

# NATIVE PLANT SOCIETY OF NORTHEASTERN OHIO

Founding Chapter Of

THE OHIO NATIVE PLANT SOCIETY

6 Louise Drive  
Chagrin Falls, Ohio 44022  
(216) 338-6622

*On the Fringe*

---

Volume 4

July/August 1986

Number 4

---

## PHYLLIS M. LEONETTI

We report with deepest regret the loss of Phyllis Leonetti on May 27, 1986. Phyllis was one of the Charter Members who met at Holden Arboretum on October 14, 1982, to found the Native Plant Society. An outstanding watercolorist, Phyllis painted our logo, the Fringed Gentian, and the plates made from her rendering are used on all our stationary and membership cards. In addition, she donated several flower paintings to Dick Evans and in return he printed all of our stationary and cards gratis, enabling our Society to begin with a real touch of class. Phyllis was also the first membership chairman as well as serving as the first Annual Dinner chairman. A Patron Member since the beginning, she made additional donations when the need arose.

Phyllis was a volunteer at the Holden Arboretum, working in the Myrtle S. Holden wildflower garden and with Tom Yates at Lantern Court. She served as chairman of the Annual Plant Sale in 1984. Phyllis was a most accomplished artist, working in several mediums and styles and had exhibited widely and had received many prizes. She was noted for her delicate pencil sketches of bird's nests and for her flower watercolors. A stunning portrait of her mother won Best of Show at Gates Mills several years ago.

We offer our profound sympathy to her husband Frank Jr., daughter Jill, and sons Frank III and Eric. The Native Plant Society has sent a memorial check to the Holden Arboretum Rare and Endangered Plant Propagation Program in her name.

Phyllis was a rare and gentle soul who made the world a better place by her presence. She gave much of herself to her family, her friends, and her associations. I have lost a dear and treasured friend. The Society is diminished by her passing.

AKM

**ANNUAL DINNER - DECEMBER 5TH**

**NEW FIELD TRIP PLANNED DUE TO MAY 15 LECTURE ON OAK OPENINGS:**

- ✓ **JULY 26TH (Saturday) Cleveland Chapter - 9:30 a.m.**  
**TOUR OF LOU CAMPBELL PRESERVE, IRWIN PRAIRIE AND SCHWAMBERGER PRESERVE. GUIDED BY DICK MOSELEY, CHIEF OF NATURAL AREAS AND PRESERVES.**
- **MEET AT IRWIN PRAIRIE PARKING LOT. IT IS ESSENTIAL THAT YOU CALL TOM SAMPLINER (932-3720 evenings) TO LET HIM KNOW THAT YOU ARE ATTENDING AND HE WILL GIVE YOU DIRECTIONS.**

\* \* \* \* \*

**PROGRAM AND EVENTS:**

**July 19 (Saturday) Wilderness Center - 1:00 p.m.**  
**Tour of Stebbins Gulch, Holden Arboretum. Meet at the Main parking lot.**

**July 26 (Saturday) Columbus Chapter - 8:30 a.m.**  
**Tour of Adam County's Lynx Prairie, Buzzard Roost Rock and Edge of Appalachia Preserve. Guided by a member of Cincinnati Museum of Natural History. Meet at Spring Hollow Park, Columbus. Bag lunch. Call Jim Stahl 614/882-5084 evenings.**

**August 10 (Sunday) Wilderness Center - 2:00 p.m. to 4:00 p.m.**  
**Tour of Wilderness Prairie. Guides will be stationed on the trails to help identify grasses and forbs.**

✓ **August 14 (Thursday) Holden Arboretum - 7:30 p.m.**  
**Mrs. Thelma McKibben of Windsor will lecture on the abundant native herbs found in our area and how to prepare them for consumption. Mrs. McKibben has been a volunteer at Holden and is a member of the Western Reserve Herb Society. She and her husband run a true working organic farm. This is a chance to learn how to live off the land.**

**August 16 & 17 (Saturday & Sunday) Wilderness Center - 10 a.m. until Dark.**  
**Pioneer Farm Days, 19th Century Living. Wilderness Center will have a display of useful wild plants featuring their edible and medicinal values.**

**PROGRAMS AND EVENTS - Cont'd**

✓ **August 23 (Saturday) Cleveland Chapter - Arcola Creek - 1:00 p.m. NOTE CHANGE**  
Jim Bissell, Curator of Botany at the Museum of Natural History, will lead us on a field trip to Arcola Creek on the edge of Lake Erie. This is a wetland of tremendous importance in our ecological system and has many unusual plants and birds. Canoes will be used and there will be a small rental fee. Call Ann for reservations (338-6622).

**August 23 (Saturday) Columbus Chapter - 8:30 a.m. to 5:00 p.m.**  
**Tour of Darby Creek Prairie, Bigelow Cemetary and Smith Cemetary.** Meet at Spring Hollow Park. Bag lunch. Call Jim Stahl (614/882-5084 evenings).

If additional details are needed, please call the local chapters listed below:

|          |   |                             |                         |
|----------|---|-----------------------------|-------------------------|
| TWC      | - | Bobbie Lucas                | (216) 645-0302 evenings |
| Cinci    | - | No programs for the summer. |                         |
| Columbus | - | Jim Stahl                   | (614) 882-5084 evenings |

\*\*\*\*\*

✓ **FEBRUARY 22 FERN CLASS ATTENDEES:**

Jay Beswick will lead a fern field trip on Saturday, July 19 at 9:30 a.m. Meet at Brecksville Nature Center.

There will be a series of walks both morning and afternoon and individuals may stay for as much of the day as they choose.

