

NYFA Newsletter

New York Flora Association
of the New York State Museum Institute

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Co-Editors:

Richard S. Mitchell

Robert E. Zaremba

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New York State Museum The Nature Conservancy

ADDRESS ALL CORRESPONDENCE TO NYFA, 3132 CEC, ALBANY, NY 12230 - DUES \$10 PER YEAR

Purple Mountain Saxifrage - New to New York State -

by Peter F. Zika and Jerry C. Jenkins

The remote wild-water stretches of the Hudson River Gorge are renowned among rafters, but not as well known by biologists. With that in mind, we took an excursion and floated through the gorge in search of both nautical and botanical thrills in the spring of 1990. Although it was too cold and early in the season for many flowers to have appeared along the shores, one north-facing cliff looked promising for later exploration. We examined it carefully with binoculars and joked about an imaginary community of *Astragalus*, *Pinguicula* and *Braya*. Surely at least one of these boreal rarities, well known in New England, awaited us on the dormant precipice. Somewhere in Hamilton County, there must be interesting cliff plants, we reasoned, and this spot seemed the best prospect.

Returning there in August was not easy. The river was running too shallow for boats, and there were no roads or trails that approached the cliffs. Access was also blocked by large tracts of jealously patrolled private land. So we walked a few miles of public trail to reach the opposite shore, and arrived in late afternoon. Then, we swam across a large eddy in the river and finally arrived at the base of the cliffs, poorly equipped and wetter than we had ever been on the entire "wild water" raft trip. Tired from the ordeal of the approach, we were grateful that the cliffs were not just another sterile anorthosite outcrop of the type with which the Adirondacks are overly endowed.

We noticed first that one of the commoner species on the damp ledges was *Erigeron hyssopifolius*, daisy-leaved fleabane. It was growing with scattered clumps of the inconspicuous sedge, *Carex capillaris*. Last seen in the 1880s, both species were believed to be extirpated from the state. We were delighted to collect modest specimens of each to document their rediscovery in New York. More remarkable than their resurrection, however, was the presence of dense mats of *Saxifraga oppositifolia* L., purple mountain saxifrage. We saw perhaps 500 fruiting plants of this northern



Saxifraga oppositifolia L. Purple Mountain Saxifrage, is distributed widely in arctic-alpine habitats, but it is a rarity in the northeastern United States, and a notable new state record for New York.

species, which was recognized immediately as an addition to the state flora. We were familiar with the spectacular floral displays of this species in early spring elsewhere (it is reputedly one of the first plants of the season to bloom in the arctic), and we wondered why we had not seen its hot-pink flowers from the boat on our first trip through the gorge.

Several other interesting plants grew on dry, nearly inaccessible shelves on the cliffs, notably: *Woodsia glabella*, *Allium schoenoprasum* var. *sibiricum*, and *Calamagrostis stricta* ssp. *expansa*. All three are ranked S1 by the New York Natural Heritage Program. We had trouble reaching some of these without safety ropes, which would have been too heavy to swim with, and our slippery, wet shoes didn't help.

The late hour of the day and the prospect of the return swim and hike hurried us along, although our only deadline was darkness. We merely gave the cliff a cursory inspection, and we suspect that there is more to find there, as well as elsewhere in the gorge.

Peter F. Zika, 4230 NW Clubhouse Pl., Corvallis,
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Jerry Jenkins, Shaftsbury Hollow Rd., White Creek,
NY 12057

How I Met Liberty Hyde Bailey

by Eugene C. Ogden

When I was a student at Michigan State College (formerly Michigan Agricultural College and now Michigan State University), I learned in my genetics course that Dr. Liberty Hyde Bailey had written a book on plant breeding before most scientists even knew about the experiments of Gregor Mendel. Dr. Bailey had cited Mendel's paper but not translated it. As Dr. Bailey was then still alive and active, it was pointed out that the science of genetics was very young indeed. Dr. Bailey was a dean at Cornell University at the time. He was considered to be Michigan State's most famous alumnus, and his portrait hung in the college library. When I was graduated in 1932, Dr. Bailey was the commencement speaker. I didn't attend the ceremonies, since I couldn't afford a cap and gown. In fact, I had to work that day (at 30 cents an hour) to pay my living expenses, including tuition, which was \$105 a year. I did get a look at Dr. Bailey, however, when I was sent to check the public address system in my job as a campus electrician.

