

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

THE JOURNAL OF THE OHIO NATIVE PLANT SOCIETY

Volume 6

September/October 1988

Number 5

ANNUAL DINNER

SATURDAY, NOVEMBER 5

Garden Center of Greater Cleveland

The Annual Dinner will be held on Saturday, November 5, 1988 at the Garden Center of Greater Cleveland. After the dinner we will adjourn across the circle to the Museum of Natural History for the lecture. Vans will be available to ride to the Museum in case of inclement weather.

The reception hour will be 5:30, as usual, with dinner at 6:15 and the lecture at 8:00p.m. The cost for dinner **AND** lecture is \$10.00; lecture only is \$4.00. A separate flyer will be sent to you in late September. Get your reservations in early.

The speaker will be Dr. Kerry Walter, Director of Botany & Information Systems at The Center for Plant Conservation in Massachusetts. Dr. Walter's topic will be "Conserving the Past for the Future; How a Nation Attempts to Preserve its Natural Heritage." With the Center since its inception, Dr. Walter travels to all the participating arboretae and botanic gardens, coordinating their efforts to bring under cultivation and/or establish seed banks of our critically endangered species. Walter is a taxonomist whose specialty is orchid systematics. He works with Kew Gardens in England, heading up the international standardization of computerized data bases of 23 gardens around the world, and has written the software for this operation.

Dr. Walter will use a 2-projector slide presentation to illustrate the fact that if we do not succeed in preservation efforts now, then by the year 2060, less than 100 years from now, we will have lost 60,000 species of plants forever. There are many efforts underway to prevent this disaster, and Walter will tell us about them.

PROGRAM & EVENTS:

September 9 (Friday) Cincinnati Chapter - 7:30 p.m. - Member's sharing program at Avon Woods Outdoor Education Center.

September 10 (Saturday) Dayton Chapter - 9:00 a.m. - Tour of Little Beavercreek Prairie with Mark Ray. Meet in the Beaver Valley Mall parking lot nearest Seejay Drive and Eastgate Ford.

September 15 (Thursday) Cleveland Chapter - 7:30 p.m. - Holden Arboretum. Jim Bissell has spent much time in the last several years researching the rare plant communities of Presque Isle in Pennsylvania. He will give us a slide lecture illustrating the plants he has found and the environments they grow in. We will also have the presentation of 1989 slate of officers and nominations from floor.

September 17 (Saturday) Cleveland Chapter - 10:00 a.m. - Presque Isle State Park, Pa. Jim Bissell will lead us on a field trip of this area. We will use both canoes and the old shank's mare. This is an opportunity not to be missed to see this unusual area with the leading expert on it. Telephone: 338-6622 for details and reservations.

September 17 (Saturday) Wilderness Center - 2:00-4:00 p.m. - Field trip to Shaker Lakes with the Wilderness Chapter.

September 19 (Monday) Dayton Chapter - 7:30 p.m. - Cox Arboretum. David Nolin of the Dayton-Montgomery County Park District will speak about rare native plants in the Beavercreek wetlands.

September 19 (Monday) Columbus Chapter - 7:30 p.m. - Sharon Woods Metro Park. Members slide-sharing of summer trips and flowers.

October 1 (Saturday) Cincinnati Chapter - 9:00 a.m. - Field trip to Adams County for fall wildflowers. Call for information.

October 1 (Saturday) Cleveland Chapter - 10:00 a.m. - Beaver Creek State Nature Preserve is one of the newest preserves in the system. It is in Columbiana County and is a pristine river valley. Emliss Ricks will lead us on a field trip exploration of the area. Call for reservations and directions - 338-6622.

October 2 (Sunday) Dayton Chapter - 1:30 p.m. - Tour of Clifton Gorge State Nature Preserve. Fall colors should be perfect. Call for information.

October 8 (Saturday) Wilderness Center - 2:00-4:00 p.m. - Field trip to Hinkley Reservation. Call for information.

October 9 (Sunday) Cincinnati Chapter - 10:00 a.m. - Fall color field trip to Clifton Falls State Park, Indiana. Call for information.

October 14 (Friday) Cincinnati Chapter - 7:30 p.m. - "Where's the Bruce?" A slide program on the June state trip at Avon Woods Outdoor Education Center.

October 17 (Monday) Cleveland Chapter - 7:30 p.m. - Holden Arboretum, Dr. Vic Soukup of the Univ. of Cincinnati will give us an illustrated lecture of the "Trilliaceae of the World." The Trilliaceae are closely related to the Lily family and include the

Trillium, Paris, Mediolae, and Scoliopus. There are 4 genera and 53 species in Eurasia and North America. Vic has traveled in both these areas and has done extensive research on them. We are honored to have so distinguished a speaker to close our regular season.

October 17 (Monday) Columbus Chapter - 7:30 p.m. - A slide lecture on Ohio Wildflowers, emphasizing prairie plants. Sharon Woods Metro Park.

October 30 (Sunday) Wilderness Center - 1:30-4:00 p.m. - A plant skeleton hike to identify dried flower heads and other plant remains at Wilderness Center.

REFERENCER PHONE NUMBERS FOR CHAPTER PROGRAMS:

Athens	-	Scott Moody	-	614/593-2360	Day
Cleveland	-	Tom Sampliner	-	216/932-5481	Eve
Cincinnati	-	Jim Innis	-	513/385-0670	Eve
Columbus	-	Jim Stahl	-	614/882-5084	Eve
Dayton	-	Ellen Fox	-	513/897-8139	Eve
Natural Areas	-	Switchboard	-	614/265-6453	Day
Toledo	-	Denise Gehring	-	419/535-3058	Eve
Wilderness Center	-	Marvin Smith	-	419/869-7575	Eve

* * * * *

**VANS ARE NEEDED FOR THE ANNUAL DINNER
IN CASE OF BAD WEATHER.**

CALL 338-6622 IF YOU CAN HELP FERRY TO THE MUSEUM.

* * * * *

Three new books of interest to the N.E. Chapter are scheduled for end of the year publication. The first one is our own Dr. Barbara Andreas' book on the Flora of Glaciated Northeastern Ohio, a work that will be of inestimable value to us in the field, by one of Ohio's most respected botanists. The second book is in the Flora of Ohio series, (the first volume, actually) and will deal with that abstruse group, the Compositae. I, for one, will welcome this book with open arms. The Flora of Ohio has been long in the making, and we can hope that this will herald additional volumes in the very near future. The final book is a bio-geography of the Erie islands.

Unfortunately, it does not look like Andreas' book will be published in time for the Annual Dinner, but we will try to make it available to you as soon as it is out, and we will sell it to you at Cost with no markup as other sources do. The Flora book is going to cost in the area of \$70.00 so those who want it will have to let us know. We will keep you advised.

THE TEAYS RIVER by Michael C. Hansen

Part I

The Teays had a dramatic effect on the flora of Ohio. In Part I we present to you the geologic history of southern Ohio that enabled species to come to Ohio. In Part II, Jim Burns talks about some of the rare plants that remain in southern Ohio to this day.

You can't swim in it, fish in it, or boat in it, but the Teays River is the best known nonexistent river in the midwestern United States. A surprising number of Ohioans are familiar with the fact that the Teays was an ancient river that once flowed across Ohio. Indeed, there is even a school district in Pickaway County, Ohio, near where the Teays once passed, that is named "Teays Valley" in honor of this long-vanished watercourse.

Few people grasp, however, the full dimension of the Teays River and its tributaries, which are thought to have formed an 800-mile long system that drained a vast area from headwaters in the Appalachian Mountains to the point of discharge in an embayment of the Gulf of Mexico in southwestern Illinois. It is also unclear to many that the Teays originated sometime during the Tertiary Period, more than 2 million years ago, and long predates the Ohio River, the Great Lakes, and other surface waters in Ohio and adjacent areas. That the Teays is long gone is well known, but the history of its demise from Pleistocene glaciers, as well as the complexity of drainage changes throughout the Ice Age, is a story that is commonly confused and still being unraveled by geologists.

