to another lady's-slipper to have it combed out by the sticky stigma as described above. . . . Sometimes the largest bumblebees, either unable or unwilling to get out by the legitimate route, bite their way to liberty. Mutilated sacs are not uncommon. But when unable to get out by fair means, and too bewildered to escape by foul, the large bee must sometimes perish miserably in his gorgeous prison." □

Some short notes about *Cypripedium acaule*:

- The lady's-slipper can live for decades, perhaps 60 years or more.
- Plants may lie dormant for a year or two before returning to bloom.
- The symbiotic relationship with mycorrhizal fungus is important not only in plant growth but in the germination of seed.
- The right balance of sunlight and shade is also critical. A tree canopy too dense will cause plants to die, though too much sun will have a similar impact. □

ORDER AND HARMONY IN THE (WILD) GARDEN

I've learned that native plants are less likely than hybrids to be victimized by the rigorous conditions in my garden. The wild blue phlox will tolerate the encroaching shade better than the shepherd's crook that we must fertilize diligently in the perennial bed, and the hairy sunflower stands strong and prosperous in the August drought, while "Miss Martha's" triple-petaled geranium withers (when we fail to water) and is riddled with holes (since we rarely spray).

This isn't, however, to say that our natives aren't sometimes particular about where they settle. For instance, we first planted purple phacelia in humus along the south side of our driveway, and the first year it seemed pleased with the place. But the next spring it had taken up root (so it appeared) and moved to the opposite side of the drive. Soon there were other changes. After a season, the solomon's seal relocated down the path apparently to more pleasant company beside a pair of jacks. From that spot the solomons have spread nicely but not back under the white oak where they would form a green backdrop—of course not—they obstinately hang their stalks over the stone walk and force us to travel other pathways.

Once we had a nice colony of foxglove along a low stone wall. They aren't there now. They moved over near a line of blueberries. Skullcap, once happy near the drive, has moved into the center of things where primroses have had to make room. Beardtongue now puts on a show where the previous residents, a colony of *Rudbeckia triloba*, may yet reappear. Even the jacks have sent their children off to other corners of the yard.

We've finally decided that people don't really garden native plants. Not the way our mothers orchestrated their showy perennials. Instead, wildflower gardening is an adventure in the uncertain and the unexpected. It's not for disciplinarians.

J. A. Windsor

A NON-PINK PINK, THE BRILLIANT RED INDIAN PINK

One eye-catching Tennessee native too often ignored in the literature (horticultural and botanical) is *Spigelia marilandica*. The favorite common name is Indian pink, though it's not a member of the pink family but is a *Loganiaceae*.

The flowers grow in terminal clusters of usually two to four on a spike, one or two feet high. Each is like a tube flared at the top—a brilliant red outside and an equally brilliant yellow inside. Along a woodland trail, even in deep shade, these flowers will stop you in your tracks.

Indian pink blooms later than most woodland wildflowers and, therefore, makes a nice addition to the wild garden. It prefers moist woods. The leaves are ovate to lanceolate-ovate and provide an attractive stage on which the blossoms play out their parts.

In his book, *Wildflowers of the Central South*, Professor Tom Hemmerly notes that "an extract from this plant, also known as Pink-root, has been used to get rid of intestinal parasites. Care should be exercised because the effective alkaloid, spigeline, is poisonous."

Indian pink can be readily propagated from seed, provided the seed can be caught. The seed pod ripens quickly and literally explodes, scattering its tiny treasures in all directions. One technique for seed collection is to tie a piece of panty-hose over the fading flower head; then wait and watch. □



WHAT FATE THE AMERICAN HART'S-TONGUE FERN?

Tennessee's rarest plant is, arguably, the American hart's-tongue fern (*Phyllitis scolopendrium* Newm. var. *americana* Fernald). Our single extant population—two plants—manages to hang on in a thirty-foot-deep sinkhole in Marion County where a waterfall into the cave provides a cool mist most of the year.

This federal endangered species survives also at two sinkhole cave locations in Alabama, but the next nearest populations are found at least 600 miles north in New York and Michigan. We might infer that our southern plants are remnants of ice age populations, but more study is needed to understand the distribution of this elegant, broad-bladed fern.

George Ramseur, professor of botany at Sewanee, has been monitoring the Marion County site and, with Latham Davis, prepared a paper Dr. Ramseur delivered in March at the meeting of the Association of Southeastern Biologists. Excerpts follow:

The American hart's-tongue fern was first discovered in 1807 by Frederick Pursh at a place known as split rock on the plantation of J. Geddes about five miles west of Syracuse, New York. At that time it was thought to be the same species as the common European plant *Scolopendrium vulgare*, which was said to be one of the most common ferns in the city of London.

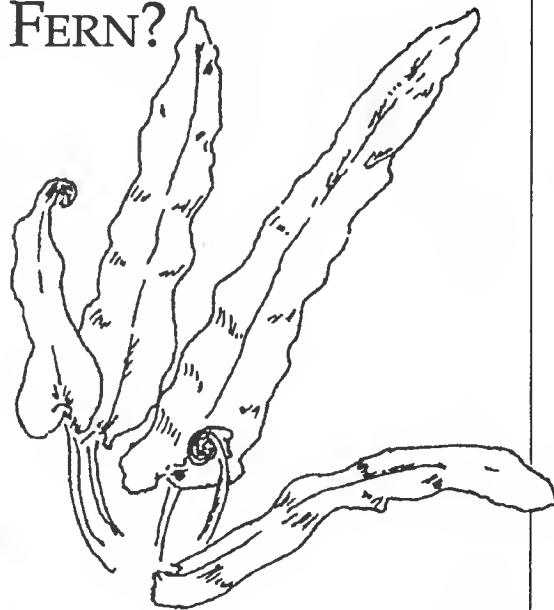
It was later found at three other New York locations within a radius of about 15 miles: Chittenango Falls, Jamesville, and Perryville. The fern was extirpated from the original New York site by a quarrying operation by the Solvay Soda Ash Company in 1895. The other locations in Onondaga and Madison counties now have 15 sites which contain the largest number of individuals of hart's-tongue fern in the U.S.

The first hart's-tongue fern from Tennessee was found by Gatteringer in 1849 in a cave mouth known as Post Oak Springs in Roane County, but as early as 1929 A. C. Gill reported that he was unable to find the hart's-tongue fern there and assumed it had been exterminated. This site was later inundated by Watts Bar Lake.

In 1878 the hart's tongue fern was discovered in a sinkhole in Marion County by Major Cheatham, an engineer looking for new mine sites. This is now the only known location in Tennessee. There was a report of hart's-tongue from Grassy Cover, but Gill was not able to find it in 1929. . . .

It was reported from Ontario, Canada, at Owen Sound in 1857 and is now known from about 30 locations in seven Ontario counties. A single specimen was reported from New Brunswick in 1882, but the reported site "has been all burned over, plowed up, and is now a fine farm," to quote a Mrs. Dibblee from Maxon's paper in 1900. Three locations were reported from upper Michigan in 1954, 1956, and 1978.

The most recently discovered hart's-tongue locations are in Alabama—in



Continued Next Page

Jackson County in 1978 and Morgan County in 1980. On a visit to Butchart Gardens on Vancouver Island last spring, I noticed a nice hart's-tongue fern growing on a rock wall along a path in the garden. The resident botanist was unaware of it, but assured me that it had not been planted there. There is a statement in a single reference that it had been found on Vancouver Island.

The three southern locations are all in deep, well-watered limestone sinkholes where cave temperatures prevail. The New York locations were described as calcareous plunge basins. The Ontario and Michigan locations are along the Niagara scarp, which represents the ancient shoreline of Lake Algonquin, which formed as the last continental ice sheet retreated and was a precursor of Lake Michigan and Lake Huron.

The unusual and limited distribution pattern of this plant has made it the subject of much attention and speculation. It was named *Phyllitis scolopendrium* var. *americana* by Fernald, and although it is similar in morphology it differs from the European variety in that it is diploid, while the European plant is tetraploid.

I first learned of the Hart's-tongue in the early 1960s and have visited the Marion County site fairly regularly since then. The number of plants there has usually varied from about eight to 18, with the number and locations changing with each visit. On a visit in August 1991, I was disturbed to find only two small plants. The numbers reported by various early visitors had ranged from as high as "about two hundred" to a single plant. In 1929 a Mr. Graves described the fern population as "three healthy plants and three on the way to shriveling." Fearing for the future of the fern, he took spores from a plant in his garden which originally came from a site in Owen Sound, Ontario, and scattered them in the sink. It is not known if the present population is original or is from these exotic spores.

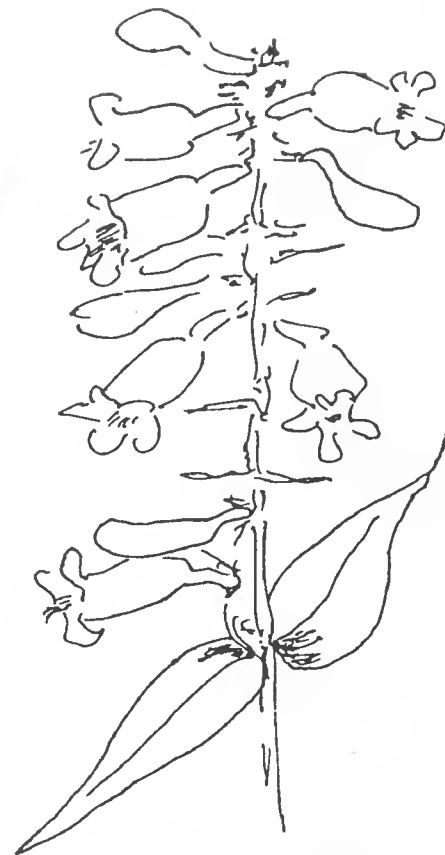
With the realization that the only population of this rare plant in Tennessee was so near extirpation, I wondered what might be the cause for the decline in numbers and how it might be preserved. There were no signs of digging or other human interference, but I had noticed on several occasions that a number of animals had fallen into the sinkhole and been trapped. These included snakes (especially copperheads), box turtles, lizards, snails, and others. In my notes from a previous visit, I found two specimens which were found "detached and away from any living plant." These specimens had holes in leaf blades or margins which appeared to have been chewed. The observation of snails feeding on nearby thallus liverworts suggested that snails might be the culprit. Dr. Harry Yeatman of our department confirmed that this was the type of damage caused by snails. Also in a review of literature I found that Maxon had reported observations of snail damage in 1900.

In order to exclude snails from the plants, screen-wire cages one foot square were placed over the two plants, and other coverings were placed in points where ferns had been observed before. The use of screen enclosures was discussed with Dr. Murray Evans, Dr. Maurice Edwards, both fern specialists, and Geoff Roach of the Nature Conservancy, which has a lease on the site. They all approved the plan.

Since I had not visited the two Alabama sites, I decided to make a determination of the status of ferns there. At Peterson's Pit in Morgan County, I found some 36 plants, most of them much larger and with many more leaves than I had ever seen in the Marion County, Tennessee, site. They appeared to be doing well with no signs of human disturbance, but some bore signs of snail predation. The other Alabama location is a sinkhole known as the Morgue in Jackson County near Paint Rock. Only about three plants (two large clusters of leaves) were found, but each had a large number of big healthy-looking leaves. This sinkhole is also the hibernaculum for an endangered bat and is protected by the U.S. Fish and Wildlife Service.

What is to become of Tennessee's rarest plant? It may be gone already or it may be on its way back. Either way it has been a great botanical curiosity for the few people who have been fortunate enough to know the hart's-tongue fern.

George Ramseur
Sewanee



Large-flowered beardtongue
(*Penstemon grandiflorus*)

LATE NOTE ON TRILLIUM PUSILLUM

In the April TNPS newsletter, Harry Yeatman of Sewanee shared some information about the dwarf trillium (*Trillium pusillum*) and the varieties *pusillum* and *ozarkanum*, both of which can be found in Tennessee.