That fall, I hitchhiked to Maine to become a half-time graduate student and half-time lab assistant at the University of Maine. The following fall, on Labor Day, I was the only botanist in the biology building when *in* walked Dr. Bailey. He had gone earlier to Cambridge Massachusetts, intending to study some plants in the Gray Herbarium of Harvard University, but, since it was a holiday, the place was locked up. Not being one to waste time, he took the train to Bangor, Maine and the bus to the University at Orono. He wanted to see New England grape (*Vitis novae-angliae*) at its type-locality in Veazie, nearby.

I was unable to locate a botany professor in town, but I found a graduate student whose brother-in-law had a car, so we finally got to Veazie and found the grape along the Penobscot River. Dr. Bailey pinned a branch of the vine up on the wall of a shed, aimed his trusty, but heavy, 5x7 plate camera at it and opened the shutter. While the exposure was being made he chatted about his field experiences, saying that, unfortunately, his daughter was too old to accompany him into the field anymore. He was then 87, and I had to trot to keep up with him. After a while he closed the shutter. I was sure the film was overexposed and offered to make a good picture for him when he found that it was. He returned to Cambridge, developed the negative in the clothes closet of his hotel room, and wrote me that it was satisfactory and he wouldn't need to bother me further.

I met Dr. Bailey several more times when he visited the Gray Herbarium while I was there as a graduate student. He was always cordial and entertaining.

Cornell University honored him in his 90th year, but the planned celebration had to be postponed until spring because he was in Panama on his birthday, collecting palms. He continued to publish while in his 90s. Although he was over six feet tall, a stack of his published botanical and horticultural papers and books, piled on top of each other, was taller than he, as evidenced by a well-known photograph.

Editorial Note: Dr. Ogden, who turns 87 this year, is State Botanist Emeritus. He has an impressive publication record and, like Dr. Bailey, he is not easy to keep up with himself. (R. Mitchell)

When is a Flower Not a Flower?

by Richard S. Mitchell

My recent involvement in the design of a museum exhibit entitled "The Enduring Flower" gave me cause for some morphological reflection. When asked to write an introduction to the botanical part of the exhibit, I wrote:

Flowers, for all their beauty and poetic value, are basically the reproductive structures of many of the world's plants... predecessors of the fruits and seeds that enable species to carry on.

That's O.K., I thought, but not very satisfactory in a botanical sense -- not to *me* at least. If you start to think too carefully about flowers, complications set in. For instance: a daisy is a composite head of many, small flowers, some tubular and densely grouped at the center and some strap-like simulating petals at the margin. But, any school child will tell you that a daisy is a flower. The fact that it isn't a true flower in the botanical sense, but an inflorescence of many flower units, is a moot point until you try to identify a daisy.

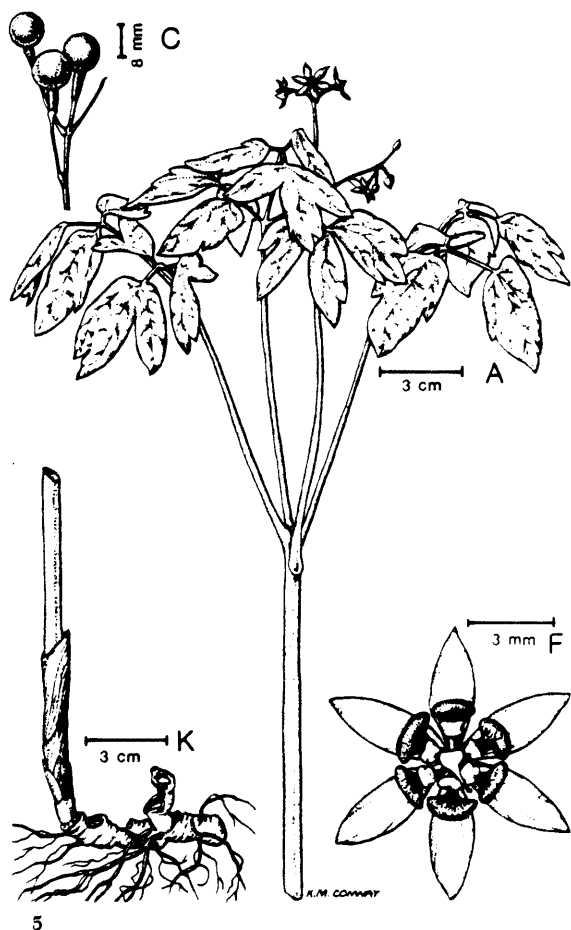
So, what is a flower? I ask, with some trepidation, and a nagging fear that my answer might ring as hollow to the ear as a Gertrude Stein poem.

