

George Landis Arboretum Newsletter

Volume 13 • Number 4

Autumn 1994

Nature's Paintbrush

Sonja Javarone

What is the point? Leaves and fruits reveal their colors in autumn, but to what purpose? Granted, the colored fruits may aid in seed distribution by attracting birds and mammals. What value, however, is served by a colored leaf? Fall color, apparently, is just a by-product of the degenerating metabolism within leaves and the process serves no useful purpose for the plant. We do appear to have an exception to one of mother nature's laws. Usually "form follows function". For each structure and process a useful purpose can be



Asclepias syriaca-Milkweed
⇒ Anne Jaster

identified. In the case of fall coloration, an event of spectacular dimensions occurs, seemingly, for the enjoyment of our human eyes only. For the plant, it appears to be no more than chemical chaos leading to leaf loss and winter dormancy.

Let us talk about pigments. We really need to get acquainted with pigments somewhat in order to appreciate fall coloration. A pigment is a substance that absorbs particular wavelengths of light and reflects others. Our perception of pigment color depends on those wavelengths reflected. Chlorophylls reflect yellow-green. Pigments include several kinds of chlorophylls, seventy or more carotenoids (mostly yellow and orange), unknown numbers of anthocyanins (reds and blues), and many others.

The chemistry of life does seem to have a universal basis. Interestingly, both hemoglobin and chlorophyll each contain a unit called porphyrin. In hemoglobin, the porphyrin contains iron. In chlorophyll, the porphyrin contains magnesium. Carotenoids in corn, egg yolk and carrots are yellow or orange; in tomatoes, are red; and, in squid ink, are gray-black. All of the carotenoids are similar in structure, but vary tremendously in function. As we can see pigments are not exclusive to plants.

Many pigments are pH sensitive. Many are used to produce indicator papers and indicator solutions. Remember litmus paper? The pigment in litmus paper comes from a lichen. Hydrangea and certain other flowers will change from pink to white to blue

as the pH of the soil, leaves or petals increase. Some indicator pigments turn color in strong acids, others in strong bases. The colors also vary with the type of pigment exposed to the pH changes.

Chlorophylls and carotenoids are found in plastids. Other pigments may be dispersed in the cytoplasm of the cells. The cells of red onion skin, for example, show some red cells and some clear cells. If you have a microscope, vinegar and a mild base, you could investigate flowers and leaves. Look for plastids, tinted cytoplasm and check for pH indicator potential.

It is only in this century that methods were devised to separate mixtures of organic compounds. Pigments were among the first to be studied. Chromatography is one such technique. Plant pigments are soluble in organic solvents like ether, acetone and alcohol. (If they were soluble in water, it would rain green under trees). Try putting crushed spinach leaves (they contain about a dozen pigments) in nail polish remover (acetone). Let set until the acetone is green. Wrap part of a coffee filter around a pencil. Touch the bottom of the paper on the pencil to the colored solution. Wait. As the green solution soaks up the paper, the bands of pigments will become visible as they move at different rates up the paper. Chromatography is a beautifully simple, clever and useful technique. It generated an explosion of activity among biochemists. Today, gelatin emulsions on plastic are used instead of the paper.

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The George Landis Arboretum Newsletter

is published quarterly for members of the Arboretum. The GLA's mission is to provide natural history and horticultural education through programs and through its plant collection.

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Autumn is an interesting time. It is a time for reflection. A time for reviewing the events of the season just past and for these reflections to become the seeds of plans for the year to come.

The Arboretum has had many changes this growing season. Change is a necessary, and often difficult, component or precursor of growth. As detailed in our last newsletter, the composition of both Board of Trustees and staff have changed significantly. I am very pleased to announce the recent addition of a new Office Manager to our Arboretum staff. Mary Madison has taken on the responsibility of keeping our garden on the right track. In addition to managing the daily operations of the office, she will be working on membership records, assisting in production of the quarterly newsletter and all other Arboretum publications and generally providing support and sharing her skills where needed. Her enthusiasm and intelligence are a great asset for our garden.

The two major projects of the year have been the state grant* funded Interpretive Materials and Signage project, and the Conservation Survey Project which is partially funded with federal funds*. Signage and interpretive material development (including new guide maps, on site directional markers and brochures) have been the main focus of Sonja Javarone's work. The products resulting from her extensive efforts will be available at the beginning of our season in 1995. Dovetailing nicely with this project is the Conservation Survey Project. The major external visual effect of this project for visitors will be the installation of plant identification markers on the trees, shrubs and vines in our collection.

