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

Solidago

Newsletter of the
Finger Lakes Native Plant Society

Volume 25, No. 2 ∞ June 2024

WALK REPORT

Baltimore Woods Nature Center – April 27th 2024

by Rosemarie Parker

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Despite the intermittent drizzle of rain, FLNPS members and friends were treated to a wonderful walk led by ***David DuBois***, Land Steward at Baltimore Woods in Onondaga County, N. Y. As David described in his talk last year (March 2023), the preserve covers 270 acres with a varied terrain. We stayed in the mature forest, full of spring ephemerals and herbaceous species that prefer calcium-rich environments. Highlights included hillsides of White Trillium, swaths of Blue Cohosh, blue Hepatica flowers, and quite a few violet species (including an interesting color range of non-native English Violets near a designated garden). A highlight for me was the frequency of pale *Trillium erectum* plants (*below*), including one albino with a white ovary (*see next page*).

I would highly recommend a visit to this preserve. The trails are well maintained, and we took about 3 hours to botanize only a small portion of the preserve. I would like to visit again and see more of their restoration efforts. It only takes an hour to get to Marcellus from Ithaca, and the trip is well worth the time.

*Photos by **Sarah Zipfel**, except the normal red one, taken in Ithaca by **R. Parker** for comparison*

▲Trillium slope in Baltimore Woods
photo by R. Parker

▲*Sambucus pubens*
photo by R. Parker

➤Albino *Trillium erectum* fading to pink. Note the white ovary.
photo by Sarah Zipfel

Some of the species we saw are listed below. (An exhaustive list would be too exhausting.)

Plants Observed at Baltimore Woods

Species	Common Name	Blooming Y/N
Actaea rubra	Red baneberry	N
Adiantum pedatum	Maidenhair fern	N
Agrimona sp	Agrimony	N
Albugo heiseri (on Cardamine diphylla)	White rust	?
Antennaria spp.	Pussytoes	N
Arisaema triphyllum	Jack-in-the-Pulpit	Y
Asarum canadense	Canadian Wild Ginger	Y
Asplenium platyneuron	Ebony Spleenwort	N
Cardamine concatenata	Cut-leaved toothwort	Y
Cardamine diphylla	Two-leaved toothwort	Y
Cardamine maxima	Large toothwort	Y
Carex plantaginea	Seersucker sedge	(past)
Caulophyllum giganteum	Early blue cohosh	Y
Claytonia caroliniana	Broad leaved spring beauty	Y
Danthonia spicata	Poverty Oatgrass	N
Dicentra canadensis	Squirrel Corn	Y
Dicentra cucullaria	Dutchman's Breeches	Y
Erigeron pulchellus	Robin's Plantain	N
Erythronium americanum	American trout lily	Y
Geum fragarioides (Waldsteinia fragarioides)	Barren strawberry	Y
Hepatica acutiloba	Sharp-lobed hepatica	Y
Hydrophyllum canadense	Canada waterleaf	N
Hydrophyllum virginianum	Virginia waterleaf	N
Linum catharticum	Fairy flax	N
Lobelia siphilitica	Great blue lobelia	N
Luzula acuminata	Hairy woodrush	(almost)
Medeola virginiana	Cucumber Root	N
Mertensia virginica	Virginia bluebells	Y
Mitella diphylla	Miterwort	Y
Nabalus sp.	Rattlesnake Roots	N
Persicaria virginiana	American Jumpseed	N

Continues on next page

Plants Observed at Baltimore Woods (*continued*)

Poa alsodes	Grove blue grass	N
Podophyllum peltatum	Mayapple	N
Polygonatum pubescens	Hairy Solomon's Seal	N
Ranunculus abortivus	Small-Flowered Buttercup	Y
Sambucus racemosa (S. pubens)	Red-berried elder	Y
Sceptridium dissectum	Cutleaf Grapefern	N
Streptopus lanceolatus	Rose Twisted-Stalk	N
Tiarella cordifolia	Foam flower	Y
Trillium erectum	Red Trillium, wakerobin	Y
Trillium grandiflorum	great white Trillium	Y
Uvularia grandifolia	Largeflower Bellwort	Y
Viburnum acerifolium	Maple leaved Viburnum	N
Viburnum lantanoides	Hobblebush	Y
Viola blanda	Sweet white violet	Y
Viola canadensis	Canada violet	Y
Viola eriocarpa (V. pubescens var scabriuscula)	Smoothish yellow stemmed violet	Y
Viola odorata	English violet	Y
Viola rostrata	Long spurred violet	Y
Viola sororia	Common blue violet	Y
Vitis spp.	Wild grapes	N

Thank You!

We are grateful for the contributions of ***writers*** John F. Cryan, Rosemarie Parker, Norm Trigoboff, David Werier, & Robert Dirig. Images were shared by ***photographers*** John F. Cryan (pp. 9, 11, 13), Rosemarie Parker (pp. 1-2, 14-15), Norm Trigoboff (p. 5), David Werier (p. 6), Sarah Zipfel (pp. 1-2), & Robert Dirig (pp. 4, 7, 10, 16-17). Cryan drew the map on p. 8. The portrait of Robert T. Clausen (p. 13) is from his obituary in *Gentes Herbarum*, Vol. 12, Fasc. 3, May 1984, p. 1.

Layout & design by the Editor, ***proofreading*** by Rosemarie Parker & John F. Cryan, and ***printing*** by Gnomon Copy. Anna Stalter emailed copies, Pat Curran mailed paper copies, & Rosemarie posted to the web.

Please check our website (**www. flnps.org**) regularly throughout the summer for announcements and details of walks and other events. Many thanks to our Steering Committee (p. 4) and all of our members for supporting FLNPS and its activities. We wish everyone in our reading audience a delightful summer, filled with joyous outdoor revels with wild plants!

— Robert Dirig

Review

"Observations on Assisted Migration" Talk

by Rosemarie Parker

While listening to **Monica Gelber**'s wonderful review of issues and experiences with trying to move plants to accommodate climate change, I realized how very complicated the process is, even for government/academic-sponsored programs. The number of variables to consider really limits the ability to migrate and establish a significant population. So, is there any role for home gardeners in this effort? Clearly botanic gardens can play a role by providing both a safe location and propagating. But Monica mentioned one other benefit of botanic gardens — that their collections are searchable, thus supplying a range of locations and conditions where a given species is known to survive.

