Founded in 1997.
Logo art of Tall Goldenrod, *Solidago altissima*, by Nat Cleavitt, 2006.

Solidago

Newsletter of the
Finger Lakes Native Plant Society

Volume 21, No. 2 June-July 2020

EDITORIAL

Merging into Summer!

by Robert Dirig

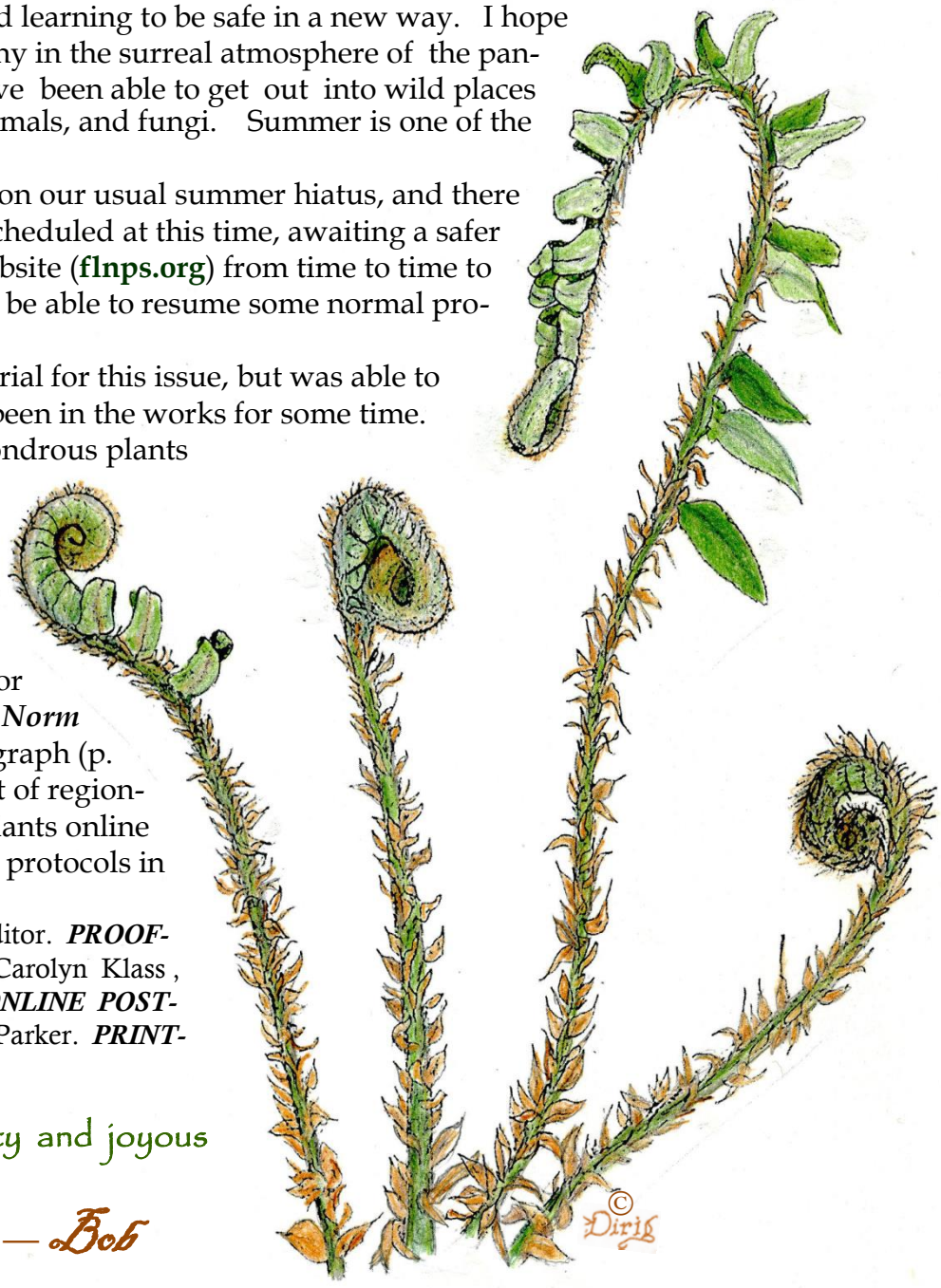
Christmas Fern (*Polystichum acrostichoides*)'s unrolling croziers in May. The fronds retain their bright yellow-green color into June.

Dear Readers,

WELCOME TO SUMMER! After a long seclusion, it is encouraging to begin the process of emerging and learning to be safe in a new way. I hope readers have been healthy in the surreal atmosphere of the pandemic, and that you have been able to get out into wild places to commune with the flora, animals, and fungi. Summer is one of the best times for this.

FLNPS is still here, but we are on our usual summer hiatus, and there are no walks or other programs scheduled at this time, awaiting a safer atmosphere. Please check our website (**flnps.org**) from time to time to see if anything is posted. We may be able to resume some normal programing in the fall.

I have not received much material for this issue, but was able to finish an article on bogs that has been in the works for some time. These wetlands are filled with wondrous plants and unusual animals. I hope you will enjoy the text and illustrations, and perhaps visit a local bog, and see some of the plants for yourselves.



THANK YOU! to ***David Werier*** for his quarterly plant puzzle (p. 3), ***Norm Trigoboff*** for an intriguing photograph (p. 4), and ***Rosemarie Parker*** for a list of regional nurseries that provide native plants online or via customer visits, with safety protocols in place (p. 4).

LAYOUT and DESIGN by the Editor. ***PROOF-READING*** by Rosemarie Parker, Carolyn Klass, John F. Cryan, & Robert Wesley. ***ONLINE POSTING*** by Audrey Bowe & Rosemarie Parker. ***PRINTING*** by Gnomon Copy.

Best Wishes to all for safety and joyous revels with the summer flora!

— Bob

Please Contribute to *Solidago*

WE WELCOME CONTRIBUTIONS THAT FEATURE WILD PLANTS OF THE FINGER LAKES REGION OF NEW YORK AND NEARBY. We include cryptogams (bryophytes, lichens, fungi, and algae) as "flora," and recognize that green plants provide habitats and substrates for these and many animals, especially insects. We are interested in zoological associations as long as plants are an integral part of the story.

We can use a wide spectrum of material in a variety of writing styles. Our regular columns include **LOCAL FLORA** (plant lists or details of species from specific sites), **OUTINGS** (reports of FLNPS-sponsored excursions), and **PLANT PROFILES** (on specific local plants). We also occasionally publish **APPRECIATIONS** (memorials to local botanists and naturalists), **REVIEWS** (of books, talks, meetings, workshops, and nurseries), **LETTERS** (commentaries and letters to the editor), **ESSAYS** (on botanical themes), **VERSE** (haiku, limericks, sonnets, and poems of less formal structure), **ART** (botanical illustrations, plant designs, pencil sketches, decorations), and **PHOTOGRAPHS** (stand-alone images, photo essays, and full-page composite plates, or originals that can be scanned and returned). We also can always use **FILLERS** (very short notes, small images, cartoons) for the last few inches of a column.

Solidago
Newsletter of the
Finger Lakes Native Plant Society

Volume 21, No. 2 June–July 2020

Published quarterly at Ithaca, New York, USA.

FLNPS (founded in 1997) is dedicated to the promotion of our native flora. We sponsor talks, walks, and other activities related to conservation of native plants and their habitats. *Solidago* is published as a colorful online version, and a B&W paper version that is mailed. The online format is posted 3 months after publication. Please see ***www.flnps.org*** for details of membership, past *Solidago* issues, and updates about our programs.

A flower of the **PURPLE PITCHER PLANT (*Sarracenia purpurea*)**, showing articulation of the greatly expanded, umbrella-shaped summit of the style surrounded by the petals (*inner*) and sepals (*outer row*). Pollinators enter between adjacent petals, where the hook-like stigmas capture pollen. See p. 12 for further explanation. Photographed at the Pit Road Bog in Oxford County, Maine, on 23 June 2003, by Robert Dirig.

***Please send *Solidago* contributions & correspondence to Robert Dirig, Editor, at editorofsolidago@gmail.com**

Deadline for the September 2020 issue is August 15th !

Name That Plant Contest

The photo from last issue's ***Name That Plant Contest*** [*Solidago* 21(1), p. 4] was of **Dwarf Ginseng (*Panax trifolius*)**. Dwarf Ginseng is an ephemeral, leafing out and blooming early in the spring, and dying back to the ground by late May or June (see bottom left image). Individuals of this species can change from having bisexual flowers one year to having only staminate flowers another year.

A colleague of mine recently described a new genus, *Nanopanax*, placing only this species in it as *N. trifolius*. His rational is that the two genera differ in many substantial ways, including being molecularly distinct. Among other things, *Nanopanax* has the petals white (rarely tinged pink), inflorescence nodding in bud, underground storage organ a spherical tuber, fruits green to green-yellow, and plants spring ephemerals; while *Panax* has the petals light green, inflorescence erect in bud, underground storage organ a ± elongate root (this vertical or horizontal, and sometimes branched), fruit red, and the plant deciduous toward the end of the growing season.

Thanks to all who entered the contest, and congratulations to the winners: ***Betsy Crispell, Bob Dirig***, ***Ken Hull, Susanne Lorbeer***, and ***Robert Wesley***.

This issue's mystery plant is shown below.

Hints and suggestions are often provided to contest participants who try. Common and/or scientific names are acceptable, and more than one guess is allowed. Please submit your answers to **David Werier** at

The photographs were taken by David Werier in New York State: the background and closeup of the flower in Erie Co. on April 12, 2011, the capsule in Washington Co. on May 23, 2017, and the leaves in Tompkins Co. on May 7, 2009.

Letter

Foxglove Penstemon Project

Hello,

My name is ***Yedra García***. I am a postdoctoral fellow at the University of New Brunswick (Canada). I am writing to you because I am looking for people willing to collect a few seeds from **Foxglove Penstemon (*Penstemon digitalis*)** this summer, as due to the COVID-19, I have to cancel my fieldwork trip to the USA.

We need seeds from naturally occurring populations of *P. digitalis* in the USA (not from gardens, or plants in restoration prairies). You can find more information about the project and how you can help us on our website

https://foxglovepenstemonproject.wordpress.com/

If you have any further questions, please let me know.

Thank you so much in advance.

Best regards, **Yedra**

email of 12 June 2020

Foxglove Penstemon (*Penstemon digitalis*) , Cady Road Fen near Freeville, N.Y., 3 July 2004. Photo by Robert Dirig.

Wild Gardening

No May Sale? Get Your Native Plants Anyway

by Rosemarie Parker

Most nurseries in New York are open by now, and have safety procedures for shopping. Check the website of your favorite nursery, and if Covid procedures are not mentioned, call ahead to be certain they are open for dropping in. Calling ahead is a good idea, anyway, as planting slows in the summer, and commerce this year will likely make it worse. Late summer and fall are great times to plant, but you can do it all summer if you are a dedicated waterer. Here are some nurseries that FLNPS has recommended on our website as providers of native plants that are responsibly propagated and frequently of local genotype.

Amanda's Garden (Ellen Folts)
Please call ahead and wear your mask.
Online shopping options.
8030 Story Rd, Dansville, NY 14437
(585)750-6288
amandasgarden@frontiernet.net
www.amandasnativeplants.com

Go Native! Perennials (Mary Menapace & Janice Wiles)
The website is oriented towards the produce CSA side of the business; email or call for native plants.
3134 East Lake Rd
Skaneateles, NY 13152
(240)626-5209
gonativeskan@gmail.com
https://growingforskan.luluslocalfood.com/Pages/Index/About%20Us

The Plantsmen (Dan Segal)
Open daily 10-2; contactless & online shopping options
482 Peruville Road, Groton, NY 13073
(607)533-7193
info@plantsmen.com
https://www.plantsmen.com/

Twisted Tree Farm (Akiva Silver)
Spring shipping is over, but email if there is some edible native shrub or tree that you must have.
279 Washburn Road, Spencer, NY, 14883
ttfarm279@Gmail.com
http://www.twisted-tree.net/

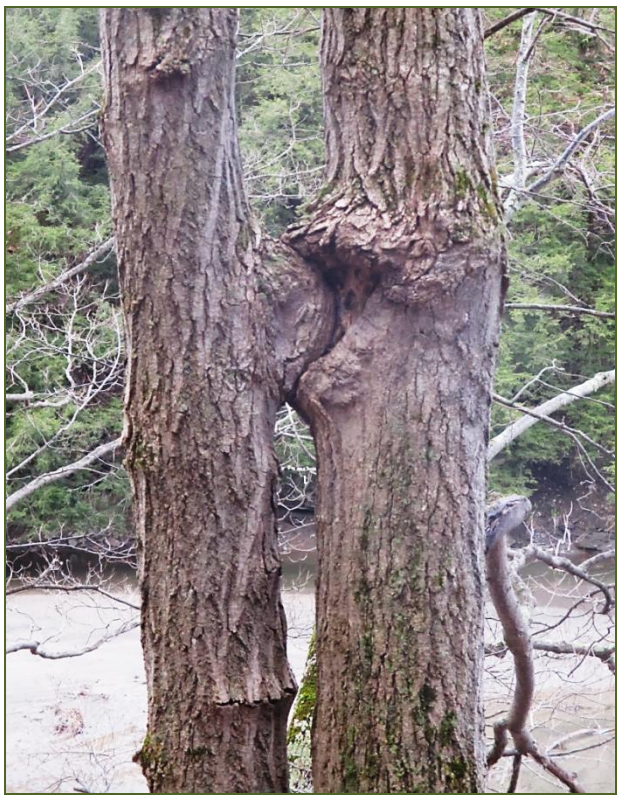
White Oak Nursery (Jim Engel)
Spring Sales cancelled; see website or email for options
jengel53@rochester.rr.com
http://www.whiteoaknursery.biz/index.shtml

Appreciation

Dr. Richard E. ("Dick") Andrus, renowned *Sphagnum* expert and environmental educator, passed away on April 5, 2020, at age 78. He was awarded his Ph.D. in botany at SUNY-ESF at Syracuse, N.Y., and was hired at Binghamton University in 1973 to establish an Environmental Education program. He made major contributions in bryology, especially in the peat mosses, including a monograph on the "Sphagnaceae (Peat Moss Family) of New York State," *NYSM Bulletin* No. 442, published in 1980.

Dick cultivated (and advocated for) a healthy lifestyle. He used to ride his bicycle from Binghamton to Ithaca, arriving around 10:00 a.m., and starting back at 3:30 p.m., coming to study the *Sphagnum* specimens at Cornell University's Bailey Hortorium Herbarium! He was wonderful in the field. At McLean Bogs Preserve, in the early 1980s, he pointed out an astonishing number of *Sphagnum* species, knowing exactly where to look (top or sides of hummocks, in the shrub zone, wetter or less soggy parts of the floating mat, etc.).

Dick was always cheerful and enthusiastic. He occasionally attended FLNPS's evening programs in recent years, and always attracted a crowd of friends. He will be greatly missed. *— Robert Dirig*



"Kissing Trees" by Norm Trigoboff

ECOLOGY

Cherishing the Hungry Hill Bog

by Robert Dirig

Wild Calla (*Calla palustris*) 4 June 1972

Starflower (*Lysimachia borealis*) 11 June 1972

ARE PATIENT, TIMELESS PLACES — each a rich mirepoix of images, fragrances, melodies, flavors, and textures — sitting in damp, steamy "kettles" formed by glacial ice. In their varied guises, bogs may be mystical, surreal, treacherous, or enchanting, and often shelter startlingly beautiful flowers, rare purple butterflies, and poignant vistas. Their origins are tied to ancient days, when a massive continental glacier was violently crumbling along its southern terminus. In warmer months, the incessant roar of meltwater was punctuated by thunderous crashes, as huge shards of ice tumbled down, soon to be buried in an outwashing rubble of soil and stones. As these terrestrial icebergs broke apart and melted, their subterranean volume was slowly replaced by water, eventually forming ponds and lakes on a raw, new moraine. As the melt line continued to recede northward, plants that abutted the southern edge of the ice colonized this recently exposed landscape, beginning to heal and bring order where all had been plunged into chaos.