The concept that much of the course of the Teays is buried beneath glacial debris—a buried valley—is familiar to many Ohioans; however, beyond this point, the understanding becomes muddled for most people. Ground water derived from the valley of the Teays and other buried valleys perhaps has contributed to the Styxian misconception that the Teays still lives as a flowing stream that has abandoned the sunlight for a subterranean course. Unfortunately, the notion of underground rivers is well ingrained in the minds of many people, with little distinction being made between genuine underground flowage in limestone caverns and a buried valley in which water is present only in the tiny pore spaces between sediment grains.

The history of the Teays River in its preglacial majesty and its destruction, with subsequent drainage modifications, by Pleistocene glaciers nearly 2 million years ago is a fascinating chapter in Ohio's geologic past. Perhaps no less interesting is the history of the discovery of the Teays and other preglacial drainage systems by several generations of geologists.

THE DISCOVERY OF PREGLACIAL DRAINAGE

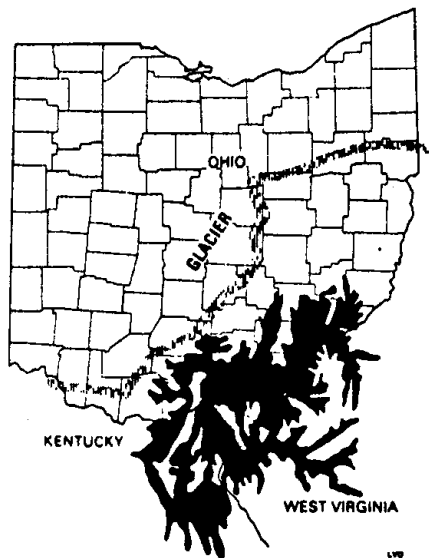
Among the first geologists to seriously examine the state was Samuel P. Hildreth, a Marietta physician, who noted in 1836 and 1838 the presence of abandoned stream valleys in southeastern Ohio and the presence of unusual plants with southern affinities. Similar observations were made by later 19th-century Ohio geologists,

but it was not until the advent of the glacial theory and the detailed demonstration of the effects of glaciation in Ohio and adjacent areas in the latter half of the 19th century that the complex story of the state's drainage history began to emerge.

William George Tight (1865-1910), professor of geology and botany at Denison University (1887-1901), Granville, and later president of the University of New Mexico (1901-1910), soon emerged as the leading student of drainage history and was the first to piece together the most important part of the puzzle. Although there were numerous other contemporaries who were important contributors, Tight was preeminent in both his original observations and in his ability to synthesize the contributions of other workers.

Tight's studies culminated with his 1903 U.S. Geological Survey Professional Paper, **Drainage modifications in southeastern Ohio and adjacent parts of West Virginia and Kentucky**. In this work, Tight demonstrated the former existence of a mighty preglacial river that had its origins in the Appalachian uplands of North Carolina and Virginia. Tight traced the course of the stream across West Virginia into southern Ohio and northward to Chillicothe, where the valley disappeared beneath the glacial drift. Tight actually applied two names to this river--the Chillicothe River for the lower portion and the Teays River for the main axial stream in its upper portions in West Virginia. The name "Teays," derived from a village in an abandoned valley segment in West Virginia, has been applied to the entire master stream including its westward extensions into neighboring states.

Tight's work delineated a major river that, for much of the Tertiary Period, flowed northward into Ohio until it was destroyed by early Pleistocene glaciers, with the eventual result that a new drainage system, the Ohio River, was created. The once-mighty Teays was forever abandoned, its former course marked by broad valleys in which only tiny streams flow today.



Glacial Lake Tight as it may have appeared at some phase in its nearly 7,000-year history. The glacier is shown at maximum known extent of glaciation in Ohio, although it is likely that the early Pleistocene glacier that dammed the Teays River to create Lake Tight was not this extensive at any one time. Ridge tops above 900 feet formed islands in the lake and the Minford clay accumulated to a thickness of at least 80 feet in some of the submerged valleys. Extent of Lake Tight is greatly generalized from a map by J. N. Wolfe, 1942 (Ohio Journal of Science, v. 42, p. 2-12).

A glance at modern satellite imagery or even topographic maps of southern Ohio and adjacent parts of West Virginia and Kentucky clearly shows the course of the former Teays River in this region, but Tight did not have the benefit of such tools. Most of the first topographic maps (15 minute quadrangle maps) of the region were published in the period between 1898 and 1911 and were not available to Tight at the time of his research. Indeed, he bemoaned the fact that existing maps were inadequate and that benchmarks from which elevations could be determined were not always available in a particular area.

Although as early as 1894 Tight speculated on the northward course of the Teays River across an area mantled by thick glacial drift, precise tracing of the buried river course was

impossible because of inadequate numbers of records from water and oil and gas wells. Tight's entry into university administration, far from Ohio, and his premature death precluded further work by him on this subject.

Karl Ver Steeg, professor of geology at the College of Wooster, began publishing on drainage changes in Ohio in 1930 and by 1936 had outlined the northwestward course of the Teays beneath the glacial drift from Chillicothe to the Ohio-Indiana border. Ver Steeg used logs from water and oil and gas wells to determine elevations of the bedrock surface beneath the drift and was thus able, through this first extensive map of the bedrock surface (also known as a top-of-rock map or bedrock-topography map) to delineate the course of buried valley. The classic interpretation of the course of the Teays River in Ohio reached its essentially modern interpretation in the 1943 Division of Geological Survey Bulletin **Geology of water in Ohio** by Wilber Stout, Karl Ver Steeg, and George F. Lamb. This bulletin presented the first statewide bedrock-topography map, detailed tracing of the Teays and its tributaries and other preglacial drainage systems in Ohio, and interpretations of later drainage modifications due to additional glaciations.

By the 1940s, geologists in Indiana and Illinois had delineated the channel of a westward-flowing stream beneath the extensive glacial drift covering much of each of these states. This presumed preglacial stream was named the Mahomet River, after a community in Illinois. Researchers soon began to embrace the concept of the Teays as an 800-mile-long drainage system that stretched from the Appalachians westward across Ohio, Indiana, and Illinois.

THE CLASSIC TEAYS

The classic concept of the Teays that had developed during the first half of the 20th century was of a stream that originated during the Tertiary Period, more than 2 million years ago, with headwaters in western North Carolina, near Blowing Rock. The course of this stream is marked across Virginia and West Virginia by the modern New River (a misnomer as it is actually very old) and the Kanawha River. Near St. Albans, West Virginia, the modern Kanawha River continues northward to its junction with the modern Ohio River, whereas the Teays swung westward from St. Albans. The northward course of the Kanawha River was established after abandonment of the Teays system.



From St. Albans, the Teays flowed westward in a channel that is now abandoned by major modern streams to near Procterville, Ohio, where the valley of the Teays is now followed by the Ohio River to Wheelersburg. At Wheelersburg the Teays continued northward,

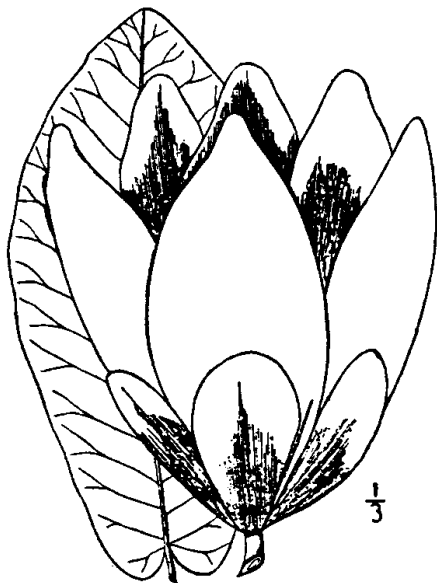
although the modern Ohio swings westward. The Teays River continued northward, with some slight meanderings of the valley, across Scioto County, a small portion of Jackson County, and across Ross County. The now-abandoned valley from Wheelersburg to Chillicothe presents perhaps the most dramatic evidence, particularly on satellite imagery, of the existence and majesty of the Teays.

North of Chillicothe the valley of the Teays disappears beneath glacial drift. By means of water-well logs and other data the channel has been traced northwestward across Pickaway, Fayette, Madison, Clark, Champaign, Shelby, Auglaize, and Mercer Counties to the Ohio-Indiana border. At the Ohio-Indiana border the valley appears to be continuous with a valley that has been traced westward across Indiana and Illinois. In Ohio this valley is up to 2 miles wide and in some cases lies beneath more than 400 feet of glacial drift.