An extensive undertaking, the latter project has a two year duration. However, we anticipate visitors will be pleased by a significant increase in the number of labels on plants by spring of 1995.

Note:

We need volunteers to aid in researching plant information for entry into our new data base. Much of this work may be done at home. Please call the office to find out how you can help.

An additional project nearing completion is the installation of subsurface drainage around the barn and in the field between the barn and the Library/Greenhouse Complex. The drainage will greatly extend the life of our beloved barn, eliminate large amounts of surface water in the area between the barn and library and will enable excess water from the adjacent pond to be controlled. In addition the drainage project completion was a necessary precursor to the expansion of the Dwarf and Unusual Conifer area. Many of the outstanding cultivars of Conifers donated by Trustee Richard Southwick will be planted in this area in the spring of 1995. A living exhibit both aesthetically pleasing and intellectually challenging will result.

Much of nature rests in the winter season. Work continues at the garden. Winter is the season for planning and figuring out ways to make plans a reality. From tree pruning, to grant writing, to planning educational programs and fundraisers, to working on existing ongoing projects both indoors and out there is much to be done. Join us in our efforts, you'll be glad you did.

(* See Quarterly Newsletter
Volume 13 No. 2)

This Native Plant

Fraxinus americana: American or White Ash

Sonja Javarone



◆ Charles Edward Faxon from "Manual of the Trees of North America" by Charles Sprague Sargent Houghton Mifflin & Co., 1906

We know it. One may have grown in the backyard of our childhood home. It is a "nice tree". It doesn't have one single outstanding feature to capture our attention and associate it with a name. We know the lilac and magnolia, but our backyard tree may still be nameless. Let us get acquainted with the white or American ash, *Fraxinus americana*, a really "nice tree".

What do Little Leaguers, King Arthur and bentwood chairs have in common? You may have guessed—ash is the connection. Ash wood is elastic, shock resistant and strong. It is tough, yet bendable and lightweight. The unique characteristics of the wood have yielded a plethora of uses including baseball bats (Little Leaguers), tennis racket frames, hockey sticks, polo mallets, spears (King Arthur), tool handles, oars, scythes, hayforks, plows, furniture (bentwood chairs), bowling alleys, church pews and airplanes. Sometimes the wood has unique grain patterns which are used for veneers and interior finishing. As firewood, however, ash is mediocre. Ash is not suitable for outdoor uses as it does not hold up in contact with damp ground. For the herbalist, a white ash leaf rubbed on a bee sting or mosquito bite supposedly relieves the itching. It does appear, after some reflection, that ash

has touched all of our lives.

The white ash, *Fraxinus americana*, the largest and most valuable of our North American ashes, has been quietly disappearing as the demand for the wood has been quietly increasing. White ash, fortunately, is a good coppicing species—it sprouts from the stumps of fallen trees. The roots of the cut trees regenerate shoots at a remarkable rate. Young fast growing trees provide the desired sapwood sought by most ash wood users. The tree also transplants easily and is pH and sun tolerant. Landscapers especially look to the white ash for fast growth in problem areas. Most white ash in the country today is in the farmers woodlot and is marketed through a few national distributors. It is not likely to be found at the local lumber yard. This may be a market to explore.

According to Algonquian Indian folklore, an arrow into an ash tree created the human species. The Norsemen and Greeks have similar legends. About sixty species of ash are found worldwide in the North Temperate Zone. Each species has its own differentiating characteristics, but all the ashes have certain traits in common. Perhaps, the stuff of legends has to do with the fact that most ashes

are large trees and that their wood was associated with weapons and tools. The white ash, although non-descript in many respects, makes a large pleasantly shaped dominant feature on the landscape, whether in the natural environment or cultured. The white ash and other ashes worldwide must have touched the spirit of those early Indians, Norsemen and Greeks.