If you look at forestry texts and botanical manuals of forty years ago (and even some published today), you'll find to your surprise that pines and spruces have "flowers." Someone, armed with the knowledge that flowers bear pollen and seeds, unfortunately used reverse logic and applied the name "flower" to structures that bear pollen or seeds on cone-bearing trees and other gymnosperms. In reality, the production of seeds and pollen historically preceded the origin of true flowers by hundreds of millions of years. Flowers first appeared in the fossil record during the Mesozoic Era, signaling a successful, though very late, addition to the repertoire of seed-bearing plants.

Early seed plants like the seed ferns (now extinct) and Ginkgo tree (thankfully still with us), were already bearing seeds on fertile leaves (sporophylls) or shoots over 400 million years ago. The yew is an example of a member of such an ancient lineage -- a bush that bears a truly "naked seed," exposed at its tip from the

berry-like aril-cup surrounding its base. Such plants were among the earliest seed plants, and their origins pre-date flowers by a span of time scarcely imaginable.

It isn't botanically correct to use the term "flower" for gymnosperm parts for a number of reasons, but the following three I find most important: 1) the term, gymnosperm, itself refers to naked seeds, as opposed to the flowers of angiosperms in which the seeds are enclosed in fruits; 2) the scales of gymnosperm cones, once considered in some way comparable to petals and sepals are not equivalent. Pine cone scales, for instance, are complex, fused, fertile shoots, while most flower parts are derived from leaves; 3) there is good evidence from embryology and other disciplines, that flowering plants arose only once, presumably from an ancient ancestral line that has no close relatives among the gymnosperms of today.



Blue Cohosh (*Caulophyllum thalictroides* L.), a common, native flowering plant that bears naked seeds instead of fruits.

Can you be sure you are looking at a flowering plant by studying only the male catkins of a willow? Microscopic examination of the pollen might give you some clues, but you really need the structures associated with seed production to be sure.

The Flower Defined: A flower is best recognized by the presence of ovary tissue that later develops into a fruit. The ovary bears one or more concealed ovules, and these become the seeds within the fruit, after pollination and a process of double fertilization that is almost unique to flowering plants. One of the two fertilizations produces an embryo, while the other results in the growth of an endosperm tissue that is starchy or oily, and serves as food for the young plant throughout its life within the seed.

So, must a plant be capable of bearing fruits to qualify as a flowering plant? Leaving aside male plants, barren female plants and those that reproduce primarily by vegetative cloning, the answer to that question is usually yes. The ability to produce fruits is a major and defining feature of most flowering plant species. Having said that, I must note that there is a common, local, woodland wildflower in our area that is a notable exception to the rule.

Blue cohosh (*Caulophyllum thalictroides*) is a flowering plant that qualifies in every other way to be counted among the angiosperms, but it bears no fruit, and so it may be said to exhibit a "gymnospermous" condition. The so-called berries of blue cohosh are actually stalked seeds. Although an ovary is present when the plant is in flower, it aborts, just as the fertilized ovules and their stalks (funiculi) begin to enlarge. Throughout growth and development, the seeds are borne naked and exposed to the surrounding environment, unlike nearly all other flowering plants. This, of course, doesn't disqualify the blue cohosh from membership in the Barberry Family, an otherwise perfectly respectable group of angiosperms.

Richard S. Mitchell, Biological Survey, New York State Museum, Albany, NY 12230.

DUE DUES NEWS: NYFA MEMBERS: \$10 a year

Sorry I forgot to mention the amount of dues when calling for them in the last issue. That amount will be listed in the banner of the newsletter from now on. If you sent too much or too little you are paid up until the year 1991.5, 1992.5, 1993, etc., so just send a check for the difference next time. R.S.Mitchell
PLEASE SEND IN YOUR 1992 DUES IF YOU HAVEN'T DONE IT YET.

