

Chinquapin

The Newsletter of the
Southern Appalachian Botanical Society



Vol. 4, No. 1

Spring 1996

From The Editor's Desk.....

I am again and again reminded of comments that Paul Delcourt was making more than a decade ago, something to the effect that a rise in world-wide average temperatures will result in greater fluctuations of the weather rather than a simple warming of the weather throughout the world. In *Newsweek* (Jan. 22, 1996) reporter Sharen Begley singled out James E. Hansen of Goddard Institute for Space Studies as having correctly predicted that we would be seeing record warm years (1990) and more violent storms such as has happened with Hurricanes Hugo and Opal and blizzards of 1993 and 1996. I suppose we cannot argue that we have had more severe weather over the past few years, and that dramatic weather has not been restricted to either the East or West in the U. S. nor to the western world for that matter. Britain, especially Scotland, has endured recent heavy snows this winter, too.

In the last issue I suggested I would say more about my observations of the effect of Hurricane Opal. I live in a protected, slightly southwest facing valley at 2280 feet elevation between a 3400-foot ridge to the east and a lower 2700-foot ridge to the west. The storm tracked generally northward here but the winds whipped first one direction and then another. There are trees downed in my yard facing north, east and south but perhaps most to the southeast. Among the species damaged or toppled were Norway spruce (*Picea abies*), bigleaf magnolia (*Magnolia macrophylla*) and weeping willow (*Salix babylonica*) among the cultivated species and black locust (*Robinia pseudoacacia*), black walnut (*Juglans nigra*), butternut (*J. cinera*), bitternut hickory (*Carya cordiformis*), American beech (*Fagus grandifolia*) and pines (*Pinus echinata*, *P. virginiana*). By far the greatest number downed are black locusts. But not a single oak in the lower part of the valley is down. Only a few tulip trees

(*Liriodendron tulipifera*) in my immediate area were blown over though there were some further down the valley where some timber cutting had taken place recently, but they generally stood firm.

In the mountains from north Georgia to Asheville the higher elevations sustained considerable tree damage. There were only patchy areas of perhaps an acre or perhaps up to five that had most of the trees blown over or broken. Again, whether it is oaks or tulip trees, not all were downed or damaged. A regional forester, Paul Carlson, noted that most of the trees he saw downed or damaged were already damaged and this process effected a thinning that foresters might have wished to carry out if they had time. So, maybe we can suggest that the process did some silvicultural improvements if we are foresters or some understory herbaceous rejuvenation if we are primarily wildflower enthusiasts. Do
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Endowment Challenge Update HURRAH! WE DID IT!

The members of the SABS have met the Endowment Challenge that Don Windler placed before them at the annual meeting in April. It was close. The very last bit of 1995 mail brought in five \$100 donations, one more than the challenge required. Don has made good on his part of the challenge and paid the \$1,200 he agreed to contribute, thus making him the first Chinquapin Circle (\$3,000+) donor. In addition, total contributions for 1995 surpassed the previous record for annual donations. In 1993 the members contributed \$8,135. The new record is \$10,151.

The 1995 Endowment Drive resulted in one new Platinum Level

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Letters to the Editor...

Alvin R. Diamond, Jr., Director of Troy State Arboretum, Alabama, writes: "in reply to [the] 'One Liners' in the Fall 1995 newsletter regarding the dogwood forest Bartram passed through in his travels. I am originally from Conecuh County and know of no dogwood forest in south Alabama as described. There is however a forest in northern Conecuh County on the west side of the Sepulga River and extending down the Conecuh-Monroe County lines that is similar. This forest is composed of large longleaf pines (*Pinus palustris* Mill.) and occasional shortleaf pines (*Pinus echinata* Mill.) with an understory composed almost entirely of dogwood (*Cornus florida* L.). The shrub layer is composed of Elliott's blueberry (*Vaccinium elliotii* Chapm.) and the herb layer of yellow jasmine (*Gelsemium sempervirens* [L.] Ait. f.), grass leaved golden aster (*Pityopsis adenolepis* [Fern.] Semple), birds foot violet (*Viola pedata* L.), pine woods dropseed (*Sporobolus junceus* [Michx.] Kunth), slender bluestem (*Schizachyrium tenerum* Nees) and lichens. In moist areas Magnolias (*Magnolia grandiflora* L.) can be found. As you pointed out, selective removal of the overstory can create the effect of a dogwood forest. I would venture a theory as to how this could occur naturally.