Jay will have his new fern key ready for us. Brecksville has more varieties of ferns than any other area in northern Ohio.

\*\*\*\*\*

**NO REPRODUCTION OF ANY PART OF THIS NEWSLETTER IS PERMISSIBLE WITHOUT WRITTEN CONSENT OF THE OHIO NATIVE PLANT SOCIETY, 6 LOUISE DRIVE, CHAGRIN FALLS, OHIO 44022.**

## CRANBERRY BOG STATE NATURE PRESERVE

**GEOLOGICAL HISTORY:** As the Wisconsin glacier, the last in a series of major continental glaciers to invade Ohio, slowly lumbered south out of eastern Canada, northern plants as well as animals were forced southward. The glacier moved so slowly that a wide belt of Canadian forest was able to move along well in advance of the ice. By the time this massive ice sheet caught up with and pushed over and buried the mature seed producing plants, their offspring farther south of the glacier were already producing seedlings of their own. Thus, the boreal forest was able to continually keep one "step" in front of the glacier. For thousands and thousands of years during the Ice Age, these Canadian plants, including a host of bog plants, occupied a place in our landscape along with such animals as woolly mammoths, mastodons, and giant elk.

Finally, about 18,000 years ago, with a slight warming trend in climate, the glacier began to retreat northward, for its margins now melted faster than they could be replenished. As the climatic conditions associated with glaciation lessened, the Canadian forest, dominated by spruce and fir, was invaded and displaced by more southern forests which had previously occupied the site. Yet at the same time this was happening, the Canadian plants were able to retreat along with the glacier by colonizing the newly exposed wet glacial soils which emerged from beneath the receding wall of ice, as well as around the countless lakes, ponds and marshes left in the glacier's wake.

By the time the pilgrims landed on our shores, the Wisconsin glacier and accompanying Canadian vegetation had long since vanished from what was to become America. In a few isolated sites however, special environmental conditions have allowed individual species, and in the case of bogs, whole plant communities, to linger. Cranberry Bog is one such site. Today, more than 11,000 years after the final retreat of the Wisconsin glacier, this bog community of highly diversified Canadian plants still remains as a living tribute to that Ice Age.

**SURVIVAL:** The most obvious question at this point is how have countless generations of bog plants on Cranberry Island been able to survive for all these thousands of years as remnants of a boreal forest displaced hundreds of miles south of their normal range? To appreciate how this happened, we must first understand the physical setting of the bog itself.

During the early stages of the recession of the Wisconsin ice sheet, a loop moraine was formed across an ancient pre-glacial river valley just east of Thornport, the same valley now occupied in part by Buckeye Lake. Meltwaters from the glacier were impounded between the ice and moraine, forming a lake in the lower portion of this valley. Eventually, an outlet was cut and the lake drained. However, the outlet was not deep enough to completely drain this deep basin, thus a long lake, generally conforming in shape to the old river valley, remained. This finger lake was one of many glacial lakes left in the wake of the melting glacier. Bog plants retreating with the glacier were probably quick to colonize its shores and surrounding wetlands. As the glacier continued to melt farther north, the Canadian forest of

spruce and fir in the region of this lake were gradually replaced by the forests of today. Yet, why did the bog plants, which had by this time formed the typical floating bog mat around the margin of the lake, thrive while their neighboring wetland relations disappeared? The answer lies in the physical-chemical characteristics of bog lakes.

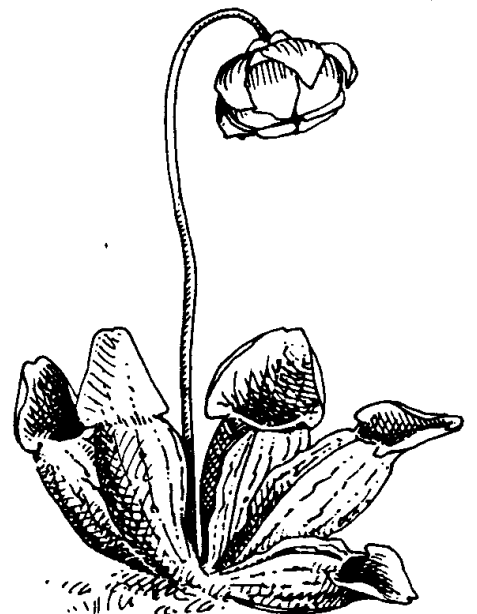
**THE BOG ENVIRONMENT:** As with all lakes and ponds which eventually fill with sediments, glacial lakes were doomed to disappear from their very beginning. By the time the first settlers reached Ohio, countless shallow bog depressions had filled to such an extent that they had been totally recolonized by marsh plants and swamp forests more typical of these latitudes. Only in the deepest of lakes, such as that in the Buckeye Lake basin, had this natural filling process been retarded enough to enable the bog mat community to survive. But even at that, the mat could have been overtaken by marsh vegetation had it not been for the very harsh environment of the bog, and environment which is very inhospitable to most marsh plants. The key to this condition is a simple yet fascinating plant called sphagnum moss. As it grows, sphagnum releases acid, a by-product of its growth process, into the water. The exceptionally large quantity of sphagnum, upon which the entire bog community is based, releases a staggering quantity of acid, often creating a pH condition of less than 4.0. Consequently, this environment becomes much too acid for survival of most plants other than those which have adapted to the bog community.

Bog lakes are also typically oxygen deficient, for they usually have neither a well-established inlet nor outlet, which tends to cause the water to stagnate. This, in conjunction with the high acidity, effectively minimizes the presence of microscopic organisms which normally decompose dead plant material. Consequently, rather than decaying and enriching the water with nutrients, dead vegetation, primarily sphagnum, builds up and compacts into peat.