Since then another interesting note has appeared about the dwarf trillium. Botanists generally recognize four varieties of *T. pusillum*, all of which are considered to be scarce. The taxonomy of the varieties, however, is still being debated. One other is called the Virginia least trillium, var. *virginianum*, which usually grows in damp woods and near swamp margins. □

NATIVE PLANT SOURCE

Native Gardens, a native plant propagator, has opened a retail outlet in Townsend along Tennessee's southern entrance to the Great Smoky Mountains National Park. □

BRACKEN FERN

(*Pteridium aquilinum*) Kunth.

Aspen?

Fern References

John M. Kingsbury, *Poisonous Plants of the United States and Canada*, (1964, Prentice-Hall, Englewood Cliffs, New Jersey), p 626.

P. Wesig, A. M. Freed, and J. R. Haag, "Antithiamine Activity of Plant Materials," *Journal of Biological Chemistry*, 165:737, 1946.

M. E. Caldwell, W. R. Brewer, "Possible hazards of eating bracken fern," *New England Journal of Medicine*, 303:164, 1980.

Bracken Notes

Jesse Shaver, in his book, *Ferns of the Eastern Central States*, describes two varieties of bracken fern—eastern bracken (*P. aquilinum* var. *latiusculum*) and southern bracken (var. *pseudocaudatum*). Both are found in Tennessee.

The leaves arise from a rootstock two to eight inches deep and which has been measured laterally on one specimen to 200 feet, thus its ability to survive fire.

Bracken Fern

(*Pteridium aquilinum*)



Bracken is a large, coarse fern up to 1.5 meters tall that grows almost throughout the northern hemisphere. It forms huge stands in poplar and jackpine forests in the north, because, like both of those trees, it thrives where fire has raged. The frond (leaf of a fern), has a long petiole (stem of a frond) which divides near the top into three branches, each of which divide one or two more times, into the ultimate segments which are pinnatifid. Spores (not seeds), like a fine powder, are formed in small cases (sori), and are grouped in rows under the narrow, recurved edges of frond margins, which cover and protect them.

The fronds emerge from the ground in spring looking like coiled springs, uncoiling as the frond petiole grows. Where the stem forks into the three branches there is usually a purple spot which exudes sweet droplets. These young fronds are called croziers, or fiddle heads.

EDIBILITY

Croziers are picked when about one decimeter high. The stems should snap off like good green beans. Some people soak them in water overnight in which wood ashes have been added. They are then cooked as one cooks asparagus or green beans. Some people eat them raw. Raw they have a not altogether pleasant "ferny" taste and are more mucilaginous than when cooked.

The best way is to pan fry them to a crisp in some bacon grease, after rolling in white corn meal. When fried alongside brook trout, and morels (*Morchella esculenta* Fr.), with a small bit of chopped ramps, you have an Appalachian epicurean delight.

TOXICITY AND BIO-CHEMISTRY

No instances of human poisoning from bracken have been reported to date. However, there is reason for some concern since major losses of livestock occur from eating the fern. Indeed, one can imagine a scenario in which some people could be, and actually may be, poisoned by bracken.

During the long cold winters of Quebec people have a diet largely of fish, pea soup, and potatoes. This diet, while nutritionally good, is poor in Vitamin B₁, (thiamine). The fish, which often is dried or eaten raw, contains an enzyme, thiaminase, that destroys thiamine. To this diet, in spring, add raw or partly cooked bracken croziers and one has a prescription for a severe case of beriberi. This can happen because bracken also contains more thiaminase. Indeed, beriberi has been prevalent in rural Quebec.

The reason for deaths in monogastric animals, such as horses, is also from the thiaminase in bracken (Wesig, 1946). Without Vitamin B₁ (thiamine), people and horses alike get beriberi. Ruminants, animals with more than one stomach, such as cows, do not get thiamine deficiency because bacteria in their rumens produce plenty of thiamine for them. Instead they fall victim to an entirely different, equally fatal, disease from bracken.

On a diet heavy in bracken, whether fresh or as hay, cows sicken and die from *aplastic anemia*, which happens when bone marrow is poisoned and stops making blood cells. The toxic substance has not yet been identified. Chemicals that interfere with bone marrow activity often induce cancers. Thus, this same factor may be behind the association between a big appetite for bracken and stomach cancer in Japan.

People probably escape beriberi from bracken because they do not have to eat the huge amounts of herbage as horses and cows do. Cooking destroys thiaminases, but may not destroy enough of the carcinogenic factor.

J. A. Churchill

Johnson City

Plants Helpful or Harmful to People

A HIKE TO MAY PRAIRIE JULY 18

The TNPS field trip for July will take members to May Prairie, which lies on the eastern highland rim just outside of Manchester.

Everyone is invited to join Dennis Horn at 10 a.m. (Central) July 18 at the Manchester McDonalds just west of exit 114 off interstate 24. If you plan to join the hike, you may find it helpful to call Dennis Horn at 615/455-5742 (home) or 454-7447 (work). Dennis provides us with the this preview:

Summer is the best time to see the plants for which the May Prairie Natural Area is famous. If the flowering times are close to those observed in 1991, we will have many interesting plants to observe.

Some of those plants include an unusual milkweed, *Asclepias hirtella*, a rare thoroughwort, *Eupatorium lancolepis*, two compass plants, *Silphium mohrii* (the fuzzy one) and *Silphium pinnatifidum* (the showy one), coppery St. John's wort (*Hypericum denticulatum*), the rare false asphodel (*Tofieldia racemosa*), two unusual plants, *Cynoctonum mitreola* (Logania family) and *Mecardonia acuminata* (Snapdragon family), large quantities of *Phlox glaberrima* and the cross-leaved milkwort (*Polygala cruciata*).

The big attraction in late July is the snowy orchis (*Platanthera nivea*), which should be beginning to bloom on the day of our hike.

While summer is the best time at May Prairie for plants, it is not the best time for comfort. Be prepared for hot sun, high humidity, and lots of mosquitos. We will have lunch in Manchester, the mosquitos will have lunch in May Prairie.

Dennis Horn
Tullahoma

HUNTING THE ROSE POGONIA

A large and enthusiastic group (30 TNPS members and friends) from all over the state participated in the AEDC orchid field trip in May.

At the orchid site, the rose pogonia (*Pogonia ophioglossoides*) was abundant and at its peak. Unfortunately, the spreading pogonia (*Cleistes divaricata*) and grass pink (*Calopogon tuberosus*) are blooming late this year and were not to be found.

Additional plants identified at this site included the slender blue flag (*Iris prismatica*), Sampson's snakeroot (*Orbexilum pedunculatum* [new Latin name]), arrow-leaf violet (*Viola sagittata*), linear-leaf violet (*Viola lanceolata*), royal fern (*Osmunda regalis*), cinnamon fern (*Osmunda cinnamomea*), bracken fern (*Pteridium aquilinum*), sundew (*Drosera brevifolia*), and death camas (*Zigadenus leimanthoides*).

At the coneflower site, the pale coneflower (*Echinacea pallida*) was only in bud, but other plants in flower included low frostweed (*Helianthemum propinquum*), nettle-leaf sage (*Salvia urticifolia*), spiderwort (*Tradescantia ohioensis*), hoary puccoon (*Lithospermum canescens*), narrow-leaf vervain (*Verbena simplex*), goat's rue (*Tephrosia virginiana*), and heal-all (*Prunella vulgaris*).

After lunch about a dozen members were able to visit the May Prairie. Plants observed include blue false indigo (*Baptisia australis*), indian paintbrush (*Castilleja coccinea*), bladderwort (*Utricularia subulata*), waxy meadow-rue (*Thalictrum revolutum*), colic root (*Aletris farinosa*), beardtongue (*Penstemon calycosus*), and sundrops (*Oenothera fruticosa*). The smooth phlox (*Phlox glaberrima*) and swamp candles (*Lysimachia terrestris*) were identified but were only in bud.

Jack Carman
Tullahoma

RETURN TO COFFEE COUNTY AUGUST 29, TO SEEK COMPOSITES

While we might find some plant sites, like May Prairie, on our own, society members will need a special guide to locate the unusual flora they will hunt on the TNPS August field trip—a return to Coffee County.

That special guide will be Dennis Horn, who asks members to meet him at 10 a.m. (Central) on August 29 at the Dairy Queen in Tullahoma. The Dairy Queen is located on highway 55 (from Manchester) and is on the left just past the first traffic light. Dennis gives us this preview:

Late summer is the prime time for composites, and we will see how many we can identify. There are 12 to 15 Eupatoriums alone in Coffee County, not to mention the sunflowers (*Helianthus*), the rosinweeds (*Silphium*), and goldenrods (*Solidago*).

One objective of the trip is to observe the rare *Helianthus eggertii*, a candidate for federal listing. Maybe after having a look at it, we can search for more populations. Other plants of interest we should see are two species of *Gaura*, *G. biennis* and *G. filipes*. They are unusual members of the evening primrose family.

We should plan for several stops at various locations in the county, with a short walk at each stop. We will have lunch in either Tullahoma or Manchester.

[Please call Dennis at 615/455-5742 (home) or 454-7447 (work)]. □

• • •

Changing Your Address?

Keep us informed when you move. Send address changes to TNPS Newsletter, P.O. Box 856, Sewanee, TN 37375.

Membership dues should be sent to the treasurer, Karen Yarbrow, 1216 Dukesbury Road, Knoxville, TN 37919. □

WHAT'S UNDER MR. THOREAU'S HAT?

I am inclined to think that my hat, whose lining is gathered in midway so as to make a shelf, is about as good a botany-box as I could have and far more convenient, and there is something in the darkness and the vapors that arise from the head—at least if you take a bath—which preserves flowers through a long walk. Flowers will frequently come fresh out of this botany-box at the end of the day, though they have had no sprinkling.

Henry David Thoreau
Journal, 24 June 1852

JOIN A "WORKING" FIELD TRIP: SURVEY ON THE WOLF RIVER

The Wolf River Conservancy and the Tennessee Native Plant Society are jointly planning a biotic survey field trip into the swamps of the upper Wolf River on September 19 and 20 of this year.

Charles Askew, president of the Wolf River Conservancy, says all members are welcome to join the trip and add their expertise to the effort.

"Using canoes as primary vehicles of access, we plan to explore the biodiversity of this extensive wetland system," Askew said. "We would like to document the occurrence of as many plants and animals as we can in these two days. Seines, plant presses, binoculars, cameras, benthic samplers, and insect nets would all be welcome tools."

Everyone planning to attend is asked to notify the leaders by August 1 so they can reserve canoes from the local canoe outfitters. Call Larry Wilson at 901/458-8724 (Leave a message on his answering machine if necessary) or Charles Askew at 901/526-2278. Additional information will be sent to members who express interest.

Some overnight space is available in homes without charge to out-of-town participants on a first-come, first-serve basis. □



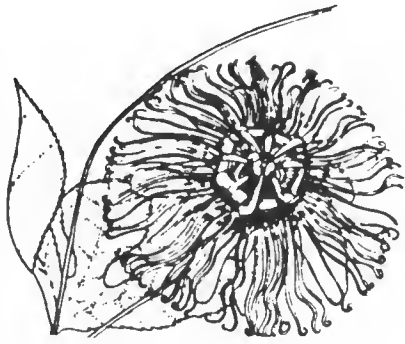
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TENNESSEE NATIVE PLANT SOCIETY NEWSLETTER

Volume 15, Number 4

August/September 1992

THE GROWING INTEREST IN WILDFLOWERS

An Interest of Growing
Interest to TNPS

There is a growing public interest in wildflowers. You surely haven't missed it. Almost every season now an article is published in the daily newspaper about wildflowers—someone has created a garden of them, a new nature trail is featuring them, the botanical garden is selling them (and can't stock enough). Magazines, from *Southern Living* to *Cosmopolitan* are featuring wildflowers.

Horticulture, traditionally the magazine of (hybridized) American gardening, began a half-dozen years ago to let a few native plants creep into its pages. Now an issue doesn't pass that fails to include an article about the use of natives in the landscape.

