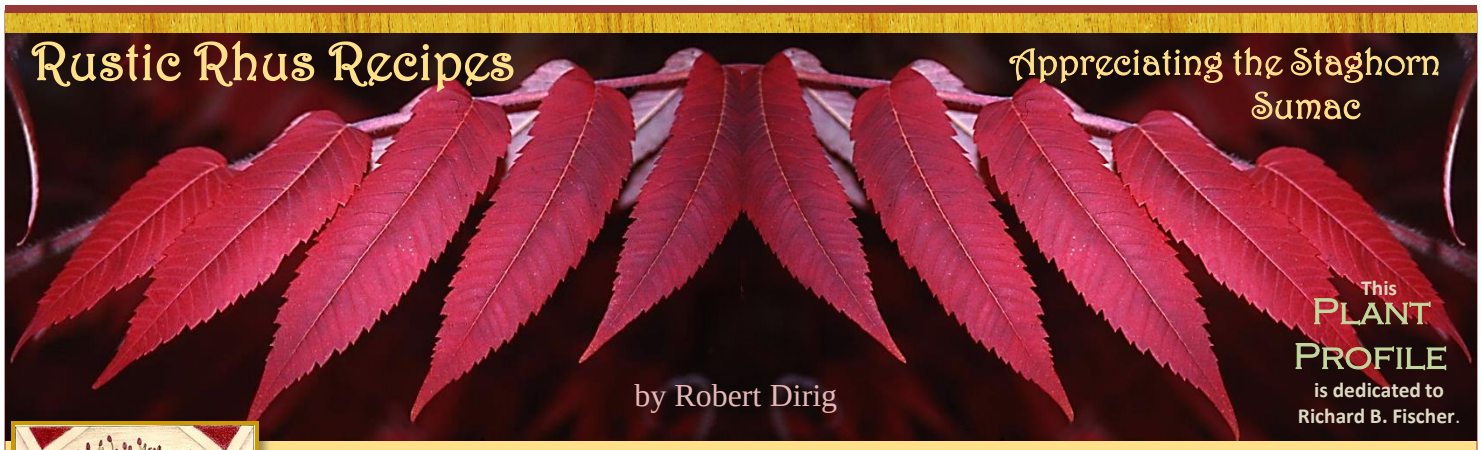
Founded in 1997.
Logo art of Tall Goldenrod,
Solidago altissima,
by Nat Cleavitt, 2006.

Solidago

Newsletter of the
Finger Lakes Native Plant Society

Volume 15, No. 4 ☙❧ December 2014

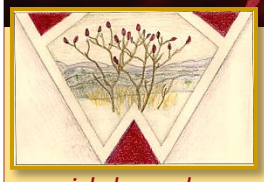


Rustic Rhus Recipes

Appreciating the Staghorn Sumac

This PLANT PROFILE is dedicated to Richard B. Fischer.

by Robert Dirig



INTER SPREADS HER ERMINE CLOAK *over the hills. From the window of a roadside house, distant groves of beech, birch, and sugar maple appear as greyish-lavender patches against the pale background. Scattered hemlocks rear skyward, showing only as darker blots in a landscape blurred by gently falling snow.*

The graceful silhouette of a ***STAGHORN SUMAC*** *looms against the muted backdrop of the hills. Even the snow storm cannot completely extinguish the red glow of its conical fruit-clusters, the brightest touch of color within the range of vision.*

*As evening approaches, the snowfall grows heavier and the temperature drops. A warmly bundled boy runs out of the house and down the short driveway to the road bank. He stops beneath the Sumacs and reaches upward, but the branches are too high. He jumps, misses, tries again, and finally grasps one. It cracks at its junction with the trunk as the child tugs, and is torn loose. With this precious burden under his arm, the boy hurries toward the house, passes it, and enters a small building immediately in back. Sitting on the chopping block, he bends the branch across his knee until it snaps, then grabs one of the pieces and breaks it in two again, and again. With a pile of short Sumac sticks (**1**) cradled in his arms, he is ready. Even in the fading light slanting between the slats of the woodshed wall, some inner fancy, some hunger for a bit of bright color, prompts the child to grab the discarded garnet berry cluster from the end of the branch (**2**) before rushing into the house with rosy nose and sparkling eyes.*

"Back so soon, Adam?" his mother marvels, then stops in bewilderment to take the red cluster held out to her by her son.

"I got the kin'lin' wood, Mama."

A rush of pride comes, then a pause, as she ponders how best to word some feedback.

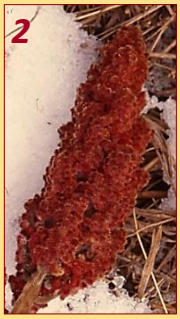
"Thank you, Adam. I'm pleased that you could get the kindling all by yourself when David is sick. But if he isn't better tomorrow, please be sure to get dead *Sumac branches. The green ones don't burn as well, and your father may have trouble starting the fire in the morning." Turning the bright, velvety cluster of berries in her hand, she adds, "Why did you bring this into the house, Adam? What do we want it in here for?"*

"It was so pretty, isn't it pretty, Mama? Can't we keep it for a day or two? Please?"

The child's anxious petition touches the woman's heart. "You've been a good boy, Adam. I guess we can keep it for a day or two." Turning back to the cooking supper, she murmurs, "The boy's right. It takes him to point out the beauty in simple things I've seen all my life."

Thus a small boy and his mother exchanged lessons one winter day — hers in practicality, his in appreciation.

☙❧



THERE ARE A GREAT MANY THINGS TO APPRECIATE ABOUT SUMAC. Although often viewed as weedy today, Staghorn Sumac held a place of importance in the lives of Native Peoples and early European colonists. It provided food, drink, fuel, dye, tannin, and medicine. To be acquainted with Sumac was to know a friend that could lend assistance of some kind at any season. Fortunately, this practical knowledge has not been lost. Here are directions for using Sumac in some of the ways our forebears did, intermingled with bits of lore that constitute a "recipe" for the overall appreciation of this common and beautiful member of our native flora.

Known botanically as ***Rhus typhina***, the Staghorn Sumac occurs throughout the Finger Lakes Region—and most of the eastern United States. *Rhus* (rhymes with "juice") is the ancient classical name for closely related plants that grow around the Mediterranean, while *typhina* means "like a cattail," in reference to the thick, fuzzy brown twigs. Anyone who has stopped to admire a Sumac's graceful, antler-like silhouette against the winter sky (***3***) will immediately appreciate its common name "Staghorn." Stroke one of the furry twigs (***4***) or fruit-clusters (***2***, ***17***) and you will understand the appropriateness of another common name — Velvet Sumac. The word "Sumac" (pronounced *sue-mack*, and in older books often spelled *Sumach*) comes from an Arabic name for a similar, related tree.