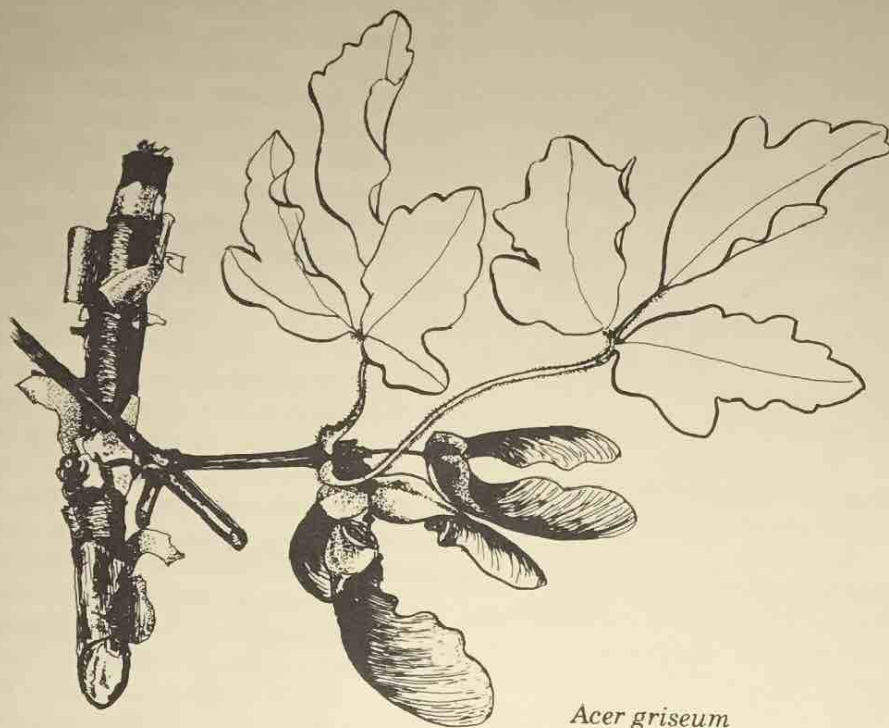
Ashes are related to olives, privet, lilacs, jasmine, chionanthus and forsythia. To be specific, the ashes belong to the olive family, Oleaceae, many of which are warm temperate or tropical species. In a sense, most ashes are north country cousins, lacking the petalled flowers, fragrance and desirable fruits of other olive family members. The wood, however, does contain an oil similar to olive oil. And, of course, most ashes are large trees.

To distinguish white ash, *Fraxinus americana*, look for these tell-tale markers. The compound leaves are pinnate with five to nine (usually seven) wavy edged and stalked leaflets. The leaves are green above and whitish green downy surfaced beneath. The leaves are opposite each other on the stout twigs. Leaf scars are crescent-shaped to semicircular. The flowers are dioecious, with sexes on separate trees. The flowers are petalless and appear before the leaves. The fruit is a single-winged samara, one to two inches long.

The white ash covers hardiness zones three to nine and has done well in Europe, as few of our tree species have. The native distribution extends from Nova Scotia to Florida and west into Minnesota and Texas. The best growth is on well-drained, moist and loamy soil. It will exceed twenty feet in twenty years, rapid growth for a hardwood species. White ash in the virgin forest supposedly reached 175 feet. One of the largest presently is located in Palisades, New York, and is 95 feet with a trunk girth of 25 feet 4 inches.

Continued on page 9

Asiatic Trifoliate Maples



Acer griseum
 ♦ Anne Jaster

For the smaller property, for the visual effect of an ancient tree in a more conservative size, for striking foliar textural effects as well as brilliant autumn coloration combined with soft gray or cinnamon red exfoliating bark - the asiatic trifoliate maples have much to offer the home landscape.

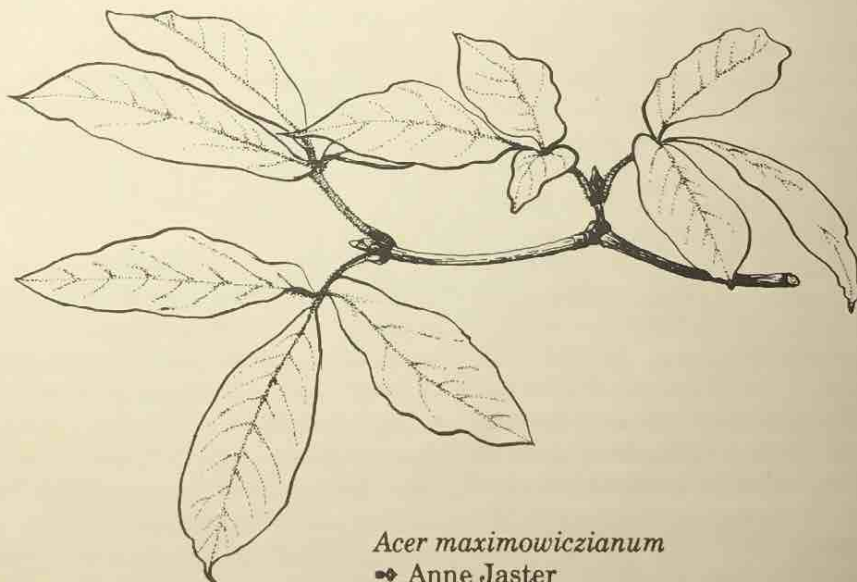
The taxonomic section of Trifoliatae of the genus *Acer* (maple), has as one of its most obvious characteristics leaves divided into three parts. As a whole the group is culturally undemanding, reasonably hardy (zone 5) and has virtually no serious disease problems.