The valleys of the Teays and its many tributaries, some of which were impressive rivers themselves, can still be seen in unglaciated Ohio or traced as buried valleys in the glaciated portion of the state. The Teays drained nearly two-thirds of the state and constituted a major river system comparable in size to the modern Ohio River. The leisurely and idyllic life enjoyed by the Teays for so long during the Tertiary Period was to meet an abrupt end with the advent of glaciers during the succeeding Pleistocene Ice Age.

THE END OF THE TEAYS AND LAKE TIGHT

The Nebraskan glacier is thought to be the earliest of at least four major Pleistocene glaciers and is commonly thought to have been the executioner of the Teays River. Direct evidence of this early glaciation in Ohio is lacking, apparently because such deposits were removed by the erosive forces of running water and later glaciations.



Magnolia macrophylla Michx. Great-leaved Magnolia. Large-leaved Umbrella-tree, or Cucumber-tree.

Direct evidence of the demise of the Teays is preserved in a large area of southern Ohio that was occupied by the Teays and its tributaries. This evidence consists of thick deposits of laminated clay, known as the Minford clay, that accumulated in extensive lakes created with the north-flowing Teays was dammed by this early glacier. The exact time of the damming cannot be accurately determined with currently available methods, but studies of the magnetic polarity of the Minford clay indicates that it was deposited during a period of reversed magnetic polarity of the earth known as the Matuyama Reversed Epoch. The earth returned to normal magnetic polarity about 690,000 years ago, so the damming of the Teays by glacial ice, and the consequent accumulation of the Minford clay in the ponded waters, must have occurred between 2 million

and 690,000 years ago.

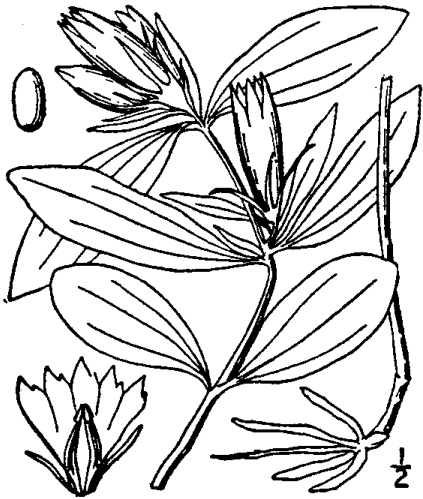
The lake created by the damming of the Teays must have been an impressive sight, as the waters rose to elevations nearly 900 feet, creating an intricate pattern of long finger lakes in tributary valleys and with numerous ridgetops poking above the waters as islands. This lake, named Lake Tight in honor of the work of W.G. Tight, is estimated to have covered an area of nearly 7,000 square miles (modern Lake Erie has an area of 5,002 square miles) in southern Ohio and parts of West Virginia and Kentucky. Lake Tight must have existed for some time because the sediments (Minford clay) that accumulated in its depths are up to 80 feet thick in southern Ohio and more than 260 feet thick in the lower reaches of the Ohio portion of the Teays valley in Madison County. The Minford clay exhibits rhythmic bedding that has been interpreted as seasonal layering. Counting of these sediment couplets suggests that Lake Tight existed for at least 6,500 years.

Eventually the waters of Lake Tight rose to an elevation sufficient to breach drainage divides and create new drainage channels, which in some cases were opposite in direction to the original Teays drainage. These new drainage channels cut below the elevation of the Teays, forming a new drainage system known as Deep Stage. This event marked the beginning of the modern Ohio River drainage system, although it would require many further modifications from the Kansan, Illinoian, and Wisconsinan glaciers to finally shape the present course of the Ohio River.

THE NOT-SO-CLASSIC TEAYS — OTHER IDEAS AND FUTURE RESEARCH

This neatly packaged concept of preglacial drainage and subsequent modification by glaciation has been pieced together over a long period of time by a large number of investigators and has captured the public imagination. But is this, in part, a story that would more appropriately begin with "Once upon a time"? Certainly, most of the story is accurate and is widely accepted by geologists because the principal facts cannot reasonably be interpreted in any other way. But there have been some interesting alternatives proposed for parts of the story.

George N. Coffey, a soils scientist trained in geology, authored two papers (1958, 1961) in the Ohio Journal of Science; the latter was published when he was 90 years old and proposed that the classic path of the lower portion of the Teays in preglacial times—across western Ohio, Indiana, and Illinois—was in error. On the basis of the position of bedrock drainage divides, Coffey suggested that the ancestral Teays River continued northward from central Ohio to the Erie basin, following the outcrop of soft, easily eroded shale of Devonian age. Coffey explained that the deep, buried valley



Dasystephana villòsa (L.) Small. Striped
Gentian.

that extends westward across Ohio, Indiana, and Illinois, the traditionally accepted valley of the Teays, was created by an early Pleistocene glacier that destroyed the lower portion of the Teays drainage and created a major westward-flowing ice-front river. He named this later stream system the Mahomet-Teays River, as it now connected the upper portion of the Teays system with the Mahomet River valley in Illinois.

More recently, Henry Gray of the Indiana Geological Survey, at a 1983 Geological Society of America symposium on the Teays, supported the idea that the deep, buried valley in western Ohio, Indiana and Illinois was not created by the preglacial Teays River. Gray, like Coffey, suspects that this valley was formed along the ice front of an early Pleistocene glacier. Gray cited evidence for this hypothesis, which includes observations that this buried valley is youthful in development rather than mature as would be expected from a long-existing preglacial river. Gray indicated that this evidence for a youthful valley includes a straight gorge that crosses three areas of elevated bedrock, the depth of the gorge across a broad plateau of limestone, relatively shallow development of karst features, and the fact that most of the tributaries to this valley do not join at grade, which would be expected with a mature stream.

The interpretations of Coffey and Gray are provocative and perhaps plausible—except that no deep, buried valley has been located that runs from Chillicothe northward to the Lake Erie basin. Coffey suggested that a broad, shallow valley across Wyandot, Seneca, Sandusky, and Ottawa Counties, as depicted on maps of the bedrock surface of Ohio by Cummins (1959) and Stout, Ver Steeg, and Lamb (1943), delineates the former course of the preglacial Teays River into the Erie basin.

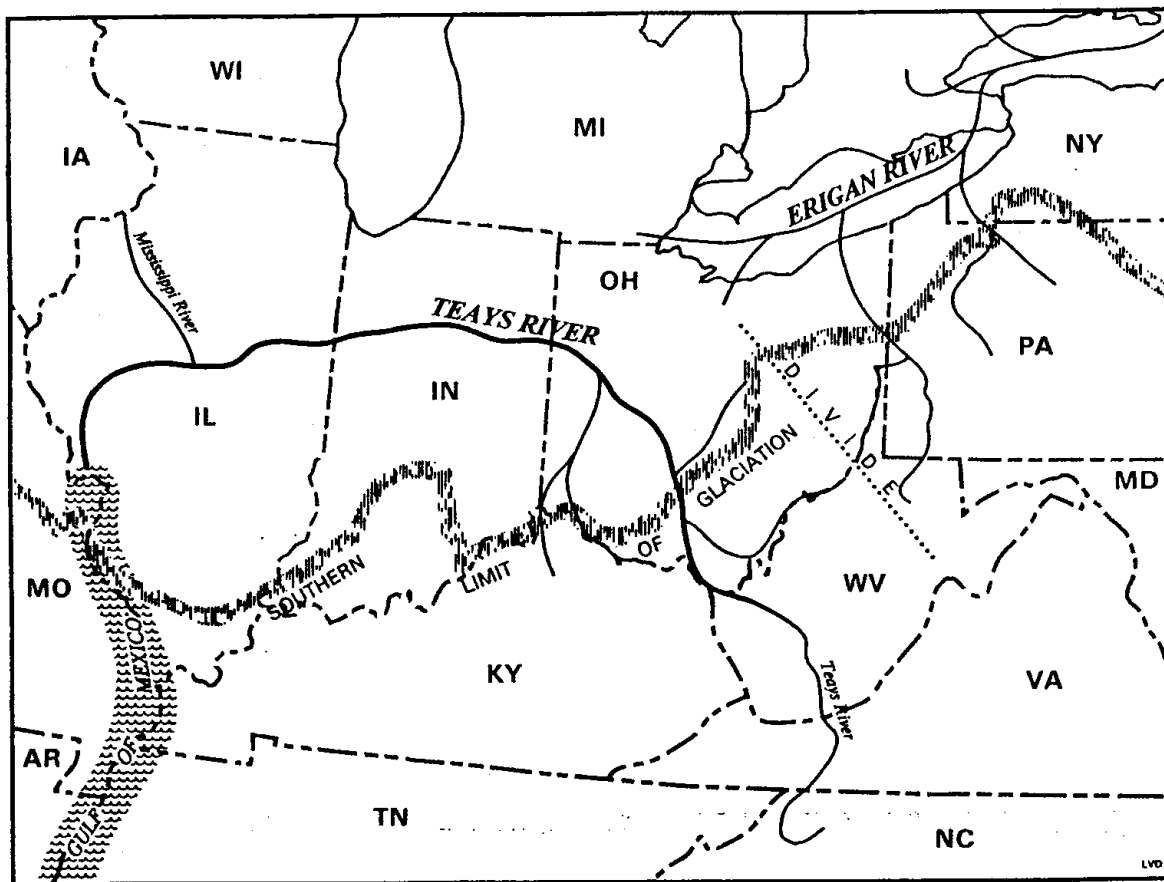
Most geologists have remained unconvinced that this shallow valley represents the course of the preglacial Teays and support the classic interpretation that this river did indeed flow across western Ohio into Indiana and Illinois. Although this deep, buried valley does not perfectly fit the model of the mature stream as would be predicted from studies of the exposed portions of the Teays valley in southern Ohio, it still appears to be the hypothesis that best fits the available geologic data. Scientific hypotheses are formulated, or refuted, on the basis of available data. As new data accumulate, however, classic hypotheses sometimes require reevaluation.