WE GREATLY VALUE YOUR SUPPORT AND CONTINUED MEMBERSHIP!

Our Beachgrasses (*Ammophila*), Including the Rare Champlain Beachgrass.

by Gordon C. Tucker

Beach or dunegrass (*Ammophila*) is a familiar component of the vegetation of coastal dunes. An amph-Atlantic genus of four species, *Ammophila* is closely related to *Calamagrostis* (as evidenced by the bearded lemma base), but distinguished from it by its strongly compressed, keeled lemmas and involute, sharp-pointed leaves. The type species, *A. arenaria* (L.) Link, marram grass, $2n = 28$, occurs on sandy beaches in Europe and northwestern Africa. It has been introduced as a sand-binding grass on dunes in Massachusetts (Seymour, 1983) and it is abundantly naturalized on the Pacific Coast. *Ammophila arenaria* hybridizes with *Calamagrostis* in Europe (Clayton & Renvoize, 1986; Tsvelev, 1983); however, no hybrids have been reported between *Ammophila breviligulata* and North American species of *Calamagrostis*.

The North American species, *Ammophila breviligulata* Fern., beachgrass, $2n = 28$, ranges from Labrador to eastern North Carolina. It is also found on shores of the Great Lakes (Dore & McNeill, 1980), and around Lake Champlain, at least on the Vermont side (Seymour, 1983). *Ammophila breviligulata* has a short, truncate ligule only 1-3 mm long, while the ligule of *A. arenaria* is acute and 10-30 mm long. It has been treated as *A. arenaria* ssp. *breviligulata* (Fern.) Maire & Weiller, but I agree with Stern (1983) that since Maire (1953) gave no data or discussion for the transfer, we should retain *A. breviligulata* as a species.

The third species, *Ammophila champlainensis* Seym., Champlain beachgrass, was described only a quarter century ago (Seymour, 1966). It has not received wide acceptance, but it does appear to be a distinct taxon. It is known from only a few populations in New York State and Vermont, on dunes along the northern half of Lake Champlain. It is listed as a rare species for both New York (Zika, 1990) and Vermont (Thompson, 1989).

In a common garden study, Stern (1983) showed that morphological differences (summarized in the key below) were maintained for samples of populations from the New England coast, Lake Champlain, and eastern Lake Ontario (all from about 44° N latitude). Champlain dunegrass flowered from late June to early July, while coastal and Great Lakes dunegrass flowered from late July to early September. Phenological differences, plus morphological ones, seem convincing evidence for specific status for *Ammophila champlainensis*. The following key is based on Seymour's work and a review of Stern's morphological data. The differences in anther and grain size are my own measurements, unfortunately from a small sample of *A. champlainensis*.

Key to *Ammophila* Species in Our Area

1. Inflorescence 20-35 cm long; uppermost (flag) leaf blade 25-40 cm long; first glume 11-12.5 mm long, attenuate; anthers 5-7 mm long; grains about 3.5 mm. long.....*A. breviligulata*
1. Inflorescence 12-16 cm long; uppermost leaf blade 10-25 cm long; first glume 8.8-10 mm long, acute; anthers 3.5-4.0 mm long; grains about 2.7 mm long.....*A. champlainensis*

There are only two known localities for *Ammophila champlainensis* in New York state, both in Clinton County: Ausable Point, mouth of Ausable River (Stern, 1983) and the following specimens: 3 Jul 1902, N. Flynn s.n. (VT, holotype), and 31 Aug 1929, W.C. Muenscher et al. 219 (CU, NYS); and Plattsburgh, S of Plattsburgh municipal beach (Stern, *ibid.*). The above information may help us to locate new populations of Champlain beachgrass. It is important to remember that *A. breviligulata* has been introduced in the Champlain Valley, but the indigenous Champlain beachgrass can be quickly distinguished by its earlier flowering time and shorter inflorescences.

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- Gordon C. Tucker, Biological Survey, New York State Museum, Albany, NY 12230



**An Occurrence of *Passiflora* in New York -
by Thomas J. Delendick**

Passiflora incarnata L., passion-flower or apricot-vine, is reported to occur naturally as far north as Virginia (Gleason, 1952) and Maryland (Fernald, 1950), and Killip (1938) noted that it is introduced farther north. There are, in fact, specimens of cultivated plants at the New York Botanical Garden herbarium (NY) from Maryland and southern Pennsylvania.