The paperbark maple (*Acer griseum*) from W. China attracts admiration in all seasons. Growing to 25 feet it has an open rounded habit. Although lovely in summer leaf, it is the scarlet fall coloration and shiny cinnamon-red colored bark which peels off in strips that awe most gardeners. The three flowered maple (*Acer triflorum*), similar in size and habit to

the preceding species, hails from Korea and Manchuria. Scarlet in the fall, the reddish-brown bark of this species clings more tightly to the trunk.

A vase shaped growth habit, with trunks of tight smooth gray bark is one outstanding feature of the Nikko maple (*Acer maximowiczianum* formerly *A. nikoense*). Native to Japan and Central China this is potentially the largest of the above species reaching 45 feet. Fall color is striking, usually a clear pink but sometimes red or purple at the end of the season.

The only negative side of the trifoliate maples is the difficulty in their propagation. Apparently there is a strong tendency in the group to parthenocarpy in which the plant embryo does not develop properly hence germination percentages are low. Propagation is achieved through seed and by grafting on understock of a compatible species. New work is being done to improve results attained with cutting propagation. Propagation difficulties may make nursery plant prices appear high. But appreciate the difficulty of production and pay the price, you will not be disappointed with the addition of one of these beauties to your garden.



Acer maximowiczianum
 ♦ Anne Jaster

Trees, Shrubs and Vines with Outstanding Autumn Coloration

(Items marked with * are native to the United States)

RED (includes red/orange and red/purple)

Acer ginnala - Amur Maple
Acer griseum - Paperbark Maple
Acer rubrum - Red Maple *
Acer saccharum - Sugar Maple *
Amelanchier species - Shadblow *
Aronia arbutifolia - Red Chokeberry *
Berberis koreana - Korean Barberry
Cornus florida - Flowering Dogwood *
Cornus mas - Cornelian Cherry
Cotinus obovatus - American Smoke Tree *
Euonymus alata - Winged Spindle Tree
Fothergilla gardenii - Dwarf Fothergilla *
Liquidambar styraciflua - Sweetgum *
Metasequoia glyptostroboides - Dawn Redwood
Nemopanthus mucronatus - Mountain Holly *
Nyssa sylvatica - Tupelo *
Oxydendrum arboreum - Sorrel Tree *
Parthenocissus quinquefolia - Virginia Creeper *
Quercus coccinea - Scarlet Oak *

Rhus copallina - Shining Sumac *
Rhus typhina - Staghorn Sumac *
Sassafras albidum - Sassafras *
Stewartia koreana - Korean Stewartia *

CLEAR YELLOW TO GOLDEN

Betula species - Birch
Carya ovata - Shagbark Hickory *
Cercis canadensis - Redbud *
Celastrus species - Bittersweet
Chionanthus virginicus - White Fringetree *
Cladrastis lutea - Yellow Wood *
Clethra alnifolia - Summersweet *
Ginkgo biloba - Maidenhair Tree
Hamamelis virginiana - Witch Hazel *
Larix laricina - Tamarack *
Larix decidua - European Larch
Lindera benzoin - Spicebush *
Liriodendron tulipifera - Tulip Tree *
Physocarpus opulifolius - Ninebark *
Pseudolarix kaempferi - Golden Larch

A Special Thank You To

William Vetter for a water pump and electrical cord
Guernsey's Schoharie Nursery for Plants for the vine program
Jeff Zappieri for a refrigerator for the green house
Dorothy Clark for alpine plants for the rock garden
Janet Vinyard for *Hosta*
Dave Vermilyea for office computer furniture and supplies as well as some much needed labeling material