The Division of Geological Survey is in the process of providing new data which, among many uses, may have important bearing on the questions concerning the Teays and other preglacial drainage systems in Ohio. This new data will be in the form of top-of-rock maps for all of the glaciated counties in the state. Such maps are contour maps, similar to the familiar topographic maps, except that they show the contours on the bedrock surface as if all of the overlying glacial sediments had been removed.

Top-of-rock maps are compiled from the logs of water wells that reach the bedrock surface. For many counties in the state several thousands of such wells are available as data points. When mapping is completed for all glaciated counties we should have a more complete picture of the buried topography—and perhaps preglacial drainage patterns—in Ohio.

Inevitably, some portions of counties that are critical to the questions concerning the Teays will not have an adequate distribution of water wells to completely solve the puzzle. Nevertheless, we may move several steps closer to deciphering the intricacies of an ancient drainage pattern that has undergone a complex series of modifications through several episodes of glaciation, ponding, and cutting of new drainage outlets. These factors have obscured or removed portions of the evidence and added considerably to the number of pieces of this puzzle.

There is a tendency to view the bedrock surface beneath glacial sediments in Ohio as having been formed at the same time and suddenly encapsulated in till, preserving the surface exactly as it was at the onset of glaciation. In reality, of course, this bedrock surface is a "crazy quilt" of erosion surfaces of different ages—some of them preglacial, some of them sculpted by various glacial advances and by streams draining the meltwaters from each of these glaciers, and some of them carved by modern streams. The task of the geologist in dealing with this problem can be compared to reconstructing several different puzzles from a variety of puzzle parts that are all mixed together in the same box. The task is further complicated by the fact that numerous pieces of the puzzle are missing. Fortunately, new pieces of the puzzle are discovered from time to time and eventually the true picture may emerge.



Course of the preglacial Teays River according to the classic interpretation. The entire extent of the Teays and its tributaries north of the glacial border is buried beneath glacial drift. Northern Ohio was drained by another preglacial stream, the Eriean River, which followed the axis of what is now Lake Erie, and flowed into the ancestral St. Lawrence River. None of the Great Lakes existed in Teays River time.

Part II

Despite the controversy concerning the lower Teays River, it seems clear that the upper Teays system originated in the southern Appalachian highlands of North Carolina and drained portions of Virginia, West Virginia, Kentucky, and most of unglaciated Ohio. That a huge ice-dammed lake formed with the advance of an early glacier, leaving only the highest ridgetops as isolated island or peninsula refugia for the terrestrial biota also seems evident. This Teays system acted as a migration network of contiguous similar habitats for the spread of southern plants into Ohio for well over a million years. By contrast, the formation of Lake Tight served to isolate these same plants to the upland refugia. With the draining of Lake Tight, many southern species were able to spread from the refugia and "fill in" the distribution gaps in the lower elevations of unglaciated Ohio. Others were even able to "jump" the glacial boundary and colonize newly-opened habitats left by deglaciation. Yet there are many rare Ohio plants of southern affinity with scattered distribution in this part of the state that were unable to spread far from their isolated refugia. Lake Tight was so great in extent and in some cases the isolation was so complete that the remaining Ohio populations may be far removed from the next nearest station to the south. We will limit our discussion to three areas of southern Ohio with high concentrations of these plants. All three would have contained relatively large areas of upland refugia above the waters of Lake Tight.

The Sharon Conglomerate area of northwest Jackson and northeast Pike counties was drained directly by the Teays and one of its major tributaries, the Marietta River. Here in deep mesic ravines occur the Bigleaf Magnolia, and Umbrella Magnolias (**Magnolia macrophylla**, Endangered) (**M. tripetala**, Threatened). Dry south and west facing wooded slopes and woodland openings hold populations of Curtiss' Milkwort (**Polygala curtissii**, E), Sampson's Snakeroot (**Gentiana villosa**, E), Flame Azalea (**Rhododendron calendulaceum**, E), White Thoroughwort (**Eupatorium album**, T), Narrow-leaved Aster (**Aster solidagineus**, T), Sweet Goldenrod (**Solidago odora**, T), Fringe-tree (**Chionanthus virginicus**, T) and Butterfly-pea (**Clitoria mariana**, Potentially Threatened). On ledges and outcrops of the Sharon Conglomerate grow Bradley's Spleenwort (**Asplenium bradleyi**, E) and Round-leaved Catchfly (**Silene rotundifolia**, P). The Jackson County populations of Bigleaf Magnolia and Curtiss' Milkwort are examples of disjuncts, since it is more than a hundred miles to the next nearest stations in Kentucky and West Virginia, respectively. Many of these plants and several other southern species can be seen at Lake Katharine State Nature Preserve. Wetlands, an uncommon habitat in southeast Ohio, with several characteristic rare plant species, such as Tennessee and Spotted Pondweeds (**Potamogeton tennesseensis**, E and **P. pulcher**, T), occur immediately to the south of the Sharon Conglomerate area, especially in the now-abandoned valleys of feeder streams to the ancient Marietta River. These wetlands formed in areas underlain by the impervious Minford clays, which hold standing water throughout much of the growing season.

The Hocking Hills region of western Hocking and southeastern Fairfield counties was drained by the Logan River, a feeder stream of the Groveport River, another major Teays tributary. The northwest-flowing Logan River occupied much the same valley as the present-day southeast-flowing Hocking River. A few south facing wooded slopes here also hold populations of Flame Azalea. On ledges and in deep shelter caves of the Blackhand Sandstone occur Southern Monkshood (**Aconitum uncinatum**, E), Appalachian Filmy Fern (**Trichomanes boschianum**, E) and Round-leaved Catchfly. The State Parks and Nature Preserves of the Hocking Hills region are good areas to view southern species along with some disjunct northern disjuncts owe their occurrence here to the proximity of the Illinoian glacier, a lobe of which advanced to within about seven miles of Old Man's Cave.

The Shawnee State Forest-Edge of Appalachia complex of Adams and Scioto counties may hold the highest concentration of rare Ohio plants of southern affinity. Most of this area was drained by the Portsmouth River and its feeder streams. The Portsmouth River flowed east and north in essentially the present-day Ohio and Scioto valleys from about Manchester to near Waverly where it joined the Teays. On two dolomitic knobs here (one actually in adjacent Highland County) grows Cliff-green (**Paxistima canbyi**, E). Mesic woods and valleys hold populations of Nodding Mandarin (**Disporum maculatum**, E), Goldenstar (**Erythronium rostratum**, E), Early Stoneroot (**Collinsonia verticillata**, E), and Umbrella Magnolia. In dry woods and openings occur Dwarf Iris (**Iris verna**, E), Crested Coral-root (**Hexalectris spicata**, E), Wherry's Catchfly (**Silene caroliniana** var. **wherryi**, E), Narrow-leaved Aster, Sweet Goldenrod and White Thoroughwort. Shawnee State Forest and the Edge of Appalachia Preserve System are good places to view southern species along with several western prairie species. These prairie species may have migrated from the west in a warmer, drier climatic era called the xerothermic period which occurred about 5000 years ago.