From this theater of primordial forces, these new wetlands entered a quieter, gentler existence that endured for centuries, then millennia. Seeds that were broadcasted onto the land germinated and thrived in spots with the exact amount of sunshine and water saturation that they needed. In due course, these hardy plant pioneers arranged themselves in zones around the edges of open waterbodies. Thus began a slow process of growth and vegetational change that came to the basins they occupied, eventually transforming them into the wetlands we know today as ***bogs***.

This kind of ***mire*** developed in static ponds that depended entirely on precipitation and runoff for their moisture, and had highly acidic, oxygen-free water in their depths that precluded decomposition. Under these conditions, dead leaves and plants, dying bases of growing mosses, animal remains, and other debris built up deep layers of compacted ***peat*** in the anaerobic fluid. The process was very slow . . . over 11,000+ years. In later stages, mires exhibited thickets of tall shrubs around their outer edges, and dense growths of knee-high shrubs that grew out over the water, their abundant roots intertwining with floating rafts of *Sphagnum* mosses. Slowly the pond contracted in area as a thick mat of vegetation overspread its surface, while peat continued to fill the basin beneath, eventually closing as the bog aged. Ultimately, a forest of Tamarack, Black Spruce, Hemlock, White Pine, Red Maple, Yellow Birch, and other bog trees might develop.[1]

The floating mat provided a home for strange and lovely plants that became signature species of such sites — Pitcher Plants, Sundews, Cottongrass, Leatherleaf, Bog Rosemary, Labrador Tea, Cranberries, and the omnipresent Peat Mosses — which waltzed through gorgeous, vertical tapestries that were accented in summer by the Pitcher Plant's unique, red-and-green flowers, and several magnificent orchids, including Grass Pinks, Rose Pogonias, and White-fringed Orchis. Accompanying these were many associated animals and fungi.

The rim of a bog is a particularly powerful "*faerie juncture*," a magical seam in time and space that, in this case, offers entry into a sublime, secluded community, shrouded by the mists of time; a special place where relict flora and fauna linger, far to the south of their present centers of abundance in the boreal forests of the Northeast and adjacent Canada. The profound quiet of bogs brings a sense of ancientness that is wild in the extreme, a place deserving of gentle entry, reverent step, and deep respect.

This is the story of one small, pristine bog, with notes and pictures of the plants, mosses, lichens, insects, amphibians, and birds that I found living there, almost fifty years ago; and of the lasting influence one regional mammal had on this fragile ecosystem.

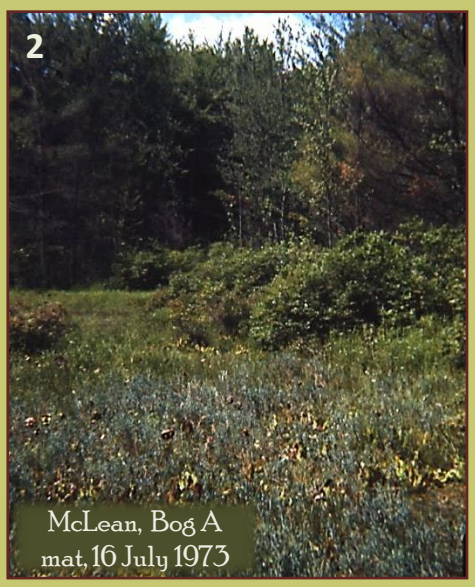
---

[1] **Ketchledge** (1964), **C. W. Johnson & Whorley** (1985), and **Damman & French** (1987) provide diagrams and text that detail the stages of bog development over long spans of time.

Bog Succession

Left: The **Pit Road Bog** near Wilson's Mills, Oxford County, Maine, has the most symmetrical structure of any bog I have seen, with its mat grown all the way across. **Right:** The much larger **Jam Pond Bog**, an "Adirondack-style" bog in central N.Y., still retains large areas of open water in the middle, remaining at an earlier stage of succession. Both mires are guarded by a ***thicket of tall, water-loving shrubs***; blending into a spiky ***palisade of conifers*** (including Black Spruce and Tamarack, signature trees of bogs); and a ***watery moat*** filled with deep muck.

From field guides and other literature, I knew of insectivorous ***Pitcher Plants*** and ***Sundews***, soggy ***Peat Mosses***, and tasty ***Cranberries***, but had never seen them growing together outdoors. My family and neighbors spoke vaguely of a "bog" on **Hungry Hill**, within a few miles of my home acres in the southern Catskills, and I had long hoped to visit it; but we did not know the owner, and had no access. In November 1970, my Uncle Hank was hunting deer near this wetland, and brought back a Pitcher Plant, which ended up in my hands. I studied it carefully, then drew three of the bizarre, hollow leaves, of seven in the rosette [**Fig. 1**], marveling over their elegant shape and wonderful red-and-green coloring.



Nearly a year later, in mid-September 1971, I finally visited a bog at the **Lloyd-Cornell Reservation at McLean** [period name, **Fig. 2**] during the second field trip of Dr. Richard B. Fischer's legendary class in "Field Natural History." This famous, 84-acre, woodland-and-wetland complex was the subject of a very early, very thorough biological survey that was conducted by eminent historical field biologists (Scientific Staff of Cornell University 1926).

Dr. Fischer's teaching method was to present a 50-minute lecture about an outdoor subject on Monday, which was designed to introduce concepts, capture interest, and build anticipation; then lead a 3-hour field trip later in the week, to visit the locality and highlight its plants, animals, and other natural history features. He projected magnificent color photographs to illustrate his lectures, and was mesmerizing in the field (**Fig. 48**, p. 23). Through his charismatic guidance, the outdoor world came alive to everyone in the class. They were the best field courses I ever had, and the class had a long waiting list each semester.

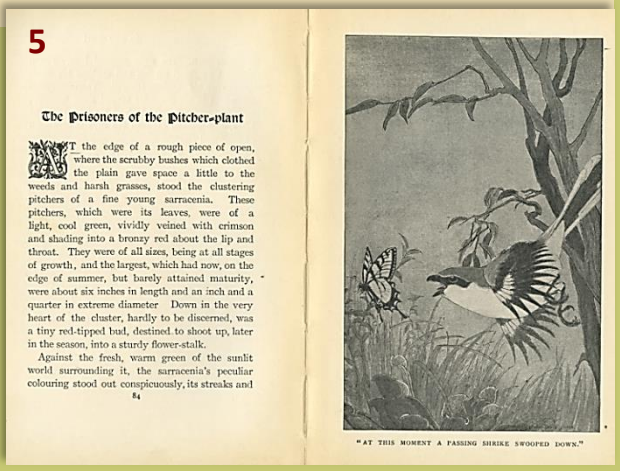
After nearly 50 years of wandering the **McLean Bogs Preserve** [as it is known today], while reveling in its atmosphere, and inventorying its plants, lichens, and butterflies, at times with student interns, it was fascinating to revisit my field notes from that first trip. The entrance path of today (off Sweetland Road) did not exist. In 1971, after meeting Mr. Marvin Young, an elderly farmer, who owned the land surrounding the Reserve, we drove through his fields, parked on the west edge of the Mud Pond Basin, and entered the woods. Dr. Fischer pointed out Christmas, Fancy, Northern Lady, Cinnamon, New York, and Sensitive Ferns as we followed a footpath through a damp forest of American Beech, Yellow Birch, Red and Sugar Maples, Black Cherry, and Hemlock. We also noticed Wood Nettle, Blue Cohosh, Mayapple, and White and Red Baneberries, as we continued along the trail to *Sphaerium Brook* (most of these plants grow in the same places today). In that stream corridor, I first saw the tiny "Fingernail Clams" (*Sphaerium simile*) that lived in the slow-flowing, shady, calcareous streambed (Zumoff 1973). After wading across, we scrambled up a steep, slippery bank to the rim of the earthen "dish" that surrounded the bog basin, and proceeded downhill into the wetland.

Today there is a boardwalk to facilitate access, but in that era we had to clamber through an outer conifer zone, soggy "moat," and inner shrub zone to reach the open mat, getting wet above our knees [**Fig. 3**]. I remember 20 students doing deep-knee bends in unison, and watching the trees tremble on the other side of the floating mat, as well as one bog-trotter losing a sneaker that came off in the clinging peat, too far down for anyone to reach. But my primary memories are of *the bog plants themselves*, including my first sightings of wild **Pitcher Plants** (*Sarracenia purpurea*), **Round-leaved Sundews** (*Drosera rotundifolia*), **Bog Rosemary** (*Andromeda polifolia*), **Leatherleaf** (*Chamaedaphne calyculata*), **Small Cranberry** (*Vaccinium oxycoccos*), **Labrador Tea** (*Rhododendron groenlandicum*), and **Tawny Cottongrass** (*Eriophorum virginicum*), all rooted in a garnet-and-green carpet of squishy **Peat Mosses** (*Sphagnum* spp.) [**Fig. 4**, *next page*]. A sheet of my class notebook still retains small snips of several of these — treasured souvenirs of a first experience with a wondrous and rare type of habitat.

Dr. Fischer assigned **Charles G. D. Roberts**'s dramatic story about "**The Prisoners of the Pitcher-plant**," from his book ***Haunters of the Silences*** (1907, pp. 84-91), as required reading about bogs [**Fig. 5**]. Roberts was the best of the "Nature Fakers" (Lutts 1990), a loose guild of authors, who, from the 1890s through the early 1920s, published fanciful stories about wildlife — some of them more *story* than truth. Later that autumn, while holding a Pitcher Plant leaf, I read this tale to spellbound students in a fifth grade class, during a lesson about bogs and bog plants (Dirig 1974, pp. 84, 88).

Friends and I revisited McLean on several occasions that semester and the following spring [**Fig. 3**], to study the microhabitats and special bog species more closely. In early June 1972, I finished at Cornell, and returned to the Catskills for a month before my summer job began in Ithaca. Primed by close study of a very well-known bog in the Finger Lakes Region, I looked forward to exploring the **Hungry Hill Bog**, an undocumented, essentially pristine wetland at the edge of my home area. When I talked to the owner, he agreed to let me investigate the bog, but stridently warned me about frequent encounters with Timber Rattlesnakes (*Crotalus horridus*). This only added spice to my anticipation!

Below I present my condensed field notes, art, and photographs, made in this bog over 16 hours on eight visits between 4 June and 23 October 1972, and another hour on 1 June 1973, during which I scrutinized the bog and began to describe and record its fascinating vegetation and rich biota.

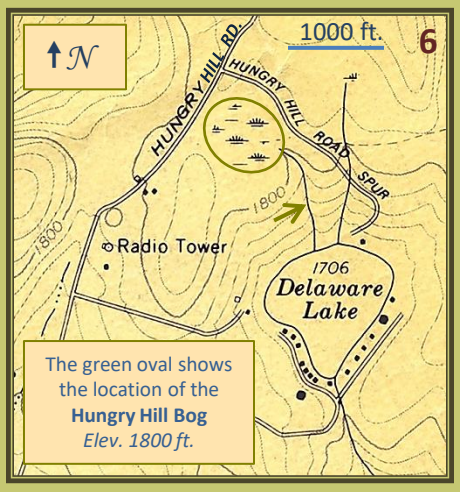


Exploring the Mire (1972-1973)

4 June 1972

I finally visited the bog, which was a few hundred feet from Hungry Hill Rd., on Hungry Hill* in Hancock Town, southern Delaware County, N.Y., about two miles north of Long Eddy (on the Delaware River), and 5 miles from my home in French Woods [**Fig. 6**].

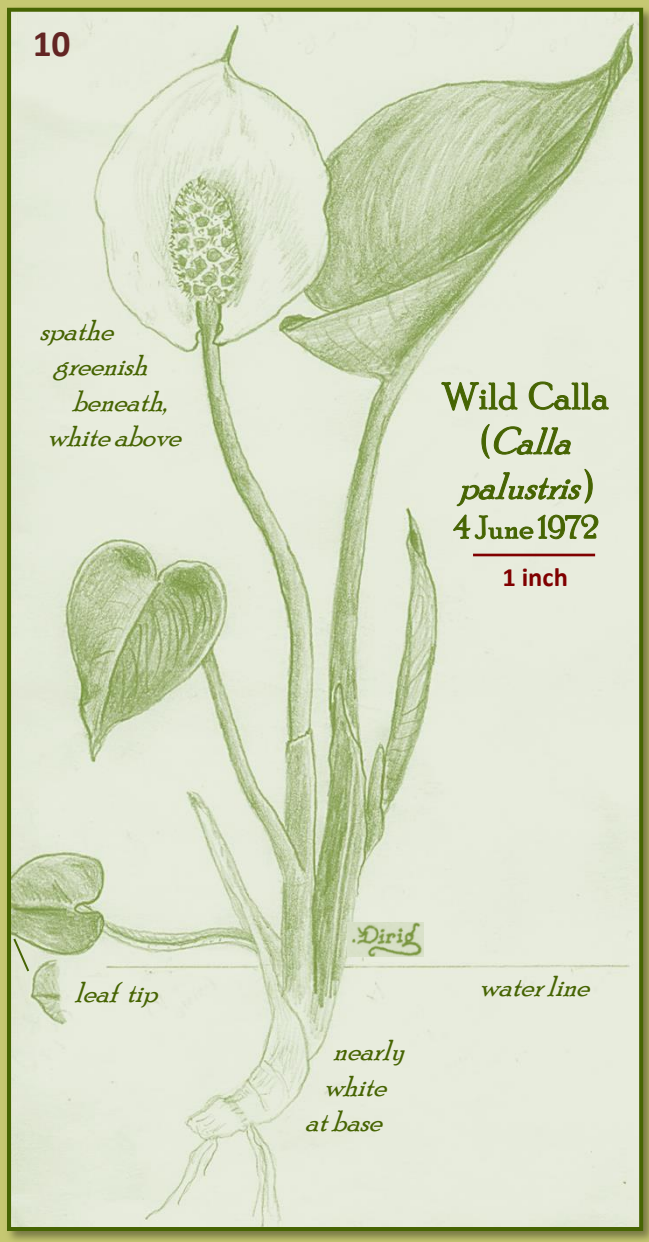
The bog sits in an 18-acre glacial depression, with a floating *Sphagnum*-heath mat grown all the way across, densely carpeted with **Leatherleaf** (*Chamaedaphne calyculata*), **Tussocked Cottongrass** (*Eriophorum vaginatum*, **Figs. 8-9**), and **Small Cranberry** (*Vaccinium oxycoccos*); magnificent **Bog Laurel** (*Kalmia polifolia*), which I had not seen before [**Fig. 7**]; blooming **Wild Callas** (*Calla palustris*), also new [**Figs. 10-11**]; and **Purple Pitcher Plants** (*Sarracenia purpurea*), with their nodding flowers almost open on 8-inch-high stems, all growing through a solid *Sphagnum* base. **Early Azalea** (*Rhododendron prinophyllum*), with elegantly formed, fragrant flowers of deepest rose-pink, **Winterberry** (*Ilex verticillata*), and tall ferns inhabit the surrounding swamp. And a mucky "moat" defines the mire's edge. Large **White Pines** (*Pinus strobus*) and **Hemlocks** (*Tsuga canadensis*) circle the open mat, grading into deciduous forest that surrounds the wetland. An intermittent stream overflows from the bog dish [**Fig. 6**, *green arrow*], dropping over 94 ft. in elevation, in an 1100-ft.-long channel, to Delaware Lake (called Perch Pond on older maps: Lounsbury 1933), which is presently a small, 23-acre "kettle pond" with a huge basin around it [**Fig. 6**]. *Quiet pervades*, making this cloistered mire an island of peace in a noisy world. I was too excited, while exploring the bog for the first time, to record many details; more will be added on future visits. This "peak experience" produced an exalted emotional plane that lasted until after midnight. I am eager for further exploration!