Individuals may choose to grow a more southern or midwestern species because they just like it (no problem), because they want it still to be alive in the warmer future (fine), or because they feel they are helping to "migrate" the species. In the last case, the one thing we could do as individual gardeners is to make our "collections" available, akin to what the botanic gardens do. And for that, I think a good option is to report your southern/midwestern acquisitions on iNaturalist. If you look at cultivated species in New York on iNaturalist, there are *tons.* The few plants you raise are very unlikely to make a difference for the species, but reporting them to a resource like iNaturalist could help.

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, 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 25, No. 2 June 2024

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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.

Foamflower (*Tiarella stolonifera*), Mundy Wildflower Garden, 9 May 2012, *photo by Robert Dirig.* See related article on pp. 14-16.

Contents

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

Deadline for the September 2024 issue is August 15th !

Plant Trivia ◆ *by Norm Trigoboff*

1. What do these plant genera have in common? *Ammophila* (a grass), *Amorpha* (a shrub), *Jubula* (a liverwort), and *Polypodium* (a fern). Hint: Go on, forage on the internet.

2. The three numbers on each bag of fertilizer:
A. tell how much calcium, iron and vitamin D are present.
B. predict which numbers will hit next week.
C. tell about nitrogen, phosphorus and potassium.
D. tell how much of the mix had its origin in animal, plant and mineral matter.
E. all of these.

3. You can tell which fertilizer, if any, to use in your garden, if you:
A. smell the dirt.
B. taste the dirt.
C. cast the dirt on a Ouija board.
D. test the dirt chemically.
E. skip the fertilizer and use compost.

4. A sign in a corner of Cornell's greenhouse on Tower Rd. by Minn's Garden reads: Carnivorous Plants! Do not leave children unattended. What is the danger here, if any?

5. The "Doctrine of Signatures" refers to the idea that:
A. genetic information flows from DNA to RNA to protein.
B. people with flowery signatures tend to eat more plants.
C. a plant that looks like a part of the human body can cure problems with it.
D. the signers of the Declaration of Independence knew that plants of commerce were vital to the nation.
E. all of these.

6. What's wrong in this photo (*above*)?

7. Name the odd man out: beet, table beet, garden beet, red beet, mangelwurzel, chard, Swiss chard, silver beet, perpetual spinach, seakale beet, beet spinach, spinach beet, dinner beet, golden beet, Estonian bagel beet, fodder beet, field beet, sugar beet, beetroot, sea beet.

8. *Beeturia* refers to:
A. passing pink urine after eating beets.
B. the area of the Middle East where beets were domesticated.
C. a minute cap-like structure on over-wintering honeybees.
D. the part of ancient markets where root vegetables were sold.
E. a corrosive fertilizer made for beets and related plants.
F. all of these.

Question 6

9. Tomato plants may be *determinate* or *indeterminate*. Which kind do you grow if you want to can tomatoes?

10. True or false?
A. The ancient Aztecs and Incans ate peanut butter.
B. All or most diamonds formed from highly compressed coal.
C. Rutabagas originated as a hybrid between the cabbage (*Brassica oleracea*) and the turnip (*Brassica rapa*).
D. Rutabaga leaves, though good food for animals, are bad for people.
E. Our glowing Halloween pumpkins evolved from the glowing rutabagas of a pagan holiday.

[*See answers on page 6.*]


Red Trillium (*Trillium erectum*), *May 26th 1996*

Name That Plant Contest

The photo from last issue's [*Solidago* 25(1), p. 4] Name That Plant Contest was of a **Tulip Tree (*Liriodendron tulipifera*)**. Being a large forest tree, it can be difficult to see the flowers up close. But when one comes upon a rare open-grown tree, or a branch has fallen to the ground and the flowers are close at hand, a feasting of the senses ensues. As Bob Dirig put it, "It's a wonderful tree, with perhaps the most elegant flowers and leaves in our flora." Bruce Gilman wrote, "Your mystery plant in the recent issue of *Solidago* is one of my favorite trees, *Liriodendron tulipifera*. Its magnificent height, straight trunk, and four-lobed leaves are unmistakable. In the springtime, the large stipules are quite noticeable, and leave an encircling line on the winter twig. Tulip Trees make me smile!" Thanks to all those who entered the contest, and congratulations to contest winners: **Bob Dirig, Bruce Gilman, Alice Grow, Meena Haribal, Susanne Lorbeer, Laura Mol, Laura Ouimette, Rosemarie Parker,** and **Robert Wesley**.

This issue's mystery plant is shown below.

Common and/or scientific names are acceptable, and more than one guess is allowed. Hints and suggestions are often provided to contest participants who try. Please submit your answer to **David Werier (Nakita@]lightlink.com).**

The photograph was taken on August 20, 2020 in Tompkins County, N.Y., by David Werier.

Plant Trivia Answers

by Norm Trigoboff

1. They are also genera of animals. *Ammophila* is a genus of hunting wasps. *Amorpha juglandis* is the Walnut Sphinx Moth. *Jubula* is an African owl. *Polypodium hydriforme* is a parasite that lives in fish eggs.

2. C. You may see **NPK** on fertilizer bags. The letters stand for nitrogen, phosphorus and potassium, the elements most needed by cultivated plants. (See me in person for hot tips on numbers.)

3. D. Chemically test the dirt. (You could google: Tompkins County soil testing.) On the other hand, many gardeners trust compost.

4. The sign is a joke. Still, the greenhouse has its share of botanical, chemical, electrical, mechanical, aquatic, and public health hazards. Your kids may beg to picnic in the shade of the nice Florida Fish Poison Tree, but you should stand firm.

5. C. This belief in sympathetic magic likely goes back to the Stone Age. Though arrogant scientists like me are unsympathetic to the idea, some herbalists still use it.

6. Everything in the photo is fine. The person standing in the Invasive Species Disposal Station is an invasive species. Okay, maybe something is wrong. The Disposal Station is too small.

7. Estonian Bagel Beet. The other names refer to forms of the important vegetable *Beta vulgaris*. (Yes, Swiss chard, table beet and the others are the same species. Domestic species often vary a lot.)

8. A. Though sometimes mistaken for blood in the urine, *beeturia* is harmless. It scared the piss out of me the first time I had it. (Beets may also stain stools in a scary way.)

9. *Determinate* (bush) tomato plants stop growing as the flowers bloom. Their tomatoes ripen all at once. Canners like them. *Indeterminate* tomato plants keep growing and growing and growing and growing and growing. People who like a constant supply of fresh, ripe tomatoes (and growing) like them.