The current composition of the flora of these areas is not the result of any one factor, but a complex mix, including geology, soils, climate, drainage and glacial history, and land-use by man. Yet some of these factors, such as the migration network provided by the Teays system, had such a profound effect, that the evidence remains more than half a million years after its destruction.

* * * * *

FURTHER READING

- Wolf, J.N. 1942. Species isolation and a proglacial lake in southern Ohio. *Ohio Journal of Science* 42:2-12.
- Spooner, D.M. 1982. Wetlands in Teays-stage valleys in extreme southeastern Ohio: formation and flora. *Symposium on Wetlands of the Unglaciaded Appalachian Region*. West Virginia University, Morgantown, WV p. 89-99.

Jim Burns is a member of ours and is with the Division of Natural Areas and Preserves, Heritage Section.

Woodsman, hold that chain saw!! Do NOT cut down the trees that seem dead. It is very possible that some are only dormant and will come back next spring. The following article gives you tips on what to do now and next year.

WOODY PLANTS AND THE DROUGHT OF '88 by Charles Tubesing

When the first substantial rains of fall arrive, many of us will heave a large sigh of relief. In many areas, this has been the driest summer in half a century. At the Holden Arboretum, we recorded one inch of rainfall in June, and two inches in July. The first signs that the drought was affecting woody plants were wilting and scorching/yellowing of leaves, followed in some cases by defoliation. Among the worst-affected trees and shrubs were those with shallow root systems, or those planted in shallow soils or on berms or south-facing slopes. Plants which were set out within the last two years are especially vulnerable, and our maintenance crew has been kept very busy trying to water all such plants at the Arboretum.

What seems amazing is that there are so many trees and shrubs in the landscape which are not scorched or defoliated. This suggests that the "average" tree or shrub has been able to tolerate the drought so far. If we were to examine closely those plants which have actually died during the drought, we would likely find that they had been afflicted with some other problem, such as girdling or damaged roots, insect infestation, disease, or a combination of these factors. Drought simply administered the coup de grace.

The most effective thing that you can do during the drought to protect your valued landscape plants is to water thoroughly once a week. By thoroughly, I mean slowly and deeply. With bare soil baked as hard as it is on the surface, large volumes of water applied with a water breaker or hose end will largely run off and be wasted. Break up that surface crust and apply an organic mulch such as wood chips or grass clippings. Then apply water slowly with a sprinkler if a sizable area must be covered. Set out a tin can for an irrigation gauge, and apply at least two inches of water. For watering individual plants, place a trickling hose at the base of the plant and let it run all day or overnight. An alternative if a number of widely spaced plants must be watered, is to punch a one-eighth inch hole in the bottom of each of several five-gallon buckets, and place each bucket next to a plant to be watered, with the hole near the base of the stem. By filling each bucket one or more times, a trickle of water is provided which will soak in deeply, with little runoff. The last is an especially efficient method to use if your water supply is restricted.

In the unlikely event that fall rains are deficient, it will be essential to continue periodic watering until the ground freezes. Desiccated plants are much more subject to winter injury than are those with an adequate supply of water.

Effects of the drought can be expected to carry over into next spring and summer, no matter how congenial the rainfall and temperatures are then. From previous drought experiences, arborists predict that a host of problems affecting trees will appear next year. In many cases, the culprits will be what are referred to as secondary agents,

1
insects and diseases which can only attack weakened plants. Examples of insects in this category are stem borers. Some of the fungi responsible for stem cankers are similarly opportunistic. Insects and diseases which typically attack vigorous plants every year have more significant effects in the year following a drought because of the weakened state of the host plants. A tree which sustained root damage in a drought may lack the vigor to leaf out again after being defoliated by caterpillars or fungal leaf spot.

To get a head start on control of some insects next summer, I recommend application of a superior grade spray oil in early spring, before the buds swell. The dormant oil is diluted with water as directed, then is sprayed to cover the entire plant. The temperature must be above 40°F during application and for 24 hours afterward. The oil spray will significantly reduce the numbers of aphids, mites, and scales and will reduce the need for applications of more toxic pesticides later in the season.

Through the rest of next spring and summer, control of insects and diseases will have to be based on early detection, identification of the causal agent, and application of the recommended pesticide. Your county extension service can help with identifications and control recommendations.

It may seem sensible to fertilize plants injured by drought the previous year, in order to increase their vigor, but this is not advisable. Application of a water soluble or granular fertilizer may further damage root systems reduced by drought. Topdressings of compost or well-rotted manure will supply nutrients at safe levels. Above all, do not fertilize at this time.

It may seem that the drought has only created problems, but it has provided opportunities, too. When you are out assessing the damage, look for plants that appear unaffected by drought, particularly those on problem sites. Check promising species again next summer for delayed symptoms of injury. Your observations will provide you with better choices for replacing drought casualties and for planting on new sites where conditions are rigorous or irrigation is inconvenient.

I would like to acknowledge information provided in talks and bulletins by members of the OSU Extension Service, which was the primary resource consulted for this article.

Charles Tubering is a Propagator with The Holden Arboretum.

* * * * *

EDITOR'S NOTE:

The June 1988 State NPS trip to the Bruce Peninsula was a great success! Perfect weather, two excellent guides, great accommodations, plus the luck of hitting the peak bloom period combined to make the whole week a joy. We had participants from Virginia (The Creepers), Pennsylvania and Michigan, as well as our own Ohioans, and reunions are already being planned to share slides and renew friendships.

Instead of writing a report of our activities, we submit the following article by the Greenops, which does a better job than we could have done in describing the allures of the Bruce Peninsula. If you haven't been there, make it a point of going — it will be a highlight of your botanical experiences.

BOTANIZING THE BRUCE by Isobel & Leslie Greenop

The Bruce Peninsula is dear to our hearts. For over forty years we have spent our summer vacations and many weekends year round at our cottage on the escarpment, north of Lion's Head. Isobel claims she inherited her love of the Bruce from her great grandparents who were early settlers near Lion's Head in 1869.

The Bruce has been described as a 'Botanist's Paradise' with over 1250 species of plants growing wild. Why is there such a great variety? During the last ice age when a thick ice cap covered much of North America, northern plants were brought down on its leading edge. When the ice retreated, southern plants joined the existing flora and gradually moved north on the newly exposed earth. The Bruce with its many different habitats — shoreline dunes, wetlands, fens and bogs, alvars, forested areas and cold damp sites along the Escarpment — provided favourable growing conditions for both types. On the Bruce, many northern plants established their southern limits — calypso orchid **Calypso bulbosa**, trailing arbutus **Epigaea repens**, bog rosemary **Andromeda glaucophylla** and heartleaf twayblade **Listera cordata**. Southern plants such as the showy orchis **Galearis spectabilis**, putty root **Aplectrum hyemale**, dewdrop **Dalibarda repens**, skunk cabbage **Symplocarpus foetidus** and woodland phlox **Phlox divaricata** still survive on the lower half of the peninsula and in very sheltered areas.

Visit the Bruce deciduous woodlots in May and early June and you will find spring flowers similar to those throughout southern Ontario — wild leek, hepaticas, blue cohosh, trout lily, spring beauty, white, yellow and blue violets, squirrel corn, Dutchman's britches, bellwort, Solomon's seal, false Solomon's seal, red and white baneberries, wild ginger, Jack-in-the-pulpit, bloodroot and white and red trilliums. All of these may be readily identified with a good field guide.