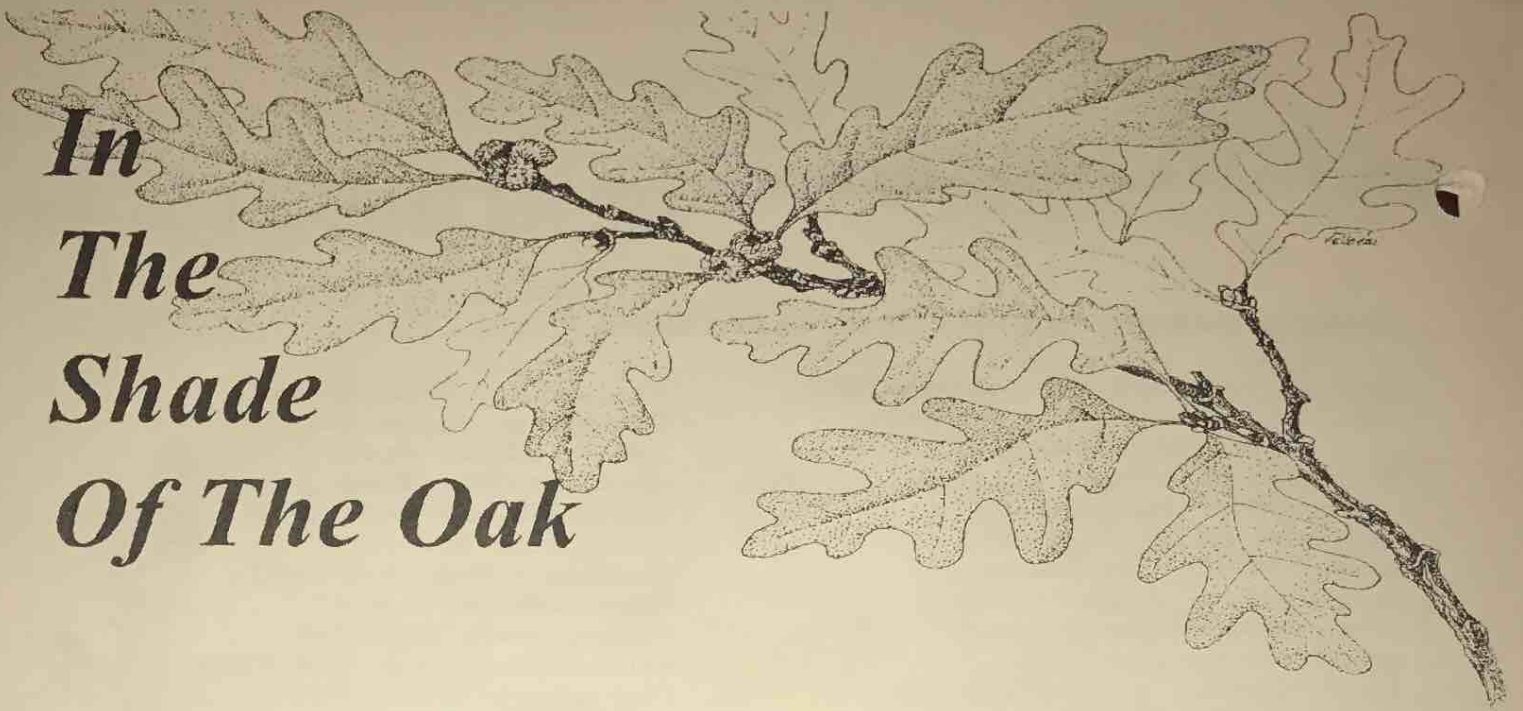
We are also very grateful to the following educators and helpers for donating their time and expertise in making our educational programs a success:

Tom Burbine
Floyd Guernsey
Phyllis Rosenblum
Laura Lehtonen
Chris Logue
David Vermilyea

Jeff Zappieri
John and Ann Carvill
Bob Farrell
Ruth Farrell
Pamela Rowling
Lucinda Willemain
Ann Daly

**SPECIAL THANKS TO ALL VOLUNTEERS
WHOSE HARD WORK AND CARING SUSTAIN OUR ARBORETUM**

In The Shade Of The Oak



They're Nuts About the Arboretum

Who's nuts about the Arboretum?

Squirrels are! The trees that are enjoyed by so many Arboretum visitors provide food and shelter for the four types of squirrels found in New York. On your next visit to the hill see how many of these medium sized rodents you can observe. While you're observing them see if you can find the abundant food they find here. Things like acorns, beech nuts, hickory nuts and apples.