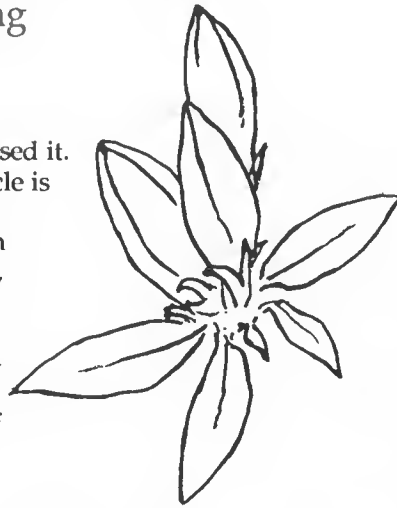
Native plant propagators—we have TNPS members here in Tennessee—seemed eccentric a few years ago. Now these entrepreneurs struggle to fill the growing demand from commercial landscapers. The traditional nursery and seed companies have expanded their offerings in native species.

Community garden clubs that once gave exclusive attention to cultivars have, in some instances, seen the light. Traditional gardening symposia and fairs have had to make room for conferences on native plant landscaping, like the annual events in Cullowhee, North Carolina; Birmingham; Memphis; and beyond.

This new interest may be part of a growing concern about the environment. Some of it is not very sophisticated; it's often accompanied by rudimentary knowledge of botany. Nevertheless, this growing interest in wildflowers should be important to the Tennessee Native Plant Society and other similar organizations.

A public that once knew wildflowers only from one week of high school sophomore biology (at best) and believed them to be mainly weeds, may now be ready to hear the real story of wildflowers and the importance of biological diversity—even in the suburban yard.

Beginning on page 2 is an article about organizations that, like TNPS, focus on the study and protection of native flora. It is a growing circle of the friends of wildflowers. □



DOGWOOD ANTHRACNOSE

Plan for the Spring Assault

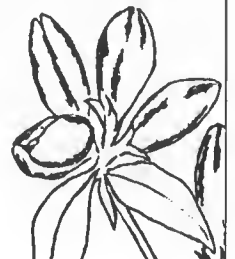
In many areas this year, the native flowering dogwood (*Cornus florida*) took a beating from the anthracnose virus.

Even before spring budding, biologists in the Great Smokies were predicting the loss of almost all park dogwoods within a few years and were attempting to save a sample in one small area by spraying.

Seedlings and smaller dogwoods, particularly those in wooded areas, seem to have been hardest hit. Larger trees fared better once the cool spring rains were over. But the spring of 1993 likely will bring another severe assault.

Homeowners with dogwoods should take stock now. Fertilize your trees this winter using fertilizers high in calcium and low in phosphorus, and perhaps do some pruning to give trees some air and a chance to dry their leaves when spring arrives. When spring does arrive, be careful about watering that keeps the leaves wet. The worst conditions are cool, damp, windless, and sunless days.

Researchers suspect that the fungus, *Discula* sp., arrived recently in the U.S. on imported Kousa dogwoods, ironically the exotic tree now being touted as the best replacement for the anthracnose harried American dogwoods. □



TENNESSEE NATIVE PLANT SOCIETY NEWSLETTER

August/September 1992
Volume 15, Number 4

This Newsletter is a publication of the Tennessee Native Plant Society and is published six times a year, generally in February, April, June, August, October, and December.

The Tennessee Native Plant Society (TNPS) was founded in 1978. Its purposes are to assist in the exchange of information and encourage fellowship among Tennessee's botanists, both amateur and professional; to promote education of the public about Tennessee flora, and wild plants in general; to provide, through publication of a newsletter or journal, a formal means of documenting information on Tennessee flora and of informing the public about wild plants; and to promote the protection and enhancement of Tennessee's wild plant communities.

Dues are \$15 for the calendar year (\$10 for students and senior citizens, \$20 for institutions, and \$150 for life memberships). Membership privileges include a subscription to the TNPS Newsletter. Dues may be sent to the Tennessee Native Plant Society, Department of Botany, the University of Tennessee, Knoxville, TN 37996-1100.

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Letters to the editor or correspondence about the Newsletter should be addressed to: TNPS Newsletter, P.O. Box 856, Sewanee, TN 37375.

NATIVE PLANT SOCIETIES AND BOTANICAL ORGANIZATIONS

What Are Others Doing?

I often get a quizzical glance whenever I mention the Tennessee Native Plant Society to a non-member. But I've discovered there are plenty of people out there with an interest in wild plants, even some knowledge to go with that interest, and they are often delighted to learn some new botanical facts.

By in large, however, TNPS remains outside the consciousness of most wildflower enthusiasts. This low profile for TNPS seems appropriate in some respects. Many members exercise their botanical interests through occasional field trips, both advertised and impromptu, and on field trips large groups are not always desirable.

Nevertheless, the society does have other goals and objectives, and a larger active membership could have many advantages, as seen in other state societies.

State Native Plant Societies

Native plant and botanical societies exist in at least 44 of the 50 states and in the District of Columbia.

Perhaps the most active state society in the country is the California Native Plant Society. Not only does CNPS organize field trips, but it sponsors workshops and conferences, and provides grants and scholarships. I'm not sure what the CNPS budget is like, but it is enough to include a staff position of executive secretary, which is expected to be upgraded to a position of executive director.

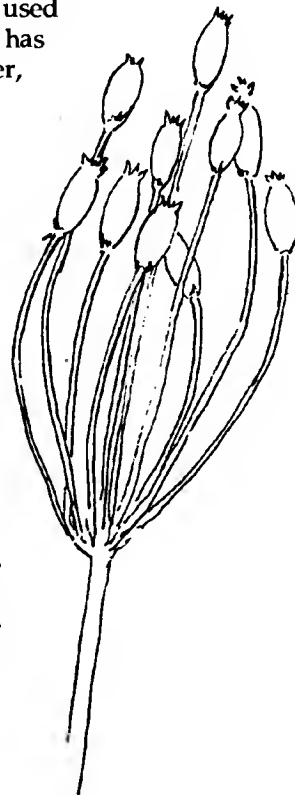
The California society also co-sponsors legislation and has joined other organizations in litigation, as it did in a suit against the Fish and Wildlife Commission for inaction in protecting certain endangered species.

CNPS has a vigorous chapter system, which is used in an active Rare Plant Program. The society even has its own library of slides. In addition to a newsletter, CNPS publishes a quarterly journal, *Fremontia*.

In ten years since its founding, the Virginia Native Plant Society has developed an active system of nine chapters and, like California, has a program of establishing natural wildflower preserves. VNPS also takes pride in a new program called the Virginia Native Plant Registry, which encourages private landowners to register with the society selected areas called Virginia Native Plant Sites.

The Kentucky Native Plant Society also is active and visible. Last year KNPS sponsored a symposium on the restoration of Kentucky Native Flora. The society established a seed bank program and organized efforts to plant wildflowers along roadsides. New and unusual this year is a series of courses initiated by KNPS, leading to certification in native plant studies. Initial courses are being offered at Eastern Kentucky University.

For interesting ideas and cooperation, we can also look to our neighbors to the south, the Georgia Botanical Society, the Alabama Wildflower Society, and the Mississippi Native Plant



Continued Next Page

Society. Each society has an informative newsletter, and the Georgia society also publishes a botanical magazine, *Tipularia*.

National Societies

Wildflower lovers may also be fascinated by a wide range of regional and national organizations catering to their interests.

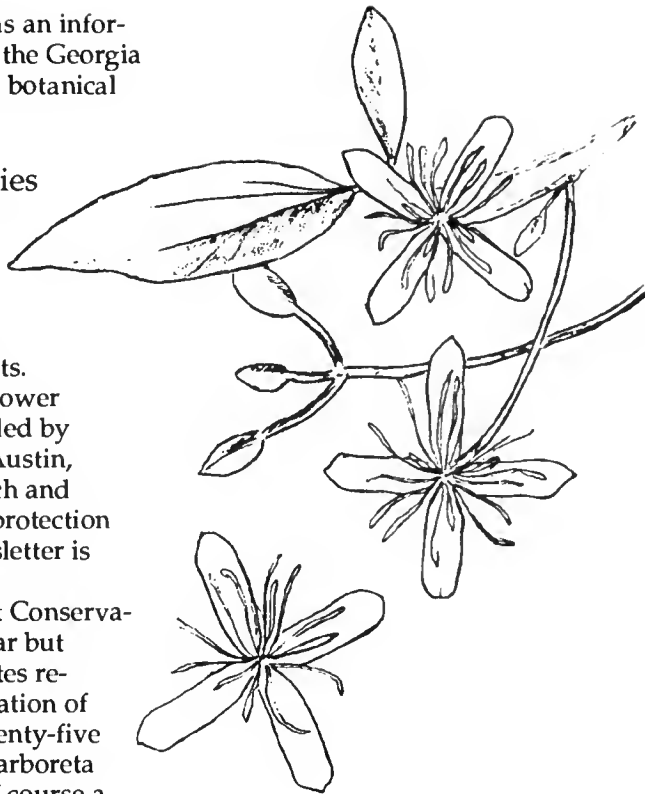
The National Wildflower Research Center, founded by Lady Bird Johnson in Austin, Texas, supports research and promotes the use and protection of wildflowers. A newsletter is mailed to members.

The Center for Plant Conservation is somewhat similar but supports and coordinates research and the conservation of rare plants through twenty-five botanical gardens and arboreta around the country. Of course a newsletter is also available.

The Flora of North America Association also sponsors research and is concerned with conservation. Of current interest is the Flora of North America project, a cooperative program to produce a flora manual of the plants of North America north of Mexico. The association has also published a directory of people, organizations, and agencies that can provide information about rare and endangered plants, permit procedures, and programs. The directory also lists other people working on plant conservation and related activities.

A slightly more popular approach is made by the New England Wildflower Society, which can still be technical enough for most field botanists and assumes a national, as well as regional, concern for wildflower conservation. The society promotes the conservation of temperate North American flora through horticulture, education, research, habitat preservation, and advocacy.

The American Horticulture Society, which is oriented mainly to gardening, has been placing increasing emphasis on native plants in the landscape in its attractive magazine, *American Horticulturalist*. The society maintains a garden that includes many native species at River Farm on the Patomac south of Washington, D.C.



Some Special Neighbors

This summary by no means exhausts the list of wildflower societies. Still our list would not be complete without a mention of the American Association of Field Botanists. The president, J. I. (Bus) Jones, is a member of TNPS, and he edits a lively newsletter that's mailed to a faithful following of wildflower experts near and far.

For its proximity mention should also be made of the Southern Appalachian Botanical Club for persons interested especially in the botany of the Southern Appalachian Mountains. The club publishes a journal, *Castanea*.

And finally, there is the Eastern Native Plant Alliance, an association that brings together all such botanical and wildflower organizations.

Anyone wishing to have the address of any of these organizations may call or write the editor.

Latham Davis
Sewanee

WILDFLOWER STAMPS

You may have noticed the U.S. Postal Service issue of 50 commemorative wildflower stamps.

The wildflowers were selected with the assistance of the Wildflower Research Center in Austin, Texas.

How many can you name? Color and structure may be a bit confusing with some flowers.

WE ARE NOW REASSURED

Louisa Jackson of Kingsport recently sent the following letter to Andrea Shea in the State Ecological Services office in Nashville:

The Michigan Bulb Co. introduced four new plants, one being pink lady's-slipper. I suspected the other three had been dug as well. I wrote them and this is the letter I received this spring.

Louisa Jackson
4408 Greenspring Circle
Kingsport, TN 37664

Dear Customer,

Thank you for your recent inquiry regarding "Native Collected" products in our advertisements. We want to assure you all of us at Michigan Bulb Company share your concern regarding endangered plants and trees. In Tennessee and Hawaii where most of these products are purchased, there are nurseries which collect the products you mentioned. Because these plants grow so prolific in their natural habitat in these areas and reproduce rapidly, we are assured there is no danger of extinction by purchasing large quantities of non-endangered plants harvested in their original setting.

Your comments are appreciated as well as the time you spent in contacting us. If we can be of any service in the future, please don't hesitate to contact us.