I now live in Pike County, Alabama. On October fourth we were hit by Hurricane Opal. Evergreen, the county seat of Conecuh County and centrally located in that county is approximately 75 miles north of the Gulf of Mexico. Troy, the county seat of Pike County and centrally located in that county is approximately 120 miles north of the Gulf of Mexico. On October third a cold front stalled over Alabama dropping over 12 inches of rain on Troy. Then came Opal, a category three hurricane with sustained winds of 125 mph at landfall and sustained winds of over 75 mph with gusts of over 100 mph at Troy.

On a 50-acre natural longleaf pine site about 12 miles north of Troy

between 60 and 70 percent of the trees were downed. On 50 acres that I own only one longleaf pine and six shortleaf pines survived. However, not a single dogwood or magnolia was uprooted. Could this have occurred in the area Bartram passed through? Longleaf pines only produce a good seed crop every three to five years and the seeds are large and fall near the tree. They are also eagerly sought by animals. With the mature trees downed and no seed source available over a large area it could take some time for the pines to reestablish themselves. This is particularly true of longleaf pine which is very fire dependent and requires bare soil and full sun to become established. Perhaps years had passed by the time Bartram traveled the area, allowing for the downed trees to decompose. Also hurricanes can be more powerful than Opal. Hurricane Camille had maximum sustained winds of 120 mph, and gusts in excess of 200 mph. At one point before landfall Opal had sustained winds of 180 mph, making it for a time a category five storm, the most powerful.

The Conecuh-Monroe County line follows a ridge dividing the watersheds of the Alabama River system and the Conecuh River system and is the site of the Old Federal Road which followed an earlier Indian trading path to Mobile. Bartram would most likely have followed that trading path on his way to Mobile.

Unfortunately the longleaf pine forest type is quickly disappearing in Alabama, being replaced by short term loblolly pine (*Pinus taeda* L.) pulp plantations. Bartram surely would not recognize this area if he were to pass through today." [Ed. Note: This is as good an explanation as I have seen. Certainly it fits the description Bartram gave. And your observation on the loss of longleaf pine forests to loblolly plantations fits our experience in the North Carolina Coastal Plain. I wonder if anyone familiar with the coastal magnolias and dogwoods has noted this pattern elsewhere.]

Editor cont.

you think the wildflowers will be expanding as a product of these tree thinnings? Or will they be declining as their cover is removed as we commonly practice in clearcutting? Let us hear from some of you backyard observers on your impressions.

One of our members to the south, Alvin Diamond of Troy State Arboretum in Troy, Alabama, describes how the stronger winds of Hurricane Opal affected the longleaf pines and he also notes that some of the understory trees, especially dogwood and magnolias, were spared (See letter below).

I'm curious: are botanists, both professional and amateur, afraid of printing "wild ideas"? I have contacted and encouraged a few professionals to share some not fully tested thoughts, some that might be on the cutting edge of investigation, some thoughts on phenomena that may not have any answers or at least ones ready to be vigorously tested by scientists. So far this effort has generated only one response to the topic I initiated. And I am not totally off my rocker with the yellow plastic duck question in the last issue. Okay, you are all busy, do not read every word printed herein and have a myriad of other things to do. But what is going on in the world of speculation in the minds of our members that we can all appreciate?

Shirts, Mugs and Totes

To order T-shirts, mugs and tote bags, please contact The Complete Naturalist, 2 Biltmore Plaza, Asheville, NC 28803, phone (704) 274-5430, FAX (704) 274-5408. The owners of this store, Laura and Hal Mahan, have agreed to receive orders and money, ship the shirts at cost and give SABS 100% of the receipts as a service to the Society. We are very pleased to accept their offer, as it will make shipping easier (they do it every day). Both Laura and Hal are active in teaching natural history and conservation. Be sure to note T-shirt size (M, L, XL) and whether you want it in white or natural (beige). T-shirts are \$10 each; totes are \$8 and mugs are \$5. Please include \$3 for first item, and \$1 for each additional item for shipping.