Occasionally the Staghorn Sumac suffers under the shadow of its notorious relatives, **POISON SUMAC** (*Toxicodendron vernix*, ***5***) and **POISON IVY** (*T. radicans*, ***6***). This stigma is as silly as that which labels all hawks "bad" because a few kinds occasionally prey on poultry, or all snakes "vermin" because rattlesnakes are venomous. The Staghorn Sumac is harmless to touch, beautiful, useful, and interesting. Poison Sumac (which is also an elegant shrub) grows in alkaline wetlands, and its ivory-white fruits are borne in drooping clusters. Poison Ivy is a woody vine with characteristic three-divided leaves, and likewise has clustered greyish-yellow, pendent fruits. Staghorn Sumac inhabits uplands, and has erect red fruiting panicles (***7***). Only the poisonous species have whitish or grey berries. Sumacs of one kind or another occur throughout the world. The cashew and pistachio (***8***) and mango share the plant family Anacardiaceae with sumacs.

The line that separates a large shrub from a small tree is rather arbitrary. Botanists usually define a ***tree*** as a plant over 20 feet tall that is supported by one woody trunk; and a ***shrub*** as a plant of less height with several woody stems. Is the Staghorn Sumac, then, a tree or shrub? Actually, it may be either, according to these definitions, depending on age and situation. I have seen true Sumac *trees* towering to 40 feet, and 6 inches in diameter at breast height. But it is more usual to find them as shrubs, in clumps originating from their habit of sending up new shoots from the base.

In its varied guises, the Staghorn Sumac is at home in several habitats, thriving especially in areas where there is little competition from other woody plants, such as roadsides, old fields, fencerows, sloping river banks (***7***), and in vacant urban lots. Once you know what Sumacs look like, you start noticing them everywhere.

Let's concentrate on each part of the Staghorn Sumac, examining its structure and use by wildlife and people.

Leaves

From the time they unfold in spring until they fall in a blaze of autumn glory, the leaves of the Sumac are its most attractive feature. Healthy bushes appear almost tropical in summer, with their luxuriant leaves growing like clumps of magnificent ferns at the tips of the twigs (***7***). The Sumac's leaves are compound, formed of 12-36 tooth-edged leaflets arranged along a central petiole. On top they are dark green, but when the wind rustles them, a hint of the surprisingly pale, almost white leaf undersurfaces show (*title marquee, p. 1;* ***12***). Break off one of the leaflets to see the sticky white sap, like milkweed latex, that issues from the wound. In your examination of the Sumac's leaves, be sure to notice the fuzzy, maroon-tinged leaf stem and the hairs on the leaflets themselves. When the leaves drop in autumn, they reveal the bud for next year that was hidden by the hollow base of the petiole.

People have used Sumac leaves in several ways. The Lenape made a smoking mixture by combining this tree's dried leaves with those of dogwood or tobacco. The leaflets and leaf stems contain a large amount of tannin, and have been used in the preparation of fine-quality leathers. The leaves were collected from July to September, dried, and sold in loose bales to manufacturers of tannin extract. The USDA's Production Research Report No. 8, *Sumac, Its Collection and Culture as a Source of Tannin*, published in 1957, provides details.

Several kinds of insects eat the Staghorn Sumac's leaves or use them to build shelters. Pale green, Ping-Pong-sized, crimson-tinged growths are occasionally seen dangling from the leaflets. These are **Sumac Bunch Galls** (***9***). Open one to find masses of grey **Sumac Gall Aphids** (*Melaphis rhois*) that inhabit the hollow. Small leaf-rolling caterpillars form interesting dwelling places using silk strands to bind the Sumac's leaves. The most spectacular Sumac leaf feeder is the **Hickory Horned Devil**, the formidable caterpillar of the **Royal Walnut Moth** (*Citheronia regalis*, ***10***). When mature, this larva is 6 inches long, with several red, black-tipped, inch-long horns near its head, and shorter spines all along the olive and turquoise body. Despite its ferocious appearance, this miniature dragon is a sham: It hurts nothing but the leaves it eats, and is one of the most beautiful caterpillars on Earth. The Royal Walnut Moth (***11***) was historically found at a handful of inland sites in New York, most often in the Hudson River valley and on Long Island, but can be abundant in places in the South, where its larvae also feed on leaves of Black Walnut (*Juglans nigra*), Sweetgum (*Liquidambar styraciflua*), hickories (*Carya* spp.), including Pecan (*C. illinoinensis*), and several other trees. It is known in the Finger Lakes Region from pre-1926 records at Ithaca (Tompkins Co.) and Elmira (Chemung County).

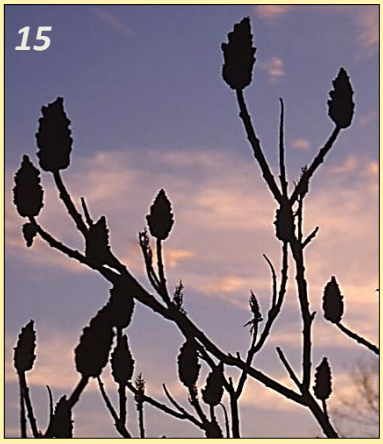
The Staghorn Sumac is visually attractive at all seasons, but autumn clothes it in resplendent glory (*title marquee, p. 1;* ***12***). It is as if Nature had gone berserk with her palette of red, scarlet, crimson, orange, and yellow. Staghorn Sumac, Poison Ivy, Virginia Creeper (*Pathenocissus quinquefolia*), Red Maple (*Acer rubrum*), and Sugar Maple (*A. saccharum*) are our most highly colored woody plants at this season. The Sumac's foliage is among the loveliest.

Flowers

FEW PEOPLE NOTICE the Staghorn Sumac's blossoms. They grow in terminal clusters shaped like chartreuse cornucopias (***13-14***), and indeed are "horns of plenty" after developing into rosy fruits a few weeks later.

Staghorn Sumac blooms in late June and early July. Sumac plants are almost always male or female — hence, flower clusters on some plants produce pollen, while those on others develop into seeds. This is why only some Sumac trees bear the wine-red fruit clusters (***15***). The pollen-producing plants may be identified after flowering by the gracefully curved shoot tips, where the bloom clusters earlier grew (***16***, *arrows*).

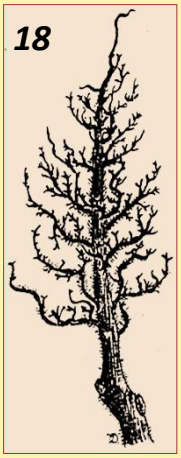
The scent of Sumac flowers is not unpleasant. Several kinds of insects are responsible for their pollination. The Red-spotted Purple and Banded Purple/White Admiral butterflies (*Limenitis arthemis* group) occasionally take nectar at the flowers. John Burroughs wrote in *Pepacton* of Honey Bees (*Apis mellifera*) obtaining nectar and pollen from Sumac flowers. As far as I know, humans use the flowers only indirectly, when we eat honey made from them, unless we consider the enjoyment of these beautiful, lilac-like blooms a use.



Fruits

SUMAC FRUITS ARE WELL DEVELOPED by early August, their red color setting them off against the dark green foliage (***17***). After the leaves fall in autumn, these ruby cones lend a touch of welcome color to the dismal grey of winter. A few may still be clinging to the tree after new leaves appear in spring.