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Grand Rapids, MI 49550



BOOKS

For Summer Research and Winter Solace

Most wildflower enthusiasts have at least a small library of botanical books to help in plant identification, to review for flora data, or sometimes for solace on those dreary winter days. For this reason it may be helpful to begin a column about books in this Newsletter. If all goes well, some issues may have detailed reviews; others may simply contain a few short notes about books. Some books may be new; other will be old.

So to begin, here are some notes on books you may find interesting. (By the way, freelanced reviews are welcomed.)

Guide to the Vascular Plants of the Blue Ridge by B. Eugene Wofford covers the diverse flora of the mountainous Blue Ridge, including 85 counties of Virginia, North and South Carolina, Tennessee, and Georgia. Keys to the 161 Pteridophyte, Gymnosperm, Monocot, and Dicot families lead the reader to 726 genera and 2,391 species. The guide has information about each taxon.

Wofford is director of the herbarium at the University of Tennessee in Knoxville and is adjunct associate professor of botany. His guide was published in 1989 by the University of Georgia Press and is available for \$35 (cloth) and \$15 (paper) from the Georgia Press, Athens, GA 30602.

Continued Next Page

BUTTERFLY WEED

Some Surprising Facts about *Asclepias tuberosa*

We should be aware that our common butterfly weed (*Asclepias tuberosa*) may in one sense be misnamed. Although butterflies are seen hovering about this colorful milkweed and their larva may feed on its leaves, butterflies are not, it seems, the pollinators.

Neltje Blanchan, usually so wonderful in her observations of plant reproductive processes, makes the following entry in her book *Nature's Garden* (Doubleday, 1901):

Surely here is a butterfly flower if ever there was one, and such are rare. Very few are adapted to tongues so long and slender that the bumblebee cannot help himself to their nectar; but one almost never sees him about the butterfly-weed. While other bees, a few wasps, and even the ruby-throated humming bird, which ever delights in flowers with a suspicion of red about them, sometimes visits these bright clusters, it is to the ever-present butterfly that their marvelous structure is manifestly adapted. Only visitors long of limb can easily remove the pollinia, which are usually found dangling from the hairs of their legs.

In the latest issue of *Bulletin*, the newsletter of the Virginia Native Plant Society, Catherine Tucker provides us with an informative update:

Butterfly weed, Virginia Wildflower of the Year 1992, provides an opportunity to see one of the unique reproductive strategies in plant biology. Typical of the milkweeds, butterfly weed has radically symmetrical flowers with five sepals and five petals, five stamens each with two anthers, and a single style and stigma, but they are not quite that simple. Once you have found the plant in bloom, examine the flowers closely to identify the unique structures and unravel their complexity.

Sepals are hidden underneath the strongly reflexed petals. Above the petals and matching them in color, the filaments of the stamens are fused and modified to form an unusual crown, or corona. Each petal-like portion of the corona has a horn curving upward from inside, arching toward or over the center of the flower. The anthers, located below and to one side of each corona segment, adhere to the stigma forming a specialized central structure called the gynostegium.

Not only stamens and stigma are modified. Pollen is not in individual grains as we see in most plants but is united into a waxy mass called a pollinium. A pollinium is hidden inside each anther and pollinia from adjacent stamens are joined by a dark, colored structure called a gland.

In order to pollinate a butterfly weed flower, an insect must extract the pollen containing masses, or pollinia, from the slits in adjacent anthers by hooking one of the glands precisely so that one of the joined pollen masses slips into a similar slit to reach the stigma of the second flower. You may often see loose pollinia adhering to the corona surface, but only a careful search discloses one reinserted.

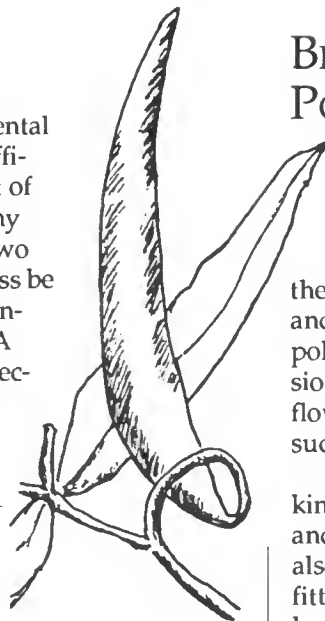
Nectar is produced in the base of each corona segment and attracts many insects besides those that pollinate butterfly weed. While butterflies visit to feed on the nectar or deposit their eggs, they are not the pollinators. Only wasps which have the correct size hooks or spurs on their legs can accomplish the transfer of pollen in these plants. Only when the wasps happen to maneuver themselves and the pollinia into just the right position does pollen successfully produce seeds.

Occasionally small wasps attracted to the nectar will be caught in the gland's slit and, unable to pull themselves or the pollinia free, will become trapped and die.

Continued Next Page

BUTTERFLY WEED —Continued

Considering the small size of the pollinia, the accidental nature of such a "catch" by the insect's leg and the difficulty of inserting pollinia from one flower into the slit of another so that it reaches the stigma, it is apparent why such large clusters of blossoms produce only one or two fruits or pods. How can these plants survive, much less be so widespread? Look at how many seeds each pod contains, each with its own aerial transportation device. A many seeded fruit, combined with wide dispersal, effectively overcomes the disadvantage of such a complex pollination mechanism.



BEES: THE BEST POLLINATORS

Honeybees and bumblebees rank with the best of the flower pollinators. They are especially valuable, not simply because they work throughout the season and visit flowers for both nectar and pollen, but because of their precision in visiting large numbers of flowers of the same species in rapid succession.

The honeybee visits only one kind of flower on any collecting trip and usually on any one day. Bees also have hairy legs that are well fitted for carrying pollen, and their long, tongue-like proboscis enable them to obtain nectar from irregular, tubular, and partly closed corollas. There are a considerable number of plants that can be pollinated only by bees, and such plants are limited in their distribution to those regions that are inhabited by bees.

Research indicates that bees readily distinguish colors. Honeybees, in fact, show a decided preference for blue, but, when working on any particular plant species, they show a preference for the color of that species whatever it may be. Bees distinguish species partly on the basis of color, and they depend on color to some extent to distinguish between fresh and withered flowers. Bees can also see differences in form, patterns, and even surface texture of flowers.

Though their sense of smell is weak and their eyesight is of little value beyond twenty meters, bees have an excellent memory and sense of direction and can return again and again to the same site. □

BOOKS —Continued

Weeds of Kentucky and Adjacent States by Patricia Dalton provides detailed information on 160 alien species found in fields, pastures, and yards, and along roadsides in Kentucky (and most likely in Tennessee, as well). Published last year by the University of Kentucky Press, the 278-page book is intended for the non-professional as an aid to weed identification.

Not only taxonomic characteristics are provided, but Dalton has included information on origin, life cycle, general distribution, folklore, and edible or poisonous properties. Each species is illustrated with a black-and-white line drawing of high quality, and drawings are also provided of flowers, fruits, and seeds.

The author is the former curator of the herbarium at the University of Kentucky College of Agriculture and was among the group that founded the Kentucky Native Plant Society. She now resides in Nashville.

Copies are available through the University of Kentucky Press, Lexington, KY 40508.

Wildflowers of North America: A Guide to Field Identification was compiled by Frank D. Venning and published in 1984 by Golden Press (New York). All of the 1,553 species in 826 genera and 101 families in this field handbook are well-illustrated in color.

Because this book covers the whole of temperate North America which has 10,000 species of wild-

flowers in 1,300 genera and 115 families, the author states clearly in the foreword that this is a field guide at the generic level, rather than a guide to individual species of plants. At this level the coverage is excellent and the good color drawings show the relationships of genera in a family very clearly. (Excerpted from a resource list of the New England Wild Flower Society.)

The Environmental Gardner is a handbook published this year by the Brooklyn Botanic Garden. Its objective is to help reverse the loss of biological diversity by recreating native plant communities in gardens and by restoring species that once flourished locally. The book is available from the Brooklyn Botanic Garden, 1000 Washington Ave., Brooklyn, NY 11225. \$6.95 softcover.

Conservation Biology: The Theory and Practice of Nature Conservation, Preservation, and Management was published earlier this year. In the foreword, John Harper says that nature conservation has shifted from an idealistic philosophy to a serious technology. This book presents the work and ideas of many of those involved in this shift. They present theories, lessons learned, and current work in progress. *Conservation Biology* (507 pages) was edited by Peggy L. Fielder and Subodh K. Jain and is available from Chapman and Hall, 29 West 35th Street, New York, NY 10001-2291. \$35 softcover. □

TO BLUFF MOUNTAIN AND THE BLUE RIDGE

Flowering time was still about ten days late as has been the case all spring from Florida to Michigan. A large group of 20 to 30 gathered for our first stop at Beacon Heights near mile post 304 of the Blue Ridge Parkway. About two-thirds of those attending were from Georgia. Ed Schell led us along the short trail to the exposed rocky bluff and to a good view of the nearby mountains.

Canada mayflower, Indian cucumber root, and minnie-bush were all in bloom along the trail. On the exposed bluff we found Michaux's saxifrage, silverling (*Paronychia argyrcoma*), and black chokeberry (*Aronia melanocarpa*) flowering, with galax and mountain holly (*Ilex montana*) in bud.

We then caravanned to Rough Ridge before the rain started and hiked up to the open area along the boardwalk. A light sprinkle began while we were eating lunch.

The turkeybeard was beginning to flower but not yet at its peak. We also saw the white beadlily (*Clintonia umbellata*), red chokeberry (*Aronia arbutifolia*), sand myrtle (*Leiophyllum buxifolium*) and flame azalea. After lunch and with a light rain falling, smaller groups went their separate ways.

For a few of us the final destination was Flat Rock Overlook. A short hike took us past great solomon's seal, carrion flower, wild sasparilla, and bowman's root. As we approached the overlook, we saw pink lady's slipper and pale corydalis (*C. sempervirens*) in good bloom, as was the catawba rhododendron.

Sunday was another rainy day as we departed for Bluff Mountain. White beadlily, mountain maple, minnie bush, three-toothed cinquefoil, and flame azalea were in good bloom near the top. Purple fringed orchid, long-bracted orchid (*Coeloglossum viride*, var. *virescens*), goatsbeard (*Aruncus*), fly poison, and galax were in bud. Overall the botanizing was excellent with the able assistance of Ed Schell and Dr. John Churchill.

Dennis Horn
Tullahoma

CARDINAL FLOWER

Hard to Beat for Its Beauty and Ecological Value

This has been the year of the cardinal flower. At least east of Tennessee's Central Basin where rainfall has been more abundant, the red lobelia has sprung up abundantly in lower marshy woods and along ditches and streams where water has continued to flow.

Those who have brought cardinal flower into their gardens know that wet conditions are not essential to sustain these brilliant herbs, but in nature cardinal flower is a wetlands indicator. In the wild they become thick and brilliant in deep rich soil where fresh water is near or around its roots.

The *Checklist of the Vascular Plants of Tennessee* lists nine lobelias, all shades of blue save the cardinal flower (*Lobelia cardinalis*). They are members of the bluebell family (*Campanulaceae*).

Ordinarily cardinal flower blooms from July into September. With the lateness of the season, this lobelia, as well as the blues, was reaching its peak around September 1.

The leafy, unbranched flower stems, which grow two to four feet high (and as much as six feet under ideal conditions), arise from compact basal rosettes which are prominent throughout the winter but are often absent during the blooming period. The flowers occur in a dense terminal raceme. Each is 1 to 1.5 inches long and consist of a tubular corolla, with two narrow lobes above and three wider lobes below.

The cluster of brilliant red flowers at the upper end of the wandlike stem not only attracts the human eye but also attracts the ruby-throated hummingbird, the flower's main pollinator. The anthers are at the end of a slender red filament extending out over the lower lip of the corolla. There it is perfectly placed to transfer pollen to the head of a hummingbird hovering to collect nectar from the corolla tube. Interestingly, the blue lobelias are pollinated mainly by bees.

Flowers mature first lower on the stem and after blooming form spherical capsules that expand and turn brown. Usually by October the pods contain an abundance of very fine seeds.

Occasionally *cardinalis* is seen with white flowers, but these color aberrations are not reproducible from seed but only from root divisions.