TO RESERVE ITEMS FOR THE ASSOCIATION OF SOUTHEAST BIOLOGY MEETING OR OTHER DATES: Contact Larry Mellichamp (Address on front).

Endowment Challenge cont.

(\$2,000+) donor; three new Gold Level (\$1,000+) donors; seven new Silver Level (\$500+) donors; and 35 new Bronze Level (\$100+) donors, 26 of which contributed at least \$100 in 1995.

The Society appreciates the support of the members who helped meet the challenge. The names of the donors who allowed us to successfully meet the challenge are listed below.

PLATINUM LEVEL (\$2,000+)

John and Lucrecia Herr

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"It turns out that lotus seeds can last 1,288 years in part because they have a potent enzyme that detects and repairs damage to DNA. This enzyme may one day be used to slow human aging and help combat environmental damage to our own DNA."—Peter White, NC Botanical Garden Newsletter, Jan-Feb 1996

"The first year it sleeps, the second year it creeps, the third year it leaps."—Sally Vilas, President, Bot. Gard. Found., Inc., NC Botanical Garden Newsletter, Jan-Feb 1996
[Ed. note: Where was this quote first printed and/or was authored by whom?]

Back Issues

The special issue of the Barrens Symposium is available for \$10.00 and regular back issues will be \$6.00 starting in 1995. This price reflects the current production, handling and shipping cost. Contact Secretary-Treasurer, Charlie Horn.

West Virginia University is disposing of all back issues in existence; some have been brought to Charlotte. **WOULD YOU PLEASE CHECK WITH YOUR LIBRARY AND SEE IF ANY BACK ISSUES ARE MISSING AND CONTACT LARRY MELLICHAMP AS SOON AS POSSIBLE (ADDRESS ON FRONT)**. Members can still get back issues before 1990 for a bargain \$1 per volume (especially if picked up at the annual meeting with the Association of Southeastern Biologists or directly at the University of NC at Charlotte). This bargain price applies to availability (there are some missing numbers in many volumes).

Welcome To Our

New Members:

Joan Pflingsten, Berea, OH; Joseph McGuiness, Erwin TN; Donna Ford, Morgantown, WV; Chris Matthews, Frostburg, MD; Don Seriff & Kim Garrett, Charlotte, NC (family members); Outdoor Ventures Associates, Columbia, SC; Wendy Rohrer, Blacksburg, VA; Steven Platt, Clemson, SC; Karen Arabas, State College, PA; Thomas E. Hancock, Wilmington, NC; Beverly Stamp, Blacksburg, VA; Martha McCombs, Brecksville, OH; Perry Peskin, Shaker Heights, OH; Jennifer Robertson, Mooresville, NC; George F. Smith, Knoxville, TN; ; Barbara L. W. Case, Yellow Springs, OH; Matthew T. Cimino, Takoma Park, MD; Jennifer A. Clevinger, Okemas, MI; Kent & Dolores Glauser, Northwood, OH; John V. Perumal, Collegedale, TN; Richard E. Kreh, Critz, VA; Brian Lokai, Dayton, OH; Timothy A. Falkenstein, York, PA; Riverbanks Botanical Garden, Columbia, SC; John H. Shaw, Columbus, OH; James Noe, Marietta, OH; Mary Longanbach, Morgantown, WV; Pamela Sutton, St. Petersburg, FL; Eugene H. Pierce, Carroll, OH; Christopher Kline, South Bloomingville, OH; David Lincicome, Urbana, IL; Stefan Cover, Cambridge, MA; Bert Kelsey, Germantown, OH; Steve Beard, Powell, OH; Maurice Moore, Columbia, SC; Thomas Pinner, Columbia, SC; Christopher Bedel, Lynx, OH; Jeanne Budde, Columbus, OH; Lonnie R. Drouhard, Athens, OH; Jeffery S. Schmela, Athens, OH; Robert Carter, Auburn, AL; Judith Rozeman, Berea, KY; Donald J. Padgett, Durham, NH; Tricia L. Frye, Murray, KY; Tate R. Erickson, Fairview, NC; Michael S. Rosenzweig, Blacksburg, VA; Kevin Caldwell, Asheville, NC; James C. Estill, Bowling Green, KY; Arthur Kuhlman, Jr., Cuyahoga Falls, OH; Paul E. Saldutte, Medina, OH; Dan Fjeldstad, Mentor, OH.