10. A. True. **B.** False. "Most diamonds that have been dated are older than the first land plants, and are therefore older than coal." (Rumors that I too am older than coal are somewhat exaggerated.) **C.** True **D.** False. They're good for people and animals. **E**. True — says the website of The Advanced Rutabaga Studies Institute:

https://rutabagas.tripod.com/history.html

For **A** and **B**, see:

https://en.wikipedia.org/wiki/List_of_common_misconceptions

For **C** and **D**, see:

https://en.wikipedia.org/wiki/Rutabaga

PLANT PROFILE

Studying a Population of Rue Anemone

(*Thalictrum thalictroides*) at Cascadilla Woods, Cornell University, Ithaca, N.Y., in April & May 1976

by John F. Cryan

The **RUE ANEMONE** (*Thalictrum thalictroides*, formerly in the genus *Anemonella*) has not often been recorded from the Cascadilla Creek drainage. Specimens from the Wiegand Herbarium at Cornell University are from one locality, **Cascadilla Woods**, which ran along the north and south sides of the creek from the College Avenue bridge, east to the impoundment of the Creek north of Campus Road, on the Cornell University campus. Two specimens from Cascadilla Woods were dated 28 October 1882 and 15 June 1932. The 1882 sheet had flowering specimens on it, indicating that some plants in the population may have flowered twice.[1] The normal range of flowering times for Rue Anemone (*hereafter R.A.*) in the Ithaca, N.Y., area falls between 22 April and 17 June, judging from the dates on Wiegand Herbarium specimens. WIEGAND & EAMES (1926) did not indicate any localities for *T. thalictroides* in the Cascadilla Creek drainage, simply stating that the species is "common about ravines and on slopes of Cayuga Lake, occasional on higher hills, rare or absent in the McLean Region."

Plants at the study site, 17 May 1997

From 42 sampling units that comprised the Cascadilla Creek drainage, two (numbers 2 and 35) were selected as optimal for R.A.; three more (numbers 13, 23, and 41) were randomly selected from the remaining 40 units to be surveyed for R.A. Only one of these five units (number 2) harbored the species. It is assumed that the population of R.A. in sampling unit 2 is the one that is vouchered by the specimens in the Wiegand Herbarium; it is also assumed, based on the results of the survey of the three randomly selected units, that the population of R.A. at Cascadilla Woods is the only one extant in the Cascadilla Creek drainage.

In my study of R.A. in Cascadilla Woods, I was interested in several questions. Among these were *the nature of, and variation in, populations of this wildflower,* and *the role of insect pollinators in defining populations of R.A.* I was also very interested in the natural and human factors limiting the distribution of the species, especially in light of its seeming absence from most of the Cascadilla drainage. Before the study began, I hypothesized that R.A. would be rather generally distributed in a fairly wide range of microhabitats, and that its flowers would be rather well-visited by insects. I also thought that its nearest relative, **Early Meadow Rue** (*Thalictrum dioicum*), in this area would be allopatric with R.A. in its microhabitat distribution, as in my experience, it seems to prefer more disturbed, drier sites. Literature that lists many minor variants of R.A. suggests great variation of populations, and I expected to find it in the one at Cascadilla Woods.

The main body of the R.A. population that I studied is bounded on the south by the abrupt rim of the gorge wall on the north side of Cascadilla Creek. It is bounded on the north by a sidewalk on the south side of Campus Road, on the east by the turn that Cascadilla Creek takes to the north as it passes under Campus Road, and on the west by a landslide caused by the construction and widening of Campus Road. A steel guardrail begins on the south side of the road where the landslide occurred, west of the R.A. population, about 30 meters west of the Campus Road bridge over Cascadilla Creek (*see map on next page*). One plant was found *north* of Campus Road, about 2 meters east of the stairs, which ascend from the west side of the Campus Road bridge to the Cornell campus, behind Schoellkopf Field. This plant is located about 40 meters from the center of the main body of the R.A. population.

The Cascadilla Woods population was visited on the following dates (hours spent in parentheses): 22 April (1 hour), 23 April (4), 26 April (1), 27 April (1), 28 April (2), 29 April (5), 30 April (4), 2 May (4.5), 3 May (1), 4 May (1.5), 5 May (2), 8 May (2), 9 May (2), 11 May (2), 12 May (3), 14

1) **R. T. CLAUSEN suggested that this date was a label error.**

stop

May (4), 15 May (1), 16 May (2), 19 May (2). Forty-five hours were spent in the field gathering observations and data.