On older branches, you may find grey skeletons of the fruit panicles from previous years, shaped like miniature evergreen trees (***18***). The individual *drupes* are thickly packed over this framework, giving the impression of a maroon velvet covering. An average-sized *panicle* (fruit-cluster) bears about 900 drupes in October. By mid-April, the number has fallen to about 300 per panicle, those missing having weathered off or been eaten by wildlife.



A single drupe has a fuzzy, oily, dark red "skin" covering one tiny, brown, bean-like seed (***19***). The red hairs have a very sour taste, caused by the malic acid they contain — the same acid found in apples (*Malus pumila*).

Sumac fruits are the part of the plant most often exploited by wildlife and people. More than 40 birds feed on them, including the American Robin, Evening Grosbeak, Ruffed Grouse, Eastern Bluebird, Northern Cardinal, Gray Catbird, Northern Flicker, Dark-eyed Junco, Eastern Phoebe, Scarlet Tanager, and Brown Thrasher. Eastern Chipmunks and other rodents may share in the tangy feast, as well as several kinds of insects.

Human use of Sumac fruits began when Native Peoples learned to make a sweet-and-sour, rosy-tinted drink from the drupes by steeping them in boil-

ling maple sap. They also gathered and dried the fruits in autumn, for use in teas throughout the year. The malic acid in the berries quickly dissolves in hot water, imparting a sour taste reminiscent of citrus. Younger palates than mine thrill at the wild, tangy flavor of this "Sumacade" (which does not particularly appeal to me — although it might be good as a tart natural additive to fruit punches or as a substitute for lemon juice).

"**Rhus juice**," as wild foods guru Euell Gibbons called it, is easy to make. Gather a few Sumac panicles in late summer or fall (***17***). Remove the individual drupes, spreading them out on a napkin or cookie sheet, and pick out any impurities. Measure three tablespoonsful onto a 5×5 inch square of cheesecloth, gather the corners, and tie with a piece of string to make a "teabag." (A teaball would also work.) Put this in a cup and pour boiling water over it. Steep 2-3 minutes, then remove the fruits and sweeten to taste with maple sugar or honey. Use the same proportion of 3 tablespoonsful of berries per cup of hot water to make larger amounts of this rosy beverage. Fruits gathered in late summer have a stronger flavor because their malic acid has not been leached out by autumn rains. More drupes may be needed to make as strong a tea if they are gathered in winter or spring. The above proportion was tested in early November. The tea may be chilled and used like pink lemonade.

A much stronger, rather astringent Sumac berry brew was gargled to relieve sore throats in the past, and revered as a virtual panacea for many ailments ranging from alimentary disorders to malaria.

A delicious **Sumac jelly** may be prepared as follows: Make a very strong tea, following the procedure above, but steep 2 cups of detached drupes in 3 to 3½ cups of boiling water for 1-3 minutes. Strain; then, if necessary, add enough water to make exactly 3 cups of juice. Mix the Sumac stock with one (l¾ ounce) package of commercial fruit pectin (*Sure-Jell*), bring to a boil, and add four cups of sugar. Bring this to a rolling boil, stir for 1 minute, remove from the heat, and pour into jars, sealing with melted paraffin. This makes about 40 ounces of scarlet, tangy jelly, somewhat reminiscent of cherry jelly, but with a delightful flavor all its own! It takes about an hour to make a batch.

In addition to their edible uses, Sumac fruits have been extensively employed for **dyeing cloth**. Because of their high tannic acid content, the warm brown or lead grey colors they impart to fabrics are very durable. Many books on vegetable dyeing mention Sumac and give directions for using it with different mordants, sometimes in combination with oak or Butternut (*Juglans cinerea*) bark. It is possible to dye cotton or wool a beautiful cocoa-brown (***20***) by filling a large pot with Sumac fruit panicles (with drupes attached), covering them with water, and bringing to a boil; then putting in the fabric and boiling for half an hour, stirring occasionally. Even without a mordant, the lovely chocolate color is quite fast. For further details see Alma Lesch's *Vegetable Dyeing*, published by Watsin-Guptill of New York in 1970; or *Natural Dyes in the United States*, by Rita J. Adrosko, published by the Smithsonian Institution Press in Washington, D.C., 1968. Internet resources may also provide details.

The graceful curves and bright color of Sumac fruit clusters contribute beautifully to **dried arrangements** and **holiday decorations**. One of my aunts annually enshrined several Sumac twigs bearing velvety garnet cones in a tall crystal vase on the mantelpiece above her Franklin stove, to enjoy their beauty throughout the autumn. One can picture a pioneer woman doing the same thing in a crock on the fireplace mantel in her log cabin.

Wood

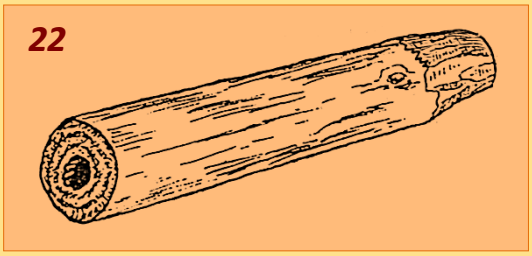
ONLY RARELY ARE THE ELEGANT silvery-grey, golden, and pale green tones of Sumac wood used in cabinetry, polished to the lustre of satin (***21***). My paternal grandfather fashioned beautiful picture frames and interesting doll furniture from Sumac wood. It is also used for carving. Were the wood a little harder and the trees larger, Sumac lumber would be as valuable as Black Walnut.

Dried Sumac reigns as “king of the kindlings” for woodstoves (***1***). Dead Sumac branches and trunks split easily, and are also excellent for starting campfires.

In the past, 4-inch-long sections of fresh Sumac twigs were commonly crafted as **spiles**, the little pipes used to tap Sugar Maple trees (***22***). The large central pith cavity was burned out with a hot iron or wire. (A slender dowel hammered through the center of the twig will work as well.) It is fun to collect sap for maple syrup made "the old-fashioned way," using Sumac spiles.

20
(wool, no mordant)

21



22

John Burroughs described flutes and whistles made from hollowed Sumac branches. And the twigs, bark (***23***), and even the roots have been used in producing dyes and tannin.

Carpenter Bees burrow into dead Sumac branches to make shelters for their larvae. The tiny Sumac Stubble Fungus (*Phaeocalicium curtisii*) grows out of its dead branches. White-tailed Deer and Cottontail Rabbits browse its twigs, and the Cottontails occasionally girdle the bark near the trunk base in winter. Pileated Woodpeckers may carve out rectangular holes in dead Sumac trunks, searching for insects, and also eat the fruits.