The species is here reported from a site on the upper west side of Manhattan (New York County) in New York. The colony is situated on the south side of the Julius and Armand Hammer Health Sciences Center (Columbia University/Columbia Presbyterian Hospital) at Fort Washington Ave. and West 168th St. It has been under observation for three years, during which time it has spread vegetatively. Shoots emerge in the third week of May, at which time they are almost hidden by rampant *Convolvulus sepium*, and flowering commences in the second or third week of June. Fruits have not been observed. Insect pollinators have not been noted visiting the flowers; furthermore, all the herbaceous vegetation at the site, including that of the *Passiflora*, has regularly been whacked back to a stem height of about six inches during the middle of the growing season. This year was the first exception.

Origin of the colony is not known, but it was well-established when first noted by me in 1989. It may have come in with shrub nursery stock when the site was landscaped. Companion plants, besides the cultivation *Pyracantha*, *Ilex aquifolium*, *Malus* and *Hedera helix*, include *Convolvulus sepium*, *Smilax rotundifolia*, *Asclepias* sp. and *Aster cordifolius*. With the exception of *Convolvulus*, none of the other herbaceous species on the site are to be found elsewhere in the vicinity. It seems unlikely that *Passiflora* was planted at the site deliberately. Its continued presence owes little to horticultural activity, and it may be said to persist despite such attention.

Persistence of the colony in Manhattan may depend on a favorable microclimate, *i.e.*, southern exposure adjacent to a building that radiates heat during the winter. It may be questioned as to whether *Passiflora*

incarnata should, in fact, be counted as a member of the flora of New York State, but it is here, and only time will tell if it will actually succeed and become naturalized.

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 Thomas J. Delendick, Health Sciences Library, Columbia University, 701 W. 168th St., NY, NY 10032.

The New York State Biological Survey invites you to



**NATURAL HISTORY
CONFERENCE II**

APRIL 29 - MAY 1, 1992

Held at the New York State Museum, Albany

The conference will update scientists and other interested parties on natural history research in the state, focusing attention on critical research findings and needs, and fostering communications between research and management groups.

Dr. Peter H. Raven, world renowned botanist and Director of the Missouri Botanical Garden, will deliver the keynote address concerning biodiversity on the evening of April 29, 1992, with a mixer to follow. Posters and oral presentations will continue through May 1, and there will be an excellent exhibit of original natural history paintings and scientific illustrations on display.

Registration: Regular preregistration \$70, includes mixer and a barbeque dinner on April 30 (extra tickets to the dinner \$12). Student preregistration is \$25.

April 1 is the deadline for preregistration, after which the rates rise. For further information, write to:

**The New York Natural History Conference II,
c/o Biological Survey, 3132 CEC, Albany, NY 12230.**

Significant Botanical Discoveries of 1991: Final Report -

by Stephen Young

There were many good finds in 1991 including 11 historical species that were relocated or identified from collections. The Heritage Program still lists many historical (SH) species for which there is location information available. For a list of historical species and locality information in your area you may call Steve Young at 518-783-3932.

Allium schoenoprasum L. - G5 S1 - Found at a site on the Black River, Jefferson Co., by Anne Johnson; last seen by Mitchell & Sheviak in 1981.

Aster ontarionis Wieg. - G5 SH - Found in St. Lawrence Co. by Nancy Eldblom. Last collected in 1952 by Stanley J. Smith and Eugene Ogden in Jefferson County.

Carex styloflexa Buckl. - G4G5 SH - A 1986 Rensselaer County specimen collected by Gordon Tucker was identified as this species. The most recent record was a 1935 collection by Homer House in Madison County.

Carex tenuiflora Wahl. - G5 SH - Documented by Anne Johnson in Bonaparte Swamp, Lewis County. Last seen there in 1920 by Homer House and the first state record since the 1930s.

Erigenia bulbosa (Michx.) Nutt. - G5 SH - Found by Pat Martin in Monroe County and documented in April. Last documented sighting in 1972.