Sphagnum moss also has an unusual cell structure which enables it to hold many times its own weight in water.

Accordingly, on hot summer days, it acts like a giant sponge, evaporating large quantities of water, thereby cooling the surface of the bog while at the same time maintaining a high humidity, a condition absolutely critical for the survival of many bog species. This thick spongy covering of sphagnum also acts like a huge blanket of insulation, keeping root level temperatures well below air temperatures, thus dramatically reducing length of growing season and seed germination in the bog as compared with surrounding environments.

Over the thousands of years since the first bog plant became established within the Buckeye Lake Basin, all of these severe environmental conditions



have tended to favor the maintenance and perpetuation of the bog community while inhibiting competition and invasion by the more typical marsh plants.

**THE BIG SWAMP:** The Indians knew it as Two-Lake, Three-Lake, Big and Little Lake, and Long-Lake Swamp. Early settlers simply referred to it as the Big Swamp. Yet the cranberry bog in which both early settlers and Indians before them collected cranberries was not at all like the cranberry bog we know today.

Even though the original glacial lake was about 46 feet deep, by the time the first settlers made their appearance, the sphagnum mat around the shoreline had closed in over and filled the original basin to the extent that the lake had become largely a tree-covered swamp, extending over an area of about 4,000 acres. The open water surface of the lake was reduced by the invading vegetation to one long lake about five miles long, but only 400-500 feet wide. During low water, the long lake often became two separate narrow lakes, only to join again during high water.

The floating bog mat which developed around this lake was primarily composed of sphagnum moss. As the living terminal portions of this rootless plant continues to grow outward, the older portion of the stem behind it dies back, yet remains attached to the growing segment. Consequently, long strands develop, enabling this plant to extend outward even into the open waters of a lake. During the thousands and thousands of years that this sphagnum mat was developing over the surface of the lake, the dead portions of its stems were building up and compacting into a dense accumulation of peat which in turn was gradually filling the basin behind and beneath the newly developing segments of the floating mat.

With this continual building up of peat, the outlying older portions of the mat eventually became firm and relatively dry enough to support the swamp forest encountered by the first settlers. Unfortunately, these tall trees and shrubs shaded out most of the bog mat plants except those around what little remained of this once extensive lake. Here, where the floating mat was still young and growing and as yet unable to support the weight of large trees, the Canadian plants thrived in sunshine as they had since the close of the Ice Age.

**THE CANAL:** With the coming of the Ohio and Erie Canal, the Big Swamp provided an excellent site for the construction of a large reservoir to furnish water needed to lift canal passenger boats and barges over the divide between the Licking and Scioto River basins.

On July 4, 1825, New York's Governor DeWitt Clinton, at the invitation of Ohio's Governor Jeremiah Morrow, turned the first spadeful of earth for Ohio's canal system. By the following year, the Ohio Canal Commission began work on an earthen dike four miles long around the west end of the swamp. The dike was finally completed and the reservoir filled in 1830. Unfortunately, it was discovered that this shallow reservoir lacked sufficient capacity to supply enough water for two-way barge traffic, especially during the dry season, so two years later it was enlarged by 50 acres. The resulting lake, comprised of both the old and new reservoirs, covered approximately 4,300 acres. Thus, the Licking-Summit Reservoir was born and the Big Swamp was no more.

**THE BIRTH OF CRANBERRY ISLAND:** Strangely enough, it was the impoundment of the Big Swamp in 1830 which made Cranberry Bog so unique. As the waters backed up behind the dike, all of the swamp was inundated and destroyed, except the very youngest and therefore most buoyant segment of the bog mat. Instead of disappearing beneath the mucky waters, as did most of the adjacent swamp forest, a 50-acre upper segment of the bog mat along the north shore stretched and expanded like a giant water-logged sponge and rose eight feet with the new water level like the legendary phoenix out of the fire.

No longer did the floating bog mat surround the glacial lake as is typically the case with such bogs. Now the lake surrounded the bog mat, the only known such occurrence of its kind in the world.

**BUCKEYE LAKE:** With the coming of the railroads, canal traffic rapidly dropped off. By 1900, the Ohio and Erie Canal was finished as a commercial waterway. In May of 1894, even before the total demise of the canal system, the Ohio General Assembly officially abandoned the reservoir as a canal feeder and proclaimed it a public park. In doing so, they changed its name from Licking-Summit Reservoirs Park to Buckeye Lake. Use of the lake for recreation intensified as transportation to it improved. By the early 1900s, Buckeye Lake had become a popular pleasure resort spot.

The 1949 when the General Assembly created the Ohio Department of Natural Resources, the body of water and adjacent state lands known as Buckeye Lake, including Cranberry Island, were officially dedicated as Buckeye Lake State Park, and became one of many state parks operated by the newly created ODNR Division of Parks.

Finally, on May 18, 1973, Cranberry Island was dedicated under the Natural Areas Act of 1970 as Cranberry Bog Nature Preserve and was consequently transferred to the ODNR Division of Natural Areas and Preserves to be managed as a state nature preserve.

**THE ISLAND'S FUTURE:** Cranberry Bog has undergone considerable changes since 1830. When the bog mat originally surfaced, there were no trees on it. Since then, the margin of the island has been colonized by a dense zone of red maples and common alders whose shade has adversely affected the other bog vegetation.