If you drive slowly along the roads on the Bruce, you will be delighted at how much of the flora you can see without even leaving your car. In late May, the roadsides are brilliant with Indian paint brush **Castilleja coccinea** and wild columbine **Aquilegia canadensis**. Two weeks later, the beautiful yellow lady's slippers **Cypripedium calceolus** are everywhere. They are the "happy sun-loving free spirits" of the orchid world, brightening the sand dunes with large clumps of up to 50 blooms, the roadsides, kilometer after kilometer, with patches of yellow and even the alvars often only with single plants as the soil is nearly non-existent. For seven years, we had four plants amid the stones on our beach until a fierce storm washed them out. In June, yellow is a prominent colour with yellow St. Johns wort, golden ragwort, coreopsis, buttercups and stonecrop. White daisy, wood lily, wild roses, white and pink musk mallows, bouncing bet, herb-Robert and daisy fleabane add variety. Summer brings Queen Anne's lace with its beautiful symmetrical pattern and tiny magenta centre, fireweed, harebell, chicory, milk weeds, northern camas **Zigadenus glaucus**, joe-pye weed, blueweed **Echium vulgare**, and black-eyed Susan. Along Lake Huron backroads, blue fringed gentian, yellow goldenrods, turtle-head and the graceful ladies' tresses orchids are plentiful. Even the ditches add colour with the gold of early marsh marigold, blue flag on Hwy 6 — just north of Mar, masses

of pure white Canada anemone, the startling red of the cardinal flower and the pale blue of dainty Kalm's lobelia *Lobelia kalmii*. A short distance north-east of the intersection of Hwy 6 and the road to Dyer's Bay, a beautiful stand of the rare limestone oak fern *Dryopteris robertiana* is located. One the west side of the highway near this corner, about a 1/4 km into the bush, a western prairie plant the stemless rubber weed *Hymenoxys acaulis* var. *glabra* grows on the alvar. Tread lightly as the soil is very sparse and those plants have struggled to survive. And don't get lost! It's easy.

Flower Pot Island National Park is a beautiful wooded island, surrounded by sparkling clear water with spectacular cliffs, flower pots, caves and stony beaches. Be sure to pick up a self-guiding trail book when you land at the dock. The trail timing may be normal for some people but not for botanists. Allow triple time so you won't miss a thing. Botanical treasures abound in this quiet and peaceful setting. Thirty calypso orchids *Calypso bulbosa*, all in prime bloom on a rocky ledge, has been our most memorable nature sighting. Alongside the trials twin-flowers, fringed polygala, bird's eye primula, rock cress, columbine, trilliums, yellow violet, Jack-in-the-pulpit, white and red baneberries, many ferns including a magnificent display of green spleenwort *Asplenium viride* on the rockface at the bottom of cave #1 vie for your attention. Both dry and moist habitats provide sites for rare orchids — early coral-root *Corallorhiza trifida*, large colonies of striped coral-root *C. striata*, spotted coral-root *C. maculata*, rattlesnake plantain *Goodyera oblongifolia*, dwarf rattlesnake plantain *G. repens*, Alaska rein orchid *Piperia unalascensis*, white bog orchid *Platanthera dilatata*, green bog orchid *P. hyperborea*, one-leaf rein orchid *P. obtusata*, pad-leaf orchid *P. orbiculata*, heartleaf twayblade *Listera cordata*, helleborine *Epipactis helleborine*. Pause for a few minutes near the end of the mountain trail to rest and admire a massive display of bunchberries *Cornus canadensis*; a fitting climax to several hours of botanizing.

Near the camping area a rare yellow form of the spotted coral-root *Corallorhiza maculata* forma *flavida*, may be readily observed in the filtered light a few metres from the path. Don't be alarmed at the great number of snakes beside the dock. They are harmless. Without predators and in the midst of a plentiful supply of food, they enjoy carefree living.

To discover many of the "goodies" of the Bruce, you must explore the sandy, lowlying rocky shorelines of Lake Huron, with its dunes and ancient treed dunes, from its northern tip to Sauble Beach. Here, nestled in protected sites, a whole new world of rare plants is encountered. A visit

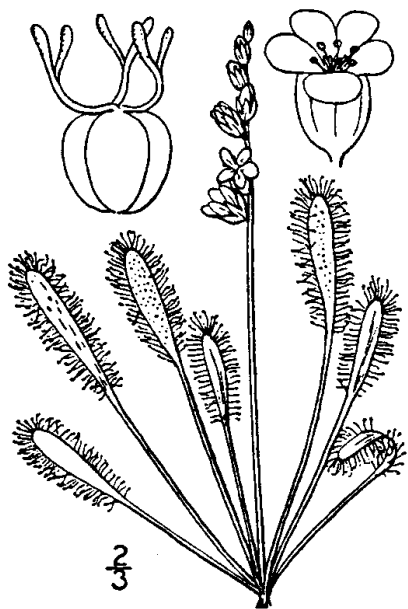


MOONWORT (MOONWORT GRAPE FERN)
Species: *Botrychium Lunaria* (L.) Sw.

to the Federation of Ontario Naturalist property at Dorcas Bay in May is most rewarding. Dwarf irises **Iris lacustris** form carpets of exquisite blue. On the beach, bird's-eye primrose **Primula mistassinica** rooted in tiny crevices in the limestone bedrock survive the cold winds and spray from Lake Huron. Frequent trips, from spring to fall, will reveal and every changing garden of wild flowers — trailing arbutus, fringed polygala, pink and white pyrolas, bastard toadflax, bluets, false asphodel, one-flowered cancer-root **Orobanche uniflora**, sand cherries, starry false Solomon's seal, Indian pipe, twin-flowers, bunch berry, columbine, rock cress, harebell, gold and silver weed, fringed gentian and goldenrods (including the rare Ohio goldenrod). Orchids are abundant all along the Lake Huron side of the peninsula. At Dorcas Bay you will find ram's head orchid, yellow lady's slipper, showy lady's slipper, striped coral-root, rose pogonia, white bog orchid, rattlesnake plantain, ladies' tresses, grass pink and Loesel's twayblade.

To many visitors, the insect eating plants at Dorcas are most fascinating. Years ago, we read about sundews, and then to find and examine our first one under a magnifying lens, was an enlightening experience. You can see literally hundreds of sundews, glistening in the sunshine, on the damp sand and water-soaked logs. You may be lucky and find all three types **Drosera anglica**, **D. rotundifolia** and **D. linearis**, growing within a few feet of each other. Pitcher plants are plentiful and most colourful. Their leaves shaped like pitchers collect rain water. Attracted by colour and a decaying odour, insects are trapped in the leaves and are absorbed by the plants as food. At the entrance to the trail, horned bladderworts with their delightful perfume and sunny yellow flowers are in the shallow pools. Walk north along the beach about 1/2 km and admire a large colony of butterworts with their buttery-yellow basal leaves and violet-like purple flowers.

Farther south near Red Bay, Petrel Point is another F.O.N. nature reserve worthy of a visit. Here in late June, wood lilies, grass pinks, rose pogonias, showy lady's slippers, sundews, and tall spires of white bog orchids are readily seen from the boardwalk. Sedges, cinquefoils, white camass and rare Indian plantains line the pathways.



Drosera longifolia L. Oblong-leaved Sundew.

In Ontario, there are 70 species of orchids and 48 of these occur on the Bruce. It has taken us years to discover all of them. Quite by accident, while looking for New York fern in a swampy area near Howdenvale, we discovered a colony of pad-leaf orchids **Platanthera orbiculata**. We were amazed at their beauty and large size, as well as the dense population of hungry mosquitoes. Two twayblades,

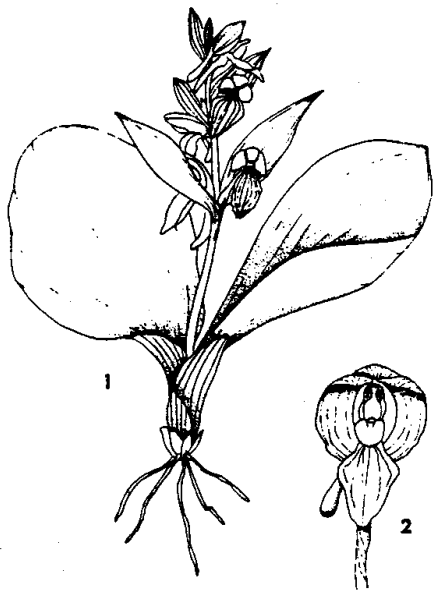
the heartleaf **Listera cordata** and the broad-leaved **Listera convallariodes**, so tiny in comparison, shared our interest. Five different club-mosses, only a few steps apart, were growing nearby. Several plants of the bracted green orchid **Coeloglossum viride** var. **virescens** have flowered each spring for many years in a maple wood south of Red Bay. Loesel's twayblade **Liparis losellii** finds favorable growing conditions in the area's ditches and wet meadows. An isolated stand of European twayblade **Listera ovata**, discovered 20 years ago, is still a mystery as it is a native of Europe. Recently, a large station of healthy downy rattlesnake plantain **Goodyera pubescens**, considered a more southerly native, was an unexpected addition to the Bruce orchid list.