Eastern Chipmunk

These are among the smallest of the squirrels. Their tawny color with black and light stripes on their back make them quite easy to identify if you can see them. Their coloration is such good camouflage they blend right in with the ground cover as they scamper



about. Be sure to look for them on the woodlot trail where they make use of the brush piles that scouts have built for them.



Red Squirrel

Look for the red squirrel in the pine and spruce areas. They leave a sure sign of their presence with the piles of stripped cones. They chew of the cone scales to get to the seeds. These are the most aggressive of the squirrels and can often be seen chasing the larger gray squirrels out of their territories.

Gray Squirrel

These are the largest of the squirrels. They are very at home in the trees and are quite acrobatic. Their antics at birdfeeder as they try to get seeds can be an enjoyable aggravation. Look for their leaf nests in the trees at the Arboretum. Now that winter is coming they'll be leaving those nests for hollows in trees.

Flying Squirrels

There are flying squirrels at the Arboretum but they are so secretive they are seldom seen.

A Missing Family Member - Can You Guess

Next time you're at one of the family programs tell me about the one member of the squirrel family I didn't mention.





END OF SEASON SALE

SUBSTANTIAL SAVINGS ON
ALL ITEMS

at the Acorn Shop

Special October hours:

Weekdays 10- 2:00

Saturday 10 -5

Sunday 12 - 5

November Weekdays only 10 -2

Why not start you holiday shopping early and enjoy a visit to the arboretum at the same time?

Nature's Paintbrush from page 1

Now back to the leaf in autumn. A layer of cells form where the leaf petiole is attached to the twig. This abscission layer or separation layer forms as auxins (plant hormones) cease maintaining the transport channels, xylem and phloem, which move water, sugars and other materials in and out of the leaf. Meanwhile, ethylene, which also stimulates flowering and ripening of fruit, and abscisic acid both stimulate the growth of the abscission layer and cause the eventual shedding of the leaves. Other factors including temperature, pH, light, water and minerals interact with the organic compounds trapped within the leaf.

Do not panic. We are going to look at some basic leaf biochemistry. This should not be too painful. Normally, chlorophyll and other pigments absorb energy from certain wavelengths of light. This energy bounces electrons

into higher energy levels (away from the nucleus). These "hot" or "excited" electrons provide energy for chemical reactions. In chlorophyll, the energy from "hot" electrons is used to split water into hydrogen ions and oxygen gas. The oxygen is released immediately—a nice bonus for us. The hydrogen ions eventually join with carbon dioxide to form sugars. Thus we have photosynthesis—the long-term energy storage system. Certain other pigments also supply "hot" electrons to chlorophyll. Now think about this. If the sun never set, plants could use the energy from "hot" electrons directly and the energy stored in sugars would not be needed. Where would we get our food supply then?

In the fall, chlorophyll is one of the first pigments to fall victim to stresses within the leaf. With the loss of chlorophyll, other pigments in the leaf become visible. Now we have trapped sugars, "hot" electrons, breakdown products and other factors all interacting in an uncontrolled fashion as the chemical systems within the leaf crash. This chemical chaos becomes another bonus for us—a bonus perhaps more spiritual than physical, this time enriching our lives forever.

Sonja Javarone is currently Publications Director supported by ZBGA grant funds. Writer, photographer and former high school biology teacher, Sonja began as a volunteer last March.

Apple Adventure

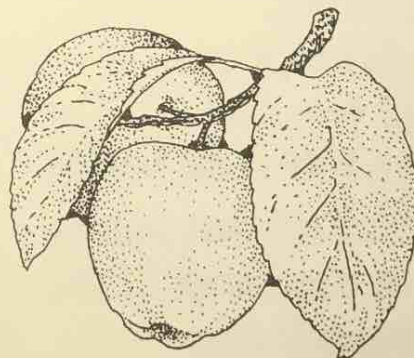
Sunday, November 13, 1994 2:00 p.m.

Rice Center of the Cornell Cooperative Extension
Martin Road (near High School) Voorheesville, NY.

Discover the origin of apples! "Apples on the Silk Road"

Dr. Phil Forsline

USDA Plant Genetic Resources Unit in cooperation with Cornell University.



Taste old and new varieties!
"Apple Tasting Event" After
Dr. Forsline's program
Apples courtesy of Indian
Ladder Farms
Purchase homemade pies
Coffee and cider served.