The most startling changes which have occurred since 1830 have been the deterioration of the island itself. When the island first surfaced, it was about 50 acres in size. By 1910, only 45 acres remained. By 1955, a mere 45 years later, the island had deteriorated to only about 23 acres. In 1963, studies showed that the island had lost even more ground and was now down to 19.75 acres.

Today, Cranberry Island encompasses an area of less than 19 acres. It is our smallest state nature preserve and in all probability will become much smaller during the next 150 years—that is, if it doesn't disappear altogether before then.

Why is Cranberry Island disappearing? This island was created by an act of man, not nature. Now the forces of nature and man are slowly destroying it. Canadian vegetation surviving this far south is at a marked disadvantage even under the best

of conditions. Unfortunately, this little island is at the mercy of severe wave and ice action coming off a very large, shallow lake.

Another significant factor is that while the highly acid stagnant waters of bog lakes typically help perpetuate the sphagnum, mat, the well-oxygenated, slightly alkaline waters of Buckeye Lake allow and accelerate natural decomposition of the mat. The waters of this man-made reservoir also enable trees and marsh vegetation to invade the edges of the island where bog acid has been sufficiently diluted and oxygen is readily available. Although this dense ring of trees and shrubs has somewhat helped stabilize the margins of the island, it also has shaded out adjacent bog plants. Not only do these trees shade out bog vegetation, but occasionally when they are blown over, large clumps of peat clinging to their shallow but extensive root system are torn away from the island and lost. There is also reason to believe that the annual winter drawdowns of Buckeye Lake tend to do structural damage to the island as well. So too, natural wave action as well as wakes from passing speed boats tend to severely erode the shoreline.

The concerns of many scientists relative to the island's ultimate fate led to the adoption of House Resolution No. 26 on April 17, 1963, by the Ohio House of Representatives. Pursuant to this resolution, the Division of Parks of the Department of Natural Resources was directed to undertake a study of the possible remedial measures that could be utilized to save Cranberry Bog.

After an intensive investigation of the problem by scientists and engineers, the consensus was that there is no practical way to stop the deterioration of the island. It was feared that remedial measures sufficient to prevent further deterioration might tend to change the character of the bog environment and actually do more damage. A similar study conducted by the National Park Service came to the same conclusion. Just how much times does the island have? Its deterioration could stabilize and the island might be around for several more generations, or it could break up and totally disappear within the next few years. No one really knows. In any event, Cranberry Bog Nature Preserve remains today as one of the most unique and fascinating natural areas in the nation. Due to the extremely fragile condition of the island, a no-wake zone has been posted for the waters around the island and access to the preserve is restricted to small, well-supervised groups who must remain on the established boardwalk trail. No one is permitted on the island without written permission from the Chief of the Division of Natural Areas and Preserves.

### **THE PLANTS OF THE CRANBERRY BOG**

**CALOPOGON ORCHID:** Around late-June, the Calopogon or grass-pink orchid puts on a magnificent floral display. Thousands of these delicate beauties accent the bog meadow with a hue of magenta-pink. The flowers are borne in loose clusters of 2 to 10 and will continue to adorn the sphagnum and cranberry carpet through July.



**ROSE POGONIA ORCHID:** In sharp contrast to the Calopogon orchid, rose pogonia or snakemouth orchid is extremely rare on this island, and for that matter, throughout the state. Although it might be confused with the preceding orchid, notice that the rose-pink flowers are usually solitary and instead of grass-like leaves, a single oblong leaf clasps the middle of the stem. It also blooms in mid-June, but unlike Calopogon, only lasts for a week or so before disappearing.

**TAWNY COTTON-GRASS:** Cotton-grass is neither a cotton nor a grass, but rather a grasslike plant called a sedge. By late August, it becomes quite conspicuous throughout the bog meadow when the flower spikelets go to seed, forming a fluffy, white cottonlike tuft atop the wiry stalk.

Like many bog plants, tawny cotton-grass is circumpolar in distribution, ranging all the way north to the Arctic Circle.

**THREE-WAY SEDGE:** This very distinctive sedge abounds throughout the bog meadow during late summer. The name comes from the numerous short leaves that are perfectly 3-ranked.

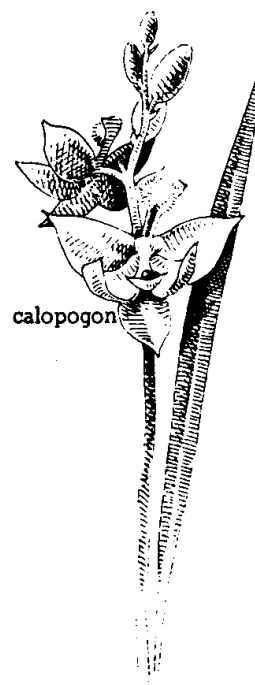
Dulichium is not restricted to bogs and ranges throughout much of temperate North America.

**NORTHERN PITCHER PLANT:** Pitcher plant is so named for its unusual pitcherlike leaves. Each leaf is ingeniously designed for catching unsuspecting insects. Notice the tiny, downward-pointing bristles lining the inside upper portion of the leaf and the liquid contents below. Insects lured into the colorful leaf can easily work their way downward, but the stiff bristles prevent them from reversing their direction. At that point just above the liquid contents, there is a glossy, smooth surface upon which most victims lose their footing and fall into the basin below. Eventually, they drown in this curious mixture of rainwater and enzymes, are digested, and then absorbed through the walls of the leaf.

There are probably more pitcher plants growing on Cranberry Island than in all the other bogs in Ohio combined. When Freda Detmers made her plant study of the island, no pitcher plants were found. Either they had not survived the flooding or had been extirpated long before. It is reported that all of these plants growing here today are descendants of a single plant introduced to the island by her more than 65 years ago.