✱ **Why "Hungry Hill"?** An elderly resident (born in 1919) suggested that "people were hungry up there, since they lived on such a big hill, and couldn't get down in the winter." Another 98-year-old, lifelong resident (born in 1921), who was immersed in local history, did not know how the name originated.

Daphne du Maurier's novel ***Hungry Hill*** (1943) may derive from a 2247-foot-high prominence of the same name, the highest peak in the Caha Mountains of County Cork on the southwestern coast of Ireland. It has seemingly endless stretches of bogs and bare rock that troubled climbers who were trying to reach the summit. Perhaps Irish settlers in the southern Catskills named ours for a landmark in their homeland?

4 June 1972 *continued*



Tussocked Cotton-grass

11 June 1972

There 2:00 - 4:30 p.m. It was sunny, cool, and windy. I left my camera at home the first time, not knowing how wet the bog would be, but returned today with photographic equipment and fresh enthusiasm! The time flew — but seems to have little meaning in an ancient enclave like this. There is so much to investigate! [***Hindsight would reveal this visit to be the most thorough and productive springtime exploration of the entire survey.***]

Bog Laurel is out of bloom, with its graceful seed capsules a lovely red. **Sheep Laurel** (*Kalmia angustifolia*) has flower buds — it didn't a week ago. This evergreen shrub reaches the same knee-height as Bog Laurel, but its flowers arise from the axils of new leafy shoots, in contrast to Bog Laurel's, which occur in terminal clusters, and have an earlier bloom season in May. The leaves and twigs of these are also quite different [*compare* **Figs. 7** & **13**]. Abundant **Small Cranberry** vines sport pink flowers, with five reflexed petals around a long "beak" of orange fertile parts, gracefully nodding on long, *crane*-like necks, as its name suggests. I found a vine of **Creeping Snowberry** (*Gaultheria hispidula*) on the mat, its fragrance like that of nearby luxuriant **Wintergreen** (*G. procumbens*) plants, still with a few dry berries from last year, which grow at the edge of the opening. Mystically lovely white **Starflowers** [*Lysimachia* (formerly *Trientalis*) *borealis*] [**Fig. 12**] gather in graceful constellations of usually *seven*-pointed stars, twinkling in the shadows at the edge of the mat, in company with **Canada Mayflowers** (*Maianthemum canadense*). The **Sphagnum** carpet embodies the "riotous emerald joy" of growing mosses, with no hint of rose or red coloring on this visit.

Pitcher Plants are in full bloom — enchanting, lovely flowers with a faint but delightful fragrance (see images on pp. **2** & **12**). The flowers are nearly the size of a tulip, and grow on 12- to 18-inch-high stalks. Their new leaves are about 6 inches long, unfolding from last year's rosette, with only one flower per clump in all cases observed. When fully inflated, the mature, 8- to 12-inch-long leaves are modified to hold water, in which insects drown. Then the Pitcher Plant digests them to provide nutrients it cannot obtain from peat or highly acidic bog water. Many are still in bud.

I walked all the way across the mat, carefully testing my footing by probing with the long handle of my insect net, and was delighted to discover it is solid and safe! After photographing several views from the mat surface, I climbed 30 feet up into a dying **White Pine** on the west side of the mat to take aerial shots from that vantage [Figs. **1-3** on the next page (*Scenics*)].

Starflower

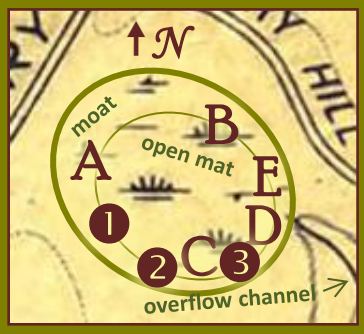
Wild Callas are blooming, some still opening [**Fig. 11**]. **Early Azalea** [**Fig. 14**] in the surrounding swamp remains in bloom, although several flowers have fallen. The bushes reach 12 feet in height, and the rose-pink, velvety flowers remain delightfully fragrant, appreciated also by Bumble Bees (*Bombus* sp.). **Leatherleaf** shows new shoots nearly fully unfolded at the tips. I caught dragonflies (Odonata), and saw two mating in flight, the female laying eggs in the sphagnum mat. The piercing whine of mosquitoes is evident; and I saw a **Tiger Swallowtail** (*Papilio glaucus* group, likely *P. canadensis*), and several tiny, very attractive, day-flying "butterflies" (I collected a couple). I started to look them up under metalmarks (*Calephelis*),

[*Text continues on page 11.*]

Hungry Hill Bog Scenics

*All images taken 11 June 1972, except **D***

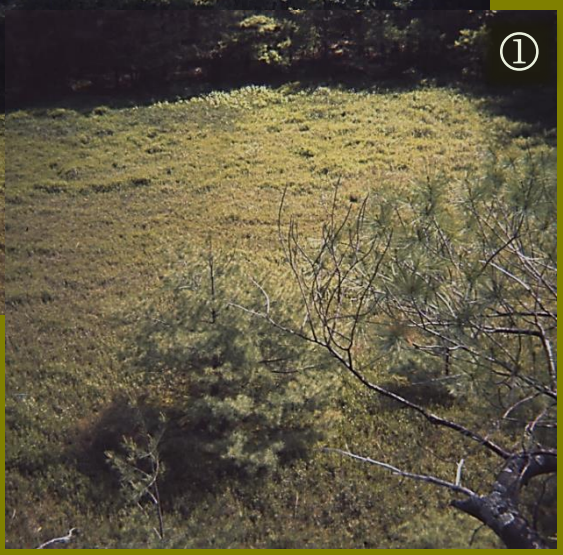
West rim of the open mat



Heavily shaded northeast rim

South rim of the open mat

A: Small White Pines colonizing the mat. Aerial views **1**-**3** were taken from a dying White Pine (*DWP*) in the background.



1-3: A montage of three aerial views, showing the south rim of the open mat, from 30 ft. up in a dying White Pine. **A** (*top left*) is a view of the bog mat at the base of the dying Pine; its branches frame views 1 and 2.

Bog Map: The ***bold outer oval*** defines the edge of the bog basin; the ***inner oval*** is the approximate rim of the open mat. A spillway of the basin fed a small intermittent stream (southeast of *D* on the map) that drained into Delaware Lake [**Fig. 6**, p. 8].

Photo D shows the author (*left*), and a dead, fallen White Pine (*arrow*) where the Grass Pink grew within a large, very wet Calla patch.

East rim of the open mat

Southeast rim of the open mat. *Photo by J. F. Cryan, 22 July 1977*

11 June 1972 *continued*

▲ **Black-banded Orange** [Moth] Jam Pond Bog, 27 May 2002

then noticed the lack of knobs on their antennae, and realized they were *moths*, finally finding an image that matched in Holland's *Moth Book* (1903, plate XLIII, fig. 26). It is the **Black-banded Orange** (*Epelis truncataria*, wingspan ⅝ - ¾ inch), a geometrid that feeds as a larva on Leatherleaf [**Fig. 15**]. This miniature diurnal lepidopteran adds subtle charm and animation to the bog mat.

On the rim of the mat, where they find a more solid substrate, **Goldthread** (*Coptis trifolia*)'s white blooms are still open, but fading. Thickets of **Cinnamon Ferns** (*Osmundastrum cinnamomeum*) surround the mat on all sides, and fill openings in the bordering swamp. Small **Red Maples** (*Acer rubrum*) and **White Pines** are seeding out onto the mat [**A** & **E** on p. **10**]. I notice only *Sphagnum* growing beneath these — suggesting that the knee-high shrubs of the open mat can't tolerate their year-long shade or competition (or maybe the degree of saturation is lower there). A trail with droppings indicated the presence of **White-tailed Deer** (*Odocoileus virginianus*). I stowed my camera and other field paraphernalia at the edge of the mat while scouting the rim. Returning a few minutes later, two deer with beautiful reddish-brown coats had indeed appeared in the center of the mat. I scared them while trying to retrieve my camera. **Tussocked Cottongrass** (*Eriophorum vaginatum*) grows in numerous clumps on the mat [**Fig. 8**], my photo blurring from constant movement of the slender, green, 18-in.-tall culms. Their beautiful, fluffy seeds imply wind-dispersal [**Fig. 9**]. **Great Laurel** or **Rosebay** (*Rhododendron maximum*) also grows in the swamp!

19 June 1972

I returned briefly to photograph the **Sheep Laurel** and **Small Cranberry**, correctly anticipating that they would be in bloom. The Sheep Laurel is just beginning to flower, but I found a few plants with the clusters fully open [**Fig. 13**]. **Callas** also are still flowering.

Small Cranberry is blooming all over, and there's a great deal of it [**Figs. 20-21**]. A **Viceroy** butterfly (*Limenitis archippus*) flushed from the center of the mat (on this cloudy day); I can't imagine what it's doing there, as I notice no larval hosts [willow (*Salix* spp.) or poplar (*Populus* spp.)]. Mosquitoes bit me all over my hands and face while taking pictures. I also flushed a **Black-banded Orange** moth again, but it was very cloudy and misty, with not much evident animal life. I had hoped for **Bog Copper** butterflies (*Lycaena epixanthe*; **Fig. 22,** p. 13), whose larvae eat Cranberry, but saw none; if they were here, their flight season should begin about now, lasting through the beginning of July.

▼ **Eastern Towhee**'s nest

18

◀ **Veery**'s nest

13 June 1972

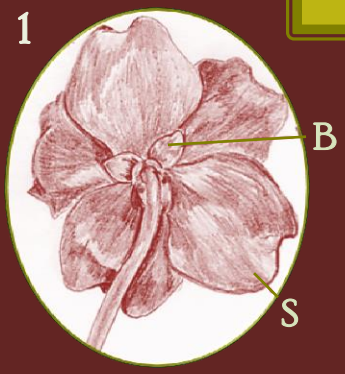
There 8:00 to 11:15 a.m. I thoroughly searched, but found nothing newly in bloom. A **Red Eft** (juvenile stage of the Eastern Newt, *Notophthalmus viridescens*) and a small **American Toad** (*Anaxyrus americanus*; old genus *Bufo*) crawled on the mat; and fresh nests and eggs of the **Eastern Towhee** (*Pipilo erythrophthalmus*) [**Figs. 16-17**] and **Veery** (*Catharus fuscescens*) [**Figs. 18-19**] made charming pictures on the ground in the entrance woods.

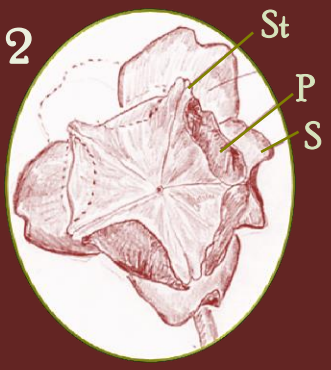
[*Text continues on page 13.*]

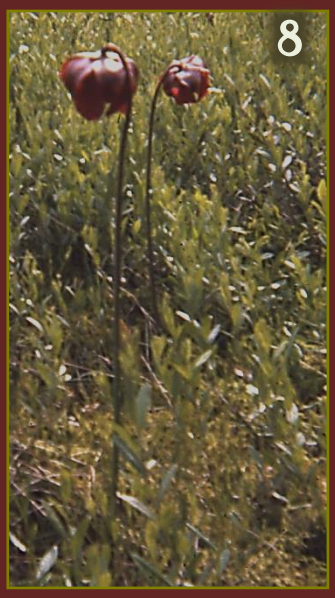
11 June 1972

The Wonderful Pitcher Plant!

All images from 11 June 1972, except as noted



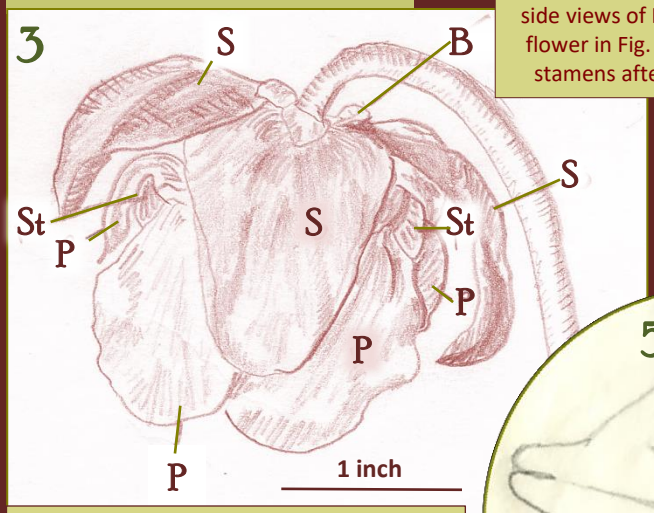


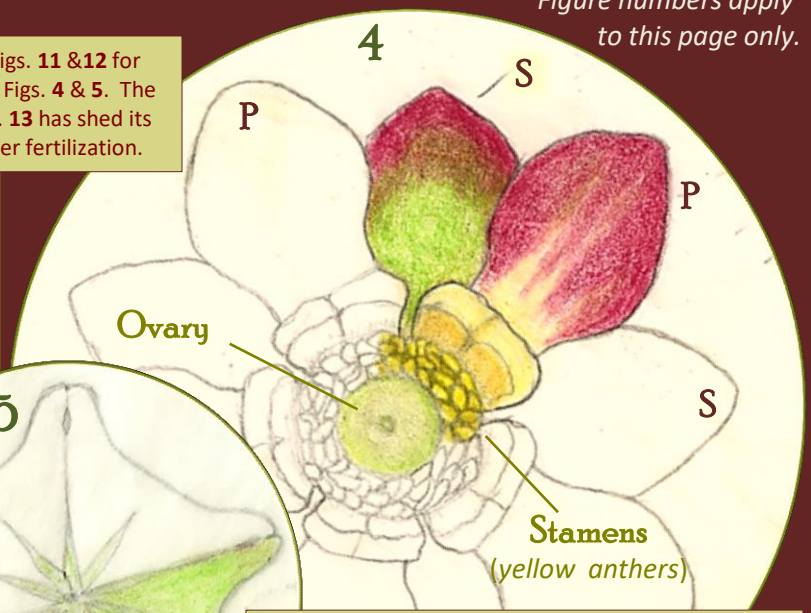


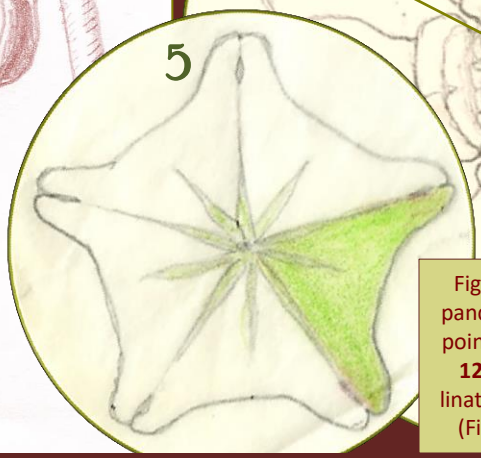
The **flowers** are the size of a tulip, and grow on 12- to 18-inch-high stalks (*scapes*, Fig. **8**). Drawings **1-5** show flower structures (**3-5** are life size). Fig. **6** shows the gorgeous leaf shape and design, with white, downward-pointing *bristles*; Fig. **7** is a mass of water-filled leaves. Fig. **9** suggests the grace of the nodding flowers. Fig. **10** shows a female sarcophagid fly resting on a sepal.

Figure numbers apply to this page only.

Compare Figs. **11** &**12** for side views of Figs. **4** & **5**. The flower in Fig. **13** has shed its stamens after fertilization.







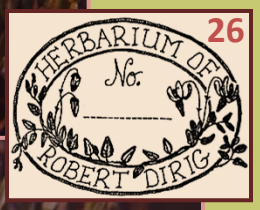
Key to Symbols

B = bractlet, S = sepal, P = petal, St = stigma (on inside)

Figs. **4-5** were drawn from flowers near Ithaca, N.Y., on 18 June 1989.