Admission: \$5.00 to benefit the George Landis Arboretum

Garden Forum

Tom Burbine

Winter Protection

This fall we are still seeing the results of a very severe 1993-94 winter. Injured plants still appear in the landscape with partial death of plant parts to the entire death of trees and shrubs. This means that we should pay more attention to winter protection activities this fall for our woody plants. It may take a little time and effort to prepare plants for the winter, but when one considers the cost of replacement and enjoyment from a nature plant, it's worth it.

Winter injury occurs in several ways: **FREEZING INJURY:** Ice crystals form within the cells causing disruption if the plant tissue. This can cause complete death or killing back of the plant.

WINTER BURN: Woody plants, especially evergreens, continue to lose water even during the dormant season. If plants are exposed to strong winds direct sun or both, their leaves lose water faster than it can be replaced by the roots locked in the frozen soil. This results in the leaves wilting and browning. If it is severe, this dehydration can kill the plants.

HEAVING: The alternate freezing of the soil during the winter and spring months can heave plants out of the soil exposing roots to drying conditions. This can occur with new transplanted material or perennial beds.

BARK SPLITTING: This is the vertical splitting of the trunk of a plant due to differences in temperatures between the north and south side of the plant or the freezing of the water within the heartwood of the tree.

MECHANICAL INJURY: This occurs due to the accumulation of ice and snow on branches, severe wind conditions, and bark damage by mice, rabbits and deer.

Here are some tips to prevent injury with evergreens: Mulch evergreens when growth has hardened the fall. This will be after non-evergreen plants have dropped their leaves. Mulching will insulate the soil

from sudden temperature changes and reduce the depth to which freezing takes place. Keep mulches in place in summer for their insulation and moisture retention value. Plants with more than one upright stem often are damaged by snow and ice falling off eaves of roofs on foundation plantings. Plant breakage can be prevented by fastening heavy twine at the base of the trunk and winding it up spirally to the top and back down.

In foundation plantings snow and ice damage to evergreens can also be prevented by erecting wooden shields to protect the plants.

Lastly, protect evergreen plants which are sensitive to exposure by a windbreak or sunshade. Plants may be shielded by less sensitive evergreen trees, lath, burlap or other suitable materials which will moderate the wind and the sun's rays.

Keep in mind that winter protection takes time and may be done every year in this climate. But in the long run is worth it when one puts a dollar amount on plant replacement and enjoyment.

Tips to prevent winter injury to woody plants: During the winter, mice and rabbits often damage trunks or stems of fruit trees and ornamental shrubs. Damage varies from loss of bark on only one side, to complete girdling of all bark along several inches of the stem or trunk.

Several procedures can be followed to prevent stem girdling.

For control of rabbit injury, cylindrical wire guards made of one inch mesh poultry wire may be used to protect young fruit trees. In placing these guards around the trees make sure they are adequately anchored several inches away from the main trunk and extend high enough to reach at least two feet above the height of accumulated snow. This height will vary with the greatest depth of snow expected in location of the tree and the manner and height of the branches of the main trunk.

Field mice work effectively underneath a heavy snow cover

girdling a nicely developed tree or shrub. This injury can be prevented by the use of wire guards made of a one-quarter inch hardware cloth 18 to 24 inches high. This is usually placed around the tree with the wire base extending several inches into the ground.

Deer can also be a big problem in both urban, residential and rural areas. Fencing and various types of repellents can be used to reduce this injury.

Tom Burbine, Montgomery County Cooperative Extension Agent, is a member of our Board of Trustees. He will be delighted to answer your garden questions, so call in or mail them to the Newsletter Editor.

This Native Plant from page 3

In New England, white ash will associate with the oaks on rocky hillsides. In the vast deciduous forest of much of the eastern United States, it partners with beech, birch, maple and basswood. In prairie groves of the Midwest, it shares with communities of elm, basswood and cottonwood.

White ash is one of the fall colorists. The colors range from purple to maroon, mauve and gold. Curiously, more purple is seen in the North and gold in the South. The colors appear early. Cultivars are available for fall display and include:

'Autumn Applause' - maroon, 'Autumn Purple' - red purple, 'Chicago Regal' - regal purple with earth tones, 'Elk Grove' - rich royal purple, 'Greenspire' - dark orange, 'Royal Purple' - royal purple, and 'Rosehill' - bronze red.