Watch for the blood-red flowers in late May.

**ROUND-LEAVED SUNDEW:** The round-leaved sundew is easily overlooked, for its rosette of tiny club-shaped leaves covers an area scarcely larger than that of a quarter. This plant seems to prefer the most disturbed areas of the bog. Look for it adjacent to the observation platform in the bog meadow.



This, too, is an insectivorous plant. Notice its covering of reddish hairs or tentacles tipped with clear droplets of liquid. This gives the plant an appearance of being covered by morning dew, hence the origin of the name "sundew." Insects attracted to the sweet droplets soon find themselves hopelessly entangled by the sticky consistency of the bait. The more they struggle, the further entrapped in the tentacles they become. Eventually, their struggle ends and they are digested by special glands in the walls of the leaf, which by this time has wrapped itself around the victim.

The tiny, 5-petaled white flowers bloom one at a time in early June and usually are open only while the sun is shining.

**ARROW ARUM:** Although arrow arum is not particularly indicative of peat bogs, it does rather well throughout this bog meadow. Notice its distinctively veined arrow-head leaves.

Tuckahoe, as it is sometimes called, belongs to the Arum family. Like its woodland cousin the Jack-in-the-pulpit, its inconspicuous flowers are located on a fleshy club-shaped spadix which is nearly concealed by a long flaplike spathe wrapped around it.

**LARGE CRANBERRY:** Cranberry Bog has long been famous for its namesake, the large cranberry. This ground-level creeping shrub is the common cranberry of commerce which is cultivated extensively on Cape Cod, in New Jersey and in Wisconsin. The name "cranberry" is reported to be a corruption of "craneberry," in reference to the flowers which somewhat resemble the silhouette of the head and neck of a crane. The tiny pinkish-white flowers bloom in late May. By August the tart berries begin turning red. If not picked, the ripened fruit will remain on the stem until the following spring.

**BUCKBEAN:** One of the very earliest flowers to bloom on Cranberry Island is the buckbean or bogbean, as it is sometimes called. Often late seasonal frosts kill the flower buds before they have a chance to bloom. Consequently, years may pass before one is treated to the beautiful spike of spun, glasslike, white flowers this plant displays in mid-May.

Although the 3 oblong leaflets rising from its creeping rootstalk may somewhat resemble those of beans, the bogbean is actually a member of the Genetian family.

This rare plant is known to occur in only one other location in the state besides Cranberry Island.

**POISON SUMAC:** The first shrub or small tree which you will probably encounter on this island is the poison sumac, our most poisonous woody plant. Large specimens are plentiful around the edges of the bog meadow, especially at the beginning of the boardwalk. Like poison ivy, the only other poisonous member of the sumac family, contact with the plant may cause a severe rash. Learn to identify this plant before visiting the island!

In the fall it becomes strikingly attractive with its brilliant crimson leaves and drooping clusters of white fruits.

**SPHAGNUM MOSS:** Instead of earth, this entire island is made up of sphagnum peat moss. Sphagnum moss is the most abundant and important member of the bog community. It is a rootless plant whose leaves die off near the base of the stem yet are green and continually growing near the tip. As it grows, sphagnum releases acid which to a great extent accounts for the acid condition of this as well as other sphagnum peat bogs. During World War I, sphagnum was often used in place of cotton as a surgical dressing as its acid properties make it naturally sterile.

The leaves of this fascinating plant contain a network of empty cells which gives it a water-holding capacity of several times its own weight.

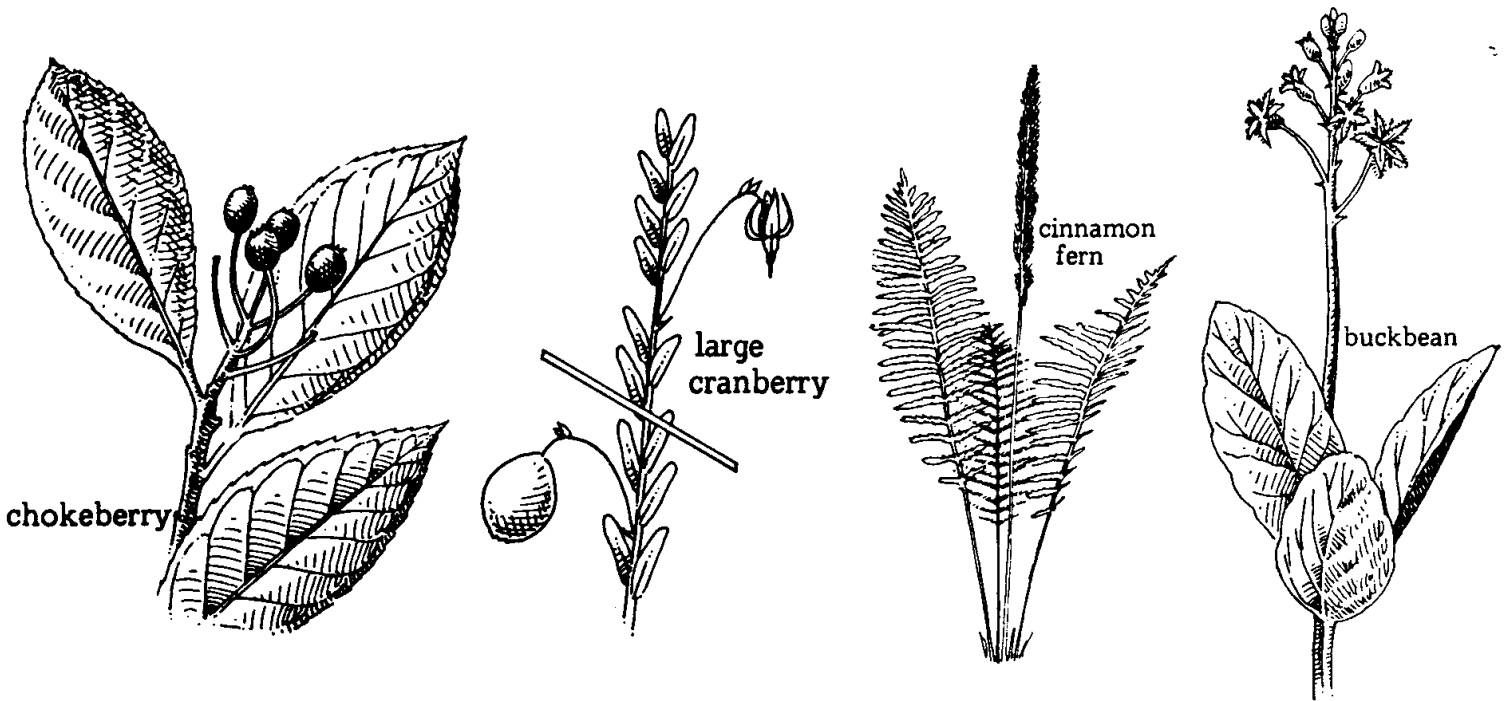
For centuries, peat moss has been of considerable economic use: here and in Europe for gardening, as a packing material and as a fuel.