Fig. **5** shows the beautiful outer surface of the expanded, umbrella-shaped summit of the style. Each point bears on the inside a small hooked stigma (Fig. **12**, circle) that receives pollen from entering pollinators, including bumble bees and sarcophagid flies (Fig. **10**). Figs. **11-12** show side views for context.

19 June 1972 *continued*



A male **Bog Copper (*Lycaena epixanthe*)** at McLean Bog, 20 June 2004. The larvae feed on Cranberry. I was disappointed not to find it at the Hungry Hill Bog (see DISCUSSION & SUMMARY, p. 18).

Pitcher Plants are at the height of their bloom [Figs. **8-9** on p. 12] — lovely, and many more than meet the eye at first glance. Their rosettes of odd leaves are well hidden among the dense shrubs and deep sphagnum that cover the whole mat [Figs. **6-7**, p. 12]. If it were not for their advertising flower stalks, they'd be hard to find. The flower I photographed reveals that the yellow anthers have already been shed [compare Figs. **12** & **13** on p. 12]. Some of the **Pitcher Plant** flowers are past their peak, when the petals turn deep crimson and drop. New leaves of the Pitcher Plants continue to inflate in the center of the rosettes; it was a great surprise to discover that they are first flat and closed, then expand later to fill with rainwater. A **Carrion Fly** (Sarcophagidae) was hanging around the flowers [Fig. **10** on p. 12]. [*Pitcher Plant figure numbers apply only to p. 12.*]

26 June 1972

There 3:15-4:45 p.m. It was cloudy and cold, after a week of heavy, daily rains and hurricane-force winds.

PLANTS: The peak of **Pitcher Plant** bloom is past — a few are still fresh. Many flowers have shed their corolla and stamens [Fig. **13**, p. 12]. In some plants, the inner surface of the style's expanded "umbrella" is covered with mold, perhaps from traces of pollen or nectar? **Small Cranberry** [*left*] is still in flower. **Sheep Laurel** is more fully open; I predict at least another two weeks for its bloom season. No new plants are blossoming. On the mat, **Wintergreen** is sending up new leafy shoots. Several **lycophytes** (Ground Pines) were noticed around the periphery (in the woods), with new, yellow-green growth at the tips of the branches, looking like miniature Hemlock twigs [*see upper left corner of* **Fig. 17**]. The **Early Azalea**'s flowers are past. **Callas** are still in bloom, but nearing the end of their season, with perhaps two weeks to go.

ANIMALS: A **Maryland Yellowthroat**'s (*Geothylpis trichas*) nest, which I found on 19 June beneath **Leatherleaf** tangles on the mat, is made of mosses and dried roots, and lined with reddish-brown rootlets. There are three young chicks with pinfeathers started, at least 4-5 days old, their bright yellow-orange maws [**Fig. 23**] adding a subtle juvenile dimension to the name "Yellowthroat"! Adults (especially the male — [**Fig. 24**] scolded all the while I was there, but did not return to the nest.

I found a **frog** I've never seen before: dark brown with *round black spots on its back*, similar to those on a Yellow-shafted Flicker's (*Colaptes auratus*) or young Robin's (*Turdus migratorius*) breast in size and arrangement. It was secretive, and made short jumps, hiding beneath a Leatherleaf tangle, where it may have burrowed into the sphagnum. A review of field guides showed this to be the brown morph of the **Northern Leopard Frog** (*Lithobatis pipiens*; older genus *Rana*). [**Fig. 25** shows the gorgeous bronze and emerald morph from the Finger Lakes Region of N.Y.] I also noticed a 1-inch-long **American Toad**.

➤ **Maryland Yellowthroat** & nest

➤ **Northern Leopard Frog**

I first heard, then saw, a **Ruby-throated Hummingbird** (*Archilochus colubris*) emitting faint squeaks at the edge of the mire, while it jousted with the **Yellowthroat**. I did not see it visit any flowers. [Also many overly friendly mosquitoes!]

Insect Visitors to Pitcher Plant Flowers: ♦ I watched many grey **Carrion Flies** (Sarcophagidae) — females are 1/3 larger than males. The males attempted to mate. My photo [Fig. **10** on p. 12] shows a female landed on a sepal, where these flies often rest. These plants have a "raw meat" color. The flies are also often found inside the Pitcher Plant flowers, wallowing through the stamens. They are difficult to catch. At times, over 75% of the flowers had a fly sitting on top. [R. B. FISCHER noted at McLean, in Sept. 1971, that these **Sarcophagid flies** help pollinate the flowers of Pitcher Plants. Their larvae also live exclusively in the water inside Pitcher Plant leaves, scavenging dead insects in the fluid. They breathe air through spiracles on the end of the abdomen, which close when the larva is submerged. Larvae wrap around their floating "prey" to hold it while feeding. See Dahlem & Naczi (2006) for further information on these flies.] I also saw a **Greenbottle Fly**. ♦ When I first entered the bog, I noticed a female **Monarch Butterfly** (*Danaus plexippus*) flying around, landing on, and sipping nectar from **Pitcher Plants** and **Sheep Laurel** flowers. I caught the Monarch with my net, then released her, hoping for a photo, but she immediately flew straight up, circled, then landed on top of a White Pine tree on the periphery. ♦ I also watched three **Bumble Bees** (*Bombus* spp.) pollinating the

26 June 1972 *continued*

Pitcher Plants. They push their way inside the flower, where hidden from view; their constant buzzing must heavily dust them with pollen before they exit [*see flower diagrams on p. 12*].

The mat is quite trampled, just from my few visits. This underscores how fragile such habitats are. They do not recover quickly from even minimal human intrusions, and may be damaged by overuse.

Grass Pink

16 July 1972

I was home briefly from Ithaca, and spent an hour at the bog, noon-1 p.m. It was very hot and muggy. The **Cinnamon Ferns** that surround the open mat on all sides are taller than I am. What a jungle! Spathes of the **Callas** have turned green or disintegrated, while the now-green, swollen spadices are well-developed. These plants spread by submerged runners.

The mosquitoes thrive! A male **Great Spangled Fritillary** (*Speyeria cybele*) was flying in the bog clearing when I arrived.

I found one **Grass Pink** (*Calopogon tuberosus*) plant at the east edge of the mat, in an emergent patch of **Callas** near a dead, fallen pine [Scenic **D**, p. 10]! The slender, 14-inch-high stem bore two striking magenta flowers with a cinnamon-like fragrance, and three more buds on top [**Fig. 27**]. Its single, narrow leaf protruded from Sphagnum at its base. A diligent search all over the mat and around the edges revealed no more plants. This is my first sighting of this exquisite native orchid.

Sheep Laurel still has a few blooms, but its season is almost over. I found much **Creeping Snowberry** on the east side, near the rim, in the open, in areas with sparse shrubs. **Pitcher Plant**'s new leaves are well developed, the flowers past. Some **Sphagnum** is faint pinkish. I wonder if it changes color as the seasons progress? Another (or the same?) **Leopard Frog** hopped near the **Calla** patch, beneath the fallen pine.

Bog Rosemary (*Andromeda polifolia*) is here! It was not evident earlier, and I looked very carefully. The plants were hidden by the Sphagnum, and were only visible today, due to new shoots growing above the top of the moss mat. The **Cranberry** bloom period is over, its unripe, 6-mm-diameter, yellow-green fruits resembling unripe **Highbush Blueberries** (*Vaccinium corymbosum*) in the moat. Cranberry is a fragile-looking but surprisingly resilient little plant. It is featured on my herbarium seal [**Fig. 26**], based on my acquaintance with it at this bog. The new shoots of **Leatherleaf** are well firmed up, as are those of **Bog Laurel**. The deserted **Yellowthroat**'s nest is now filled with fallen Leatherleaf leaves.

I noticed THREE AESTHETIC THEMES in the bog: Many ***sunlit plants had red or pink flowers, autumn leaf color, and fruits*** (Pitcher Plant, Grass Pink, Small Cranberry, Bog Laurel, Sheep Laurel, Mountain Laurel, Early Azalea, Great Rhododendron, Winterberry, and Red Maple); while low ***white flowers grew in shaded microhabitats*** around the edge of the mat (Goldthread, Starflower, Canada Mayflower, Wintergreen, Wild Calla, Indian Pipe, and Turtlehead). A year-old Pitcher Plant leaf, now dying in crimson glory, provided wonderful contrast for a newly-opened one of cool beryl-green [**Fig. 28**] — the ultimate expression of an ***overall red-and-green theme*** on the bog mat, which is always present in these wetlands.

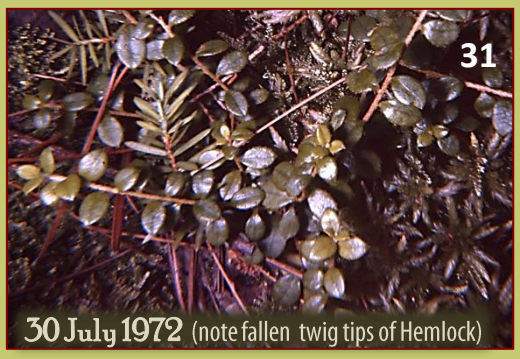
30 July 1972

I was at the bog from 10:30 a.m. to noon. A lovely day. Much of the outlying swamp is dried up, including places I scarcely dared to step into before. There were a few new **Calla** flowers, but most have fruited. I saw one *leaf* with partial *white* coloring, and another with a *double spathe*; those collected on 8 June 1976 may have been from the same plants [**Figs. 46-47**, p. 21].

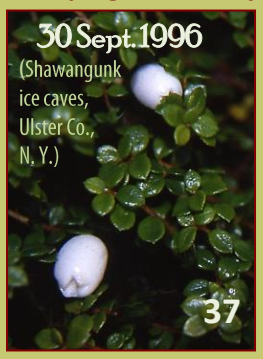
Great Laurel's flowers are nearly gone, and shedding spent, pale-pink corollas onto the moss. A **Great-spangled Fritillary** flew over the mat. The Sphagnum is rather dry, and some now appears to be turning red, like it was at McLean last fall [**Fig. 4**]. The ***Sarracenia***'s nodding flowers are past, and the calices of some have changed from dark red to chartreuse. Most of the new leaves are fully unfolded, as the old ones turn red and die [**Fig. 28**]. A few leaves of **Winterberry** (*Ilex verticillata*) have turned bright red [**Fig. 29**], and also those of **Bog Laurel** [**Fig. 30**]. I took photos of a **Creeping Snowberry** vine at the edge of the mat [**Fig. 31**], with two fallen tips of Hemlock twigs lying on the moss. I searched for but did not notice any sundews. **Wintergreen** is budded. Alabaster clumps of **Indian Pipe** (*Monotropa uniflora*) have pushed

30 July 1972 *continued*

up through the bog mat and surrounding forest litter — it is such a lovely plant [**Fig. 32**]! **Tawny Cottongrass** (*Eriophorum virginicum*) is blooming, showing squiggly pistils and pale anthers [**Fig. 33**]. The **Grass Pink** has but one flower left — this year's show almost gone.



Creeping Snowberry



23 Oct. 1972

My cousins Rebecca and Sarah Nevin came with me. The bog mat is browned and autumnal. **Leatherleaf** foliage has turned from its summer olive [**Fig. 34**] to purplish-brown, maroon, crimson, and green. **Sheep Laurel**'s leaves are evergreen, remaining the same matte jade. Current year's shoots of **Bog Laurel** are glossy, more highly textured, and evergreen, but last year's are scarlet. The five-needled fascicles of **White Pine** have yellowed and dropped all over the Sphagnum beneath them. **Tawny Cottongrass** is fruiting prettily [**Fig. 35**], the beige seed-heads seeming to float as they dance on their slender green culms over the mat. This top-heavy architecture is perfect for a plant that disperses as fuzzy, windblown seeds. Several **Pitcher Plants** have turned red, showing full growth of new leaves; the grey ghosts of the flower stalks remind me of their spring miracle. Abundant **Small Cranberries** are ripe and quite tart [**Fig. 36**]; we picked about a quart in an hour. There are no red berries on the **Winterberry** (maybe it is a staminate clone?), and its leaves have turned brown. ***Sphagnum*** has turned pinkish-red in places, where earlier it was emerald green. A few red berries gleam on **Wintergreen** plants, among their bronzed leaves. There are no white fruits on the **Snowberry**, as usual at this latitude. [I've only seen them fruiting in a deep, boreal "ice cave" in a Shawangunk fault near Ellenville, Ulster Co., N.Y. [**Fig. 37**], and at the northern edge of New Hampshire. When found, the oblong fruits are glossy white, and have the same fragrance and flavor as Wintergreen.] This beautiful plant is a quintessential boreal relict this far south. We also saw two **American Toads**.

11 Sept. 1977 [#321]
Tawny Cottongrass

1 June 1973

A fresh **Black-banded Orange** moth was flying in spring glory over the mat.

Documenting the Mire (1975-1977)

I left the area in January 1973, to work at Cornell University until the end of May in 1976, and began my herbarium of southern Catskill plants, lichens, and bryophytes in October and November 1975. Recognizing the need to document the Hungry Hill Bog, I collected a few insects and pressed a few bog plants in July 1975, between April and August 1976, and from May to September in 1977, defining my field philosophy for an ongoing regional biological inventory at the same time (Dirig 1977). I also unexpectedly changed my profession to become a botanical and mycological curator soon after this. The documentation phase occupied 19 additional hours on nine visits between 5 July 1975 and 11 Sept. 1977 (with additional quick roadside stops on 4 Sept. 1982 and 3 May 1988).

5 July 1975: During a brief daytime visit, I collected a **Virginia Ctenucha** (*Ctenucha virginica*) on the bog mat (Dirig 2018, Dec., p. 260, 262). This beautiful moth has white-fringed, matte-black forewings and jet-black hindwings, set off by a glossy blue-green body with bright orange thorax. It flies in the daytime, and also comes to lights at night.

17 April 1976: Sunny, unusually warm (90°F.). At the bog with John F. Cryan and Matthew Dirig. A large, dusky ♀ **Toothwort White** (*Pieris virginiensis*), a common, native spring butterfly of forests, flew across the mat. A bumble bee (*Bombus* sp.), a fly, a winged ant, a click beetle (Elateridae), & a Greater Bee Fly (*Bombylius major*), with elegant brown costas on its crystalline wings, were collected or observed.

10 May 1976: A beautiful clear day, 75°F., full sun, there 12:30-1:30 p.m. Hungry Hill Road was very muddy and deeply rutted by logging trucks; my car sank to the rear axle in mud when I tried to turn around where a large, lingering snow bank blocked the way near Deck Road, on the north end. Even though this hilltop has some boreal flora, May 10th seems rather late for snow! It may have piled up from a whole winter's plowing. But the *Klondike Road* in French Woods was named that for the lingering snow banks that persisted into late spring on shaded, north-facing slopes in the Victorian Era.

Plants in bloom: some **Leatherleaf**, **Goldthread**, one shrub of **Bog Laurel**, a large **Highbush Blueberry** bush, and a sedge. **Wild Callas** have sprouted.

I collected several **insects** on the mat: two **Cherry Gall Azures** (*Celastrina serotina*); a **Mourning Cloak** (*Nymphalis antiopa*); a ♀ **Clouded Sulphur** (*Colias philodice* — usually a meadow butterfly); a worn **Toothwort White**; and three of the small **Black-banded Orange** moths; plus two flies, one small bee, and a click beetle. An **American Toad** was active on the mat. Few plants were blooming; I collected **Highbush Blueberry**, **Bog Laurel**, **Leatherleaf**, and **Creeping Snowberry**.