Book Corner

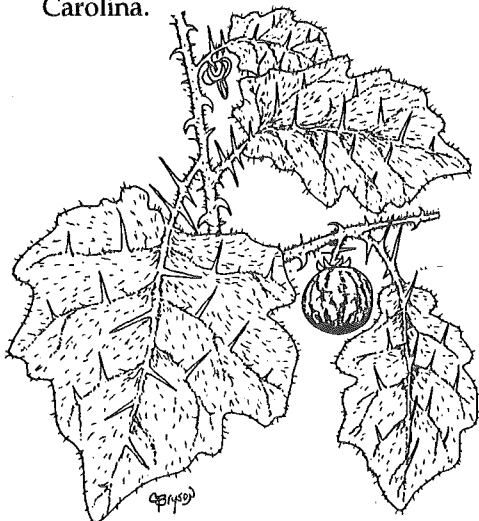
[If you know of books that might be of particular interest to the lay readers of our organization, please submit a brief paragraph of 3-8 lines for consideration in the newsletter. Longer reviews should be sent to Audrey Mellichamp for inclusion in Castanea.-Ed.]

James G. Harris and Martha Woolf Harris in Plant Identification Terminology: An Illustrated Glossary (Spring Lake Publ., UT, 197 p., paperback, 1994) are cognizant of the fact that the beginning student of plant taxonomy is faced with a formidable task of understanding plant taxonomy. They believe that the most effective way of conveying the meaning of a botanical term is a simple illustration, and they often duplicate illustrations where appropriate, but while redundancy might be criticized, this makes the book more valuable and convenient for the beginning student. They give diverse uses of terms so the student could make use of the book to cover the varied interpretation of various authors and it is valuable for professionals in this regard, if not others. I strongly recommend this book to the beginning student.—Richard Stalter, St. John's University, Jamaica, NY.

TROPICAL SODA APPLE NOW IN MISSISSIPPI

In *The Silent Spring*, Rachel Carson warned of environmental pollution by pesticides. Carson's book directly affected modern agriculture. Today, the food and fiber produced in the USA is the safest anywhere in the world and research continues to discover methods and technologies that reduce the risk of pesticides and agriculture on the environment. Currently, agriculture, forests and natural areas are faced with another major problem, biological pollutants. Annually numerous plant and animal species are introduced intentionally and unintentionally into the USA. Each of these plants has the potential to harm natural biodiversity, pristine ecosystems and agricultural production.

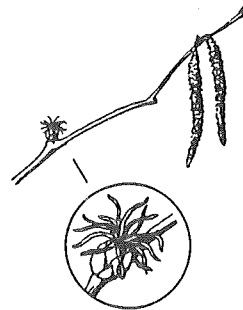
Tropical soda apple, *Solanum viarum* Dunal (Solanaceae), is an aggressive, shrubby perennial that is native to Argentina and Brazil which has been introduced into the US. It is spreading at an alarming rate in the southeastern USA. The first USA collection of this weed was made in Glades County, Florida in 1988, but the plant may have been in Florida since the early 1980's. Since that time, tropical soda apple has spread rapidly in the southern USA. Currently, it infests an estimated one million acres of pastures, croplands, forests and natural areas in Alabama, Florida, Georgia, Mississippi and South Carolina.



Tropical soda apple
(*Solanum viarum* Dunal)

(Reprinted from: *Shortia* 5(4): Winter, 1983, Newsletter of the Western Carolina Botanical Club.)

Without leaves or flowers, winter identification of woody plants depends principally on examination of the twigs, with their buds and other features. Carrying on this activity into late February brings with it the chance of coming upon the blossoms of one of the very earliest-blooming shrubs of the year, the hazel.