Lipocarpa micrantha (Vahl) G. Tucker - G4 S1 - Found by Tammy Larson on the Schroon River at a site where it was last seen in 1941.

Hypericum dissimulatum Bickn. - G5Q SH - Identification confirmed. Bob Zaremba's specimens collected from five or six sites in Suffolk County in 1985. H.K. Svenson last collected it in 1941 north of Babylon.

Myriophyllum pinnatum (Walt.) BSP. - G5 SH - Found in two locations on Fishers Island by Gordon Tucker. The last record was from Long Island in 1941.

Panicum scoparium Lam. - G5 SH - Identification confirmed this year: Bob Zaremba collection made in 1989 on Staten Island. Roy Latham last collected this species in 1959 in Suffolk Co.

Paspalum setaceum Michx. var. *setaceum* - G5T5 SH - Found this year by Bob Zaremba on Long Island. Last seen in 1941 by Roy Latham in Riverhead.

Ranunculus micranthus Nutt. ex Torr. & Gray - G5? SH - Discovered this year by David Hunt while botanizing in Columbia County. Last seen in 1924 by Roy Latham on Fisher's Island.

Sphenopholis pensylvanica (L.) Hitchc. - G4 SH - Located by Chris Mangels in Connetquot State Park where this species was last collected in 1974 by Stanley J. Smith.

Triphora trianthophora (Sw.) Rydb. - G4 SH - Discovered by Al Schotz in Erie County. Last collected in 1958 in Erie County.

EXPLANATION OF NATURAL HERITAGE PROGRAM RANKS AND CODES

The following ranks are used by Heritage Programs in all 50 states and several foreign countries, but they have no legal standing. Legal protection is afforded to plants included on state and federal lists of endangered and threatened plants. Each taxon on the Heritage list has a global and state rank. The global rank reflects the rarity of the species throughout the world and the state rank reflects the rarity within New York State.

GLOBAL RANK

G1 = Critically imperiled throughout its range due to extreme rarity (5 or fewer sites or very few remaining individuals) or extremely vulnerable to extinction due to biological factors.

G2 = Imperiled throughout its range due to rarity (6 - 20 sites or few remaining individuals) or highly vulnerable to extinction due to biological factors.

G3 = Either very rare and local throughout its range (21 - 100 sites), with a restricted range (but possibly locally abundant), or vulnerable to extinction due to biological factors.

G4 = Apparently secure throughout its range (but possibly rare in parts).

G5 = Demonstrably secure throughout its range (however it may be rare in certain areas).

GH = No extant sites known but it may be rediscovered.

GX = Species believed extinct.

GU & G? = Status unknown.

STATE RANK

S1 = Critically imperiled in New York State because of extreme rarity (5 or fewer sites or very few remaining individuals) or extremely vulnerable to extirpation from New York State due to biological factors.

S2 = Imperiled in New York State because of rarity (6 - 20 sites or few remaining individuals) or highly vulnerable to extirpation from New York State due to biological factors.

S3 = Rare in New York State (usually 21 - 100 extant sites).

S4 = Apparently secure in New York State.

S5 = Demonstrably secure in New York State.

SH = No extant sites known in New York State but it may be rediscovered.

SX = Apparently extirpated from New York State.

SE = Exotic, not native to New York State.

SR = Reported from the state, but existence has not been documented.

TAXON RANK

The T-ranks are defined in the same way as the Global ranks, but the T-rank only refers to the rarity