**SWAMP LOOSESTRIFE:** The gracefully arching branches are the most distinctive feature of swamp loosestrife. Where the tips of its somewhat woody branches touch the bog mat, it takes root and shoots out new branches.

This is often the first invader of open water in the formation of or expansion of bogs. Where the arching branches touch the water, air-filled tissue develops, often swelling the stem thus allowing that segment of the stem to float. From these small "rafts," new branches develop and repeat the process again and again until an intertwining network of stems is projected far out over the open water.

Tufts of lavender flowers appear in the upper leaf axils about late July and early August. A close examination of them will reveal that of the 10 stamen, half are long while the other half are short.

The leaves, which occur mostly in whorls of 3 or 4, turn a beautiful soft red in autumn.



## PRESIDENT'S COLUMN

On the evening of June 16th we will be in Dayton to welcome into the fold the Dayton Native Plant Society, our 5th chapter. They have a strong core of 35 people who have formed the group and they expect a larger turnout on the 16th. We will have more news of them in the September newsletter. In addition, on the 16th I will be in Toledo to talk with Jay Brewster of Crosby Gardens who has offered to get the Toledo group underway. We have had several false starts in Toledo but this looks good, as Jay will cooperate with the other interested parties. At the same time, Marilyn Ortt has agreed to consider spearheading an informal chapter in Marietta-Athens. Marilyn is an excellent botanist who works for Natural Areas & Preserves in southeastern Ohio. The group would have no formal program schedule but would be our link with that area, presenting the possibility of a field trip or other activity for chapters around the state. When and if interest and enthusiasm grew, it could then take on a more formal structure.

On May 8th, we were in Enlow Creek Nature Preserve belonging to the Western Pennsylvania Conservancy. Tucked into a little backwater in the southwestern corner of PA, this is a treasure beyond belief. We saw not 5 or 10, but dozens of Indigo Buntings, Scarlet Tanagers, Rose-Breasted Grosbeaks, Towhees, Baltimore Orioles, many species of warblers and others. The hillsides were thick with dwarf larkspur and the stream banks were carpeted with blue-eyed Mary. Rare ferns and flowers were in abundance. We promise to set up a field trip there for 1987, so mark off a weekend in May. While there, we ran into the two naturalists who were instrumental in saving the area and they will lead our trip. There is a motel nearby that has double occupancy for \$18.00 and is very nice.

We went from Enlow to Wintergreen, Virginia, near Charlottesville, to represent Ohio at the Virginia Wildflower Society's Annual Wildflower Symposium. If you can, try to get there next year. We were housed in a ritzy condo atop one of the highest mountains in the Blue Ridges with spectacular views. The people were lovely, the field trips most enlightening, and the lectures excellent. We saw many plants new to us. The fee for Friday noon to Sunday late afternoon, including lodging, was only \$94.00. The Virginia Society started just several months before we did, and its recently retired president has been most helpful to me.

Just a note that Kentucky has now founded a Native Plant Society and we are in the process of establishing communications with them as some of you may be interested in their field trips.

We have just returned from a jaunt to the Mack area between Upper and Lower Michigan where we saw 8 species of early orchids including Calypso, Rams-Head, and Arethusa, along with the endangered Bird's-Eye Primrose and Dwarf Lake Iris. The Michigan Nature Association does an outstanding job of preserving lands in Michigan and I would urge those of you who are interested to join their very worthwhile group. As a member you are welcome to visit their preserves and see the unusual plants they are protecting. Any who are interested, please call me for information.

## PRESIDENT'S COLUMN (Cont'd)

In sum, there are organizations in all of our neighboring states that do have programs and preserves that are fun and enlightening to visit.

With summer upon us, now is the time to plan short trips to nearby adventures. In many cases it is not the plants that you can see, but the marvelous people you can meet. I never met a naturalist I didn't like and one can learn an infinite variety of things from them. And if you do meet our neighboring friends, be sure to invite them to "Ohio - The Heart Of It All".