Some of the most productive wet areas are along the Oliphant shoreline. Last June, one open fen was aglow with hundreds of grass pinks, a beautiful nesting site for a pair of snipes. In late summer, we found ladies' tresses including the Great Plains ladies' tresses **Spiranthes magnicamporum**, more Indian plantain, several goldenrods, asters, and colourful patches of purple loosestrife **Lythrum salicaria**.

On the bank of the Sauble River, at the falls, thrives a small colony of shining ladies' tresses **Spiranthes lucida**. Near the center of Sauble Beach hundreds of Hooker's orchids **Platanthera hookerii** have been destroyed by home construction. Some of the owners have been alerted and shall try to save the remaining plants.

Botanizing is never boring. Last August 13th, we stopped near Sauble Beach to check on a colony of one of our favourite orchids, the northern slender ladies' tresses **Spiranthes lacera** although we knew they were well past their flowering period. We noticed some strange reddish-brown shoots, first, in some mossy patches, and then more and more, everrywhere, until we found a few with tiny flowers. Definitely an orchid! About 25 years earlier, Ross Brown had shown us five plants

of autumn coral-root **Corallorhiza odontorhiza** at the Pinery Provincial Park in Lambton County, in mid-September. It just could not be anything else! So we took a single plant with us to show to our summer neighbors, Dr. Donald and Joan Gunn. They agreed that it had to be the autumn coral-root, and a new orchid for the Bruce Peninsula. For the next few days, that site was a busy place as friends came to view several hundred plants, which had come into full flower and which no doubt had flourished there for many years. These plants belong to the showy or open-flowered race of the autumn coral-root, which is the rarer form.



ORCHIS SPECTABILIS L.

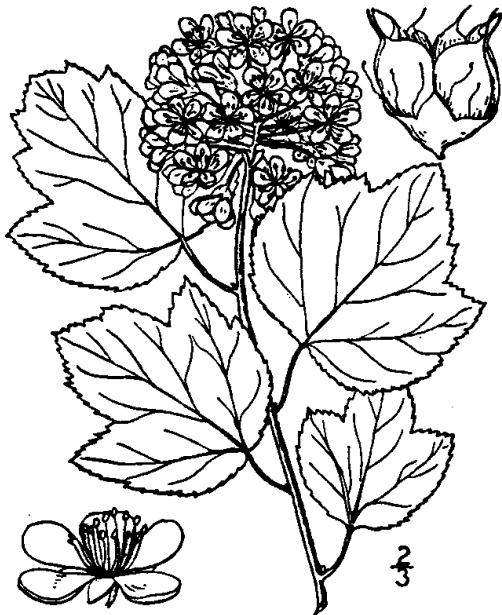
1. Entire plant. Drawing much reduced in size.
2. Front view of the flower.

Walker's Wood Conservation area,
just north of the stop light at Sauble

Beach, is a mixed forest with mature white pine, hemlock and cedar predominating. Shaded and cool, and with damp swales, it is home to many northern type plants — gold thread, clintonia, marigold, bunchberry, bog rosemary, leather leaf, Labrador tea, shining and bristly clubmosses, one-flowered pyrola, one-sided pyrola, small American cranberry, twin-flower, buffalo berry *Shepherdia canadensis*, nine-bark. As many as 15 orchids have been reported by botanists throughout this 14 hectare tract. The stemless lady's slipper *Cypripedium acaule* is not common on the Bruce but a few scattered stands of it grow here. You are requested to stay on the trails to minimize damage to the flora.

The Bruce is famous for its ferns which grow everywhere — in bogs and wetlands, along streams and lakes, in woodlands and on the escarpment limestone with its unique cool and moist habitats. Although a few are common on the Bruce, they are rare in the rest of Ontario. Walking fern, hart's tongue fern, wall rue, slender rock brake, smooth cliff brake, fragile fern, bulblet fern and northern holly *Polystichum lonchitis* grow on the cliffs and the talus slopes of the escarpment. In the rocky woods, marginal, clinton's and spinulose wood ferns, northern holly, New York fern and Christmas fern (rare) may be found. Bog and wetland ferns are lush and beautiful — northern beech fern, oak fern, cinnamon, interrupted, royal and ostrich ferns. Virginia chain fern grows only in one location — the Tobermory bog. The purple cliff brake struggles to exist in dry and dusty crevices along Hwy 6 north of the road to Dyer's Bay.

Ferns do not always grow in their usual habitat. On an outing with friends, we stopped in the "40 Hills" for lunch. We sat on a big rock just off the road when suddenly Wilf Botham got up and brought his **Britton & Brown** manual from the car. After a few minutes, he said: "I never thought I'd see one but there it is — **Botrychium lunaria**." Three tiny plants, with fruiting bodies were growing in the humus on the limestone, not in a moist meadow. They survived for the next three years and then disappeared — probably due to a very dry summer.



Opulaster opulifolius (L.) Kuntze. Ninebark.

Interested in grasses and sedges? The Bruce offers many common and rare species for your study. Yes, it is true! — the Massasauga rattlesnake is on the Bruce and is an endangered species. He does give you warning when he is defending his territorial rights. Fair enough? After all, he was here first. If you are timid, wear rubber boots, as we do when in remote wilderness.

We look forward to a visit each fall from our mushroom experts, Joan and Peter Banks of Sarnia. After a

morning foray into a nearby bog and mixed wood lot, we return with a basket full of fungi. Spread out on a table, some on spore print papers and covered by all available glassware, they make a colourful display. There are mushrooms of all shapes and sizes, the more common ones with cap and stem, with gills or pores, as well as puffballs, earthstars, coral types, cup-shaped, gelatinous fungi and even strange slime molds. Far into the night, each is examined, identified and recorded. A microscope, a pile of reference books and infinite patience are most helpful.

We are fortunate that many of our friends are amateur or professional botanists. We shall always be indebted to the late Croft Skelton who, in our early days of botanizing, helped us identify rare plants such as **Cacalia tuberosa**, **Zigadenus glaucus**, **Satureja arkansana** and who told us "Don't be so damned lazy. Learn the Latin names." That was good advice and a necessity when we discuss flora now.

In 1967 we acquired our very own environmentally sensitive bog as a Centennial project. It had been well preserved by local enthusiasts who valued it as a treasure of wild orchids, rare ferns and endangered plants. It is extremely fragile and we are dedicated to its preservation. We believe wild plants should be allowed to reproduce in their own natural environment, where all their exacting requirements can be met. Hopefully, the new Bruce National Park, taking in much of the northern part of the peninsula, will protect all plants and wildlife from removal and damage. Recently we were angered to find one beautiful **Galearis spectabilis** surrounded by 22 trampled plants of the same species after a group of photographers and visited one of two stations of this orchid on the Bruce. No picture is worth all that destruction! The Bruce, with countless endangered plants growing in the wild, is a precious heritage which must be protected so that future generations may appreciate and see a little of the Bruce as it was when Isobel's great grandparents first arrived in this rugged but beautiful part on Ontario.

Isobel and Les Greenop are well known experts on the flora of the Bruce peninsula. They live on the Bruce at Lion's Head, Ontario.

* * * * *

NOTICE ON NEWSLETTER
SUBSCRIPTIONS FOR STATE MEMBERS

If you wish a subscription to "On the Fringe" they are available at the rate of \$7.50 per year. Send your check made payable to: Native Plant Society, 6 Louise Drive, Chagrin Falls, Ohio 44022.