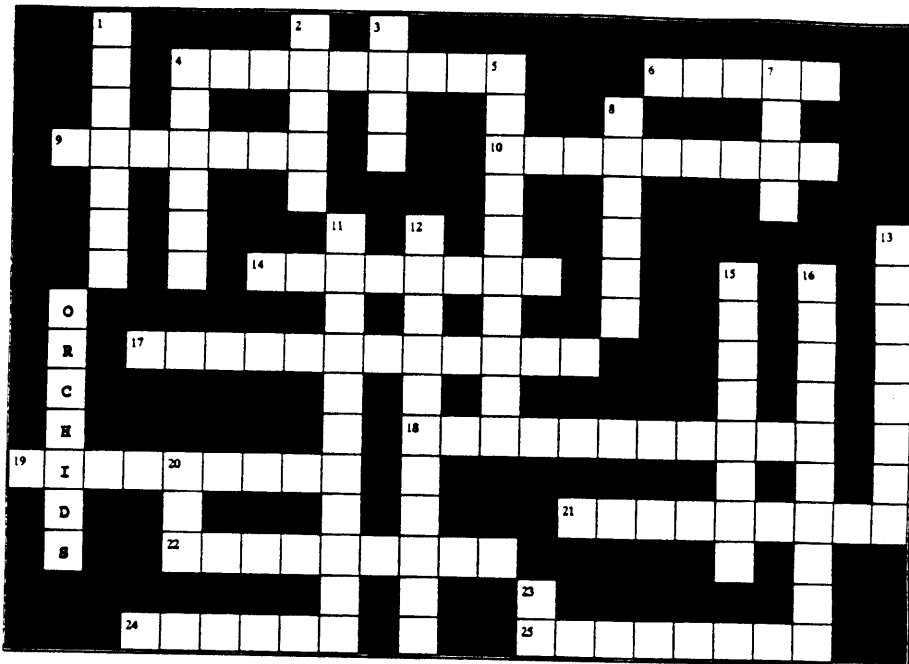
NYFA Summer and Fall Field Trips and Meetings -

Adirondacks - June 27:

NYFA will hold its sixth semiannual field trip on Saturday, June 27 to Whiteface Mountain and Silver Lake in the Adirondacks. We will meet at 10:00 am at the Santa's Workshop parking lot on Rte. 431 near the base of the road up Whiteface. We will carpool to a turn off near the summit, where we will take a short hike through a series of high elevation plant communities. You should bring warm clothes, sturdy shoes, rain gear, water and a lunch. We will see a number of alpine species rare in New York State, including *Prenanthes boottii*, and tour the summit and weather station area, exploring Krumholz, dwarf-tree, areas as well. If time permits, we will visit Silver Lake, a nearby Nature Conservancy preserve, where we will see a northern white cedar swamp and a large northern acidic bog mat. As on earlier trips, we will have a species list for both sites.

ORCHID CROSSWORD

by Charles J. Sheviak & Clifford W. Lamere



DOWN

- 1 An ovary looks like this, so the spikes look like racemes
- 2 $2 + 1 = 3$
- 3 Often modified into bulbous storage organs
- 4 usually 1, but slippers come in pairs
- 5 symbiotic association of root and fungus
- 7 always fleshy in orchids, but sometimes absent

- 8 structure composed of pistil and stamens
- 11 intricate process in many orchids
- 12 lady's-slippers *
- 13 no longer an *Orchis*, but still showy *
- 15 perianth segment in most *Cypripedium*, but not *C. arietinum*
- 16 coil flower *
- 20 modified petal
- 23 expect *Spiranthes* in ditches along the yellow brick road

Hudson River Estuary, September 12:

The fall NYFA field trip will be held on Saturday, September 12 at North Bay Tivoli in northern Dutchess County. We will meet at 9:00 am at the DEC canoe launch along the road to Crugers Island off 9G in Red Hook. We will see *Plantago cordata* and *Bidens bidentoides*, which have both been considered for federal listing, as well as many other plants with distributions in New York restricted to freshwater tidal plant communities. We will also visit nearby Stony Creek and North Bay, where the last known population of *Micranthemum micranthemoides* was located in 1941. From there we will move north to Stockport Creek to see the state's largest known population of *Plantago cordata*.

Annual Meeting:

We will reassemble at 7:30 pm, Sat., Sept. 12, at the main entrance of the New York State Museum (Madison Ave.) in Albany for our annual meeting.

For information about directions for either trip, carpooling, and overnight accommodations, call Bob Zaremba at 518-869-6959. Please call and let me know if you plan to attend these trips.

An asterisk (*) indicates that the answer is the scientific name of a genus

ACROSS

- 4 grew in the Garden of Eden
- 6 deceives pollinators of grass-pink with false pollen
- 9 non-fattening twayblade *
- 10 grass-pink *
- 14 tire-tread leaves
- 17 leafless, rootless mycotrophs *
- 18 largest orchid genus in New York *
- 19 named for an insect look-alike
- 21 weed *
- 22 pollen mass
- 24 always in tetrads
- 25 number of seeds in orchid capsule