I was attracted by a loud buzzing inside a **Pitcher Plant** leaf. A large Bumble Bee was inside a leaf of average size (7½ in. long), with about 1 in. of water inside the base. A hole in the Pitcher had prevented it from filling any further. The bee was buzzing and crawling violently at 12:40 p.m. The insides of the pitcher were so slick it could not crawl out. It was still moving, but buzzing had ceased by 1:15, and it stopped moving by 1:30, when the leaf was collected with bee inside, and put in a tightly closed plastic bag. The bee was still active, very weak, wet, and bedraggled, but in possession of all its tarsi, etc., when released at 2:00 p.m. the next day.

8 June 1976: 85°F. ***This was a very important day for scientific explorations.*** I collected 11 vascular plants, and made my first thorough investigation of any bog for **LICHENS**, finding several characteristic genera and species for the first time — **Beard Lichens** (*Usnea* spp.), **False Lungwort** (*Platismatia tuckermanii*), **Burred Horsehair Lichen** (*Bryoria furcellata*), **Chicita's Sea-storm Lichen** (*Cetrelia chicitae*), **Powdered Speckled Shield** (*Punctelia perreticulata*), **Boreal Oakmoss** (*Evernia mesomorpha*), and the magnificent **Common Antler Lichen** (*Pseudevernia consocians*) [**Fig. 38**]. I also collected several **DRAGONFLIES** [a ♀ **Common White-tail** (*Plathemis lydia*); a ♂ **Twelve-spotted Skimmer** (*Libellula puchella*); plus four others (*indet.*)]. Other insects included six ants (four winged) from 3 ft. up around a dead Hemlock trunk; a syrphid fly, three ichneumonids, a click beetle, and another beetle; plus two **Cherry Gall Azures** (♀ & ♂). A worn ♀ **Hummingbird Clearwing Sphinx** (*Hemaris thysbe*) was taking nectar at Early Azalea (Dirig 2016, p. 43)! It is rarely seen in the first brood (the second brood flies from late July to the end of August).

The most dramatic insect I saw at this bog was a ♀ **Laurel Sphinx** (*Sphinx kalmiae*) moth. She had just emerged from the pupa, and was crawling through knee-high shrubs on the open mat at 12:15 p.m. She settled 1 ft. up in a dense thicket of Leatherleaf and Sheep Laurel at 12:30, her limp wings hanging down with their dorsal surfaces together. The wings were nearly full size by 12:40, and at 1:00, the normal rest position was assumed, with the forewing dorsals exposed and flat. This very well camouflaged position was maintained throughout the afternoon, until the moth was collected at 7:00 p.m. [**Fig. 39**]. A careful search did not reveal the pupal shell (it may have been buried in the sphagnum). Bog Laurel also grew on the bog mat, with Mountain Laurel (*K. latifolia*) in the surrounding shrub zone. The larva that produced this moth may have fed on one of these Laurels — or on White Ash (*Fraxinus americana*), which is a major hostplant, according to Wagner (2005, p. 259), who only listed Oleaceae (which includes ashes) as hosts. [Forbes (1948, p. 191) also suggested that these larvae do not actually feed on *Kalmia*.] See Dirig (2016, p. 40) for further context of this moth in the Catskills. Finding any emerging large lepidopteran outdoors is a rare encounter.

25 August 1976: I collected **Centered Peat Moss** (*Sphagnum centrale*) around the roots of **Turtlehead** (*Chelone glabra*) in the moat surrounding the open mat. Also collected more lichens: my first **Powder-edged Ruffle Lichen** (*Parmotrema stuppeum*), and the lovely yellow **Powdery Sunshine Lichen** (*Vulpicida pinastri*), a dramatic boreal relict, plus four others; also three vascular plants.

Laurel Sphinx

30 May 1977: Collected a ♂ **Chalk-fronted Corporal** (*Ladona julia*), a dragonfly species of "boreal ponds and bogs" (Curry 2001: p. 235).

16 June 1977: A **Northern Leopard Frog** and twin fawns of **White-tailed Deer** flushed on the mat. I collected **Narrow-leaved Peat Moss** (*Sphagnum angustifolium*) on the open central mat, intergrown with **Small Cranberry**; also one dragonfly (*indet.*), 2 Sarcophagid flies (♂♀), a syrphid, and 1 tabanid; and 1 moss, 3 lichens, and 4 vascular plants.

22 July 1977: I collected plants and a few mosses and lichens, including a better specimen of **Powdery Sunshine Lichen** [**Fig. 40**]; and **Salted Starburst Lichen** (*Imshaugia aleurites*, new to me). Also two fungi (*Stemonitis* sp. and a coral fungus). And 4 dragonflies on the mat (*indet.*), 4 sarcophagids, 6 tabanids, 2 hornets, and 2 ichneumonids.

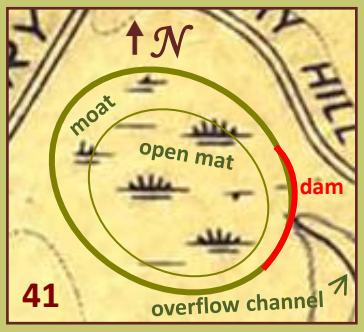
40
Powdery Sunshine Lichen

11 September 1977: ***This was the marathon collecting day***, a bookend to 11 June 1972, this time with my friend and field collaborator, John F. Cryan, and including a botanical inventory of the nearby north shore of Delaware Lake [see **Fig. 6** and Appendix 5] — *and most fortuitous, considering what happened between then and April 1978*! We collected **Fringed Peat Moss** (*Sphagnum fimbriatum*) on a shaded hummock and **Graceful Peat Moss** (*S. girgensonii*) in fruit in the north moat. [Also **Lescur's Peat Moss** (*Sphagnum lescurii*) on the west shore of Delaware Lake.] **In the bog**: *Collected* six mosses and twenty-two vascular plants; **on the north shore of Delaware Lake:** thirty-three vascular plants, two mosses.

April 1978: I returned with keen anticipation of continuing the documentation of vernal bog elements, but faced a major disappointment:

Calamity and Outrage! The bog has been destroyed by Beaver flooding!

The entire basin was engulfed, with bare, standing, dead conifers and other trees and shrubs — a fetid horror! A walk around the periphery disclosed the dam at the overflow point on the southeast side [**Fig. 41**]. It was a great shock to witness the demise of such a precious place, which had heretofore been secure. After altering the water level of Delaware Lake, years before, Beavers had proceeded up this small channel, serially damming it like rice paddies, until they reached the bog. By blocking the overflow point, they raised the water level several feet, thus drowning the entire bog basin.

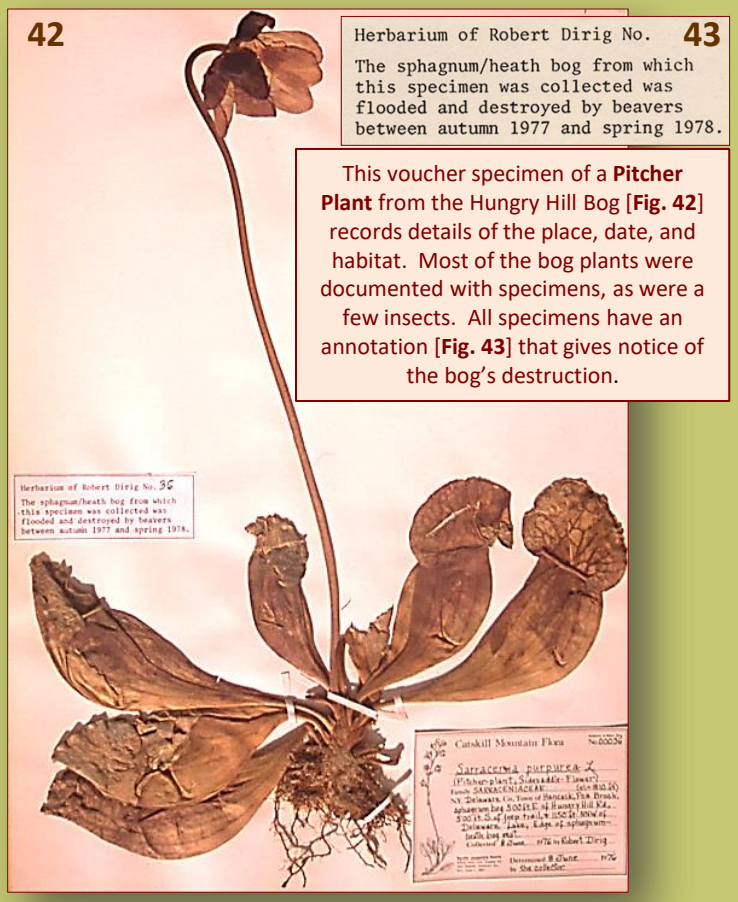


4 July 1978: My brother Matthew and I revisited the north edge of Delaware Lake, greeting the **Northern Bog Clubmoss** and **Round-leaved Sundews** on the lakeshore, and collecting **Blue Ground Cedar** (*Diphasiastrum tristachyum*) with strobili on an open, exposed knoll (Dirig 2018, June, p. 20, fig. 122).

4 Sept. 1982: I returned with Chong-wook Park of Seoul, South Korea, a Cornell Ph.D. student, and expert on a group of smartweeds [*Persicaria* spp.], to look for **Halberd-leaved Tearthumb** [*Persicaria* (formerly *Polygonum*) *arifolium*], which I had found in the north moat in 1977. We did not see it, after the flooding. ***I had hoped the bog might recover if the beaver dam disintegrated, but it has not.*** We also collected **American Marsh Pennywort** (*Hydrocotyle americana*) at the edge of the water on the north rim of the basin.

3 May 1988: I collected a **Jack-in-the-Pulpit** (*Arisaema triphyllum*, ssp. *stewardsonii*) at the northern edge of the original mire (moat), 10 years after flooding. ***The bog has not recovered***, ten years later.

30 Aug. 2017: During a quick drive-by, the bog depression could be glimpsed from Hungry Hill Road as ***a large, open, treeless mire***, behind a new house at the corner of Hungry Hill Road Spur, where the bog was still intact, forty years ago. A ***Millennium Pipeline Compressor Station*** looms a short distance to the south along this road.



This voucher specimen of a **Pitcher Plant** from the Hungry Hill Bog [**Fig. 42**] records details of the place, date, and habitat. Most of the bog plants were documented with specimens, as were a few insects. All specimens have an annotation [**Fig. 43**] that gives notice of the bog's destruction.

Discussion & Summary

Close study of the *Pennsylvania Atlas & Gazetteer* (DeLorme 1990, pp. 40-41) reveals a number of perched lakes on both sides of the Delaware River, including **Somerset Lake**, **Pierce Pond**, **Sand Pond**, **Cranberry Marsh**, and **Basket Pond** in Delaware County, N.Y.; more in the "bog belt" of southern Sullivan County, N.Y.; and in adjacent Wayne Co. Penna. (Dix 1965, p. 6). Tantalizing hints of a richer, vanished bog flora persist around the edges of regional kettle-lakes — **Northern Bog Clubmoss** (*Lycopodiella inundata*) and **Round-leaved Sundews** (*Drosera rotundifolia*) at Delaware Lake, **Large Cranberry** (*Vaccinium macrocarpon*) and the same Sundew at Pierce Pond in French Woods, and the **Sundew** also on a seepy road bank in Pea Brook. The name "Cranberry Marsh" itself is telling, but it had been drowned by a Beaver pond when I checked it in the 1970s. The **Hungry Hill Bog** may originally have been a *tangential mire* of a much larger bog that filled the Delaware Lake basin nearly to the same 1800-foot level, a few thousand years ago [**Fig. 6**]. European settlers, arriving in the 1800s, likely dredged (or "chained") the edges of present-day Delaware Lake soon after they arrived.

The plants and animals I recorded from the open mat of Hungry Hill Bog closely matched those of the **Dwarf Shrub Bog** community, as characterized by Carol Reschke (1990, p. 30), while the surrounding swamp and moat resembled her **Highbush Blueberry Bog Thicket** community (*loc. sit.*, p. 31). Dr. Richard E. Andrus,* a *Sphagnum* specialist at SUNY Binghamton, identified the few peat mosses I collected in this mire. He categorized *Sphagnum angustifolium*, which I found on the open mat, as "***ombrotrophic***" [living where water derives from precipitation] to "weakly ***minerotrophic***" [with water coming from springs or streams], and *S. centrale, fimbriatum, girgensohnii*, and *imbricatum*, which grew in the surrounding swamp, as "***minerotrophic***" (Andrus 1980). The northern edge of this bog basin rested on soil, suggesting that the swamp and moat had some nutrients derived from weak and intermittent inflow from the north.

The Hungry Hill Bog was ***very old***, with a level, solidly "closed" sphagnum-heath mat (see **Scenics**, p. 10) featuring thick Leatherleaf tangles, and no open areas, except under trees around the edges, or where a little water stood at the edge of the mat on the southeastern side. Young White Pines, Red Maples, and Purple Chokeberries had already begun to colonize the mat. Bog Laurel, Creeping Snowberry, Common Antler Lichen, and Powdery Sunshine Lichen were the ***most strongly boreal residents*** of this mire, and Massachusetts Fern the ***rarest plant***.

If **Bog Coppers** (*Lycaena epixanthe*, **Fig. 22**) ever were present, they may have died out in the past through thickening of the shrub cover, or some other natural event. In the Finger Lakes Region, I watched the **Purvis Road Bog** (south of Dryden in Tompkins County, N.Y.) lose its *epixanthe* population from shrinking amounts of Small Cranberry (*Vaccinium oxycoccos*) and limited mat openings, due to aggressive Leatherleaf dominance; but also from overly enthusiastic sampling by a butterfly collector from western Pennsylvania, who came back secretly in 1974, after I had shown him the butterfly there, and collected far too many adults! Drift from agricultural pesticides applied to surrounding corn fields may also have had a negative impact. This gorgeous purple butterfly is a special treasure of bogs, and should be safeguarded wherever it is found.

The Destructive Influence of a Voracious Rodent

Beavers (*Castor canadensis*) are intimately associated with wetlands, especially streams, and when too abundant, have had very negative impacts on fragile wetlands that cannot support their needs. Bogs are perhaps most vulnerable to their active influence. The table [**Fig. 44**] summarizes their damage to five bogs in southern N.Y. and northern Penna. (including Hungry Hill and McLean). See details of Beaver damage to other important wetlands in the southern Catskills (a pristine perched swamp in French Woods, a Hemlock swamp in Pea Brook) in Dirig (1986).

Historical and contemporary Beaver experts — **Charles G. D. Roberts** (1908), **Enos A. Mills** (1913), **Leonard Lee Rue III** (1964), **Michael Runtz** (2015), **Frances Backhouse** (2015), and **Ben Goldfarb** (2018) — have much admired the Beaver's earthworks, elucidating many ecological and aesthetic advantages that attend their presence and activities. Runtz (2015, p. 298) even declared that "Beaver ponds are living Sistine Chapels; they are Moonlight Sonatas"! One can applaud the remarkable engineering skills (dams, lodges, canals, food caches), cooperative living, and other characteristics of Beavers — and even entertain a gesture of pity for this poor beast, which was trapped by humans to near-extinction in the 1800s, because its underfur was desired in eastern North America and faraway Europe as the best source of felt for making fashionable top hats (Backhouse 2015, pp. 27, 43, 151)! As ***a wetland-obligate species*** that physically exploits, ecologically alters, and ultimately destroys its habitat, it dooms itself to a vagabond existence. Following ***historical extirpation of several major predators*** (Lynx, Cougar, Black Bear, Wolf, and Coyote), and ***early legal protections*** that began in 1877 (Missouri), 1885 (Maine), 1899 (Colorado), and afterwards in many other states and in Canada (Mills 1913, p. 50), Beavers began a gradual (Anon. 2008/1905), then teeming recovery. They went out of balance in N.Y.'s Adirondacks by the 1920s (C. E. Johnson 1927), and became a regular nuisance in central and southern N.Y. by the 1960s, when they colonized

[* See Appreciation on p. 4.]