Ornamental Uses

A CLUMP OF STAGHORN SUMAC was grown ornamentally beside "old" Comstock Hall (now the Computing & Communications Center) on the Cornell University campus, and a hedge of the smaller **SMOOTH SUMAC** (*Rhus glabra*, ***24***) fronted an Ithaca house. **WINGED SUMAC** (*R. copallina*, ***25***) is another lovely shrub that could easily be cultivated; it even has its own butterfly, the **Red-banded Hairstreak** (*Calycopis cecrops*, ***26***), which feeds as a larva on its leaves and leaf litter. **FRAGRANT SUMAC** (*R. aromatica*, ***27-28***) was one of the earliest American shrubs to be grown for its beauty, and sumacs of several varieties are planted as ornamentals in England. It was a pleasant surprise to find the flaming autumn foliage of Staghorn Sumac accenting several London gardens when I visited there several years ago. With its many potential uses, rapid growth, attractiveness to wildlife and birds, and beauty at all seasons, it is surprising that American horticulturists do not more often plant Staghorn Sumac as an ornamental shrub.

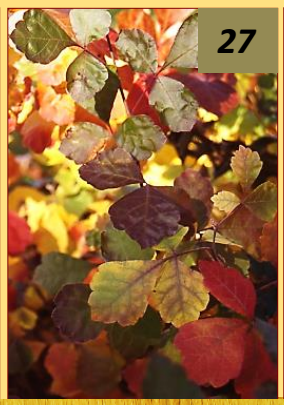
I can imagine a **SUMAC ROOM**, with decorations inspired by this highly artistic tree:

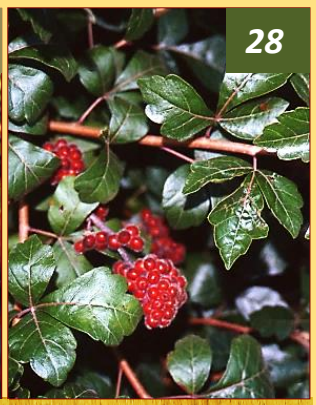
A MAN (PERHAPS AN OLDER ADAM?) *sits at a desk veneered with a highly polished, golden-yellow wood, in an upstairs study on the south side of a large stone house. He rises and walks across a plush garnet carpet to the facing wall of cabinets and bookshelves, veneered with the same rare, golden-green wood. Opening one of the leaded glass doors, he removes a volume and sits for a moment on the dark green velvet cushions of an old-fashioned window seat, flipping pages. Finding the desired passage, he rises, pausing at a drawing framed in the same unusual wood, which hangs on the pale yellow-green wall, before turning back toward his desk. Glancing out the window, he is transfixed, pulling aside the hand-dyed chocolate draperies, with their orange and yellow border of fern-like leaves, to stare outside.*

The graceful silhouette of a Staghorn Sumac rears against the orange and crimson backdrop of a dying December sunset. A few slanting rays touch the snow-dusted tops of the tree's fruit panicles, sparkling like orange stars, and transforming the tree into a huge candelabrum . . . this for just a few seconds, as if in benediction. Then it is dark.

Text and illustrations on pages 1-6

As with any unfamiliar food, tea, jelly, natural medicines, or other consumables made from Sumac should be tried in small quantities at first. Although perfectly safe for most people, this precaution is suggested. The author and FLNPS will not be responsible for any cases of accidental poisoning that might result from consuming any "wild foods."





Solidago

Newsletter of the
Finger Lakes Native Plant Society

Volume 15, No. 4 **December 2014**

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Published quarterly at Ithaca, New York, USA.

To receive a colored version when *Solidago* is published, please ask Rosemarie Parker to join our e-mail distribution list. Each colored version will also be posted on our website (*www.flnps.org*) after the next issue is produced.

Contents

Please send *Solidago* contributions & correspondence to Robert Dirig, Editor, at *red2@cornell.edu*.

Deadline for the March 2015 issue is February 15th!

Please Contribute to *Solidago*

We welcome contributions that feature wild plants of the Finger Lakes Region of N.Y. 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 the **Name That Plant Contest** (identifying a mystery plant from images), **Local Flora** (plant lists from special 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), **Charismatic Plants** (stories about formative early encounters with flora), **Reviews** (of books, talks, workshops, nurseries), **Letters** (commentaries and letters to the editor), **Essays** (on botanical themes), **Verse** (haiku, 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 & returned). We also can always use **Fillers** (very short notes, small images, cartoons) for the last few inches of a column.

Colored images in the online version will be converted into black and white before printing paper copies for mailing.

Name That Plant Contest

The photo from last issue's NAME THAT PLANT CONTEST [*Solidago* 15(3), page 5] was of a flower of **Swamp Rose Mallow (*Hibiscus moscheutos* ssp. *moscheutos*)**.

Bob Dirig wrote, "It is one of our loveliest wild plants. I've seen it in the lower Hudson valley and on Long Island, but not in the Finger Lakes Region." Susanne Lorbeer noted that she recently saw it in bloom at the Montezuma Wildlife Refuge. Thanks to all those who entered the contest, and congratulations to the winners:

Betsy Darlington, Bob Dirig, Hal Gardner, Susanne Lorbeer, and **Dorothy Stiefel**.

THIS ISSUE'S MYSTERY PLANT is shown above. Everybody reading this likely not only saw, but stepped on at least a few of these this fall. Hints and suggestions are often provided to contest participants who try. Common and/or scientific names are allowable. I will accept both the general group (or genus) this species belongs to, or the specific species. More than one guess is allowed. Please submit your answers to

David Werier ( ).

The photo was taken by David Werier on 22 November 2014 in Tompkins County, New York.

Letters

Thanks again for another *wonderful* newsletter [September 2014]. I enjoy them so much, and although unlikely to find it in my particular travels, I will be keeping my eye out for False Earthstars. Never knew they existed. I really appreciate how you open my eyes to new species in the natural world. It makes exploring this world even more exciting.

Colleen Wolpert
Apalachin, N.Y.
by email, 27 September 2014

[*Solidago* 15(3)] is by far your best one yet; a little gem of a masterpiece! The stained glass of natural history. That butterfly panel is exquisite; likewise the Earthstar one. Every little detail is perfect.

John F. Cryan
NYS-DEC, NYC Office
by email, 24 September 2014

Dear Rosemarie,

Thank you for your expertise at Judy's Day! This annual program would not be possible without you. Cornell Plantations appreciates the generosity of our community.

I want to thank you for spearheading the Native Plant Society booth. Your members did a wonderful collective job making the posters, complete with garland. The information was fascinating. Plantations is so lucky to have you as volunteers.

Thank you.
Raylene G. Ludgate
Youth Education Program Coordinator
Cornell Plantations

False Earthstars Addendum

[See *Solidago* 15(3), pp. 1-3]

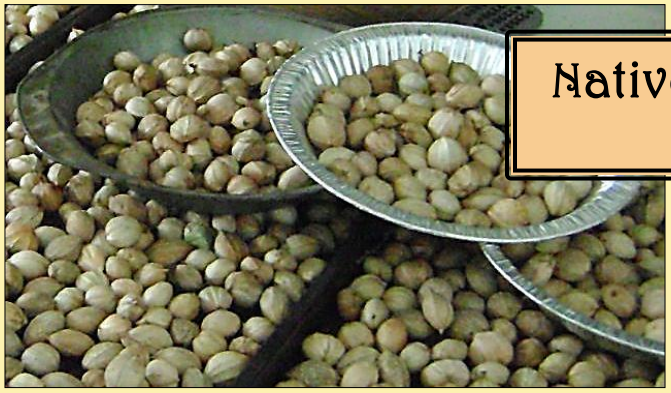
Another regional site for *Astraeus hygrometricus* is near Rochester, Monroe County, N.Y., on the east side of ***Irondequoit Bay***, just north of Rt. 104, on sandy soil in open pine barrens (*F-75* in R.D.). Wild Lupine (*Lupinus perennis*) was also present … but no Karner Blues!