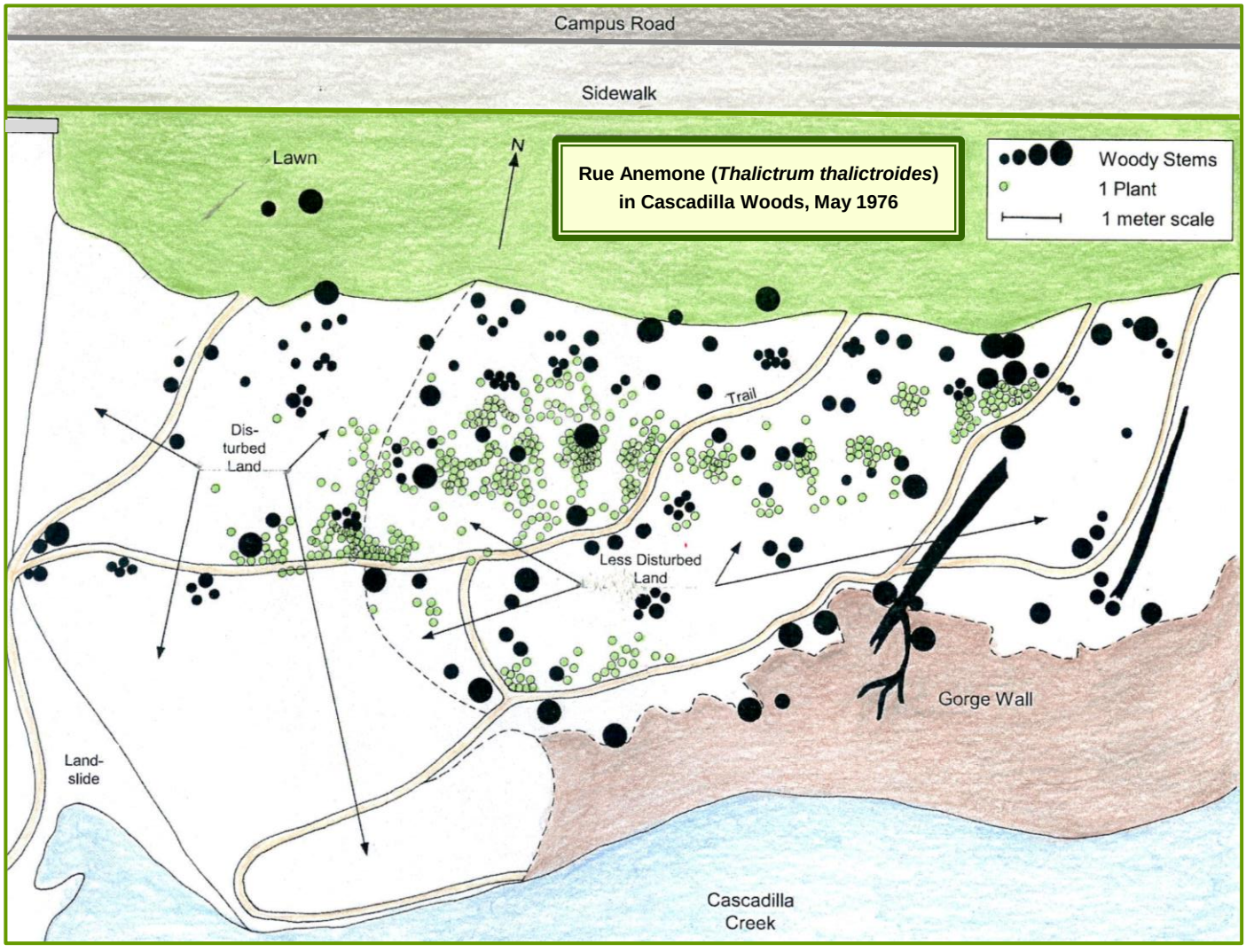
Size and Extent of the Population

About half of the time in the field was spent finding the limits of the population, enumerating and tagging individual plants, and mapping their distribution. The population was found to comprise 451 individuals on 16 May 1976. All of these were tagged to facilitate their relocation. During the course of the study, 113 individuals, or 25% of the population, germinated or began their spring growth. These were tagged as they appeared. At the end of the study period, a few individuals were still germinating, but I estimate that over 90% of the population had appeared above-ground by 16 May. The population thus consisted of less than 500 plants.

I surveyed the wooded areas *south* of Cascadilla Creek as thoroughly as possible, and found that they were extensively disturbed. No R.A. was found in any of these areas within unit 2. A similar search of the remainder of these wooded areas *north* of the Creek, comprising the remains of Cascadilla Woods, turned up no more than the single individual found there by R. T. CLAUSEN (*pers. com.*); he informed me that the site of this individual had in the past supported many individuals.

The map (*below*) shows the approximate distribution of the individuals in the main body of the population. The population now exists in a broad band below the mowed lawn south of Campus Road and above the steep drop of the gorge walls. Most of the plants are growing in soil that was relatively undisturbed by the building of Campus Road. To the west of this zone of undisturbed soil lies some that is somewhat disturbed; small landslides have disrupted most of the original herb layer, but some of the original trees and shrubs persist. To the west of this, another zone is found in which nearly all of the native plants of the gorge have been destroyed by a landslide caused by the dumping of gravelly soil for fill for the roadbed of Campus Road. The extensive disturbance continues to the tennis courts on the west. No individuals of R.A. were found on the landslide, but some were found to be recolonizing the disturbed land just west of the main body of the population.

The main area of the population, which consists of all individuals south of Campus Road, fits into a rectangle 15



meters east to west by 6 meters north to south, or 90 square meters. Within this area, the plants occupy about 40 square meters, and exist in several large clusters or clumps of individuals. Each cluster is usually on the south side of a tree, stump, rock outcrop, or other obstruction, which protects it from the detritus falling down the side of the gorge. The smallest circle (within whose radius the entire population, including the one disjunct individual, would fit) is 46 meters in diameter and 1631 square meters in area.

Reproduction and Pollination

The population seems to be reproducing entirely by sexual means. The anthers of the flowers produce abundant pollen, and every flower seen bore fruit — small ribbed achenes, usually 4 to 7 in number, which ripened quickly and were observed to drop off the peduncles. Many plants were found, and a random sample of 10 of the 45 with only one leaf and one stem showed that one of them was a seedling which had germinated that year, as evidenced by the remains of the achene adhering to the root (*below*). Toward the end of the study period, five plants were found which had germinated in the last week of the study; all of them were apparently seedlings from seed which had been set either last year or this year. Achenes were collected on 23 April from one plant and potted 1 centimeter deep in soil from the area of the R.A. population; three of five achenes had germinated by 16 May. The pots were left outside for the intervening period, and received only what rain fell on them. This little experiment demonstrated that *some of the seeds from R.A. can germinate the same year that they are produced*.

Seedling, 2.4 cm high. When dug up, it still had the pericarp attached to its root. This is one of the plants which may have germinated from this year's seed. 30 April 1976.

The plants that are now growing on the more disturbed soil in the western part of the population are indications that R.A. is producing much viable seed. It seems from the current pattern of distribution that most of the seed falls and germinates only a few meters from the parent plants. It is also apparent that many of the individuals in downslope places, more toward the edge of the gorge wall to the south, are the progeny of individuals higher up on the slope. The plants in the entire population lead a tenuous existence, and during the study period, I saw 17 individuals destroyed, mostly by small landslides caused by heavy runoff after storms. The individuals on the steeper, more exposed slopes at the southern half of the population have the greatest probability of being destroyed by the instability of their substrate.

I had expected to find many ***insect pollinators*** of R.A., but discovered during 5 hours of active pollinator observation on a warm, sunny day, and 25 hours of passive observations, that the major insect pollinators are small (3 to 5 mm), and of the family Halictidae (**Sweat Bees**), mainly *Halictus confusus* and *H. ligatus*. Three species of **Bumble Bees** (genus *Bombus*) — *B. pennsylvanicus*, *B. affinis*, and *B. fervidus* — were observed to visit R.A. flowers, but each spent only a short time at the flowers, partly because of lack of ample support. A small fly of the family Syrphidae (**Flower Flies**, genus and species unknown) sat on a flower for a few seconds, without making any attempt to extract food from it. An **Azure butterfly** (*Celastrina* sp., Lycaenidae) was seen on one sunny day, 29 April, feeding at a R.A. flower; it stayed on the single flower for 2½ minutes, and did not visit another one in the population after it took off.

The halictid bees seemed to be feeding and pollinating only R.A. flowers and those of Early Meadow Rue; however, the same individual worked only the flowers of one or the other species. This was found by marking all individuals captured on R.A. with yellow enamel, and those on Early Meadow Rue with orange enamel (one dot on the thorax between the wings), then releasing them. Of 35 individuals from R.A., so marked, 23 returned to the flowers after marking and release. The rest were handled too roughly in the net during the marking process and did not return. Thirteen of 19 individuals taken from Early Meadow Rue returned to that species after marking.