Cardinal flower and the other lobelia species were used extensively among the American Indians to treat a wide variety of ailments. Both the roots and leaves were used, sometimes simply chewed to relieve colds or sore throats, other times as teas or poultices and applied to sore muscles or skin irritations. The uses ranged from treatment of syphilis to the relief of digestive, respiratory, urinary, nervous, and muscular ailments.

Of more importance is the value of *Lobelia cardinalis* in the environment. The following excerpt is taken from an article by Marion Blois Lobstein in the *Bulletin of the Virginia Native Plant Society*:

In marshes and swamps, [cardinal flower] may contribute to the total productivity of a wetland, not just by fixing energy in its vegetative structures such as leaves and stems that herbivores can consume, but it may also become part of the "detritus mill." This "detritus mill" contributes to the productivity (up to 40 percent) of many types of wetlands. In this process, after plants die, energy is recycled by decomposition by bacteria, fungi, and protozoa, and the decomposed material or detritus becomes part of the food web for various small animals.

Wetlands were once thought to be "waste lands" that should be drained and filled. Now we are realizing that these wetlands are very productive ecosystems. . . . □



MANY UNUSUAL LATE SUMMER SPECIES FOUND AT AEDC

An enthusiastic group gathered in Tullahoma on August 29 to follow Dennis Horn into the abandoned fields of old Camp Forrest, now part of the reservation of Arnold Engineering Development Center.

The first stop was actually not far from the AEDC golf course. The old roads remain from the 1940s, and along those roads several interesting species were found.

The main objective was to find the two species of *Gaura*. Both of these close relatives of the evening primrose were found, but *Gaura filipes* was wilting from the late

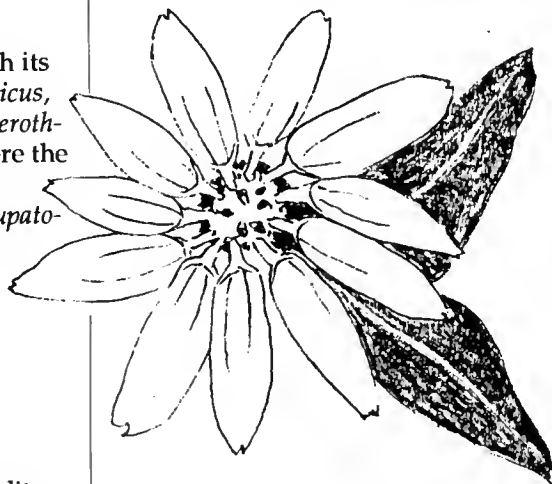
morning sun, while the flowers of *Gaura biennis* were still relatively fresh.

The differences between these two intriguing sisters are not discernable except on close examination. The four petals of *G. biennis* are slightly offset, sepals are fused at the tip, fruits are sessile. The leaves of *G. filipes* are more linear and less hairy.

Other plants in the area were ground nut (*Apios americana*) with its green bean pods, *Aster hemisphericus*, and the prairie golden aster (*Heterotheca camporum*). Also in bloom were the downy lobelia (*Lobelia puberula*), hyssop-leaved thoroughwort (*Eupato-*

rium hyssopifolium), whorled milkweed (*Asclepias verticillata*), *Rudbeckia fulgida*, with its shorter, more compact petals than *R. hirta*, *Aster hemisphericus*, and *Solidago rigida* still only in bud.

The group then drove to the edge of the Tullahoma Industrial Park not far away to see the rare Eggert's



MAY PRAIRIE

Ecological Puzzle and Botanical Delight

Twenty-six TNPS members and guests braved the heat and humidity and spent two hours in the May Prairie near Manchester on July 18. May Prairie is a State Natural Area and one of the first areas purchased by the state for that purpose. It harbors plants not generally found in Tennessee which are more common in the prairies of the Midwest and in the southern coastal plains.

The featured plant of the trip did not disappoint us. The snowy orchis (*Plantanthera nivea*) was in the early stages of flowering and perhaps showier than in recent years.

Among the many flowers we saw in the prairie were the hairy milkweed (*Asclepias hirtella*) with its unusual green spherical inflorescence, three species of compass plant or rosinweed (*Silphium mohrii*, *S. pinnatifidum*, and *S. trifoliatum*), coppery St. John's-wort (*Hypericum denticulatum*), narrow-leaved mountain mint (*Pyenanthemum tenuifolium*), the rare false asphodel (*Tofieldia racemosa*) of the lily family was just beginning to flower, as was tassel-rue (*Trantvetteria carolinensis*).

Other plants included blue hearts (*Buchnera americana*), lady's-tresses (*Spiranthes vernalis*), and mock bishop's weed (*Ptilimnium costatum*).

After lunch in Manchester about half the group drove to Tullahoma for a look at the model airplane field which is a part of the Air Force AEDC property. There we found several Tennessee rare plants. These included a sundew (*Drosera brevifolia*), narrow-leaved bush clover (*Lespedeza angustifolia*), dwarf huckleberry (*Gaylussacia dumosa*), and a frostweed (*Helianthemum propinquum*), so named because on frosty autumn mornings the stem splits open exposing the ice which has formed. It is hoped that the Air Force will adopt a management plan for this field to allow survival of these Tennessee rarities.

Other plants in flower included a showy skullcap (*Scutellaria incana*), a rose pink (*Sabatia brachiata*), and the purple headed sneezeweed (*Helenium flexuosum*). By 4 p.m. we all had had enough heat and sun and called it a day.

sunflower (*Helianthus eggertii*). This plant is a candidate for Federal listing as an endangered species, but here at this industrial park site, *H. eggertii* is quite plentiful. Very few populations have been identified outside of Middle Tennessee. Other sunflowers at this site included *H. microcephala*, *H. mollis*, *H. hirsutus*, and *H. silphoides*. The group saw several species of native lespedeza and fern-leaf false foxglove, *Aureolaria pectinata*, which is parasitic on oak roots, and lady's tresses, *Spiranthes vernalis*.

After lunch the group was considerably smaller but visited another site for *Helianthus eggertii*. Then to a small sinking pond to see a new Tennessee plant found recently by Dr. Hal DeSelm and Milo Pyne—Elliott's blueberry (*Vaccinium elliotii*). Finally the group visited a newly discovered site at AEDC for the large cranberry (*Vaccinium macrocarpon*).

Participants for this field trip, in addition to Dennis Horn, were Jack Carman, Milo Pyne, Richard Simmers, Mary Schaffner, Latham and Mary Davis, Kurt Emmanuel, and the Dr. Harry Yeatman family. □

Dennis Horn
Tullahoma

AUTUMN BOTANIZING

Color in the native landscape may be fading fast, but the browns and grays offer special treasures for botanizing, collecting, and even decorating.

Identification of plants by their dried seed pods and seeds can reveal many secrets not so obvious in the midst of the blooming season.

Note the kinship, more conspicuous now, of the asters and golden-rods, both in the composite family. Notice also the even closer relationship of coneflowers and black-eyed Susans in the genus *Rudbeckia*.

In doing so, gather up a cluster of stalks, add maybe a few knots of dried Queen Anne's lace and seed box, maybe also a dried thistle head (watch the fingers), and arrange it all on the kitchen table. A salute to the season. □

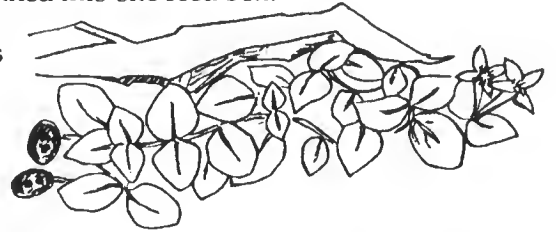
PLANT GENEALOGY

Finding the Primitives in the Old Family Tree

Pierre Magnol (1638-1715), professor of botany at Montpellier, was the first person officially to suggest the natural families of plants. The magnolia was named in his honor, which seems appropriate for the magnolia is one of the most primitive of flowering plants and is a good rudimentary example of connectedness in the evolution of plants.

Some of the characteristics of the magnolia and other primitive flowering plants are:

- 1) The flower is an open bowl, not a tube with a narrow entrance.
- 2) Petals are separate, not fused along their sides.
- 3) Stamens are numerous, not reduced to 10 or fewer.
- 4) Seed-bearing parts are held in the cup of the flower and do not form a swelling below the other floral parts.
- 5) Each flower produces many seeds.
- 6) Carpels are separate, not united into one seed box.
- 7) Leaves are simple, not compound, and leaf margins are entire, rather than toothed or lobed.
- 8) The plant has relatively few branches. □



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Printed on recycled paper

Tennessee Native Plant Society Newsletter

P.O. Box 856
Sewanee, TN 37375





TENNESSEE NATIVE PLANT SOCIETY NEWSLETTER

Volume 15, Number 5

October/November 1992

OFFICERS, DIRECTORS NOMINATED FOR RE-ELECTION

Nominations from the Membership
Requested by December 1



This is the year and season to elect TNPS officers and directors. At the society board meeting October 3, a two-person nominating committee of Nita Heilman and Dennis Horn, presented a slate of nominees, all candidates for re-election to two-year terms.

The nominees for TNPS officers include:

Mary Martin Schaffner of Nashville, president
Dennis Horn of Tullahoma, vice-president
Andrea Shea of Nashville, corresponding secretary
Nita Heilman of Clarksville, recording secretary
Karen Yarbro of Knoxville, treasurer

Nominees for director are:

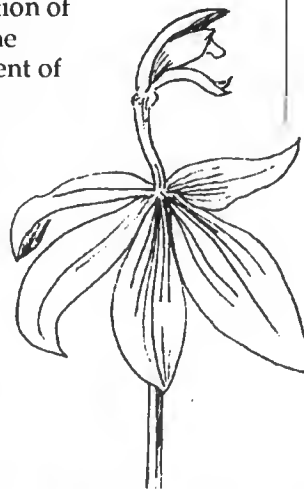
Shirley Nicholson of Knoxville, East Tennessee representative
B. F. Jones of Cookeville, Middle Tennessee representative
Larry Wilson of Memphis, West Tennessee representative

All are currently serving in the positions for which they are nominated. Nita Heilman points out, however, that the bylaws provide for nominations from the membership at large and the publication of those nominations in the December issue of the TNPS Newsletter.

Article VII, Section 3(b) and (c) of the constitution and bylaws state: "In addition to nominations by the nominating committee, any eligible member may also be nominated by written petition of not less than 10 members received by the chairman of the nominating committee. . . accompanied by written consent of the nominee to be a candidate and to serve if elected."

Therefore, the official slate of candidates will remain open until December 1, 1992. If you wish to nominate others listed above, forward the required petition and consent of the nominee to the nominating committee chairman, Nita Heilman, 429 Rivermont Drive, Clarksville, TN 37043. Nita is also available most evenings at 645-9338.

If further nominations are received and verified, ballots will be distributed for an election. If not, the nominees listed above will be declared elected and will begin new terms on January 1, 1993. □



★
TNPS
QUESTIONNAIRE
INSIDE

★
Membership
Renewal Form
on Back

☞ *Return
this Entire
Issue ★*

It Folds into
a No. 10 Envelope



RETURN TO:
TNPS Newsletter
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Sewanee, TN 37375

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H.R. DeSelm of Knoxville
Shirley Nicholson of Knoxville
B.F. (Bobby) Jones of Cookeville
Kay Jones of Columbia
Larry Wilson of Memphis
Sally Mirick of Knoxville
Lois Lord of Jackson

Latham Davis, Editor

Letters to the editor or correspondence about the Newsletter should be addressed to: TNPS Newsletter, P.O. Box 856, Sewanee, TN 37375.

TNPS MEMBERSHIP QUESTIONNAIRE

Below are a few questions that are intended to explore the dimensions of your interest in native plants and the Tennessee Native Plant Society. The questionnaire was not developed by the TNPS Board but is simply an informal survey. However, your response is a way of communicating with TNPS officers, directors, and other members. We will try to give some results in a future issue of this newsletter. Feel free to add any ideas or opinions you think will be helpful.

Return the questionnaire in an envelope with your membership renewal. (See the renewal form on the back of the newsletter.)