— *R. Dirig*

Native Plants and Food

by Akiva Silver

Hickory nuts (*Carya* sp.)



Hazel nuts (*Corylus* sp.)

Photos by the author

When I see fields plowed for corn and soybeans, I see total devastation. At certain times of the year it looks like the moon, completely devoid of plant life, the soil raw and exposed to the elements. If it were visible, we'd see huge amounts of carbon floating into the sky. In the summer, these massive fields are mono-crops of non-native plants, without even a single wildflower hiding. These fields take up more habitat and space than any "invasive" plant.

Invasive plants are often blamed for destroying native plant communities, but are they really the primary reason for declining native populations?

While crawling through thickets of exotic shrubs like Autumn Olive (*Elaeagnus umbellata*), honeysuckle (*Lonicera* spp.), or Multiflora Rose (*Rosa multiflora*), I can find abundant weeds of all kinds. I will see places for mammals and song birds to hide and feed. I can also expect to see pollinating insects, butterflies, and spiders. I often find native tree saplings like ash (*Fraxinus* sp.) and Black Cherry (*Prunus serotina*) snaking their way through the dense canopy of shrubs. Despite their aggressive nature, invasive plants conserve and build soil, provide habitat, and support life. The same can not be said for a field that is plowed every single year.

Thickets of exotics receive a lot of negative attention, and much work is being done to destroy them. It seems strange that when we see thickets next to a moonscape, we would work on rehabilitating the thicket. The fields of annuals take up far more room (95 million acres of GMO [*genetically modified*] corn, alone, in the U.S.), and they are far more devastating to wildlife and our climate.

But, We Gotta Eat, Right?

Yes, our food has to come from somewhere, and it is going to take up a lot of room, no matter how it is done. So let's make the space our food occupies be an ecosystem. Is this possible with so many people on the planet? Can native plants be a part of this? These are big questions that I am excited to be working on. I totally believe we can heal ecosystems and grow enormous amounts of food for ourselves at the same time, in the same space. To figure this out, we need to step back and look at what's been taken away to make room for the millions of acres of annual grains.

The ancient American prairie supported an estimated 60 million bison, along with untold numbers of elk, antelope, and deer. Today, there are 80 million cattle (which weigh less than bison) using that same space. With all of our barbed wire fencing, feedlots, antibiotics, and pumped water, we are growing roughly the same amount of meat that the native ecosystem originally supported. Also, most of these cattle do not feed on resilient native grasses that serve extensive ecological functions; instead, they primarily eat corn and soy. In fact, roughly 90% of grown corn is used to feed livestock. If the native prairie supported so much animal life, why did we replace it with plowed fields and feedlots?

It is also in the realm of reason that the sale of wild venison could be legal. Regulations would need to take place to ensure a healthy deer population. This would have a significant effect on forest regeneration and certain threatened plants.

By switching from corn- and soy-fed meat to grass-fed meat and venison, we can make a massive ecological shift that would have sweeping positive consequences for plant and insect communities, as well as carbon levels in the atmosphere. Pasture grasses pull carbon out of the atmosphere, while plowed fields release it.

Grain Grows on Trees

Changing how our meat is raised is actually a very easy thing to accomplish. Grass-fed meat is widely available; we simply have to vote with our dollars at the store, and industry will respond to money, as it always has.

Where it gets tricky is the grains we eat directly, not through animals. Think of all the wheat, corn, and soy that keeps us moving about at our fast pace. What on earth could replace these high-energy foods? Chestnuts, acorns, and hazelnuts is the short answer. These are extremely nutrient-dense staple foods that have been eaten by people for a lot longer than annual grains. They can be processed into things like granola bars, breads, and noodles.

I have heard the question many times, ***can you grow as many pounds of chestnuts as corn?*** It is not actually possible to answer this with a direct yes or no. An acre of corn will outproduce an acre of chestnuts, if both crops are grown in flat, fertile bottomland. However, chestnuts can grow on steep hillsides with almost no topsoil, and they can have an understory of pasture grass that is grazed by livestock. Chestnuts don't need to be fertilized,

plowed, or rotated. So the pound-for-pound question is misleading. The truth is, we could eat a lot more chestnuts. They make an excellent flour that can be used to make breads, cakes, crackers, and pasta.

Instead of allowing abandoned farmland to revert to thickets and stands of Red Maple (*Acer rubrum*), we can reforest hillsides with chestnut. We can see good examples of this in places like Turkey, Spain, and Italy. Or, you could come to my house.

Hazelnuts (*Corylus* spp.) also possess an enormous untapped potential to replace the soybean. By weight, hazels have three times the oil content of a soybean. After being pressed for oil, hazels leave behind a high-protein meal that is used in energy bars and livestock feed. The land they grow on can also be used simultaneously to graze animals. This doesn't work for soybeans. It is interesting to note that a lot of breeding work is going into finding highly productive American Hazelnuts (*Corylus americana*) because they are such tough and disease-resistant shrubs.

Chestnuts (*Castanea* sp.)

Serviceberry (*Amelanchier* sp.)

Native Fruits and Nuts

There are so many good choices here that deserve more attention in our agriculture, backyards, and hedgerows. Many native fruits are good by themselves, while others are best when hybridized with exotic species. I have no negative views of growing exotic fruits like apples, pears, and peaches. But it is interesting to see what native fruits and nuts we can grow. I already mentioned chestnuts, acorns, and hazelnuts, but other delicious native nuts include Black Walnuts (*Juglans nigra*), Butternuts (*J. cinerea*), and several species of hickory, including the Pecan (*Carya illinoinensis*). Excellent and well known native fruits include blueberries, (*Vaccinium* sp.), raspberries (*Rubus* sp.), and strawberries (*Fraxinus* sp.). Some lesser known species that are worth growing and eating in quantity include American Persimmons (*Diaspyros virginiana*), pawpaws (*Asimina* spp.), elderberries (*Sambucus* spp.), currants and gooseberries (*Ribes* spp.), native plums (*Prunus* spp.), mulberries (*Morus* sp.), and serviceberries (*Amelanchier* spp.).

Native Tubers

My favorite native tuber has to be the Jerusalem Artichoke (*Helianthus tuberosa*), also known as "J-chokes." They are not from Jerusalem, and they are not artichokes. J-chokes are actually a native perennial sunflower. There are endless varieties, both cultivated and wild. They are usually huge plants, easily attaining heights of 10-12 feet, with a happy small sunflower on top. Some varieties can be as tall as 16 feet, while others top out at 6 feet or less. They spread rapidly by underground tubers and rhizomes. It is astounding how many pounds of tubers can be harvested from a small patch. No matter how many you dig up, they always come back, and seem to thrive on disturbance. The tubers can be eaten raw, boiled, or roasted. They taste like a cross between a radish, a turnip, and a potato.