COMMON PRICKLY PEAR, *Opuntia humifusa* (Raf) Raf. by Guy L. Denny

Cactus in Ohio? You bet! Cacti are native only to the western hemisphere. The most widespread group of cacti in North America is the prickly pears which grow from southern Ontario to Guatemala. Although most of the numerous species of prickly pear cacti occur in the arid West and Southwest, the common or Eastern prickly pear cactus, *Opuntia humifusa* (Raf) Raf., occurs on exposed, dry sandy and rocky soils from Massachusetts to southern Ontario and Minnesota, southward to South Carolina, Georgia, Alabama, Mississippi, Missouri, Arkansas and Oklahoma. In Ohio, where it is listed as a potentially threatened species, common prickly pear is currently known from 20 sites within nine counties. Previously it was reported from seven additional counties, but these occurrences have since presumably disappeared.

Ohio's populations of this widespread eastern cactus tend to be centered in those counties along the Ohio River, as well as in the Oak Openings of northwestern Ohio. While most populations are relatively small, one of the largest in the state occurs in and adjacent to Fish Cemetery in Wood County on a sandy ancient beach ridge of glacial Lake Warren. At the opposite end of the state in Adams County near the Ohio River, another large population can be seen near Sandy Springs occurring on ancient sand deposits of the Ohio River. Within Ohio, common prickly pear occurs on such sites as sand knolls, sandy roadbanks, rocky outcrops and gravelly hillsides.

The species is the only cactus native to Ohio. Although the twisted-spine or plains prickly pear, *Opuntia macrorhiza*, is known from collections made near Cincinnati, it is not native to Ohio. It became established only after being introduced to the site. Naturalized populations have reportedly since been destroyed by construction of interstate highways around Cincinnati. The plains prickly pear typically occurs from Texas to Kansas and southwest Missouri. It can be distinguished from the common prickly pear by its larger, more numerous, downward pointing spines.

The generic name *Opuntia* was first used by the Roman naturalist, Pliny, nearly 1,500 years ago. It is derived from the Greek word "*Opous*," a town in Greece where a cactus-like plant, *herba opuntia*, grew. The specific name *humifusa* was given to this species by the famous naturalist Constantine Samuel Rafinesque (1784-1824). It comes from the Latin words "*humus*" meaning the ground, and "*fusus*" meaning spread out. This then is the species of *Opuntia* which spreads out over the ground. Formerly this species was referred to as *Opuntia compressa*. However, in 1982 Professor Lyman David Bensen of Pomona College, California, (perhaps the world's foremost authority on cacti) published *The Cacti of the United States and Canada*, in which he points out that *O. compressa* is nomenclaturally incorrect for this species, which instead should be referred to as *O. humifusa*.

What appear to be leaves are actually rounded or oblong succulent, photosynthetic (capable of manufacturing food) stems. The inconspicuous leaves, which are only about one-fourth inch long, appear in early summer near the upper part of the stems. They are present for only a short time before falling off. Scattered over the surface of the leaf-like segmented stems or oval green pads are small clusters of minute,

reddish-brown barbed bristles called "glochids." These spine-bearing areas on the cactus are referred to as areoles. Longer, more formidable spines may be absent or may be represented by only one or occasionally two white or brownish spreading spines at the axil of each pad. The glochids actually pose more of a threat than the long spines since they easily detach when touched and quickly work into the tissue causing painful discomfort. Worse yet, not only are they difficult to see, but they are even more difficult to extract. In spite of this, deer, as well as cattle in the Southwest, are known to browse on species of prickly pear, seemingly undaunted by the thorns. Some cattlemen even dethorn the stems with blowtorches and use them for silage for their cattle.

Around the end of June through the first part of July, the common prickly pear comes into bloom in Ohio. The showy, bright yellow flowers are 2 to 3 inches across. After blooming, the flowers are replaced by dull, purplish-red, edible fruits about the size of small prunes. These somewhat pear-shaped fruits are known as "tunas." Some very large species of prickly pear in the desert country of the Southwest, where the genus is best represented, produce correspondingly large, lemon-sized fruit which are referred to as Indian figs. The large, delicious tunas of the species **Opuntia megacantha**, which was introduced from Mexico more than a century ago by the Franciscan missionaries, is often sold in grocery stores throughout the United States. In addition to being eaten fresh or dried, the sweet fruits can also be made into candy or jelly. Although also edible, the significantly smaller, pulpy fruits of the common prickly pear are less tasty and more seedy.

In Mexico, and some of the southwestern states, seeds of the prickly pear, which are embedded within the tunas are heated and ground into flour or used to thicken soups. Even the smallest, tender stems known as **nopales** or **nopalitos** are edible. Sliced, boiled or roasted, they are occasionally used as greens. They, too, are available in many grocery stores throughout the U.S., fresh as well as canned.



Common Prickly Pear
***Opuntia humifusa* (Raf)**
Raf.

The common prickly pear will never be as economically important as its larger "cousins" in the Southwest, yet hopefully this plant of the desert will remain a fascinating part of our Ohio landscape.

Guy L. Denny, Assistant Chief of the Division of Natural Areas and Preserves, ODNR, wrote this article which appeared in the DNAP Newsletter, June-July 1988.

LAKESIDE DAISY PRESERVE

The Division of Natural Areas and Preserves is pleased to announce the acquisition of a new preserve on the Marblehead Peninsula in Ottawa County that will protect forever the Lakeside Daisy, *Hymenoxis acaulis*, *V. glabra*, now on the federal endangered species list. Many people fought long and hard to get this preserve, and in the forefront of the battle has been our own Ruth Fiscus. Congratulations to her, to the division, and to all those who worked so hard to keep the daisy safe!!

* * * * *

TONGASS ALERT

Several months ago we published an appeal for support of the Tongass National Forest. Cogent additional material is to be found in the August 1988 issue of Natural History Magazine. Should you have any lingering doubts as to the validity of this crusade to save the forest, read this article and ponder. It has been proven that groups like ours, raising their voices in unison, can make a difference. If you do not receive this magazine, it is available in all libraries. Saving the Tongass may be one of the crucial causes of our time.

Keep abreast of the arctic wildlife refuge also. Having followed all the arguments, pro and con, I cannot see how this pristine wilderness can be sacrificed to man's avarice for more profits and more energy. We must find an alternative, and this presidential election year is a perfect time to put the candidates on the griddle. Along with the rain forest devastation issue, the denouement of these causes will drastically affect the generations to come. Summer is over, so settle at your desks and take pen in hand to make your sentiments known to those in Washington whose vote will make a difference.

* * * * *

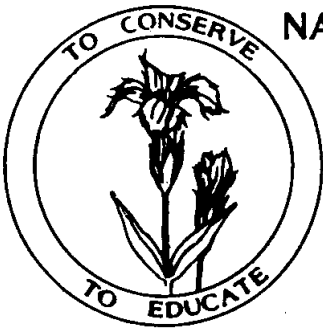
WILDFLOWER SEEDS: Economical and Satisfying

Vivid wildflowers, adapted to a wide range of locations, are outstanding additions to home landscapes. To encourage gardeners to grow more native plants from seeds or spores, the New England Wild Flower Society is offering for sale more than 150 varieties of wildflowers and ferns in their **1989 Seed List**.

Included in the List are natives for woodland, wetland, and meadow gardens. Early blooming wildflowers add color to spring shade gardens while many of the sun-loving varieties are vibrant splashes in summer borders.

All requests for the **1989 Seed List** must be received by March 1st because seed sales close March 15. Requests will be filled in the order received. The Seed List is an adjunct of the Society's worldwide distribution effort.

Send a self-addressed, 45¢ stamped envelope (#10, business size) to Seeds, New England Wild Flower Society, Garden in the Woods, Hemenway Road, Framingham MA 01701. No requests for Lists will be honored without a stamped envelope.



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

SAMPLINER, Tom
2472 Overlook Rd. #8
Cleveland Hts., OH 44106
~~(Street # 1)~~

SAM 72 4014CGN3 09/14/88
POSTAGE DUE=
RETURN TO SENDER
NO FORWARDING ORDER ON FILE
UNABLE TO FORWARD

Dated Material-Do Not Delay

ADDRESS CORRECTION REQUESTED

Memberships are **DUE FOR RENEWAL** on January 1, 1988. 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 1988 Program and Field Trips schedule will be worthwhile.

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

- | | |
|--|--|
| <input type="checkbox"/> ACTIVE.....\$ 7.50 | <input type="checkbox"/> SUSTAINING ...\$25.00 |
| <input type="checkbox"/> FAMILY\$15.00 | <input type="checkbox"/> 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: _____