How many years have you been a member of TNPS?

- Less than three
- Between three and ten
- More than ten

Which of the statements below best describe your interest in native plants?

- I enjoy learning the names of wildflowers and their structure and location.
- I have a broad interest in all native flora, including ferns, mosses, shrubs, and trees.
- I particularly enjoy photographing wildflowers.
- I love to see the simple beauty of wildflowers in nature.
- I am interested in ecology and the protection of native flora.
- I enjoy gardening with native plants.
- I am a professional in the natural sciences or horticulture.
- I hold an advanced degree in biology or botany.

Which of the following TNPS activities interest you most?

- TNPS field trips that allow me to meet other TNPS members and learn about wildflowers and their locations and habitats.
- The TNPS annual meetings with their programs and opportunities to meet other members.
- Support of private and public efforts to protect wildflower habitats.
- The Tennessee Flora 2001 publications project.
- The TNPS Newsletter.

Which of the following personal activities do you enjoy most?

- Wildflower walks near my home or on weekend and vacation trips.
- Gardening with wildflowers.
- Propagating selected species of wildflowers.
- Reading a good book or article about native plants.
- Talking with friends about wildflowers.
- Working in a community project to create or protect native plant habitats.
- Photographing wildflowers.
- Sketching or painting native plants.
- Collecting and making arrangements of wildflowers for decoration.
- Collecting and studying native plant specimens.
- Doing research about native plants in preparation of articles or books about native flora.
- Others _____

Continued Next Page

What more can TNPS do to help you explore your interest in native plants?

- Sponsor field trips closer to my home.
- Sponsor programs or workshops related to my interests in native flora.
- Provide more information in the TNPS Newsletter about activities related to native plants, e.g. suggested and pending legislation, state and federal policies on the environment, plant rescue projects.
- Publish a journal with more comprehensive articles.
- Encourage the formation of TNPS chapters to make it easier to meet other members closer to my home.
- Other suggestions _____

In what activities, projects, or positions would you like to participate through TNPS?

If asked I would. . .

- be interested in serving as an officer or director of the society.
- be interested in leading or assisting with workshops or other organized programs of TNPS.
- like to assist in projects to educate the public about the value and need to protect native flora.
- like to help organize and lead wildflower hikes in my community under TNPS auspices.
- like to write occasional articles for the TNPS Newsletter or other publications.
- like to participate in plant rescues or seed bank programs.
- like to participate in the monitoring of rare plant sites.
- like to assist with efforts to encourage the spread of wildflowers along roadsides in Tennessee.
- help with setting up and staffing the TNPS booth at the Smoky Mountain Wildflower Pilgrimage.
- be interested in participating in efforts to promote legislation designed to protect Tennessee's rich flora heritage.
- Others _____

What do you like to read in the TNPS Newsletter, or what would you like to see more? (Your choices need not coincide with your answers above.)

- Articles with details about specific plant species.
- Articles about plant ecology and geography.
- Information about TNPS field trips, past and future.
- Information about hikes, workshops, conferences, etc. outside TNPS.
- Articles about gardening with native wildflowers.
- Stories about legislation and state and federal activities related to native plant protection.
- Short profiles of TNPS members.
- Letters or articles from members about what they find interesting about the study of botany.
- Book reviews.
- Tips about wildflower photography.
- Other suggestions _____

TNPS BOARD FOCUSES ON CONSTITUTION AND FLORA 2001

The Board of Directors, meeting in Nashville October 3, discussed amendments to "streamline" the constitution and bylaws and considered plans for publication of the Tennessee wildflower book.

The wildflower book is part of Tennessee Flora 2001, sponsored and organized by TNPS. Members are being asked to contribute their labors and skills, including most of the 500 to 600 color photographs expected to be used in the book.

The book is intended for "the interested amateur without overwhelming the novice or offending the educated botanist." The book will contain descriptions of the more noticeable or common plants, mostly flowering herbaceous plants, but including ferns and some flowering shrubs, trees, and vines. The plants will be arranged phylogenetically, with descriptions provided of each family, along with a list of plants by color and a seasonal bar chart for blooming times.

All profits from the book and spin-off projects (calendars, note-cards, etc.) will go toward funding technical manuals that are also part of the Flora Project.

Two provisions of the constitution and bylaws getting the most attention were the two-year limitation on the terms of officers and directors and the selection of board members from each of the three grand divisions of the state.

Removing the term limitation would bring the bylaws into conformity with actual practice. Allowing for the election of directors at large would provide some flexibility in the nomination and election of board members.

These and other provisions are to be discussed at the next board meeting scheduled to be held in February.

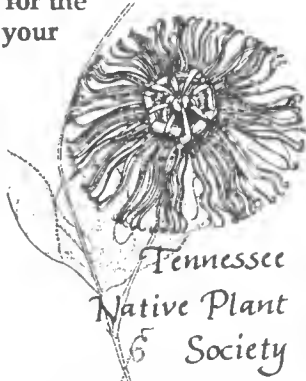
Do you have any suggestions for TNPS field trips? If so, send your ideas to Milo Pyne, Division of Ecological Services, Department of Environment and Conservation, 401 Church, Nashville, TN 37243-0447 or Dennis Horn, 222 Crestwood Dr., Tullahoma, TN 37388.

Free Gift for Early Renewal

You can receive a TNPS decal absolutely free by renewing their memberships by December 31.

This lovely pen-and-ink decal, illustrated with the passion flower, is printed in green and purple. Originally meant as a bumper sticker, the decal can also be put on a window or office door.

Include an addressed, stamped envelope for the return of your decal.



TIME TO RENEW YOUR MEMBERSHIP

The Tennessee Native Plant Society prefers to keep paperwork for its volunteers simple. For that reason, your membership runs for the calendar year. If you joined after July 1, your dues keep you a member through the following year. But for most of us, dues are due by December 31. This may be the only reminder you get.

If you are unsure if you are paid up through 1993, check the date above your name on the label below. If it says 1992, we'd like for you to renew your membership as soon as possible. Renew now and keep the paperwork simple.

Fill out the form below and return this entire sheet with your payment. Thanks for your help.

Name _____

Address _____

City/State/Zip _____

Membership Categories: Regular \$15, Student and Senior \$10,
Institutions \$20, Life Memberships \$150.

(Checks payable to Tennessee Native Plant Society)

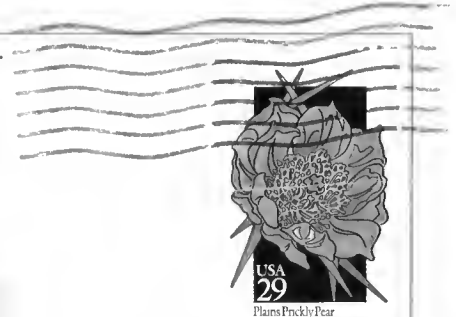
Mail with Questionnaire to: Tennessee Native Plant Society,
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TENNESSEE NATIVE PLANT SOCIETY NEWSLETTER

Volume 15, Number 6

December 1992

THE GROWING FAME OF CUMBERLAND ROSEMARY

A Rare and Endangered Tennessee Native—with a Pretty Face

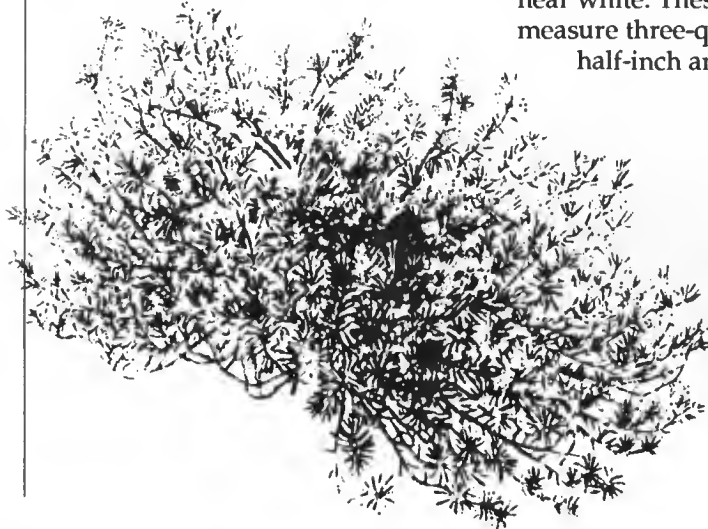
Just a year ago, Cumberland rosemary (*Conradina verticillata*) was designated an endangered species under the federal Endangered Species Act of 1973. We assume the time is still appropriate to include here a few details about Cumberland rosemary, which is recognized, propagated, and cultivated far beyond the borders of Tennessee but which grows wild only along sandy banks and bars of three river systems of the Cumberland Plateau in north central Tennessee and adjacent Kentucky.

This rare woody plant is, in fact, known from only three populations (44 colonies) in Tennessee and one population (four colonies) in Kentucky. Most colonies are small and are threatened by activities that degrade water quality and by habitat destruction by campers, hikers, white-water enthusiasts, and off-road vehicles.

Conradina verticillata is a small shrub in the mint family (Lamiaceae), growing to about 1.5 feet high with reclining branches that spread over the sandy or gravelly surface of sandbars and streambanks. The leaves are thin, flat needles of varying lengths, generally less than an inch, and are held in bunches at the nodes. The foliage exudes a scent much like culinary rosemary. The aroma apparently gives the plant one of its local names, rabbitbane, which alludes to its reputation for repelling rabbits.

From mid-May to early June Cumberland rosemary covers itself with small, two-lipped, pealike blossoms that range in color from lavender-pink to near white. These delicate flowers measure three-quarters of an inch by a half-inch and are held in clusters

Continued Page 2



OFFICERS BEGIN NEW TWO-YEAR TERMS

The December 1 deadline came and when without further nominations of members for the TNPS Board of Directors. Thus the nominees selected by the nominating committee in October will begin their new terms after the first of the year.

Mary Martin Schaffner of Nashville will continue as TNPS president. The other officers continuing are Dennis Horn of Tullahoma, vice-president; Andrea Shea of Nashville, corresponding secretary; Nita Heilman of Clarksville, recording secretary; and Karen Yarbrow of Knoxville, treasurer.

The directors beginning new terms are Shirley Nicholson of Knoxville, B. F. Jones of Cookeville, and Larry Wilson of Memphis.

The TNPS Annual Meeting has been scheduled for May 14-16 at Arnold Air Force and AEDC Reservation in Tullahoma. For more information, check the story on page 6, and check your calendar. □

A Season Special



An Article on Mistletoe

Page 4

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Cumberland Rosemary—Continued

of up to six at the leaf axil. After flowering, four small, dark brown nutlets develop as the fruit matures. In autumn some of the leaves turn yellow and drop, but most are held through the winter, turning a purplish-khaki shade.

Cumberland rosemary was first collected by Albert Ruth in 1894 from the banks of the Clear Fork River near Rugby, Tennessee. For almost 40 years it was considered a disjunct (separated) population of the coastal species *Conradina canescens*. (Three of the four species in the genus *Conradina* inhabit the sandy pine forests of the coastal plain of Florida and Alabama.) However, in 1933 University of Tennessee Professor H. M. Jennison recognized the Tennessee plant as a distinct species. J. K. Small also recognized the species as distinct and named it *Conradina montana* (Small 1933). However, Small's description of the species was published several months after Jennison's, therefore, it is a nomenclatural synonym of *C. verticillata*.

Cumberland rosemary is considered to be an old species that is now represented by relict populations that are widely disjunct from the other members of the genus. It is triploid (three sets of chromosomes), while the other species are diploid (two sets of chromosomes). Consequently, it has reduced seed germination and a reduced ability to reproduce and disperse sexually.

The Fish and Wildlife Service report, prepared by Robert R. Currie, notes that "the current distribution, ecological adaptations, and evolutionary history of the species in the genus *Conradina* increase the importance of protecting this species from extinction. Future studies of this species and the other members of the genus may provide important information on the mechanisms of evolution. . . [Patrick and Wofford 1981]."