Another native root crop gaining lots of attention in the plant breeding world is Groundnut (*Apios americana*). It is not a nut at all, but a wonderful wild and domestic perennial vegetable. In the wild, Groundnuts are often found growing along stream banks. In early spring, they can be seen right on the surface, a bunch of small brown tubers strung together by a root. The flavor of Groundnuts is outstanding, very similar to roasted potatoes. They are being bred and cultivated on a small scale in this country, and more extensively in Korea.

Native Plant Habitat

If we are serious about protecting native plant communities, then let's take a look at the real threats they face. Habitat loss is the biggest reason that native plant communities collapse, often completely. The sheer amount of space that annual agriculture and American lawns take up is devastating to Jack-in-the-Pulpits (*Arisaema* sp.), Goldenseal (*Hydrastis canadensis*), and thousands of other species. There is zero room for weeds, much less endangered natives, in a field of roundup-ready soybeans. Many of these rare native plants could thrive in a different agricultural system based on tree grains and grass-fed meat. We do not need to separate nature in tiny preserves. We can have healthy ecosystems all around us, everywhere.

To make amazing changes like reestablishing abundance, we do not need to write letters to Congress, or protest multinational corporations. We simply need to do it. Just start buying different products, growing different foods, and getting rid of your lawn. When enough people are growing chestnuts and hazelnuts, we can pool our resources and set up a chestnut flour mill and a hazel oil press. We can create change by simply being it and offering a better option to the community around us. Don't wait for politicians; plant trees now—all over the place.

Akiva Silver, *Twisted Tree Farm*, 279 Washburn Road, Spencer, NY 14883. ☎ [redacted]

Outing

Contributed by Gin Mistry

A few weeks ago, several friends and I hiked uphill through the **Polson Preserve** (off Ellis Hollow Rd. near Ithaca, N.Y.) on a beautiful fall day. We found our way up to the large wetland / beaver pond / heron rookery at the top of the hill. Here are impressions of the day from two of my friends. The poem is by **Jeanette Knapp**. I read it top to bottom first — but then bottom to top, which hit me as brilliant! The photograph is by **Norma Goldberg**.

uphill.
their water is here
the gullies are empty
no wonder we can't find the waterfall
we admire their handiwork
blackly punctuate the shining water
bare drowned trees

a giant pond sparkling in the October sun

and there it is
we clamber onto the muddy beaver dam
through marsh grass and exploded cat tails
past clinging rose thorns
Uphill toward the brilliant sky

we savor this fleeting season
climbing over rocks and under branches
Christmas ferns wave minature green stockings
a witch hazel blooms, shyly revealing yellow shreds on bare branches
oak, beech, maple, tulip, hickory crowd in
more leaves rain down, tan, crimson, butter yellow
old logs, boggy mud
fallen leaves hide the path
along the ravine
Through the woods

Uphill

—Jeanette D. Knapp
6 October 2014

ESSAY

The Potential Role of Epigenetics in the Origin of Regional Ecotypes

by Harold W. Gardner

For some time it has been known that seeds from various geographical areas show marked differences after growing into mature plants. For example, **Little Bluestem** (*Schizachyrium scoparium*) grass seeds, collected from Texas north to North Dakota, varied considerably when they grew together in one location (Cornelius 1947). Such differences in "ecotypes" referred to in this article might be more specifically defined as regional variants. Regional variations have compelled restoration organizations, such as the Illinois Nature Preserves Commission, to suggest seed collection in a 100- to 200-mile radius within the same Illinois Natural Division, particularly on an east-west orientation. I have observed striking differences in plantings of mainly **Big Bluestem** grass (*Andropogon gerardii*) mixed with less than 15% of **Indian Grass** (*Sorghastrum nutans*), when growing side by side. The illustrations (*see below*) show grass that grew in adjacent plots in Carlisle, Pennsylvania, from seed collected in central Illinois (Peoria area), compared with seed from Sherburne County, Minnesota (about 25 miles northwest of Minneapolis). What a surprising difference! The view of the non-flowering Illinois ecotype on the left is most definitely mainly *A. gerardii*, including less *S. nutans*, as confirmed by other knowledgeable persons. The regional variant from central Illinois flowers about two weeks later. In fact, tall-grass inflorescences from Minnesota can be seen in the far left background of that illustration. In addition, my Carlisle plantings of **Wild Bergamot** (*Monarda fistulosa*) flowered later if they grew from seed from central Illinois, *versus* northern Pennsylvania.

Central Illinois ecotype, July 10th

Southeastern Minnesota ecotype, July 10th

Interestingly, within about 300 years after **Tall Goldenrod** (*Solidago altissima*) and **Giant Goldenrod** (*Solidago gigantea*) were introduced into Europe, the plants transformed into regional ecotypes (Weber & Schmid 1993). That is, plants from the northern region flowered earlier and were smaller, compared with those from southern regions. Given the rate of spread of these two species of *Solidago*, the actual time would be certainly less than 300 years. It seems impossible for such specific genetic mutations to have occurred in such a short time, especially those specifically favorable to climatic conditions. Enter the new field of **EPIGENETICS**, whereby organisms adjust to new conditions in a relatively rapid fashion without altering the basic DNA sequence.

The first reports regarded human epigenetics, which found resistance from journal publishers (Cloud 2010). Now there is a plethora of reports and mini-review series in influential journals, *e.g.*, the *Journal of Biological Chemistry*

(Gottesfeld 2011). Even bacteria possess epigenetic characteristics (Casadesus & Low 2013). Recently, reports of plant epigenetics have excited plant molecular biologists, not without resistance by some plant scientists (Pennisi 2013). Of course, one can argue the point of genetic variation within species, such as hair and eye color in humans, which is a legitimate concern. New scientific discoveries, like epigenetics, are not without detractors, such as Darwin's Theory of Evolution, and Watson and Crick's structure of DNA. Epigenetics effects its "magic" by methylating* or demethylating* specific cytosines* in DNA, causing changes in expression (Chen & Riggs 2011).

Additionally, chromatin histone proteins* are involved in changing DNA expression through biochemical modification, such as acetylation*, methylation*, phosphorylation*, or small peptide changes* (Zaidi *et al.* 2011; Wang & Patel 2011). Also implicated are small noncoding RNAs* (Zhang & Rossi 2011), as well as histone chaperones* (Winkler & Luger 2011). In the 2013 *Science* (*News*) article cited above, Pennisi reported results of research with the cultivated crucifer ***Arabidopsis***, stating that "heritable changes in plant flowering time and other traits were the result of epigenetics alone, unaided by any (DNA) sequence changes." It is noted that plant flowering time is exactly the issue I have seen with tall-grass Big Bluestem and Indian Grass, as well as *Monarda fistulosa*. Others reported the same regional effect with *Solidago* species (Weber and Schmid 1993).