All of the pollinators seen on R.A. ranged quite a distance away from the population. Many were seen to fly in a straight line across Campus Road toward Schoellkopf Field (a large sports stadium), as though they were using this structure as an orientation device. Several of the orange-marked *Halictus* were observed in the vicinity of the tennis courts to the west of the R.A. population, where they apparently were nesting. The disturbed, gravelly soil near the creek furnished these solitary bees with many nesting opportunities, and many nests were found in this area.

Distributional Data

The altitudinal range inhabited by the R.A. population is 780 to 810 feet above sea level. The creek below the population lies at 750 feet in elevation. There is a crest at the top of the slope occupied by the population which rises almost 10 feet above Campus Road. This small slope protects the plants to some extent from debris from the road. The exposure of the area occupied by the plants ranges from slight to moderate, with a gradient toward greater exposure running from the upper to the lower part of the slope. The plants are found only on slopes of less than 45°; the steeper slopes have very little soil, are subject to severe erosion, and have great exposure to the sun. Drainage throughout the area is good to excellent; again, the droughty, steeper slopes support no plants of R.A.

Many outcrops of rock exist throughout the lower parts of the slope, and these are bare of vegetation unless they have caught and held soil washed down from the upper slope. The outcrops are the top of the eroded side of the gorge. The soil above these is very rich, and consists of an *untyped loamy humus*. Its source seems to be the vegetation on it; some of it may come from the fill dumped to make the roadbed, especially in the more disturbed western half of the population. Using a pH meter, readings were obtained from the dry soil which ranged from 5.4 to 5.9, indicating moderate acidity.

The vegetation of the area has been so badly disturbed that it is hard to tell what it originally comprised. At present, the trees are **White Pine** (*Pinus strobus*), **Choke Cherry** (*Prunus virginiana*), **American Elm** (*Ulmus americana*), **Slippery Elm** (*Ulmus rubra*), **Witch Hazel** (*Hamamelis virginiana*), **Red Maple** (*Acer rubrum*), and **Northern Red Oak** (*Quercus rubra*), in decreasing order of dominance and abundance at the R.A. population. The original association was probably **Beech-Maple**, with a smaller number of White Pine and oaks. There are many small **American Beeches** (*Fagus grandifolia*) scattered throughout the area, probably remnants of a larger population. The tree species mentioned above are the main ones that shade the R.A.; their importance to the population increases as the season progresses. The peak flowering of R.A. came at about the end of April, when most of the shading trees had not yet completely leafed out. The number of flowering individuals dropped off greatly, from 31 to 5, in the period between 30 April and 11 May; this period corresponds to the full expansion of the leaves of shading trees.

Several other plants were observed competing with individuals of R.A. for space. **Field Pussytoes** (*Antennaria neglecta*) has become established on the mowed lawn above the R.A. population, and in places is crowding them out by its stoloniferous growth, forming mats around the R.A. plants and depriving them of light. The response of the R.A. has been to increase their height, making the plants look spindly. **False Solomon's Seal** (*Maianthemum racemosum*) is found often shading and crowding the R.A. plants, particularly in the western half of the area. A species of **Blue Grass** (*Poa*, probably P. *compressa*) has been planted along Campus Road, and has escaped into the R.A. population, preventing plants from getting established near the top of the slope. The western boundary of the population is well defined by a line of **Yellow Rocket** (*Barbarea vulgaris*) and **Japanese Honeysuckle** (*Lonicera japonica*), which have grown on the landslide, preventing all but alien herbs from penetrating underneath. There is quite a lot of **Early Meadow Rue** and **Yellow Pimpernel** (*Taenidia integerrima*) growing within a few centimeters of many R.A. plants. It seems that R.A. completes its flowering before either of these two species has fully expanded its leaves.

A surprisingly large number of plants were found to be within 25 cm of their nearest neighbors. The clumped distribution of the plants explains this high figure. None of the three plants which are more than 1 meter from their nearest neighbor had flowered by the time this study was ended; they appear to be young individuals, and in the case of the two south of Campus Road, they appear to represent the farthest advancement of the R.A. population onto the disturbed soil to the west of the main group of plants.

Individual blooming plants of Rue Anemone at the study site, 17 May 1997

The table below gives the number of plants and percentage of the population of R.A. found in each of its six categories, based on the distance to each individual's nearest neighbor:

Distance to nearest plant	0-5	5-10	10-25	25-50	50-100	over 100 cm
Number of plants	76	130	165	47	30	3
Percent of population	17	29	36	11	7	below 1

Morphological Variation

The table below summarizes the data taken from a random sample (simple) chosen from the entire population of 451 individuals using the random number table of Steel & Torrie (1960). The characters chosen for measurement were: height and diameter to demonstrate vigor; the number of stems per plant; the number of leaves per plant; the mean length/width ratio for leaflet blades per plant; the mean petiole length per plant; the mean stem length to the first node per plant; and the number of flowers per plant, as of 19 May. The 95% confidence interval for each sample was calculated using the formula **$d=2/(.512)\ (s^2)$**, which is derived from Stein's two-stage sample test (Steel & Torrie 1960, p. 86).

Character	n	$\bar{x}$	s^2	s	range	95% conf. interval
Height	10	92.3	174.5	13.1	62-143	18.9
Diameter	10	62.7	913.0	30.2	28-113	13.6
# of stems	10	1.6	0.6	0.8	1-3	0.4
# of leaves	10	3.8	5.0	2.2	1-8	3.2
l/w leaflets	10	1.25	0.02	0.02	1.1-1.4	0.06
petiole lgth.	10	22.1	193.2	13.9	11.6-28.5	19.8
stem length	10	60.7	290.5	17.0	33.5-98.0	24.4
# of flowers	10	0.2	0.2	0.4	0-1	0.2

A second simple random sample of plants was chosen from those that were flowering on 30 April (N=31); the data may contain biases due to their temporal nature, but are of value as a gross indicator of variation.

Character	n	$\bar{x}$	s^2	s	range	95% conf. interval
Sepal length	10	9.3	3.1	1.8	6-12	2.5
# of carpals	10	4.9	1.0	1.0	3-7	1.4
# of stamens	10	15.3	18.5	4.3	8-22	6.2

[All measurements above in mm.]