The cultivars are all male trees—an advantage to the homeowner who dislikes clearing ash seedlings from hedges, lawns and gardens.

Will we know white ash by name the next time we see it? Will the "nice big tree" of old memories and legends become a familiar friend?

How Does Our Garden Grow

New Members (*) and Renewals June 1994 through August 1994

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Memorial Trees

Redbud (*Cercis Canadensis*) given by Claudia Dean
in memory of Bronwyn Caroline Dean.

2 Hybrid American Chestnut trees (*Castanea dentata*
x. C. mollissima) given by the Men's Garden Club of
Albany in memory of Ferd Johnson.

Gardeners' Workshop

Eastern Forest Communities - (Part 3)

Anne Best

Predicting A Forest's Future

Compare the species of trees that make up the canopy with those that are growing as tiny seedlings and small saplings on the floor of the forest. If the canopy is primarily oak species, do you find oaks as seedlings and saplings? If you do then it is safe to conclude that the forest is self producing and will continue to be an oak forest. If you find, however, that the species present as seedlings and saplings are quite a bit different from those established in the canopy, this indicates that the species composition of the forest may be changing. These changes are slow, taking the equivalent of several human lifetimes.

Forest development is very slow because the lifetimes of trees are long. A forest may appear quite stable when in fact its species composition is changing. Some species such as sugar maple, are very shade tolerant as seedlings and saplings. These tiny trees can persist in the shrub and herb layer for many years while growing very slowly. Eventually, by exploiting gaps, they take their places in the canopy, replacing other species.

A gap is a localized forest opening created either by a small scale disturbance, such as the death of a large canopy tree, or a larger disturbance, such as a hurricane or fire. Wind-throw and lightning are very common causes of small scale gaps. Sunlight floods into gaps, creating excellent conditions for the growth of subcanopy and shrub species as well as vines, such as Poison-ivy and Virginia Creeper. Gaps often develop a dense, almost jungle-like understory. Some gaps may be large, covering as much as an acre or more. Large gaps support species found in successional areas.

Gaps eventually close as those species characteristic of the canopy return and grow to their full statures. However, as older gaps close, new ones are created by naturally occurring events. Most forests will consist of numerous gaps of varying ages. Gaps add greatly to the diversity of forests.

Most forests are surrounded by different types of habitats, such as fields of varying ages, croplands, or residential areas. The border between two types of habitats, such as where a forest meets a field, is called ecotone. An ecotone is often described as "brushy" or "shrubby." Ecotone species are often the same as those found in disturbed areas. The species richness of ecotones is often higher than that of either of the bordering habitats because the ecotone contains species from both habitats. Ecotones may be broad; a forest may intergrade very gradually with another habitat. An ecotone may also be abrupt, with a sharp border. Within a forest ecotone competition is fierce among plant species for light, soil moisture, soil nutrients, and space. It represents a transitional area as one habitat becomes dominant at the expense of another. Throughout eastern North America, forests expand their borders unless stopped by human activity such as cutting. If you are standing in a forest-field ecotone and facing the forest, the forest is slowly moving in your direction.

So, what would you call the areas under power lines in a forest or field? Powerline rights-of-way are usually characterized by a thick growth of low spreading shrubs. Species such as huckleberries, blueberries, sweet fern, greenbrier, alders (wet sites), meadowsweet, arrowwood, and common juniper may occur in dense single stands or in various combinations. There will be a few, if any tree seedlings or saplings. Trees will not replace shrubs as they do in normal old-field succession. These

communities are examples of "arrested succession." The shrubs are there to stay.

Why do the shrubs become dense enough to resist invasion by trees? In many cases the answer is due to human intervention (herbicides, or directly removing the trees). This allows the shrubs to keep spreading which develops an ever denser cover. Once a dense shrub cover is established, the shrubs are able to out compete invading new seedlings on their own. Dense cover can reduce the level of light at the soil surface enough to prevent seedling growth. Shrubs may out compete trees for moisture and/or nutrients as well. Some evidence also indicated the litter from huckleberries, lowbush blueberries and greenbrier may be somewhat toxic to tree seedlings. Shrub dominance can occur without human intervention as well. It can also occur naturally. Not all old fields become forests; some become shrub communities.

Anne Best is owner of Greenspace Environmental Design in Albany.

Wish List:

The Arboretum is in need of the following! Donations are greatly appreciated!!

Computer Monitor

Projector Stand

Dust Buster

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(paper, layout board etc.)

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