Paul Somers reported that there are 44 colonies of Cumberland Rosemary in Tennessee. These colonies are grouped into three distinct populations, one along the Big South Fork Cumberland River and its tributaries in Morgan, Scott, and Fentress counties; one along the Caney Fork River in Cumberland and White counties; and one along the Obed River system in Morgan and Cumberland counties.

Tom Patrick and Eugene Wofford reported on the four colonies of Cumberland rosemary in Kentucky. All of the Kentucky colonies are along the Big South Fork Cumberland River in McCreary County.

Cumberland rosemary's habitat, as described by Patrick and Wofford, is always in close association with the floodplain of water courses. Specific areas supporting the species include boulder bars, sand bars, gravel bars, terraces of sand on gradually sloping riverbanks and islands, and pockets of sand between large boulders on islands and streambanks. All sites exhibit the following characteristics:

1. Open to slightly shaded conditions. Plants growing in full sun always produce more flowers.
2. Moderately deep, well drained soils, consisting of pure sand or a mixture of sand and gravel with no visible organic matter.

*Many plants that are rare
in the wild should remain
rare in the garden. . . .
But one rare plant that
deserves a space in even
the smallest of gardens is
Cumberland rosemary, for
this low growing jewel
combines rarity with ex-
ceptional beauty.*

Rob Nicholson,
Arnold Arboretum

Continued Next Page

3. Periodic flooding that is forceful enough to maintain the open condition of the site.

4. Topographic features such as long, narrow channels or depressions on gravel bars, bank terraces, or large boulders that enhance sand deposition and to some degree protect the plants from the full force of the flooding and help in their establishment.

Conradina verticillata is listed as an endangered plant in Tennessee under the State's Rare Plant Protection and Conservation Act of 1985. This protects the species from being taken without the permission of the landowner or land manager. The federal act provides the additional protection against interstate commercial trade and for plants located on federal land or in the way of federal activities.

There is a commercial trade in Cumberland rosemary, a fact accentuated by an article published in the January 1990 issue of *Horticulture* magazine (p 88). The writer of the article, Rob Nicholson, emphasized, however, that collection of the plant from the wild is illegal without a permit. Nicholson goes on to say, "I am happy to report that Cumberland rosemary is the easiest plant to propagate I have ever handled, making wild collection even more criminal. Cuttings strike root quickly when dipped in a medium-strength hormone treatment and stuck in moist sand, and they take well to production in containers. Seed seems to be rarely produced. The few that I have germinated were susceptible to damping off."

Nicholson is on the propagation staff of the Arnold Arboretum in Boston. He said that the arboretum has been distributing cuttings to interested nursery growers. Therefore, Cumberland rosemary may be available through some of our native plant nurseries. □



Cumberland rosemary is the easiest plant to propagate I have ever handled, making wild collection even more criminal.

Rob Nicholson



ON THE MEANING OF RARITY

Following is an excerpt from a short article by John E. Averett, research director of the National Wildflower Research Center, published in the January/February 1992 issue of the center's newsletter, *Wildflower*.

At the Wildflower Research Center, we have been working with a rare plant that has only two or three existing populations. The plant grows easily in cultivation, seed set is high, and germination is high. When I explain this to visitors to the center, they almost invariably ask, "Then why is it rare?" That, to me, is one of the really interesting questions related to endangered species. Having some insight into what causes a plant's rareness may be critical if we hope to decrease the probability of its extinction.

Early in this century, two general and opposing theories emerged regarding rare plants. One was that the species were old, maladapted to present environments, and on their way out naturally. The other was that they were young and had not filled the niche to which they were adapted. I still hear these arguments, even from botanists, and, certainly, relic species do exist, as do newly derived species. However, numerous examples exist of rare species that are neither old nor young. That is, these examples are of intermediate age in the evolutionary process.

Another widely held truism is that rare plants are poor competitors. But studies specifically related to competition suggest that certain sparse prairie grasses are evenly matched or competitively superior to widespread, common species. . . .

Suffice it to say that the causes for rarity (or commonness) may be as individual as the species involved and no common pattern will emerge—except, perhaps for one. All are highly vulnerable to extinction. Up to this point, I have not mentioned human impact. With few exceptions, humans have not caused species to be rare. Humans are, however, the greatest cause for extinction, primarily by the destruction of habitats.

AMERICAN MISTLETOE

Phoradendron serotinum

The American mistletoe is primarily a southern plant and is conspicuous at this time of year throughout Tennessee clustered high in the nude branches of deciduous trees.

A semi-parasitic, evergreen shrub (It creates its own chlorophyll), mistletoe produces axillary clusters of tiny yellow flowers (3 mm wide) on its smooth, green, jointed stems. Male and female flowers appear on different plants. Though field guide authors do not seem to be in total agreement, flowering apparently can occur throughout the summer, and the small, milky white berries are present in the fall.

The American mistletoe (*Phoradendron serotinum*) is in the mistletoe family (Loranthaceae). The genus name is derived from *phor*, meaning "a thief," and *dendron*, or "tree," a reference to the ability of mistletoe to draw minerals and moisture from trees. The common name, mistletoe, has Old English origins, apparently from the words "mist" and "tan," which means "branch."

While most of the literature suggests that the berries are poisonous, the extent of the toxicity seems to be uncertain. And, curiously, there is considerable folklore about the medicinal uses of the plant and berries.

Since pre-history mistletoe was regarded as a life-giver and a panacea. Later in Europe, it was said to cure tuberculosis, stroke, palsy, epilepsy, and the effects of poisoning. These European beliefs were carried to the New World and applied to the American species. Colonists apparently recognized the plant's sedative effects. There is some evidence that the plant may induce menstruation, and it has shown some effectiveness in treating tumors in experimental animals. But toxicity remains controversial. Ingestion is discouraged. □



MISTLETOE

The following essay has been taken from the book, *Earthly Pleasures: Tales from a Biologist's Garden*, by Roger B. Swain (New York, Viking Penguin, Inc., 1981)

Over the doorway someone has tucked a sprig of mistletoe into a spray of white pine and holly. Turning from the fire to get more punch, a young man is startled under the lintel by a woman who throws her arms about his neck and kisses him solidly, serving up a round of laughter to the guests.

It would be easier to say that, like Yule logs and plum pudding, the tradition of kissing under the mistletoe originated with the English. Indeed it may have, but the roots of the mistletoe tradition go much deeper into history. Throughout Europe many scattered groups considered mistletoe (*Viscum album*) to be, among other things, divine, a fertility agent, a cure-all, a bestower of mystical powers, or a protection against witchcraft, lightning, and physical harm.

The Druids, ancient inhabitants of Gaul, Britain, and Ireland, harvested mistletoe during the winter solstice for use in their religious ceremonies, selecting only the rare specimens that were growing on oak trees, because they believed the sacred oak contributed additional powers to the mistletoe. The Druids also hung mistletoe in their homes to attract the kind spirits from the forest, thus perhaps originating the use of mistletoe as a domestic decoration.

Norse folklore tells the story of Balder, son of Odin, whose mother, Frigga, sought to protect him by placing all earthly objects under oath not to harm her son. However, she overlooked the insignificant mistletoe growing west of Valhalla. The evil Loki fashioned a spear from mistletoe, and Balder was slain. Today, however, many Scandinavians hang mistletoe above their doorways to keep out evil spirits and wear finger rings made from it to ward off sickness.

The plant's parasitic habit may have been the source of the legends and beliefs surrounding it. Seeing that the mistletoe grew from the branches of trees without connection to the ground, men must have marveled that a plant could grow without drawing sustenance from the earth. In addition, the plant's ability to remain green and in leaf when the host plant has shed its leaves may have suggested immortality.

When European colonists first arrived in North America, they found a mistletoe that looked much like their own growing widespread in the forest. They identified this North American variety as *Viscum album* and transferred all their traditional significance to it. In actuality, this mistletoe, growing from New Jersey to Florida and west to Texas, is *Phoradendron serotinum*, a genus that does not occur in the Old World, but this distinction was not made until 1847.

Phoradendron serotinum, our familiar Christmas Cupid, is an evergreen parasite whose yellow foliage appears in clumps up to three feet in diameter on branches of host trees. Some sixty-two species have been identified as hosts, ranging from the persimmon to the red maple and the black

Continued Next Page

MISTLETOE —Continued

walnut. The flowers of this mistletoe are minute, with the two sexes on separate plants. On the female plant, the flowers give way to watery, translucent white berries that are harvested for Christmas decorations.

In the wild, the berries are eaten by winter birds, but the seed in each berry has a sticky coating that causes it to adhere to the beak or feet of the bird. To remove the seeds, the bird scrapes its beak against a tree trunk, thereby transporting the seed to a growing place. The seed soon germinates and sends out a root that forms an adhesive disk when it makes contact with the bark. From the underside of this disk is formed the haustorium, a specialized organ that parasitic plants use to obtain nutrition from the host plant. This haustorium grows into the cambium layer of the host tree and sends out so-called sinkers that grow until they contact the xylem vessels of the host. From the xylem the mistletoe obtains water and minerals. *Phoradendron serotinum* is considered a semiparasite, for it does not feed on the primary products of photosynthesis contained in the phloem of its host. The mistletoe has its own chlorophyll; it only relies on its host for water, minerals, and a place in the sun.

Phoradendron serotinum grows very slowly. The visible shoot does not appear until the second year, and by the end of the third year it may only be one and one-half inches long. But once the haustoria and sinkers are firmly established, the plant grows rapidly, reaching full size in six to eight years.

There are at least seven hundred species of mistletoe in the world; some authorities would double that number. Formerly, all the mistletoes were grouped in one family, the Loranthaceae, but recently the family has been divided into two families, the Loranthaceae and the Viscaceae (which contains *Viscum* and *Phoradendron*). Most species of mistletoe are tropical and subtropical. Their host relationships can be ornate. For instance, there are mistletoes that parasitize other mistletoes, and there are even cases of hyperparasitism to the second degree, where one mistletoe is growing on another, which in turn is growing on another, which is growing on a host.

Perhaps the most spectacular mistletoe occurs on the other side of the world. *Nuytsia floribunda*, found only in southwestern Australia, is a tree twenty to forty feet high. The gray bark and the dark green leaves contrast sharply with the masses of yellow orange blossoms that appear in December. Although the tree is terrestrial and photosynthetic, the roots form haustoria around the roots of other plants growing in the surrounding savannah. These hosts range from grasses to *Banksia* and even cultivated carrots. A one-inch-thick underground electric cable was even found with a haustorium cutting through the insulation and shorting out the cable. While it is not clear how much this tree relies on its many hosts for nourishment, it is intriguing to find a full-size tree that is partly parasitic on the grasses growing around it.

The residents of southwestern Australia consider *Nuytsia floribunda* to be the most spectacular of their flowering trees and welcome its peak of bloom at the end of December. Here, in spite of temperatures in excess of one hundred degrees Fahrenheit (thirty-eight degrees Celsius), they celebrate Christmas with roast beef, Yorkshire pudding, and a rousing game of tennis. There is no Yuletide snow, but there is *Nuytsia floribunda* with its flaming masses of flowers, and they call it their Christmas tree. □

ANOTHER AMERICAN MISTLETOE

The Audubon Society *Field Guide to North American Wildflowers* mentions a northern dwarf mistletoe (*Arceuthobium pusillum*), which has short yellow-green stems one-inch long, with leaves reduced to thin brown scales. This dwarf mistletoe occurs only on evergreens, especially spruce, and is found in northern bogs south to New Jersey and Pennsylvania and west to Michigan. □



GARDEN PROGRAM AT CHEEKWOOD

Cheekwood Botanical Gardens in Nashville will host a one-day program, March 27, of lectures and demonstrations about the residential garden—preparing a design and selecting plants old and new.

Leading the program will be authors Norman Kent Johnson of Birmingham and Felder Rushing of Jackson, Mississippi, along with area horticulture experts.

The cost will be \$35 (\$30 for Cheekwood members), with lunch optional. For registration or more information, call Cheekwood's Education Department at 615/353-2146. □

WARNER PARK ACTIVITIES

Warner Park on Highway 100 in Nashville sponsors periodic programs and hikes of interest to botanists. For instance, from 9 a.m. to 2 p.m. on January 7 and 9, park naturalists will lead a winter woods hike. Participants are asked to bring a sack lunch.