Finally, a quick report on the Midwestern Symposium on Plant Conservation Strategies: Options for the Future, put on by Holden Arboretum and Lakeland College. From the Friday evening keynote address by Stuart Udall, through the Saturday lectures, we were stimulated and informed by outstanding speakers from all over the country. We promulgated the program in the January newsletter and I wish more of you could have been there. In addition to the formal program there was ample opportunity to talk with the conferees who represented 22 states, all the way to the West coast. Hearty congratulations to the Holden staff for a job well done!!

\* \* \* \* \*

## POLLINATION OF TIPULARIA DISCOLOR, AN ORCHID WITH MODIFIED SYMMETRY by Warren Stoutamire

The great majority of orchid species produce bilaterally symmetrical flowers—they can be divided in only one plane so that the two halves are mirror images. Strict radial symmetry in which flowers can be divided in more than one plane to produce similar halves is not possible in orchids because in most characteristic structure, the column, is bilateral. Radially symmetrical sepals and petals (the perianth) do occur in a few orchids where the lip is not differentiated from other petals, the best known examples being some species of the Australian and New Zealand sun orchids (**Thelymitra** spp.). Bilateral floral symmetry serves primarily in orienting an insect so that pollinia are applied to precise areas of the visitor. In orchid flowers producing a single pollinarium, the structure is usually applied somewhere along the midline of the proboscis, face, thorax or abdomen. In orchids which produce two pollinaria, the usual situation in the subfamilies Orchidoideae (**Habenaria** and **Platanthera** as examples) and Cypripedioideae (examples are **Cypripedium** and **Phragmipedium**), the pollen masses are either placed on lateral organs of the visitor such as compound eyes or legs, or the insect is forced to make an off center entrance or exit removing pollen on a midline organ.

A small number of orchid species produce flowers in which either or both the perianth or column are twisted so that flowers have a modified bilateral symmetry and these have received little attention from the standpoint of function. Examples occur

## POLLINATION OF TIPULARIA DISCOLOR - Cont'd

in the general **Ludisia** (**Haemaria**), **Dipteranthus**, **Macodes** and **Mormodes** in which the columns and/or lips are twisted to one side. Dunsterville (Dunsterville and Garay 1959) illustrated **Dipteranthus planifolius** with dextral and sinistral column torsions. Bilaterally symmetrical flowers are also produced by the species. In a letter discussing this, he says "Assuming some bees may be leftleaners, one would have to predicate a parallel species of right-leaning bees if the asymmetry is to have any evolutionary meaning, it seems, with middle-of-the-road bees having their own role to play with the symmetric flowers." It is more likely that all visitors to these orchids belong to the middle-of-the-road category and that the orchid asymmetry assures lateral pollinarium attachment. The twisted column of **Ludisia discolor** functions by placing pollen on one of the pollinating butterflies' forelegs (Ridley 1896). The torsion of **Mormodes** columns is such that pollinaria are symmetrically placed on the thorax of the euglossine bee visitor (van der Pijl & Dodson 1966). I have seen no reports of the functioning of other orchids with modified symmetry, although Dressler (1968) illustrated pollinaria of **Cirrhaea**, **Sievekingia**, **Kefersteinia** and **Catasetum** species on lateral organs of euglossine bees.

The "Crippled Crane-Fly" orchid, **Tipularia discolor**, differs from all other North American orchid species in modified floral symmetry. The flowers face outward from the central axis with the column oriented to the right or left of the nectary opening. Sepal and petal positions are also modified so the flowers have a highly irregular appearance (Fig. 1). The derived asymmetry of this species is part of a character complex adapting the flowers to pollinarium attachment off the visitor midline by medium-sized moths of the family Noctuidae.

The numerous species of noctuids are often called "millers" and are frequent visitors to artificial lights. They are known to anyone who carries a lantern or camps in mid-to-late-summer. They are attracted to nocturnally fragrant flowers, fermenting plant sap and decaying fruits. Body, legs and wings are covered with scales usually in shades of gray and brown. Orchid pollinia will not adhere to such a covering and few of the northern, temperate orchid species have adapted to the noctuids perhaps because of this mechanical barrier to pollen transport. Only the tongue and compound eyes are free of scales and some orchid species evolved mechanisms for attracting the moths and attaching pollen masses to one of the scale-free areas. **Tipularia** accomplishes this by moving the column out of the vertical plane so that it contacts either the right or left compound eye of the visiting moth. The distance between nectary opening and column tip is 1.5-2 mm. This matches the distance between tongue base and compound eye of a noctuid visitor.

Pollination of this orchid was first observed by Donald Schnell near Statesville, NC in August, 1975. He contacted me and we then made joint observations of moth behavior. The moths began their flights at dusk, flying 10-30 cm above the forest floor. Moths began visiting **Tipularia** flowers just before complete darkness, and visits continued for about 45 minutes, all activity ceasing at the end of this period. **Tipularia** flowers emitted a perceptible fragrance during this period but, as is the case with most faint floral odors, human detectors and human language cannot adequately describe them. **Tipularia** plants differed in the odor intensity

and some retained faint scents during the day. Moths locate the dull-colored racemes presumably by scent, alighting on the lower flowers first and working their way upward on the racemes. Moths move about on the inflorescence both by clinging to the projecting flowers with their forelegs and by wings kept in constant fluttering motion. The torsion of sepals and petals probably serves to produce more lateral supports for insect legs. Visitors maintain a nearly vertical position as they move about the inflorescence. As the 15-mm tongue is inserted into the 18-20 mm-deep nectary, the lateral column contacts one of the compound eyes. When the moth withdraws its proboscis, the two waxy, yellow pollinia of a pollinarium are attached to the compound eye.