Beaver Damage to Bogs in Central New York & Northern Pennsylvania, 1965-1987

44 Site	Years	Wetland Damage	Reference
Bogs near Lakewood & Scott Center, Wayne Co., Pa.	before 1965	Flooding drowned a bog with Bog Laurel & Bog Rosemary. Creeping Snowberry managed to survive flooding at another site.	W L. Dix, 1965 Anon. 2014 Anon. 2019
Emmons Pond Bog, Delaware Co., NY, TNC-maintained	mid-1970s 7 Aug. 1976 (my visit)	A 150-acre preserve flooded , drowning part of a pristine bog. A policy of non-interference with any "natural developments" prevented removal of the Beavers or their dam.	Karl L. Brooks *pers. comm.*, 1985
Hungry Hill Bog near Long Eddy, Delaware Co., NY	1977-1978	Complete destruction of a pristine bog by flooding of its entire basin. Includes only Catskill population of Massachusetts Fern (*Thelypteris simulata*).	Dirig 1986 & this article
McLean Bogs Preserve near Dryden, Tompkins Co., N.Y	1982, *ff.*	A continuing nuisance at this Cornell preserve, periodically flooding the Mud Pond basin & Grass Bog 3, drowning *Menyanthes, Calopogon, Pogonia, Ophioglossum pusillum*, and other rare botanical treasures.	Ostman 1982 & pers. obs. through 2019
White Lake Swamp Onondaga Co., NY	1987	"Repeated flooding caused by beaver dams has contributed to complete extirpation of a ... rare fern, and at least two (probably three) rare orchids."	Berg *et al.*, 1987, p. 52

every mud puddle, it seemed, they were so desperate [**Fig. 44**]. However thoroughly Roberts, Mills, Rue, Runtz, Backhouse, and Goldfarb (*op. cit.*) have known and championed the Beaver, *none of these writers has considered* ***the Ancient Outdoor Temple that is lost*** *whenever a highly specialized, relict bog flora and fauna perishes or is diminished, each time this rodent penetrates such habitats*. It can sometimes be difficult, as a botanist, to avoid demonizing Beavers, when, after a few nights of sneaking activity by the orange-toothed monsters, all that is left of a treasured, botanically rich wetland are telltale prints of horrid, clawed paddy-paws around the proud rim of their newly wrought desolation [**Fig. 45**].


45

After studying details of the Beaver's yearly routine in the references cited above, the autumn-to-spring events in 1977-1978 at the Hungry Hill Bog might be reconstructed thus: During the autumn 1977 frenzy to prepare a cache of branches for winter feeding, which began after Cryan's and my visit of Sept. 11th, and was probably triggered by the first frost (Backhouse 2015, p. 25), Beavers moved upstream for the last time. These may have been inexperienced two-year-olds that were recently expulsed from a downstream lodge. It was easy to dam the channel that intermittently overflowed on the southeast corner of the bog [**Fig. 41**], and build short arms to the north and southwest, raising the water level of the entire basin by several feet, perhaps as an auxiliary food supply for their series of narrow, downhill dams. But this effort was futile: There were no desirable aspens or willows, White Birches (*Betula papyrifera*) or dogwoods (*Cornus* sp.), amid all the resiny Hemlocks and White Pines that Beavers avoid. Instead, they found only a few Yellow Birches (*Betula alleghaniensis*), phenol-filled Red Maples, a handful of Winterberry and Purple Chokeberry (*Aronia prunifolia*) bushes, and tiny bog shrubs, and the dam was abandoned as a Dead End. Or perhaps they were trapped. The raised water drowned all the trees before a single one was cut, no lodges or canals were built, and in April 1978, the horror of a wide, reeking pool, filled with decaying vegetation, confronted a hopeful naturalist. His grief resonated with a plaintive nocturne, fluted by Wood Thrushes and Veeries in the wooded surrounds, to mourn a sacred outdoor enclave that was gone.

Perhaps it is fitting that such an old bog should end its life in watery chaos — which, on a minuscule scale, mirrored the massive, flooding sweep of glacial wasting that was the cradle of its genesis.

Acknowledgements: Experts who helped identify or verify plant and cryptogam names are listed in the Appendices. ***Henry A. Dirig*** offered my first Pitcher Plant, a charismatic outdoor marvel, if there ever was one! ***Marjorie Dirig*** provided early transportation. I am very grateful for permission to study and collect at the Bog (***Torquato D. Rango***, 1972-1978), and on the north shore of Delaware Lake (***Ed Rauch***, 1977-1978). ***Doug Murray*** helped to assemble my lichen vouchers from the bog. ***Kristin Barron*** helped research the origin of the odd name "Hungry Hill." ***John F. Cryan***, ***Carolyn Klass***, and ***F. Robert Wesley*** reviewed a draft of this article and provided helpful feedback.

References Cited

Andrus, R. E. 1980. Sphagnaceae (Peat Moss Family) of New York State. *New York State Museum Bulletin* 442: i-iv, 1-89.

Anon. 2008, 13 Aug. 1905 Newspaper Article Marveled That Beaver Colony Existed in Wayne Co. [Pennsylvania]. *Hancock Herald* 138(18): 5.

Anon. 2014, 5 March. 50 Years Ago [Beaver trapping in 1964]. *Hancock Herald* 141(44): 2.

Anon. 2019, 17 July. Fifty Years Ago [Beavers flooded road near Equinunk, Wayne Co., Penna., 24 July 1969]. *Hancock Herald* 147(13): 2.

Backhouse, F. 2015. *Once They Were Hats, In Search of the Mighty Beaver*. ECW Press, Toronto, x + 262 pp.

Berg, C. O., S. C. Horn, S. A. Peron, F. R. Wesley, & R. B. Fischer. 1987. *Preserving the Best: Guide to Preserves of The Nature Conservancy in Central and Western New York*, fifth edition. Published by The Nature Conservancy, iv + 69 pp.

Curry, J. R. 2001. *Dragonflies of Indiana*. Indiana Academy of Sciences, Indianapolis, xiv + 304 pp.

Dahlem, G. A., & R. F. C. Naczi. 2006. Flesh Flies (Diptera: Sarcophagidae) Associated with North American Pitcher Plants (Sarraceniaceae), with Descriptions of Three New Species. *Annals of the Entomological Society of America* 99(2): 218-240.

Damman, A. W. H., & T. W. French. 1987, July. The Ecology of Peat Bogs of the Glaciated Northeastern United States: A Community Profile. *U. S. Fish and Wildlife Service Biological Report* 85(7.16), xii + 100 pp.

DeLorme Mapping Company. 1990. *Pennsylvania Atlas & Gazetteer*. Freeport, Maine, 96 pp.

Dirig, R. 1974. *Can Environmental Attitudes Be Taught?* M.S. thesis, Cornell University, Ithaca, N.Y., ix + 141 pp. + many folded inserts.

Dirig, R. 1977. *Labelling and Storing an Insect Collection*. Ithaca, N.Y., N.Y.S. College of Agriculture & Life Sciences, 4-H Members' Guide M-6-7, 21 pp.

Dirig, R. 1986. *Sphagnum* of the Southwestern Catskills, Hancock Town, Delaware County, New York. *Evansia* 3(1): 4-7.

Dirig, R. 2016, March. Natural History Notes on Sphinx Moths (Sphingidae) of the Catskill Mountains, New York. *Southern Lepidopterists' News* 38(1): 37-50 [Laurel Sphinx account on p. 40].

Dirig, R. 2018, June. A Gallery of Catskill Ferns. *Solidago* 19(2): 7-26 [small photo of the bog mat and discussion of Massachusetts Fern on p. 10].

Dirig, R. 2018, Dec. Natural History Notes on Lichen and Tiger Moths (Erebidae, Subfamily Arctiinae) of the Catskill Mountains, New York. *Southern Lepidopterists' News* 40(4): 253-264 [Virginia Ctenucha on pp. 260-263].

Dix, W. L. 1965. Notable Plants of Northeasternmost Pennsylvania. *Bartonia* 34: 5-6 [Wayne Co., Pa., beaver damage at the same time as in adjacent Hancock Town, N.Y.].

Forbes, W. T. M. 1948. Sphingidae, pp. 176-202. ***In*** his *Lepidoptera of New York and Neighboring States*, Part II. *Cornell Univ. Agricultural Experiment Station Memoir* 274:1-263 [Laurel Sphinx on p. 191].

Goldfarb, B. 2018. *Eager, The Surprising, Secret Life of Beavers and Why They Matter*. Chelsea Green Publishing, White River Junction, Vermont, xii + 287 pp.

Holland, W. J. 1903. *The Moth Book, A Popular Guide to a Knowledge of the Moths of North America*. New York, Doubleday, Page & Co., xxiv + 479 pp., + 48 color plates.

Johnson, C. E. 1927, July. The Beaver in the Adirondacks: Its Economics and Natural History. [Roosevelt Wild Life Forest Experiment Station, N.Y.S. College of Forestry at Syracuse University.] *Roosevelt Wild Life Bulletin* 4(4): 495-641 + 3 fold-out maps.

Johnson, C. W. & I. A. Worley. 1985. *Bogs of the Northeast*. University Press of New England, Hanover, N.H., & London, xvi + 269 pp.

Ketchledge, E. H. 1964, June-July. *The Ecology of a Bog. Information Leaflet*, N.Y. State Conservation Dept., Division of Conservation Education [reprint from *The N.Y. State Conservationist* magazine], 4 pp.

Lounsbury, C. 1933. *Soil Survey of Delaware County, New York*. Washington, D.C., U.S. Bureau of Chemistry and Soils. Series 1930, No. 7, 31 pp., plates, large fold-out colored map.

Lutts, R. H. *The Nature Fakers: Wildlife, Science & Sentiment*. Fulcrum Publishing, Golden, Colorado, xvi + 256 pp.

Mills, E. A. 1913. *In Beaver World, with Illustrations from Photographs by the Author*. Houghton Mifflin Company, Boston & N. Y./The Riverside Press Cambridge, xiv + 228 pp. + 18 photos and maps.

Ostman, N. L. 1982, Summer. Beavers *vs.* Rare Plants — Or, What Is a Natural Area? *Cornell Plantations* 38(3): 40-41.

Reschke, C. 1990, March. *Ecological Communities of New York State*. New York Natural Heritage Progam, N.Y.S. Dept. of Environmental Conservation, & The Nature Conservancy, Latham, N.Y., i-xii, 1-96, covers.

Roberts, C. G. D. 1907. *The Haunters of the Silences, A Book of Animal Life*. Grosset & Dunlap, Publishers, New York, xiv + 316 pp.

Roberts, C. G. D. 1908. *The House in the Water, A Book of Animal Stories.* L. C. Page & Co., Boston, viii + 301 pp. [Beaver stories on pp. 1-123.]

Rue, L. L., III. 1964. *The World of the Beaver*. A Living World Book. J. B. Lippincott Company, Philadelphia & New York, 155 pp.

Runtz, M. 2015. *Dam Builders: The Natural History of Beavers and Their Ponds*. Fitzhenry & Whiteside, Markham, Ontario, xxiv + 306 pp.

Scientific Staff of Cornell University. 1926. A Preliminary Biological Survey of the Lloyd-Cornell Reservation. *Bulletin of the Lloyd Library of Botany, Pharmacy & Materia Medica* 27(5): 1-247.

Wagner, D. 2005. *Caterpillars of Eastern North America, A Guide to Identification and Natural History*. Princeton University Press, Princeton & Oxford, 512 pp. [Laurel Sphinx on p. 259].

Werier, D. 2017. *Catalogue of the Vascular Plants of New York State*. *Memoirs of the Torrey Botanical Society* 27: i-iv, 1-543.

Zumoff, C. H. 1973, 1 Feb. The Reproductive Cycle of *Sphaerium simile*. *Biological Bulletin* 144(1): 212-228.

Appendix 1: MOSSES of Hungry Hill Bog

Collecting of mosses had just begun when the bog was flooded, a most unfortunate circumstance, because of their importance in the bog matrix. Identifications were provided by **Dr. Richard E. Andrus** (SUNY Binghamton, *Sphagnum*), **Dr. Edwin H. Ketchledge** (Syracuse University, College of Forestry), & **Dr. Lewis E. Anderson** (Duke University). See Dirig (1986) for further notes on *Sphagnum* in this region.

Dicranella heteromalla [Fine Hair Moss]: On hummock in moat, near standing water, 17 April 1976 (*M-68*, R.D., BH, NYS).

Polytrichum commune [Common Haircap Moss]: On hummocks, 17 April 1976, (*M-67*, R.D., BH, NYS); 8 June 1976 (*M-57*, R.D., BH, NYS); 11 Sept. 1977 (*M-154*, R.D., BH).

Polytrichum ohioense [Ohio Haircap Moss]: On dry roots of fallen *Tsuga canadensis* at interface of bog and drier upland woods, 11 Sept. 1977 (*M-156*, R.D., BH).

Rhizomnium magnifolium (formerly called *Mnium punctatum,* var. *elatum*) [Red Penny Moss]: On hummock in moat, near standing water, 11 Sept. 1977 (*M-201*, R.D., BH; *M-203*, R.D.).

Sphagnum angustifolium [Narrow-leaved Peat Moss]: On the open central mat, intergrown with Small Cranberry (*Vaccinium oxycoccos*), 16 June 1977 (*M-144*, R.D.).

Sphagnum centrale [Centered or Two-colored Peat Moss (latter translated from a German vernacular name)]: Clinging to roots of Turtlehead (*Chelone glabra, 144*, R.D.) arching over a hummock, in wooded swamp ringing the bog mat, 25 Aug. 1976 (*M-271*, R.D.).

Sphagnum fimbriatum [Fringed Peat Moss]: On a shaded hummock in the north moat, 11 Sept. 1977 (*M-120*, R.D., BING).

Sphagnum girgensonii [Graceful Peat Moss]: On mossy hummock in swamp, north side of mat, fruiting, 11 Sept. 1977 (*M-121*, R.D., BING, BH)

Sphagnum imbricatum [Shingled Peat Moss]: On shaded hummock in swamp, 11 Sept. 1977 (*M-119*, R.D., BING; *M-122* , R.D., BING).

Tetraphis pellucida [Four-toothed Moss]: 17 April 1976 (*M-58*, R.D., BH); on dead tree stub, 16 June 1977 (*M-153*, R.D., BH, NYS); on roots of upturned log, 11 Sept. 1977 (*M-155*, R.D., BH, DUKE).

Appendix 2:
LICHENS [and two Fungi] of Hungry Hill Bog

Identifications were by **Dr. Richard C. Harris** and **Dr. C. Richard Prince** (New York Botanical Garden), **Dr. Irwin M. Brodo** (Canadian Museum of Nature, Ottawa), and the author. (There were likely many more species, especially crusts.)

Bryoria furcellata [Moustache Lichen; Burred Horsehair Lichen]: depauperate, on slanted trunk of Hemlock (*Tsuga canadensis*), 8 June 1976 (*L-326*, *L-327*, R.D). *My first collections of this species.*

Cetrelia chicitae [Chicita's Sea-storm Lichen]: on dead, slanted Hemlock trunk in partial shade, 8 June 1976 (*L-307*, R.D., NY, NYS). *First collection of this.*

Evernia mesomorpha [Boreal Oakmoss Lichen]: all 8 June 1976: 4-5 ft. up on living Red Maple (*Acer rubrum*) trunk, in partial sun, pendent thalli well developed (*L-297*, R.D., NY, NYS, BM); and young thalli, same place (*L-317*, R.D., NY; *L-320*, R.D.); on fallen Red Maple branch (*L-298*, R.D., NYS, CUP); on dead Hemlock in full sun (*L-306*, R.D., NYS; *L-315*, R.D., US). *First time to see this species.*

Hypogymnia physodes [Monk's Hood Lichen]: On dead, fallen Hemlock in full sun, 8 June 1976 (*L-319*, R.D., NY, NYS; *L-322*, R.D. , CUP, BM).