A good start has been made with *Arabidopsis* epigenetic research in explaining the origin of plant changes. If further research should conclusively demonstrate epigenetic control of regional variants, then collection of seeds from specific locales would become less important. Thus, some future seed from a misplaced plant may adapt to the new geographical conditions causing a stable epigenetic line. With one caveat, the use of local seed would be advantageous in obtaining relatively quick results from plants that already possess regional adaptation. In conclusion, plants may have far more "smarts," in a brainless epigenetic sense, than we give them credit for.

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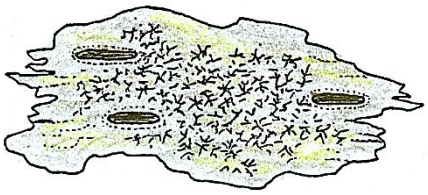
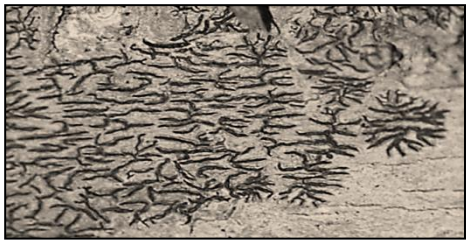
Photos: Indian Grass (*left*), Big Bluestem (*center*)

Photo: Wild Bergamot (*right*)

***Editor's Note:** **Hal Gardner** has provided a brief introduction to this interesting recent theme in genetics. Some readers may find unfamiliar terms (*among those identified above by red asterisks*). If so, please see "The Illustrated Guide to Epigenetics," by Joe Kloc, for further explanation: *http://www.motherjones.com/environment/2011/02/illustrated-guide-epigenetics*. Hal "would be pleased to answer any questions readers have about the topic" in *Solidago*. If readers have specific queries for him, please send them to the Editor.



Elvenscript thriving on the bark of Yellow Birch

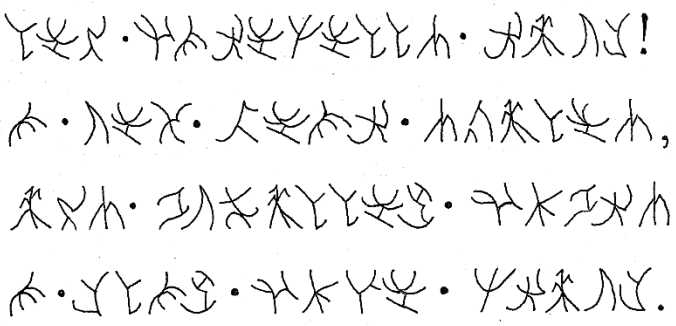


This ancient language was discovered in the **Elvenscript Lichen** (*Graphis scripta*), which often grows on the bark of **Yellow Birch** (*Betula alleghaniensis*). The black "pen strokes" are actually the ***lirellae*** (slit-like apothecia) of this lichen's fungal partner.

Elvenscript

by Robert Dirig

And there, upon a Birchen tree,
I found in flowing Elvenscript,
a cipher, written just for me
by elvish pens in dark ink dipped,
with graceful, quaint calligraphy:



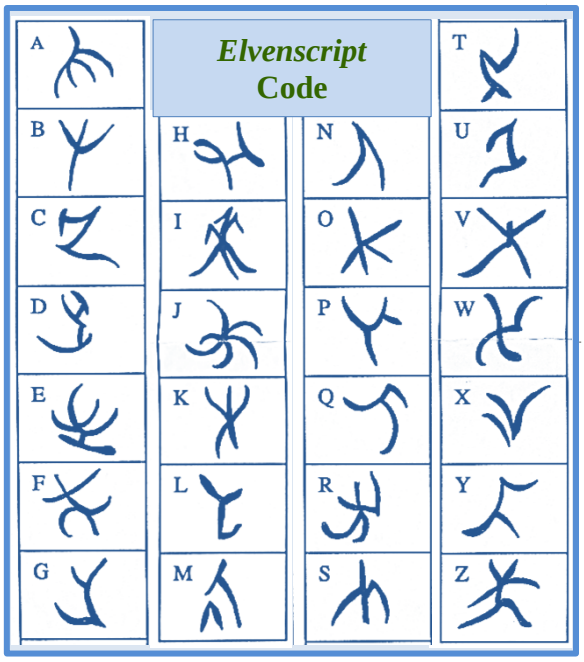
Room for Translation:

____ _____ _____!

_ ____ _____ _____,

____ _____ _____

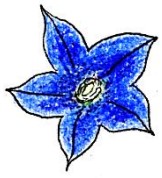
_ _____ _____ _____.



Answer

Let Harebells ring!
A New Year smiles,
its unfilled hours
a glad hope bring.

Harebell
Campanula rotundifolia

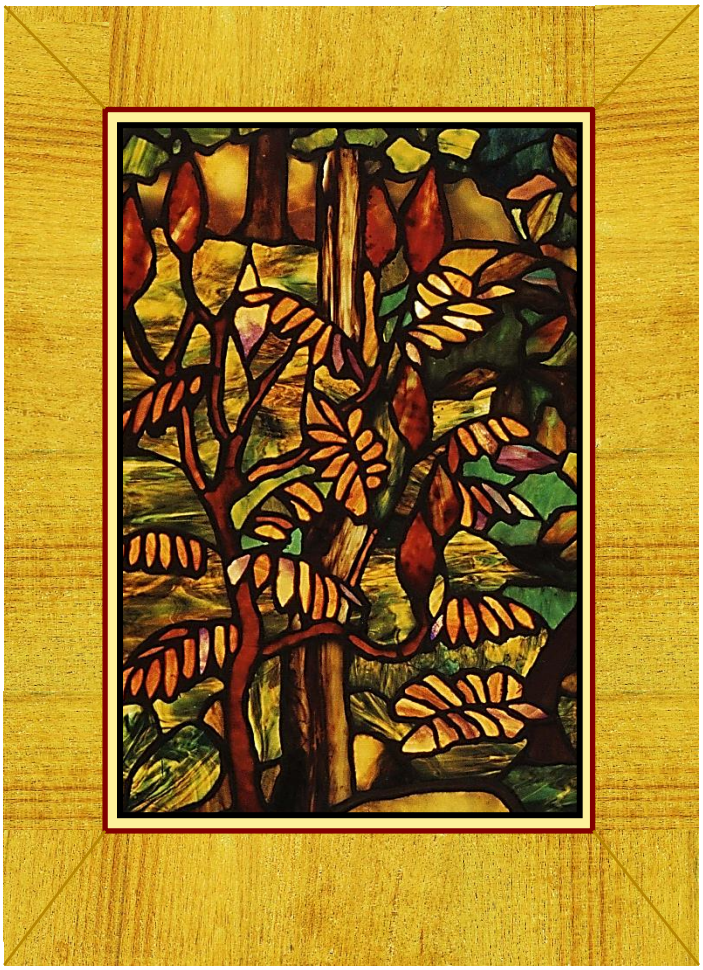


Thank You!