There was great range in height and diameter, which indicates a rather diverse population. There seems to be a correlation between size and age of individuals of R.A. The youngest seedlings had only one stem, one leaf, and were very small, while the oldest flowering individuals had many stems, many leaves on each stem, and more than one stem with flowers. A system was developed to classify this gradient of size and morphological development into eight categories, each with a code number to facilitate recording. The categories advance from those characters which I consider to indicate youth to those indicative of great age in an individual. The categories follow:

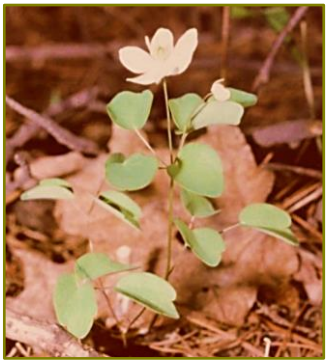
Type 1: 1 stem, 1 leaf
Type 2: 1 stem, 2 or more leaves
Type 3: like Type 2 with 1 flower
Type 4: like Type 2 with 2 or more flowers
Type 5: more than 1 stem, 1 stem with 2 or more leaves
Type 6: like Type 5 with 1 flower
Type 7: like Type 5, 1 stem with 2 or more flowers
Type 8: like Type 5, 2 stems or more with flowers

All of the 451 plants were placed in one or more of these categories, based on the three characters of *number of stems*, *number of leaves*, and *number of flowers*. The number of stems was the more important character for determining age, because those individuals with greater numbers of stems also had greater biomass, larger tubiferous roots, and greater root diameter. These three characters are all commonly used to estimate age in perennial species.

Type 3
numerous stamens and three carpels

Type 4
middle flower in fruit, side ones in anthesis (*left*); and showing 3-toothed leaflets (*below*)

Type 6
showing whorled arrangement of leaflets



Type 7
central flower in anthesis, side one budded

Photos scanned from faded, 48-year-old prints. Images taken on 30 April 1976.

Code # (Types)	1	2	3	4	5	6	7	8
Number of plants	45	215	16	9	72	50	31	13
Percentage of population	10	48	3	2	16	11	7	3

These counts were made on the last two field days, to enable as many plants as possible to finish flowering, thus negating the bias caused by temporal flowering variation.

- They indicate that the population consists, in the majority, of young plants.
- They also indicate that I was wrong in selecting number of stems as the primary character to use in demonstrating age, because the categories 5 and 6 contain a substantial number of individuals.
- A better arrangement of the present categories, based on increasing age, would be 1, 2, 5, 3 and 6, 4 and 7, and 8.
- Apparently some of the plants become multiple-stemmed before bearing their first flower, while others stay single-stemmed.
- It also seems, judging from the growth patterns of the plants in Types 1, 2, and 5, that Rue Anemone individuals must undergo several seasons of vegetative growth before they begin to flower.
- None of the smaller plants, adjudged to be of Types 1, 2, and 5, developed flowers at the end of the period, and I feel that they will not at all this season.

Interspecific Hybrids

There is a distinct possibility that hybridization between *Thalictrum thalictroides* and *T. dioicum*[2] has occurred at Cascadilla Woods, but the evidence that I have is scanty. It consists of various individuals of both species, which, in their vegetative condition especially, resemble typical individuals of the other species in one or more characters. ◆There were several R.A. that had flowers approaching those of *T. dioicum* in diameter (ca. 9 mm). ◆These flowers were usually found on very short pedicels, and had five sepals, but no stamens. ◆There were three carpels. ◆Three individuals were found that had leaves that were malformed at the edges. ◆The *T. dioicum* found that resembled R.A. did so in leaf characters only: the leaves were three-toothed instead or five- to nine-toothed, they curled upward at their side margins, as do those of R.A., and their leaflet blade length/width ratios fell between 1.3 and 1.4, instead of under 1.0 as is the case in typical *T. dioicum*. Unfortunately, I was able to preserve only parts of individuals of both species with intermediate vegetative characters, as the flowering R.A. which seemingly exhibited some *T. dioicum* characters lost their flowers in heavy rains and high winds on 26 and 27 April.

Discussion

The R.A. population at Cascadilla Woods seems to have suffered greatly in both numbers of individuals and extent due to the development of the Cornell University campus in the area. The small remnant that is left of a once-larger population does not display the variation found by earlier workers in other populations. None of the many named varieties were found, and most of the individuals appeared similar. It is possible that the population has become highly inbred since the building of Campus Road, and the disturbance of the woods north and west of the main body of the present population. It seems that the population was reduced by the development of Campus Road to a handful of flowering individuals, most of which were located on the lee (south) side of the trees and shrubs that were spared from destruction. Most of these survivors were in the northeastern part of the main body of the present population. Together with those across the road, on the south-facing bank where the one disjunct individual is now located, the survivors began to spread propagules in fan-shaped patterns below each fruiting individual. The survivors grew best where microclimatic conditions were favorable, forming the present clusters, and leaving less favorable spaces between themselves. The part of the original population which existed on the slope north of the impoundment of Cascadilla Creek, northeast of the present population, was destroyed recently by overzealous landscaping crews, leaving what is now recorded. Similar destruction probably took place during the building of the Engineering Quadrangle (R. T. Clausen, *pers. com*.) and the tennis courts south of Campus Road.

The preponderance of young individuals in the population remaining in Cascadilla Woods offers some hope that the population may be able to spread somewhat and persist on the steep, relatively undisturbed slopes where it is now. This hope is tempered by a pessimistic outlook for the long run, however, because of increasing human traffic on the trails already lacing the area of the population. Greater erosion and destruction of individuals in the population will result from the constant use of this path by pedestrians attempting to travel between the creek and Campus Road. Several of the destroyed plants were trampled by humans. Also, a better foothold will be given to numerous alien plants, such as *Antennaria neglecta* and *Taraxacum*, which are on the verge of choking the R.A. I expect that by my twentieth class reunion visit, there will be no more of this population left to greet me.

2) Cryan called Rue Anemone *Anemonella thalictroides* in 1976. This plant is now placed in the genus *Thalictrum* (Werier 2017); thus, if juxtaposed, these two plants might hybridize. —*Ed.*

Editor's Note: I visited the study site on *17 May 1997* (21 years later), and photographed several blooming plants (pp. 7 & 10), noting "a few, still…." A return on *26 April 2024* to the site (48 years later) disclosed *no* Rue Anemone *or* Early Meadow Rue *plants*, validating Cryan's prophecy! Not surprisingly, Garlic Mustard (*Alliaria petiolata*) has colonized the area. The footpaths are gone, and the site is now part of a Natural Area of the Cornell Botanic Gardens. — *Robert Dirig*

Conclusions

◆The **individual variation** within the population is quite limited for most characters, leading me to believe that some inbreeding has taken place.

◆The **present distribution** of the population reflects more the effects that humans have had on it than the natural phenomena limiting such populations. I can draw almost no general conclusions concerning extent, distribution, abundance, and interpopulational variation in R.A. populations from the one studied.