Imshaugia aleurites [Grizzly Starburst Lichen]: Dead basal branches of White Pine (*Pinus strobus*), 22 July 1977 (*L-2172*, R.D., NY). *A new lichen for me.*

***Lecanora thysanophora* R. C. Harris** [Mapledust Lichen]: On shaded bark of *Acer rubrum*, 25 Aug. 1976 (*L-311*, R.D., MICH, NY). *My first sight of this crust, which was identified by R. C. Harris using TLC, but not described by him until 2000.*

Ochrolechia pseudopallescens [Conifer Saucer Lichen]: On dead, fallen Hemlock, 5 ft. above mat, 25 Aug. 1976 (*L-312*, R.D., NY, NYS) & 16 June 1977 (*L-2169*, R.D., NY). *This crustose apotheciate lichen was described as a new species by I. M. Brodo in 1991.*

Parmotrema stuppeum [Powder-edged Ruffle Lichen]: 3 ft. up on shaded, gnarled *Acer rubrum* trunk, 25 Aug. 1976 (*L-303*, R.D., NY, NYS). *First time to see this.*

Platismatia tuckermanii [False Lungwort]: On slanted Hemlock trunk in partial shade, 8 June 1976 (*L -301*, R.D., NYS, BM); 10-12 ft. up on slanted Hemlock trunk, 25 Aug. 1976 (*L-313*, R.D., NY, NYS); on dead, fallen Hemlock in full sun, depauperate thalli, det. by R. C. Harris (*L-316*, R.D., NY, NYS); 4 ft. up on Hemlock branch in full sun (*L-296*, R.D., NY, NYS). *My introduction to this species.*

Pseudevernia consocians [Common Antler Lichen]: On dead, fallen Hemlock in full sun, 8 June 1976 (*L-295*, R.D., NY, BM, **Fig. 38**; *L-299*, R.D., CUP; *L-309*, R.D., NY, NYS); same place, miniature thalli, 25 Aug. 1976 (*L-300*, R.D.). *My first acquaintance with this magnificent, lacy lichen.*

Punctelia perreticulata [Powdered Speckled Shield]: In partial sun, 3 ft. up on Hemlock trunk, 8 June 1976 (*L-310*, R.D., NY, NYS). *First collection of this.*

Tuckermanopsis ciliaris (Ach.) Gyelnik [Tendril Lichen; Fringed Wrinkle Lichen]: 5 ft. above ground on dead, fallen Hemlock, 16 June 1977 (*L-2168*, R.D., NY); on dead, basal White Pine branch, 22 July 1977 (*L-2171*, R.D.). *First collections.*

Usnea spp. [Old Man's Beard]: On Red Maple and a dead Yellow Birch (*Betula alleghaniensis*), 25 Aug. 1976 (*L-304*, R.D.). All the rest on 8 June 1976: *L-318*, *L-321*, *L-323*, *L-324*, R.D. *My first Usneas* (awaiting identification).

Usnocetraria (formerly *Allocetraria*) ***oakesiana*** [Yellow-green Ribbon Lichen]: all 8 June 1976: On slanted Hemlock trunk (*L-305*, R.D., NY, NYS); base of *Acer rubrum* trunk in partial shade (*L-302*, R.D., CUP; *L-308*, R.D., NY).

Vulpicida pinastri [Powdery Sunshine Lichen]: Thallus bright yellow, soredia limitedly marginal, mostly laminal (var. *soralifera*); on basal branch of small *P. strobus*, 2 in. above the mat, 25 Aug. 1976 (*L-314*, R.D., NY, NYS, **Fig. 40**); on dead basal branch of White Pine, 22 July 1977 (*L-2170*, R.D., NY). *My first interactions with this gorgeous species.*

Fungi

***Stemonitis* sp.** [Chocolate Tube Slime Molds, or Tree Hair]: On dead, prostrate, damp Hemlock log in the swamp, 22 July 1977 (*F-37*, R.D.).

Clavariaceae [Coral Fungus]: On hummock beneath Hemlock, beige, gregarious, 22 July 1977 (*F-38*, R.D., CUP); at same place on 11 Sept. 1977.]

Appendix 3:
VASCULAR PLANTS of Hungry Hill Bog

A few determinations were provided by **Karl L. Brooks**, **Steven Clemants**, **E. A. Cope**, **John F. Cryan**, **William J. Dress**, **Chong-wook Park**, & **F. Robert Wesley**.

* = a naturalized, non-native plant. The sword symbol (†) indicates species new to me.

Acer rubrum [Red Maple]: Small tree growing on mat, 8 June 1976 (*68*, R.D.). Mentioned on 11 June & 16 July 1972, and as a lichen substrate (*Appendix 2*).

***Andromeda polifolia* L.** [Bog Rosemary]: Sparse on open bog mat, 11 Sept. 1977 (*324*, R.D., BH).

***Anthoxanthum odoratum* L.** [Sweet Vernal Grass]: Edge of sphagnum-heath mat, 16 June 1977 (*319*, R.D., BH). [Usually in weedy, open areas; out of place here.]

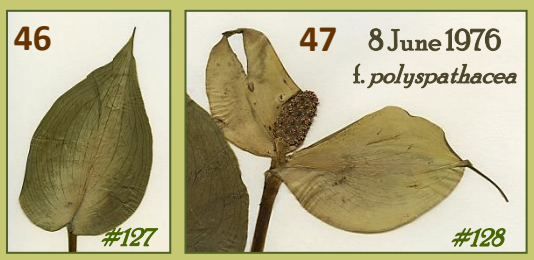
***Aralia nudicaulis* L.** [Wild Sarsaparilla]: On hummock in moat, 11 Sept. 1977 (*339*, R.D.).

***Arisaema triphyllum* (L.) Schott** [Swamp Jack-in-the-Pulpit]: Moat, 11 Sept. 1977 (*336*, R.D.); 3 May 1988, **ssp. *stewardsonii* (Britton) Huttl.** (*221*, R.D., BH).

†***Aronia prunifolia* (Marsh.) Rehd.** [Purple Chokeberry]: Scattered small shrubs on bog mat, leaves only [likely browsed by White-tailed Deer], 11 Sept. 1977 (*322*, R.D., BH). [Closely matching a blooming, leafy specimen of this species from Jensen Hill, a sandstone bluff near the Delaware River, ca. 2 mi. SW of the bog, 21 May 1983 (*1840*, R.D., BH, NYS).]

***Betula alleghaniensis* Britton** [Yellow Birch]: A substrate for *Usnea* in the bog moat (*Appendix 2*).

†***Calla palustris* L.** [Wild Calla, Water Arum]: Mentioned on 4 (flowering, art (**Fig. 10** and pp. 5-6, 9, & 19), 11 (flowers continuing to open) [**Fig. 11**], 19 (still in bloom), & 26 June (nearing end of bloom); 16 (patch on east edge) & 30 (still a few in bloom, most fruited, with green spathes) July **1972**; 10 May **1976** (plants sprouted). The following collected on 8 June 1976: in standing water off mat, (*86*, BH; *129*, R.D.); with white area in leaf similar to spathe (*127*, R.D., BH, **Fig. 46**); with double spathe (f. **polyspathacea**) on one flower (*128*, R.D., **Fig. 47**). [These two oddities were also seen on 30 July 1972, perhaps on the same plants?]



†***Calopogon tuberosus* (L.) Britton, Sterns, & Poggenb.** [Grass Pink]: One blooming plant, (2 open flowers, 3 buds, single basal leaf), 16 July (**Fig. 27**, & this image glued to herbarium sheets *1531*, R.D., BH); 30 July (last flower) in 1972. One basal leaf, evident in July 1972 and summer 1973, after which the plant apparently died [or went dormant].

†***Carex trisperma* Dewey** [Three-fruited Sedge]: On mat, large clumps beneath huge White Pine, 8 June 1976 (*222*, R.D., NYS; *223*, R.D., BH). Det. by F. Robert Wesley.

***Chamaedaphne calyculata* (L.) Moench** [Leatherleaf]: The major shrub component of the floating mat. Mentioned 4, 11 (new shoots nearly fully unfolded), & 26 June (sheltering nest of Maryland Yellowthroat); 16 July (new shoots well firmed up, and fallen old leaves in empty Yellowthroat nest); & 23 Oct. (foliage turned from summer olive color to purplish-brown, maroon, crimson, and green), in 1972. ***Specimens*:** on mat, flowering, 10 May 1976 (*72*, R.D.); 11 Sept. 1977 (*338*, R.D., BH, **Fig. 34**). Also evident in scenics on p. 10.

***Chelone glabra* L.** [White Turtlehead]: In moat, 25 Aug. 1976 (*144*, R.D., BH); on open bog mat, 11 Sept. 1977 (*341*, NYS, GH).

***Coptis trifolia* (L.) Salisb.** [Goldthread]: Mentioned on 11 June 1972 (still in bloom, but fading); 10 May 1976 (in flower). In moat, 8 June 1976 (*215*, R.D., BH).

†***Eriophorum vaginatum* L.** [Hare's Tail or Tussocked Cottongrass]: 11 June 1972, clumps on mat (**Fig. 8**). In same area, 8 June 1976 (*111*, R.D., BH, NYS, GH).

***Eriophorum virginicum* L.** [Tawny Cottongrass]: Flowering on the bog mat, 30 July (**Fig. 33**), and fruiting, 23 Oct., in 1972; 11 Sept. 1977 (*321*, R.D., BH, NYS, GH, **Fig. 35**).

***Fraxinus americana* L.** [White Ash]: Obs. in moat, 8 June 1976.

†***Gaultheria hispidula* (L.) Muhl. *ex* Bigelow** [Creeping Snowberry]: Growing flat on bog mat in open areas with sparse shrubs, 11 June, 16 July, 30 July (**Fig. 31**), & 23 Oct. (no flowers or fruits), in 1972. Collected 10 May 1976 (*73*, R.D.) & 11 Sept. 1977 (*326*, BH, NYS).

***Gaultheria procumbens* L.** [Wintergreen]: On edges of bog mat, 11 & 26 June (new shoots), 16 & 30 July (flower buds), & 23 Oct. (a few red fruits, the leaves bronzed), in 1972; also 25 Aug. 1976 (*134*, R.D., BH).

***Gaylussacia baccata* (Wagenh.) K. Koch [Black Huckleberry]:** On bog mat, 11 Sept. 1977 (*334*, R.D.).

†***Glyceria striata* (Lam.) Hitch.** [Fowl Manna Grass]: In moat, 25 Aug. 1976 (*224*, R.D., BH, NYS), det. E. A. Cope.

***Hydrocotyle americana* L.** [American Marsh Pennywort]: Vines on S edge of Hungry Hill Rd. Spur, 4 Sept. 1982 (*1124*, BH). Apparently new at this site; this species appears to have been spreading rapidly throughout wetlands in this region at the time.

***Ilex verticillata* (L.) A. Gray** [Common Winterberry]: Obs. on N edge of mat, with red leaves falling on sphagnum, 30 July (**Fig. 29**), and 23 Oct. (no fruits) in 1972. Collected 11

Sept. 1977 (*787*, R.D.). [A shrub with scarlet drupes on the Delaware Lake shore, 11 Sept. 1977 (*Appendix 5*).]

†*Kalmia angustifolia* L. [Sheep Laurel, Lambkill]: On open mat, 11, 19 (flowers, **Fig. 13**), & 26 June; 16 July; and 23 Oct. in 1972. Collected 8 June 1976 (*121*, R.D., BH) & 16 June 1977 (*316*, R.D., NYS).

***Kalmia latifolia* L.** [Mountain Laurel]: Mentioned on 16 July 1972 & 8 June 1976. One large shrub in moat, 11 Sept. 1977 (*320*, R.D.).

†*Kalmia polifolia* Wang. [Bog Laurel]: Mentioned 4 (art, **Fig. 7**) & 11 June; 16 & 30 July (red leaves fallen on sphagnum, **Fig. 30**); & 23 Oct. (old leaves scarlet), in 1972. A few short shrubs on open mat, one flowering, 10 May 1976 (*71*, R.D.).

***Lindera benzoin* (L.) Blume** [Spicebush]: In moat, 11 Sept. 1977 (*327*, R.D.).

†*Luzula bulbosa* (Alph. Wood) Smyth & L. C. R. Smyth [Bulbous Woodrush]: Shady area at edge of open bog mat, 16 June 1977 (318, R.D.).

***Lysimachia* [formerly *Trientalis*] *borealis* (Raf.) U. Manns & Anderb.** [Starflower]: Mentioned 11 June (p. 5 & **Fig. 12**) & 16 July 1972. Edge of mat, 8 June 1976 (*217*, R.D., BH).

***Maianthemum canadense* Desf.** [Canada Mayflower]: Noticed 11 June & 16 July 1972; swamp N of mat, 8 June 1976 (*216*, R.D., BH).

***Monotropa uniflora* L. [Indian Pipe]:** Mentioned 16 & 30 July 1972.

***Oclemena acuminata* (Michx.) Greene** [Whorled Wood Aster]: In swamp N of mat, 11 Sept. 1977 (*329*, R.D.).

***Onoclea sensibilis* L.** [Sensitive Fern]: In moat, 11 Sept. 1977 (*340*, R.D., BH, GH).

***Osmundastrum cinnamomeum* (L.) C. Presl** [Cinnamon Fern]: Observed 11 June & 16 July 1972. A major component of the moat and swamp, collected 8 June 1976 (*218* & *220*, R.D.).

†*Persicaria arifolia* (L.) Haraldson [Halberd-leaved Tearthumb]: Large masses between hummocks in moat, in flower and fruit, with unusually small leaves, det. by Chong-wook Park, 11 Sept. 1977 (*337*, R.D., BH). Not found there by me & Park on 4 Sept. 1982, after beaver flooding of 1977-1978.

***Pinus strobus* L.** [Eastern White Pine]: Mentioned on 4 & 11 June, 16 July (dead, fallen, p. 12, Fig. D), & 23 Oct. (yellow needle fascicles dropped on mat) in 1972. Small trees on mat, seeded from very large trees in surrounds, 11 June 1972 (p. 12, Fig. E) & 11 Sept. 1977 (*328*, R.D.); a large dying tree on W side of mat (p. 12, Figs. A, 1); others in surrounding conifer zone (p. 12, Figs. 2, 3, C, D, E).

***Rhododendron maximum* L.** [Great Laurel, Rosebay ("Long-leaved Rhododendron" locally)]: Noticed on 11 June, 16 & 30 July, in 1972. Collected on E side of mat in swampy surrounds, 22 July 1977 (*315*, R.D.).

***Rhododendron prinophyllum* (Small) Mallais** [Early Azalea]: Noticed 4 & 11 (Fig. 14) June, & 16 July 1972. One shrub in moat, flowers very fragrant, 8 June 1976 (*70*, R.D.).

***Sarracenia purpurea* L.** [Purple Pitcher Plant]: A signature bog plant, observed on 4 (budded), 11 (flowering), 19, & 26 (stamens shed) June, 16 & 30 (**Fig. 28**) July, & 23 Oct. (old flower stalks) in 1972. A Bumble Bee (*Bombus* sp.) was trapped in a pitcher on 10 May 1976. Collected 8 June 1976 (*36*, R.D., **Fig. 42**) & 11 Sept. 1977 (*325*, BH). Figs. 1-13 on p. 12 record floral structures and development throughout the year; autumn leaves, Nov. 1970 (**Fig. 1**).

***Solidago rugosa* Mill.** [Rough- or Wrinkle-leaved Goldenrod]: N moat, 11 Sept. 1977 (*333*, R.D., det. by K. L. Brooks, confirmed by W. J. Dress).

†*Symphyotrichum puniceum* (L.) Á. Löve & D. Löve [Purple-stemmed Aster]: North moat, 11 Sept. 1977 (*330*, R.D.).