The forest is too dark during most of the activity period for human observation without additional light. Flashlights have to be used cautiously - because moths appear to be disturbed by light and they are strongly disturbed by observer movement, making close approaches for photography impossible. The moths collected by Don Schnell and myself were identified by J.H. Newman and D.M. Forbes as *Plusia oxygramma* (3), *P. precatationis* (2), and *Cucullia convexipennis* (1).

A moth carrying pollen on its right eye can pollinate another right-handed (dextral) flower but not a left-handed (sinistral) one. Each raceme carries both floral types and self pollination is likely without some preventive mechanism. Anther caps usually remain on the freshly removed pollen masses until mechanically dislodged or until drying and shrinkage allows the cap to fall. This mechanical barrier probably reduces selfing.

The genus *Tipularia* includes three disjunct species. Aside from the North American species discussed here, the Himalayan *T. josephii* (illustrated in Hooker, 1898) and *T. japonica* (Ohwi 1953) produce much smaller, greenish, apparently bilaterally symmetrical flowers. There is no available information on the floral mechanics of either of these species. The bilateral symmetry of the two oriental species probably represents an ancestral state since it is the predominant condition in the Orchidaceae. The North American *Tipularia discolor* is modified in an unusual way for transport of pollen on lateral organs of noctuid moths. Symmetry changes such as these which are biologically successful are relatively rare events in the orchid family.

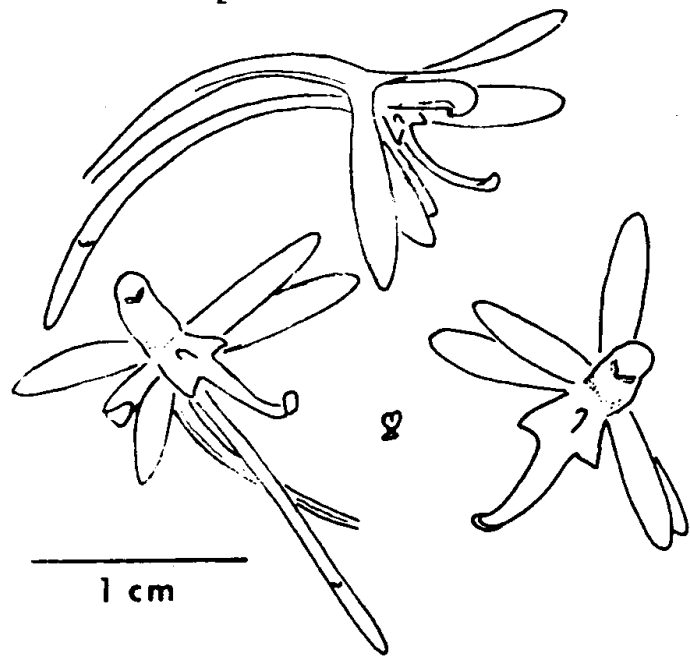
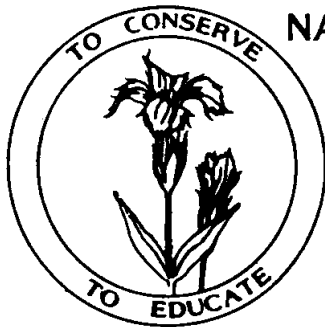


Fig. 1 — lateral and face view of *Tipularia discolor* flowers, pollinarium in center. Dextral and sinistral flowers are illustrated, the terms as used here referring to column position in relation to nectary opening as observed from the front.

**Warren Stoutamire is a Professor of Botany at the University of Akron and one of the country's experts on native orchids.**



# NATIVE PLANT SOCIETY OF NORTHEASTERN OHIO

Founding Chapter Of

THE OHIO NATIVE PLANT SOCIETY  
6 Louise Drive Chagrin Falls, Ohio 44022

NON-PROFIT ORGANIZATION  
U.S. Postage  
**PAID**  
Chagrin Falls, OH  
Permit No. 11

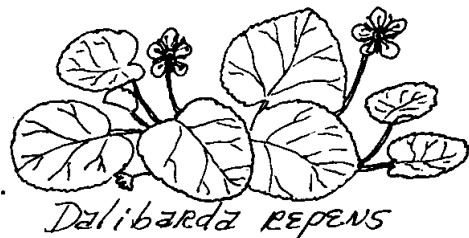
*Tom Sampliner*

## ADDRESS CORRECTION REQUESTED

Memberships are **DUE FOR RENEWAL** on January 1, 1986. Please continue to support your Society and renew at the **highest** possible category. Those of you who send us Sustaining and Patron memberships are enabling us to go on with our worthwhile projects. An active membership just about pays for the newsletter costs. However, economics aside, we need **EACH** of your memberships, and each year we get stronger and better. The 1986 Program and Field Trips schedule will be well worthwhile.

Please enroll me as a member of the NATIVE PLANT SOCIETY OF NORTHEASTERN OHIO.

- ACTIVE.....\$ 7.50
- FAMILY .....\$15.00
- SUSTAINING ...\$25.00
- PATRON.....\$50.00



Membership runs from January through December and is not pro-rated.

Make checks payable to: NATIVE PLANT SOCIETY  
6 Louise Drive, Chagrin Falls, Ohio 44022

Name: \_\_\_\_\_ Phone: \_\_\_\_\_

Address: \_\_\_\_\_

City/State: \_\_\_\_\_ Zip: \_\_\_\_\_