◆**Hybridization** may have occurred between *Thalictrum thalictroides* and *T. dioicum*, which are sympatric, congeneric, and flower at the same time in Cascadilla Woods.

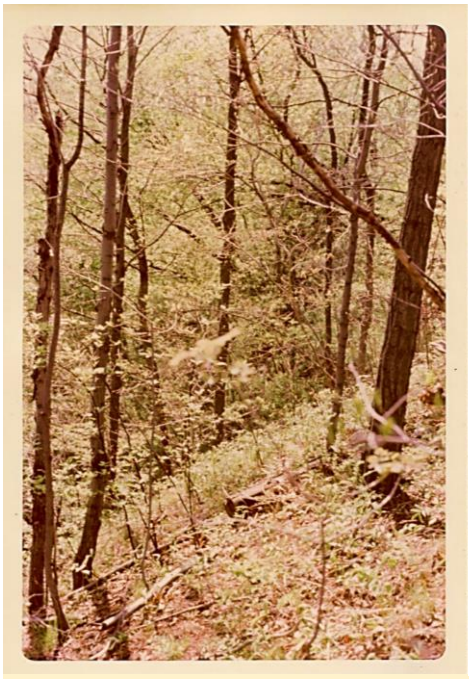
◆**Insect pollination** of R.A. flowers seems to be the province of three species of small halictid bees. The bees visit one species at a time during the day, and so insure the pollination of many of the R.A. flowers. These bees have an unknown range, but some were seen nesting near the tennis courts only a few hundred meters from the R.A. population. It seems unlikely that much significant gene flow occurs between this population and the next-nearest one on the north side of Beebe Lake on the Cornell campus.

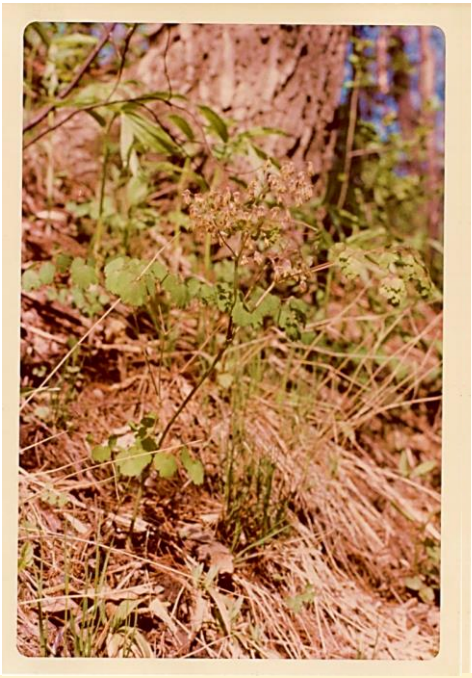
Literature Cited

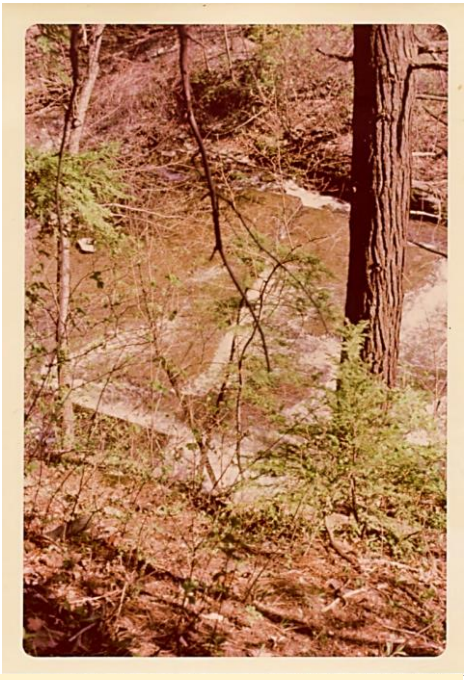
Steel, R. G. D., & J. H. Torrie. 1960. *Principles and Procedures of Statistics, with Special Reference to the Biological Sciences*. McGraw-Hill Book Company, New York: xvi+ 481 pp.

Werier, D. 2017. "Catalogue of the Vascular Plants of New York State." *Memoirs of the Torrey Botanical Society*, Vol. 27: [iv] + 543 pp.

Wiegand, K. M., & A. J. Eames. 1926. "The Flora of the Cayuga Lake Basin, New York." *Cornell University Agricultural Experiment Station Memoir* No. 92: 491 pp. + fold-out map.







***Left*: A disturbed area in the western half of the population, looking west. In the background can be seen the dense undergrowth of alien shrubs on the upper part of the landslide. Note steep slope.**

***Center*: Early Meadow Rue (*Thalictrum dioicum*), male plant in anthesis. (The three-dimensionality of this plant makes it very difficult to photograph.) This species was mixed with the Rue Anemones, but occurred more abundantly on the disrobed western section of the site.**

***Right*: A view from the less disturbed area of the population, looking south to the Cascadilla Gorge.**
(*All photographed on 30 April 1976.*)

This article is adapted from a field project report by a student in Robert T. Clausen's legendary Cornell course on "Taxonomy of Vascular Plants," which he taught for 36 years. Professor Clausen (*left*) received the *Chancellor's Award for Excellence in Teaching* from the State University of New York in 1974, and was also Curator of Cornell's Wiegand Herbarium. He wrote: "Your report is excellent, particularly good in demonstrating the effects of man, and on reproduction and pollination. The part about possible hybrids is important." This fine example illustrates Clausen's ability to foster independent thinking during field work by his students, who were profiling native plants. —*Ed.*

WILD GARDENING

Tiarella, ×*Heucherella*, *Heuchera*

by Rosemarie Parker

All photos by the author except as noted

***Tiarella stolonifera* in flower. The smaller leaves at the left and bottom are from stolons.**

SHADE GARDENERS AND HIKERS love seeing a swath of ***Tiarella*** **(Foamflower)** in bloom. It can light up an otherwise dark corner and carpet a road or stream bank. The leaves can have reddish or yellowish areas ranging from subtle (most wild) to strongly demarcated (cultivars and some wild) and remain alive over the winter. They are quite hairy. ***Heuchera*** spp. **(Coralbells, Alumroot)** are found in sun and shade throughout North America, and often have strongly patterned hairy leaves. In some species the leaves overwinter. The flowers range from cute to inconspicuous. Horticulture has morphed Heucheras into wildly toned

stop

***Tiarella stolonifera* leaves in winter (4 leaves). The two separate leaves are from cultivars and are a bit more elongated.**

options for any color scheme. And, to get "better" flowers on more colored leaves, enter ×***Heucherella*** sp. — a hybrid of the two species that is increasingly popular, based on catalog and shelf space. But let us stick with non-hybrids.