***Thelypteris noveboracensis* (L.) Nieuwl.** [New York Fern]: In moat, 11 Sept. 1977 (*799*, R.D., BH).

***Thelypteris palustris* Schott** [Marsh Fern]: In moat, 11 Sept. 1977 (*797*, R.D., BH).

†*Thelypteris simulata* (Davenp.) Nieuwl. [Massachusetts Fern]: In moat, 11 Sept. 1977 (*783*, R.D., BH, NYS). *The only station known from the Catskills!* (Dirig 2018, June). Cited by Werier (2017, p. 41).

***Tsuga canadensis* (L.) Carrière** [Eastern Hemlock]: Obs. 4 June 1972, and as a substrate for *Polytrichum ohioense* (Appendix 1) and several lichens (Appendix 2). See fallen twig tips in photo of *Gaultheria hispidula* (**Fig. 31**).

***Vaccinium corymbosum* L.** [Highbush Blueberry]: Noticed 16 July 1972; 10 May 1976 (flowering). Tall, blooming shrubs in moat, 10 May 1976 (*120*, R.D.). Also on mat, where apparently deer-browsed.

***Vaccinium oxycoccos* L.** [Small Cranberry]: Noted on 4, 11, & 19 June (blooms, **Figs. 20-21**); 16 July; & 23 Oct. (fruits, **Fig. 36**) in 1972; also 8 June 1976, 16 June 1977. Common on open mat, 8 June 1976 (*74*, R.D.); 16 June 1977 (*317*, R.D., BH).

A small residue of unresolved vouchers [***Bidens*** (*332*), ***Lycopus*** (*331*), ***Persicaria*** (*335*), and ***Viola*** (*219*)] remains unidentified due to the unavailability of the Cornell Herbaria during the 2020 coronavirus pandemic.

Appendix 4:
ANIMALS of Hungry Hill Bog

The sword symbol (†) indicates species new to me. Unidentified insects may be made available to specialists on request.

Vertebrates: White-tailed Deer (*Odocoileus virginianus*): 11 June 1972; fawns, 16 June 1977. **Red Eft** (juvenile stage of the **Eastern Newt**, *Notophthalmus viridescens*): 11 June 1972. **†Northern Leopard Frog** (*Lithobatis pipiens*): 26 June & 16 July 1972; 16 June 1977. **American Toad** (*Anaxyrus americanus*): 11 June & 23 Oct. 1972; 10 May 1976. **Timber Rattlesnake** (*Crotalus horridus*): Reported as "frequent" in surrounding uplands (Torquato D. Rango & Francis Peake families, who resided in the area), but not encountered by me. ***Nesting birds:* Eastern Towhee** (*Pipilo eyrthrophthalmus*, **Figs. 16-17**) & **Veery** (*Catharus fuscescens*, **Figs. 18-19**): Nests in entrance woods, 13 June 1972. **Maryland Yellowthroat** (*Geothylpis trichas*): nest on mat (**Figs. 23-24**), 19 & 26 June, 16 July 1972. **Ruby-throated Hummingbird** (*Archilochus colubris*): territorial behavior, 26 June 1972.

General Insects: Most were collected on dates indicated: ***Flies* (*Diptera*): Mosquitoes**: 11 & 19 June, 16 July 1972. **†Grey Carrion Flies** (Sarcophagidae): Associated with Pitcher Plants, 19 & 26 (Fig. 10 on p. 12), June 1972; mated pair, 16 June 1977; 22 July 1977. **Greenbottle Fly**: 26 June 1972. **Greater Bee Fly** (*Bombylius major*): 17 April 1976. **Syrphid Fly**, 8 June 1976, 16 June 1977. **Deer Fly (Tabanidae)**: 16 June & 22 July 1977. **Indet. Flies**: 10 May 1976. ***Dragonflies*: ♀ Common White-tail** (*Plathemis lydia*), & **♂ Twelve-spotted Skimmer** (*Libellula pulchella*), 8 June 1976; **Chalk-fronted Corporal** (*Ladona julia*), 30 May 1977. ***Indet. Odonata***: 11 June 1972; 8 June 1976; 16 June & 22 July 1977. ***Hymenoptera*: Bumble Bees** (*Bombus* spp.): 11 & 26 June 1972; 17 April 1976 (trapped inside Pitcher Plant leaf). **Ichneumonids**: 8 June 1976, 22 July 1977. **Hornet**: 22 July 1977. **Winged Ants**: 8 June 1976. ***Beetles*: Click Beetles (Elateridae)**: 17 April, 10 May, 8 June 1976.

Butterflies & Moths (Lepidoptera): Monarch (*Danaus plexippus*): *nectaring* at Sheep Laurel, and perhaps *nectar-thieving* with its long proboscis at Pitcher Plant flowers, 26 June 1972. ♀ **Clouded Sulphur** (*Colias philodice*): 10 May 1976. **Great Spangled Fritillary** (*Speyeria cybele*): patrolling males, 16 & 30 July 1972. **Toothwort White** (*Pieris virginiensis*): 17 April (fresh) & 10 May (worn) 1976. **Tiger Swallowtail** (*Papilio glaucus/canadensis* group): 11 June 1972. **Viceroy** (*Limenitis archippus*): 19 June 1972. **Mourning Cloak** (*Nymphalis antiopa*): 10 May 1976. **Cherry Gall Azure** (*Celastrina serotina*): 10 May, 8 June 1976; on the mat. ♀ **Laurel Sphinx** (*Sphinx kalmiae*): 8 June 1976 (**Fig. 39**). [Butterflies probably flew over the forest canopy to reach the open mat.] **†Black-banded Orange** (*Epelis truncataria*, Geometridae): a small, diurnal moth, with larvae reported on Leatherleaf, flew on the mat on 11 & 19 June 1972, 1 June 1973, 10 May & 8 June 1976, & 16 June 1977. **Virginia Ctenucha** (*Ctenucha virginica*) on mat in daylight, 5 July 1975.

Appendix 5:
VASCULAR FLORA [& 1 moss] of the North Shore of Delaware Lake

Perch Pond (elevation 1760 ft.) is an older name for this lake (Lounsbury 1933). All were collected on 11 Sept. 1977 by R. Dirig & John F. Cryan, except as noted. *Juncus* were determined by **Steven Clemants**, *Spiranthes* by **Charles J. Sheviak**. The sword symbol (†) indicates species new to me. Three celebrities grow at Delaware Lake: Northern Bog Clubmoss, Round-leaved Sundew, & Blue Ground Cedar.

Anaphalis margaritacea* (L.) Benth. & Hook. *f. [Pearly Everlasting]: on shore (*763*, BH, NYS).

***Bidens cernua* L.** [Nodding Beggar Ticks]: *8846* (R.D.).

***Callitriche palustris* L.** [Vernal Water Starwort]: on wet mud (*2636*, R.D.).

***Chelone glabra* L.** [White Turtlehead]: *773* (BH).

***Dichanthelium implicatum* (Scribn.) Kergélen** [Long-hairy Rosette Grass]: *1653* (R.D.), det. by E. A. Cope.

***Diphasiastrum digitatum* (Dill. *ex* A. Braun) Holub** [Southern Ground Cedar]: *747* (BH).

***Diphasiastrum tristachyum* (Pursh) Holub** [Blue Ground Cedar]: sterile (*760*, R.D., BH, NYS); with strobili, 4 July 1978 [*759*, R.D., BH; see image in Dirig (2018, p. 20, Fig. 122)].

***Drosera rotundifolia* L.** [Round-leaved Sundew]: dried and browned, in fruit, on wet sandy lawn (*757*, R.D., BH, NYS); on dead log floating in lake (*758*, R.D., BH).

***Eleocharis obtusa* (Willd.) Schult.** [Blunt Spike Rush]: *724* (R.D., BH, NYS)

***Gentiana clausa* Raf.** [Meadow Bottle Gentian]: *791* (R.D., BH).

***Gratiola neglecta* Torr.** [Northern Clammy Hedge Hyssop]: on sandy beach (*723*, R.D., BH).

***Ilex verticillata* (L.) A. Gray** [Common Winterberry]: small ♀ shrub on shore, with red drupes (*1738*, R.D.). [♂ shrubs 1500 ft. uphill on bog mat.]

†***Juncus acuminatus* Michx.** [Sharp-fruited Rush]: edge of lake (*2823*, R.D., BH), det. S. Clemants, 1989.

†***Juncus brevicaudatus* (Engelm.) Fern.** [Narrow-panicled Rush]: *2824* & *2825* (R.D., BH), det. S. Clemants, 1989. David Werier (2017, p. 90) cited *2825* as a voucher for his *Catalogue of the Vascular Plants of New York State*.

***Juncus effusus* L.** [Common Soft Rush]: *762* (R.D., BH).

†***Juncus marginatus* Rostk.** [Common Grass-leaved Rush]: (*2826*, BH; *2827*, R.D., BH).

***Ludwigia palustris* (L.) Elliot** [Water Purslane]: *958* (BH).

†***Lycopodiella inundata* (L.) Holub** [Northern Bog Clubmoss]: on sandy lawn at edge of water, dancing with *Drosera rotundifolia* [*725*, R.D., BH, NYS; Dirig (2018, June, pp. 20 & 25)]. A rare species in this region.

***Lycopodium clavatum* L.** [Staghorn Clubmoss]: *761* (BH, NYS).

***Oenothera perennis* L.** [Small Sundrops]: *771* (BH).

***Onoclea sensibilis* L.** [Sensitive Fern]: 776 (BH).

***Pteridium aquilinum* (L.) Kuhn,** ssp. ***latiusculum* (Desv.) Hultén** [Eastern Bracken Fern]: *746* (BH).

***Solidago bicolor* L.** [Silverrod]: flowers silvery (*792*, R.D., BH).

***Solidago nemoralis* Aiton,** ssp. ***nemoralis*.** [Grey Goldenrod]: *793* (R.D., BH, NYS).

***Sparganium americanum* Nutt.** [American Bur-reed]: *2726* (R.D.).

***Spiraea alba* Du Roi,** var. ***latifolia* (Aiton) Dippel** [Broad-leaved Meadowsweet]: *764* (BH).

***Spiranthes cernua* (L.) Rich.** [Nodding Ladies' Tresses]: many plants, flowers white (*794*, R.D., BH, NYS), det. confirmed by C. Sheviak, 1983.

***Symphyotrichum undulatum* (L.) G. L. Nesom** [Wavy-leaved Aster]: (*2841*, R.D.).

***Thelypteris palustris* Schott** [Marsh Fern]: *790* (R.D., BH, NYS).

***Viburnum dentatum* L.,** var. ***lucidum* Aiton** [Smooth Arrowwood]: shrub (*774*, BH).

***Sphagnum lescurii* Sullivant *in* A. Gray** [Lescur's Peat Moss]: on exposed shoreline, where *Sphagnum* was very scarce at the time (*M-117* & *M-118*, BING, R.D.). Det. by Richard E. Andrus.

A small residue of unresolved vouchers [***Galium*** (*8845*), ***Persicaria*** (*8847*), and ***Symphyotrichum*** (*2843*)] remains unidentified due to the unavailability of the Cornell Herbaria during the 2020 coronavirus pandemic.

Appendix 6: Specimen Repositories

Plant, moss, lichen, and fungus specimens have been deposited in these herbaria:

BH: Bailey Hortorium Herbarium, Cornell University
BM: Herbarium, The Natural History Museum, London, England
BING: SUNY Binghamton Herbarium. (Dick Andrus' *Sphagnum* collection has recently been transferred to DUKE.)
CUP: Cornell Plant Pathology Herbarium, Ithaca, N.Y.
DUKE: Duke University Herbarium, Durham, N.C.
GH: Gray Herbarium, Harvard University, Cambridge, Mass.
MICH: University of Michigan Herbarium, Ann Arbor
NY: New York Botanical Garden Herbarium, Bronx
NYS: New York State Museum Herbarium, Albany
R.D.: Author's herbarium, Ithaca, N.Y.

Insect specimens will be deposited at
CUIC: The Cornell University Insect Collection.

BOGS are among the loveliest natural open spaces in our vegetation. With each passing year, those that remain are more precious and vulnerable. Perhaps someday a curious palynologist will extract a long column of peat from what remains of the Hungry Hill Bog, and its layers will disclose details about the age and early backstory of this basin.

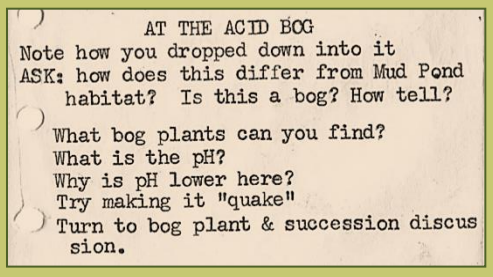
Finis

Dr. Fischer at McLean

Notes by Robert Dirig

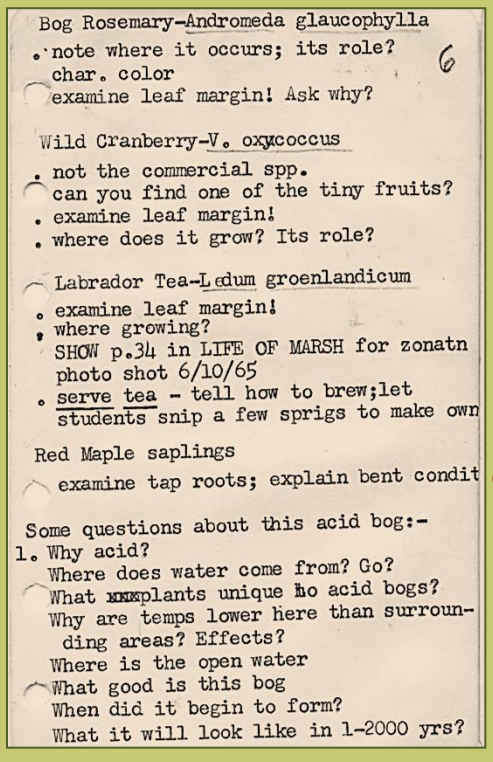
Dr. Richard B. Fischer, teaching about bogs at McLean, ca. 1970s. He is demonstrating the bent taproot of a Red Maple sapling from the mat of Bog A. Tawny Cotton-grass is evident around him. This photo was taken in early September [*photographer unknown*].

Dr. Fischer always carried a small pocket notebook on his field trips. This outlined the points he wanted to make about habitats and each plant species (in this example). Below are excerpts from two pages of the McLean Bog lesson. The first posed questions to ask as the class arrived at the bog.



AT THE ACID BOG
Note how you dropped down into it
ASK: how does this differ from Mud Pond habitat? Is this a bog? How tell?

What bog plants can you find?
What is the pH?
Why is pH lower here?
Try making it "quake"
Turn to bog plant & succession discussion.



Bog Rosemary-Andromeda glaucophylla
• note where it occurs; its role?
char. color
examine leaf margin! Ask why?

Wild Cranberry-V. oxycoccus
• not the commercial spp.
can you find one of the tiny fruits?
• examine leaf margin!
• where does it grow? Its role?

Labrador Tea-Ledum groenlandicum
• examine leaf margin!
• where growing?
SHOW p.34 in LIFE OF MARSH for zonatn photo shot 6/10/65
• serve tea - tell how to brew;let students snip a few sprigs to make own

Red Maple saplings
examine tap roots; explain bent condit

Some questions about this acid bog:-
1. Why acid?
Where does water come from? Go?
What ~~xxx~~plants unique to acid bogs?
Why are temps lower here than surrounding areas? Effects?
Where is the open water
What good is this bog
When did it begin to form?
What it will look like in 1-2000 yrs?

The second page outlined observations to make about Bog Rosemary, Small Cranberry, Labrador Tea, and Red Maple, and further general questions to ask about bogs.

I remember making "Labrador Tea" (the drink) at the lab, after we returned to campus.

Dr. Fischer worked with Dr. Arthur A. Allen at Cornell for his Ph.D. project, documenting "The Breeding Biology of the Chimney Swift." His outdoor classes included frequent references to birds.