Trees in winter will be the subject of a program from 9 a.m. to 3 p.m. on both February 5 and 6. The focus in the morning (inside) will be twig and bud identification, while afternoon outdoor activities will concentrate on bark, shape, habitat, and other characteristics.

Warner Park is continuing its volunteer program of removing exotic plants. A special day for this work is scheduled for January 23.

Reservations are required for most programs and may be made by calling 352-6299. □

PLANS FOR THE TNPS ANNUAL MEETING

May 14-16
at Tullahoma

The 1993 TNPS Annual Meeting has been scheduled for May 14-16 at Arnold Engineering Development Center near Tullahoma.

Accommodations at the Arnold Center reservation include motel-type facilities often used by guests to the center. Plans are still being made, and more information will be provided in the February newsletter issue.

Kay Jones of Hampshire, who is in charge of the preparations, said not all rooms will have private baths but all will have notable luxuries, such as televisions, coffee makers, and microwave ovens. And the rooms are available at the very affordable price of \$8 per person, per night. Camping facilities are also available.

Kay also said that the names of everyone planning to attend must be given to the Air Force at least two weeks before the meeting.

URBAN LANDSCAPING SEMINAR: KINGSFORT

The third annual Trees and Things urban landscaping seminar, sponsored by Clean Kingsport will be held March 5, 1993, at the Renaissance Center in Kingsport. The all-day seminar will emphasize the importance of plants in urban living and inform participants of how to plan and maintain responsible landscapes that add value to their property and quality of life.

J. C. Raulston from the North Carolina State Arboretum will be the keynote speaker and will be joined by other nationally recognized authorities.

More information may be obtained by calling Clean Kingsport at 615/392-8817. □

The Membership Questionnaire

Do you recall the membership questionnaire included in the October issue of the TNPS Newsletter? Many of you (at least 80) remember it very well, for you filled it out, and several of you enclosed letters or jotted down notes on the questionnaire.

The mere fact that you returned the questionnaire is gratifying; so thanks for your time and your thoughts. (To anyone who has not completed a questionnaire, your response is still needed and will be welcomed. Don't forget your membership renewal if necessary.)

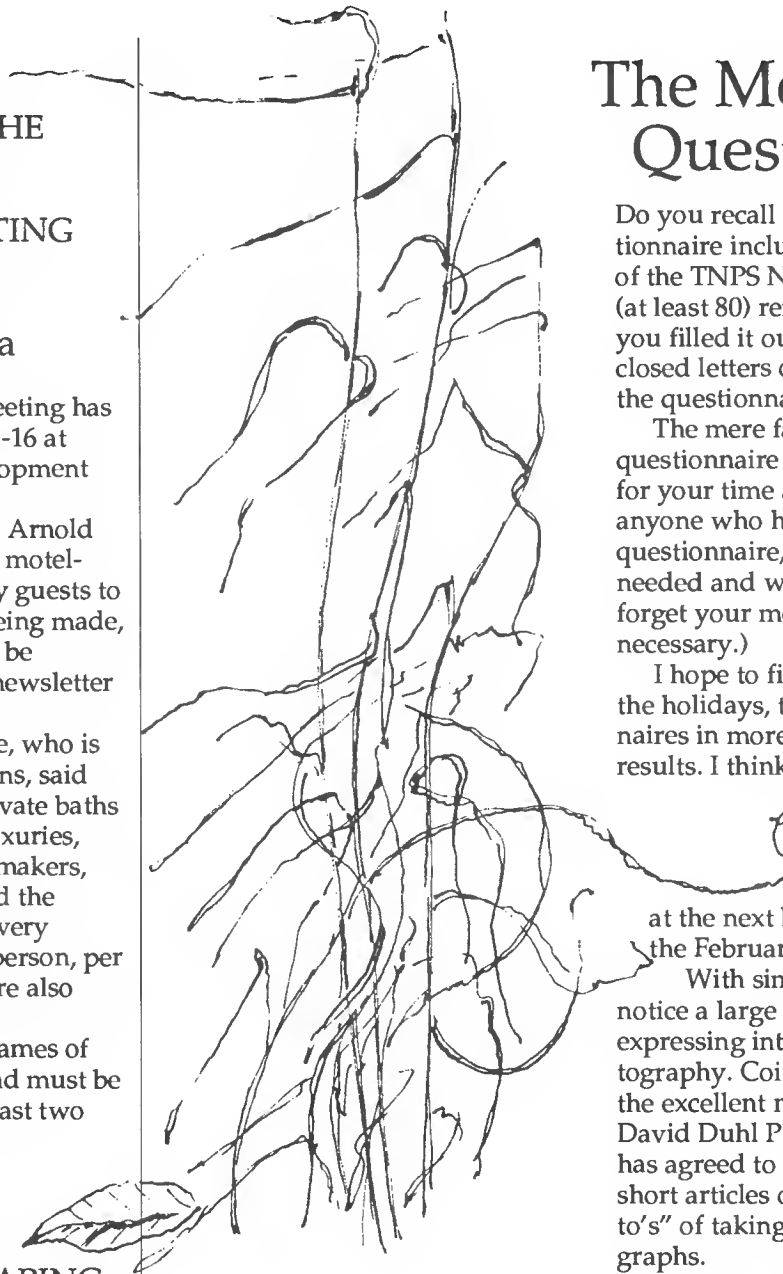
I hope to find the time, perhaps over the holidays, to pursue those questionnaires in more detail and tabulate the results. I think your answers will be of interest to TNPS officers, as well as the general membership. So I plan to report results at the next board meeting and also in the February newsletter issue.

With simply a few glances, I did notice a large proportion of members expressing interest in wildflower photography. Coincidentally, David Duhl, the excellent nature photographer of David Duhl Photography in Nashville, has agreed to write for us a series of short articles or columns on the "how-to's" of taking good wildflower photographs.

That series begins soon.

You will find a partial list of TNPS members on the opposite page. Perhaps we can have the rest of the membership in the following issue.

Latham Davis
Editor



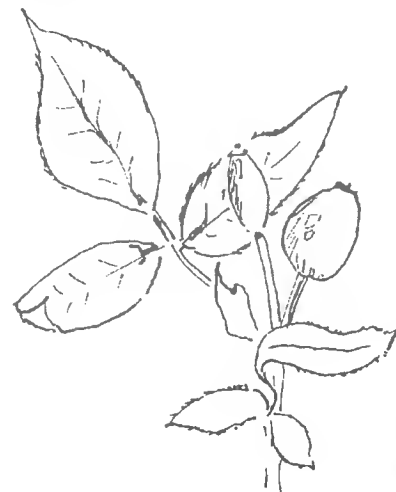
TNPS Members: New and Renewing for 1993 (Partial list as of 1 December 1992)

Bob Anderson, Paris
 Cheryl Anderton, Franklin
 Daisy S. Arrington, Doraville,
 Georgia
 Jane M. Barnes, Kingston Springs
 Mrs. J. Alonzo Bates, Fairview
 Betsy Bunting, Nashville
 Dr. Gordon M. Burghardt, Knoxville
 Edward W. Chester, Clarksville
 Elizabeth N. Chitty, Sewanee
 Dr/Mrs John Churchill, Johnson City
 Ed and Meredith Clebsch, Greenback
 Mrs. Elizabeth Collins, Nashville
 Zell Combs, Oak Ridge
 Ilene J. Cornwell, Nashville
 Maureen Cunningham, Oak Ridge
 Martha Davenport, Jonesborough
 Mary & Latham Davis, Sewanee
 Robert & Evelyn Davis, Seymour
 Dr. H. R. DeSelm, Knoxville
 Michael Doochin (Arboretum at
 Interstate Packaging), White Bluff
 David Duhl, Nashville
 Jeanne A. Dyer, Smithville
 George W. Eckerd, Knoxville
 Mrs. Parker D. Elrod, Centerville
 Lamar Field, Nashville
 Dr/Mrs L. R. Fitzgerald, Memphis
 Sharon M. Fleischer, Kingsport
 Joe C. Freeman, Jr., Norris
 George W. Horal, Goodlesville
 Hallie Hope Galyon, Knoxville
 Carolyn F. Giamarco, Nashville
 Carol Gieske, Loretto
 Toni Gilbert (Reflection Riding),
 Chattanooga
 Ann W. Goodpasture, Brentwood
 Charles M. Gorman, Oak Ridge
 Calysta Haglage, Nashville
 Ellen Hammond, Chattanooga
 Kenneth Heck, Chattanooga
 Wynn Herbert, Kingsport
 Otto R. Hirsch, Nashville
 Patsy Huffman, Murfreesboro
 Mrs. Norah E. Hut, Morristown
 William F. Hutson, Northbrook,
 Illinois
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 Louisa Jackson, Kingsport
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 Lois E. Kenyon, Parrottsville
 Mr/Mrs Charles Lapham, Glasgow,
 Kentucky
 Gail Leverett, Nashville
 Samuel R. Lloyd, Johnson City
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 Virginia H. Lusk, Indian Springs,
 Alabama

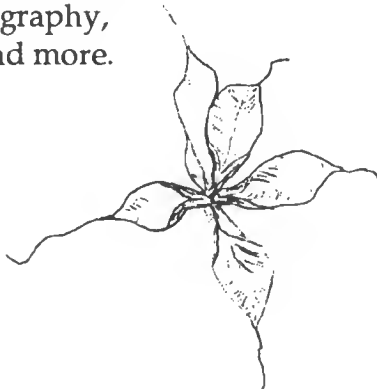
Norma Sue Luton, Oak Ridge
 Martine Madlinger, Arlington
 Lillian T. Manning, Hermitage
 Barbara M. McDonald, Winchester
 Dorcas H. McDonald, Chattanooga
 Catherine J. McDowell, Kingsport
 Robert W. McGowan, Linden
 Eileen J. McCay, Memphis
 Bob & Joyce Merritt, Chattanooga
 Richard P. Metcalf, Oak Ridge
 Patricia & Brant Miller, Rockwood
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 Paul Moore (Moore & Moore Garden
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 Dr. Lorene Sigal, Oak Ridge
 Richard Simmers, Cookeville
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 Angela Spurling, Turtletown
 Susan McMahon Stahl, Old Hickory
 Ogden & Barbara Stokes, Nashville
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 Sunlight Gardens, Andersonville
 Candy L. Swan, Monterey
 Allen & Susan Sweetser, Powell
 Joe H. Taft (Bays Mountain State
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 Reta Taylor, Greeneville
 Geneva Thomas, Lebanon
 Wanda L. Thomas, Norris
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 Adam & Sue Turtle, Summertown
 Kenneth & Helen Warren, Oak Ridge
 Peggy Welch, Nashville
 Barbara Wickersham, Knoxville
 Mr/Mrs Ronald A. Wilson, Oneida
 Flora T. Yando, Tullahoma
 Dr/Mrs Harry Yeatman, Sewanee
 Grady L. York, Manchester
 Norval F. Ziegler, Oak Ridge □

Life Members

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 Hector Black (Honorary), Cookeville
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 Mary Martin Schaffner, Nashville
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 Dr. A. J. Sharp (Honorary), Knoxville
 B. Wayne Swilley, Goodlettsville
 Charles L. Wilson, Hixon
 Larry M. Wilson, Memphis
 Joyce Woodford, Memphis



You won't want to miss upcoming issues of the Tennessee Native Plant Society Newsletter. You will find articles about the fascinating traits of wildflowers, native plant propagation, field trips and programs of TNPS and other organizations, conservation efforts, wildflower photography, and more.



Just a Reminder Check Your TNPS Membership

We include here, one more time, a simple membership renewal form as a reminder that memberships run for the calendar year. Your label below should reflect the nature or status of your membership. If there is a date above your name that says something other than 1993, this is the time to renew by sending in 1993 dues.

Consider telling a friend about TNPS, even giving someone a guest membership.

Name _____

Address _____

City/State/Zip _____

Membership Categories: Regular \$15, Student and Senior \$10,
Institutional \$20, Life Memberships \$150.

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University of Tennessee, Knoxville, TN 37996-1100.

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