MANY THANKS to all who have contributed to *Solidago* in 2014! For **Volume 15, No. 4**, we thank **WRITERS** John F. Cryan, Harold W. Gardner, Jeanette D. Knapp, Rick Lightbody, Raylene G. Ludgate, Gin Mistry, Rosemarie Parker, Akiva Silver, David Werier, & Colleen Wolpert, whose contributions made this issue special. **CALENDAR ITEMS** and **ANNOUNCEMENTS** were organized by Rosemarie Parker. **ILLUSTRATIONS** were loaned by David Werier (p. 8), Akiva Silver (pp. 9-10), Norma Goldberg (p. 11), Hal Gardner (p. 12), and Robert Dirig (pp.1-8, & 13-14). The banner (p. 16) was tinted and adapted from a drawing in *The Transformations* (*or Metamorphoses*) *of Insects*, 3rd edition, by P. Martin Duncan, 1882. **LAYOUT & DESIGN** by the Editor; **PROOFREADING** by Rosemarie Parker, John V. Freudenstein, Angie Macias, Scott LaGreca, Thelma Turner, & David Werier; **PRINTING** by Gnomon Copy, Ithaca, N. Y.; and **MAILING** by Rosemarie Parker & Susanne Lorbeer.

BEST WISHES to FLNPS members (and all others in our reading audience) for pleasant holidays and a botanically exciting New Year!

— Robert Dirig



SUMAC TIFFANY, detail from *Whence Cometh My Help*, the Foot Memorial Window, 1905-1910, originally in Church of the Unity, Springfield, Mass., now in a private collection [image from an old calendar]. The frame of Staghorn Sumac wood was created digitally.

Get Ready for the Annual Solstice Gathering, December 17th!

by Rosemarie Parker

It's time again to relax as we share experiences and expertise. Please plan to attend and participate. ***We will be in our usual meeting location in the Unitarian Church Annex this year***. Please read on for a few other changes.

Our annual **SEED EXCHANGE** is part of the festivities. A list of seeds we already have is included with this mailing. Please get in touch with me (or *info@flnps.org*) if you have native plant seeds to offer, and want a photo included on our board. Remember, you can take seeds to plant, whether or not you bring any. Even if you have no more room in your garden, the Gathering is the perfect time to decide what you want to grow for FLNPS to sell at the Spring Plant Sale; many species require a cold, moist stratification period before they will germinate.

The plants we use to decorate the room for the Gathering give us materials for an **IDENTIFY THE DECORATIONS "QUIZ."** This is always fun, as well as educational, as we expect people to collaborate, and you don't need to get all the answers right to qualify for the **DOOR PRIZE DRAWING**. It's always fun to have some new and different species. Please notify me if you want to bring plant material.

Every year, **DOOR PRIZES** are donated by members. If you would like to contribute in this way, again, please let me know ***early*** so we know how many to expect. We may save some for later meetings!

To keep up our energy during all these activities, we ask people to bring some **FOOD WITH A NATIVE ELEMENT**, and a prize is awarded to the creator of the food voted the favorite by the most participants. You can think "outside the box" here. Besides the all-time popular blueberry, cranberry and apple dishes, there are many possible ingredients from native plants like Black Walnuts, Butternuts, maple syrup, elderberries, Wild Rice, mushrooms, quinoa, squash, peppers, corn, potatoes (Meso-American origin is OK). ***Creativity and truly local ingredients are appreciated.***

Finally, we always need help with ***Set Up*** and ***Clean Up***, and I am the person to contact if you want to volunteer for either.

Our annual Solstice Gathering is fun and friendly. Please come and enjoy the plants and plant-loving people!

The traditional Members' Slide Show will be a part of the January meeting this year (see next page), so please plan to attend that as well. If you would like to participate in this event, please see *http://flnps.org/activities/856/members-night* for details.

Finger Lakes Native Plant Society

Unitarian Church Annex,
East Buffalo Street, Ithaca,
New York
(same place as our monthly talks)

2014 Solstice
Celebration
Wed., December 17th, 7:00–9:00 p.m.

Please see details on page 15.

Upcoming Talks & Events, Winter - Spring 2015

January 21 — Wednesday — 7:00 p.m. FLNPS MEMBERS' NIGHT.

This evening program will replace and expand upon the **Members' Slide Show**, which has been part of past Solstice Gatherings in December. If you like to take photos, paint, draw, write poetry (or read the poems of others), do needlepoint, sing and play music, tell stories, or do anything else with a plant-related theme that you think others might enjoy, please come and share your talents and enthusiasm with us. The more participation we have, the more fun this evening will be. **Rick Lightbody** will be coordinating the program and making sure there's time to fit everything in. Please let Rick know of your interest and intentions: Include your presentation's subject, format, any tech support needed, estimated length, and your email address and phone number, and send to [redacted], with "FLNPS Members' Night" in the subject line. If you expect your presentation to run longer than 5 minutes, please contact Rick by **January 2nd**; if less than 5 minutes, by **January 14th**. We look forward to seeing you there!

February 18 — Wednesday — 7:00 p.m. ALVAR PLANT COMMUNITIES, by **Renee Petipas**, Cornell University.

At the northeastern corner of Lake Ontario, between the Thousand Islands and the City of Watertown, lies a secluded wilderness of great beauty and biological intrigue. This recently discovered cluster of *alvar barrens* is a globally rare type of vegetation that develops on windswept limestone pavement. Our alvars have been the focus of much scientific interest during the last thirty years, and harbor many rare species. Renee will describe her field work at the famous Chaumont Barrens and other similar sites in that region.

March 18 — Wednesday — 7:00 p.m. FROM COLTSFOOT TO ASTER: A VISUAL GUIDED TOUR OF OUR NATIVE AND NATURALIZED SUNFLOWER FAMILY SPECIES (ASTERACEAE), by **Arieh Tal**.

An introduction to the large composite family, Asteraceae.

April 15 — Wednesday — 7:00 p.m. CATERPILLAR GARDENING: THE PLANTS THAT BUTTERFLIES AND MOTHS NEED TO COMPLETE THEIR LIFE CYCLES, by **Colleen Wolpert**, a Lepidoptera enthusiast and educator from Apalachin, N.Y.

[Details to follow, closer to the date.]

May 20 — Wednesday — 7:00 p.m. THE GILBOA FOSSIL FOREST, by **William Stein**, Binghamton University.

The Gilboa Fossil Forest, near Schoharie Dam in New York, has been known for some time. A few years ago, new excavations allowed much more insight into this Middle Devonian forest of giant cycads. Remember, the definition of "native" requires not only a place, but a time period. So come and hear about a much earlier native flora of New York!

FLNPS talks are held on the third Wednesday of the month at the Unitarian Church Annex (second floor) in Ithaca, N.Y., beginning at 7:00 p.m. The entryway is on East Buffalo Street. An elevator is available.

Please watch our FLNPS website (www.flnps.org) for updates and summaries of talks and upcoming outdoor walks.