Heuchera and ***Tiarella*** are closely related genera within the family Saxifragaceae. ***Mitella*** (Mitrewort) is also closely related, and can hybridize with the others, but I am writing only about the first two. According to *Flora North America*, there are 37 species of *Heuchera*, of which 32 are North American and only one is in New England (FNA1).

Heuchera americana *var.* ***americana*** (Common Alumroot) is native in the warmer and more southern parts of New York in rich woods, generally associated with rock outcrops (NYFA). It is also found in parts of Connecticut. The bulk of the population is south of the Great Lakes, and it intergrades with other species where they overlap (FNA1). The only other *Heuchera* listed in the NYFA Atlas, *H. villosa* var. *villosa*, is native to the mid-Atlantic and Appalachians, and is not naturalized in New York (NYFA). Pennsylvania has *Heuchera alba* and *H. pubescens* in addition to *H. americana*, but again, the former are not in New York (Schuette 2018).

Heuchera americana **leaves in winter** (*left*) **and spring** (*right*)

I first saw *Heuchera americana* in Pennsylvania, where it both lined a path and grew naturally in a wooded area. It grows well in the Finger Lakes Region, and can be a nice groundcover in part- to full-shade. The flowers are inconspicuous on a long *leafless* stalk. Cultivars with highly colored leaves (reds and silvers) are available, some cultivated from natural forms. I have grown *Heuchera americana* from seed, and the Mundy Wildflower Garden has some of the offspring.

Depending on how you lump or split, ***Tiarella*** has 3 species globally (or 8-9) of which 2 (6-8) are North American. Only one is found in and native to New York State, but it probably is not what you would expect. In the time I have been in Ithaca, the eastern Tiarellas have been recognized as a few species (including *T. cordifolia* & *T. wherryi*), then one species only, *T. cordifolia* [FNA2]), now five species (Nesom 2021). In the old days, *cordifolium* was local and stoloniferous, *wherryi* was a bit more southern and clumping, not stoloniferous. The newer taxonomy is described in a simplified version below.

Tiarella **sp., with a good example of an extended terminal lobe. Possibly a result of introduced plants to Bowman's Hill Preserve (southern Pennsylvania, where this was taken by T. G. Potterfield), and where *T. stolonifera* should be the only wild species.**

"Three morphological features are emphasized here in defining the eastern *Tiarella* species … and inferring relationships …. **Stolons**: the most unambiguous discontinuity is the presence or absence of herbaceous stolons (present in *T. austrina*, *T. stolonifera*). All plants in a *Tiarella* population either do or do not produce stolons. **Leaf shape**: plants from the southern Blue Ridge Mountains and southward have relatively large leaves with an extended terminal lobe, its apex sharp-pointed and often acuminate (*T. austrina*, *T. nautila*, *T. wherryi*). **Stem leaves/bracts**: leaves or foliaceous bracts consistently occur on the flowering stems of two of the southern Blue Ridge species (*T. nautila*, *T. austrina*); the other three species have ebracteate [*i.e.,* no bracts on] stems" (Nesom 2021). Whew! And New York has ***Tiarella stolonifera*** only. Our plants have not changed, but in the current taxonomy, the range of *Tiarella cordifolia* is restricted to Maryland and south to northern Georgia. If you see *Tiarella* in the woods around here, you can be positive which species it is. (At least until someone else studies them and decides differently.) Of course, while all the eastern forms were considered to be one or two species, horticultural outlets (nurseries, seed exchanges) would not have distinguished sources to the extent needed for the new taxonomy. Gardeners certainly have a variety of species, and cultivars exacerbate the difficulty. Many of the available cultivars are non-stoloniferous and have leaves with extended terminal lobes, often acuminate; presumably more southern species. But the native species spreads faster into a lovely groundcover. The Mundy Wildflower Garden has both stoloniferous and clumping forms of *Tiarella* for easy viewing.

Gardening: Both *Heuchera americana* and *Tiarella stolonifera* grow in part- to full-shade, in rich soil, preferably somewhat moist. They grow reasonably well from seed, and the local *Tiarella* can be readily divided once the stolons with their new leaves have rooted in. Neither species does that well with lots of tall competition, but can intermingle with stemmed *Viola*, *Dicentra*, and similar low-statured and less aggressive neighbors.

Thank you to David Werier for supplying these

References:

FNA1 http://floranorthamerica.org/Heuchera_americana

FNA2 http://floranorthamerica.org/Tiarella

Nesom, G.L. 2021. Taxonomy of *Tiarella* (Saxifragaceae) in the eastern USA. *Phytoneuron* 2021-31: 1–61. Published 5 July 2021. ISSN 2153 733X

NYFA Werier, David, Kyle Webster, Troy Weldy, Andrew Nelson, Richard Mitchell†, & Robert Ingalls†. 2024 **New York Flora Atlas**. [S. M. Landry and K. N. Campbell (original application development), **USF Water Institute**. **University of South Florida**]. **New York Flora Association**, Albany, New York.

Potterfield, T.G. 2014 Flickr, accessed 5/6/2024. https://www.flickr.com/photos/tgpotterfield/8267921745/in/photostream/

Schuette S, Folk RA, Cantley JT, Martine CT (2018) The Hidden *Heuchera*: How science Twitter uncovered a globally imperiled species in Pennsylvania, USA. *PhytoKeys* 96: 87–97. https://doi.org/10.3897/phytokeys.96.23667

[† = a *deceased author*.]

Early Summer Gallery

▲ **Yellow Star Grass (*Hypoxis hirsuta*),** on South Hill in Ithaca, N. Y., 24 June 2017.

➤ **Rose Pogonia (*Pogonia ophioglossoides*)**, in an "Adirondack style" bog in Central New York, 5 July 2010.

Photos by Robert Dirig

PHOTO ESSAY

Miss Moosie's Flower Garden

MISS MOOSIE loves beautiful flowers. Here are some of her favorites:

1. Albino and normal **Pink Lady's Slippers.** Base of Mt. Katahdin, Maine, 5 June 2005.

2. **Rhodora**, a dwarf Rhododendron of bogs. Base of Mt. Katahdin, Maine, 9 June 2003.

3. **Miss Moosie** in her Happy Solitudes. West of Mt. Katahdin, Maine, 9 June 2003.

4. **Sheep Laurel**, often growing in bogs. Base of Mt. Katahdin, Maine, 6 July 2000.

5. **Blue Flag**, Miss Moosie's favorite wildflower. She likes to wallow in the mud where these native irises grow, incidentally making more habitat for them! Colebrook, New Hampshire, 23 June 2003.

Photos and whimsical captions by Robert Dirig