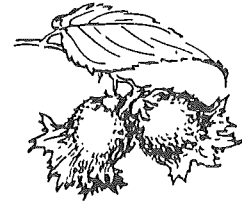


catkins

The staminate catkins are not especially remarkable, looking pretty much like those of other members of the birch family; it is the pistillate flowers that are worthy of a close look (use a hand lens, for they really are tiny). These flowers are gathered into clusters and even at this late stage are almost entirely concealed by bud scales. All that protrudes is a bunch of stigmas less than three millimeters long, but a glistening ruby-red. Were it not for their small size, the astonishing color would make them light up the late winter woods like lanterns.

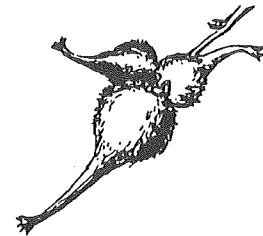
The flowers do not, however, help us to decide whether we are looking at American hazel (*Corylus americana*) or beaked hazel (*C. cornuta*), so if we wish to know we

must go back to studying the twigs. There the evidence is plain, but don't put the lens away. The twigs of *C. americana* will be densely beset with bristles and stalked glands, while those of *C. cornuta* will be smooth or at most will have a few scattered soft hairs.



C. americana

Final proof of their identity will not come until fall, when the faintly pungent nuts - sometimes called filberts - ripen, but it is very positive. Hidden by the scales beneath the red



C. cornuta

stigmas were minute bracts, and these have now grown enormously, the pair subtending each flower forming an involucre to completely enclose the nut. In *C. americana* they resemble leaves, with their raggedly cut edges, but in *C. cornuta* they fuse together and are prolonged far beyond the nut into a narrow, tubular beak.

-Dick Smith

Tropical soda apple is distinct from other closely related *Solanum* species. Mature plants of tropical soda apple are 3 to 6 feet tall and are armed on the entire above ground portion of the plant with broad-based white to yellowish thorn-like prickles. The leaves and stems are hairy. Flowers are white with five recurved petals and white to cream colored stamens surrounding a single pistil. Immature

fruits are mottled whitish to light green and dark green, like a watermelon. Mature fruits are yellow, about the size of a golf ball and each fruit can contain up to 420 flattened reddish-brown seeds.

Tropical soda apple has spread rapidly in the southeastern USA because habitat requirements are extremely diverse, it possesses a high reproductive capability, it has numer-

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BOTANICAL EXCURSIONS

By George Ellison

SEX IN THE PULPIT

"Jack-in-the-pulpit, in this day of women's liberation and equality of the sexes, really should have its name changed to Jack-or-Jill-in-the-pulpit. Long before the controversy surrounding ordination of women to the pulpit, nature decided it was all right."

— Jim Horton, The Summer Times (1979)

Everybody recognizes Jack-in-the-pulpit. It appears in spring throughout eastern North America in moist woodlands and bogs as a plant bearing one or two long-stalked leaves with three leaflets each. What catches the eye, however, is the so-called "pulpit," a leafy bract called a spathe. Sequestered within is "Jack," a fleshy stalk called a spadix. In late summer and fall, plants that have been successfully pollinated display vivid clusters of red berries.

Jacks are highly variable, ranging from slender pale plants a few inches high to thick-stemmed heavily-mottled individuals over three feet high. Some botanists recognize three species or subspecies within this complex. (See Newcomb's Wildflower Guide, pp. 36-37, for a good description and depiction of the three basic forms.) But most current vascular floras — including the Manual of the Vascular Flora of the Carolinas and the Guide to the Vascular Plants of the Blue Ridge — recognize a single species: *Arisaema triphyllum*.

Jacks can reproduce asexually, but it is their peculiar sexual tactics that have brought them under scrutiny in recent years. Numerous plants (holly, doghobble, ginkgo, etc.) are dioecious; that is, they have separate

male and female plants. But Jacks can change their sex from season to season; female one year, male the next or vice versa.

Sex reversal is relatively rare (or, perhaps, just undetected) in the natural world. In recent years, however, scientists have discovered animals on Caribbean coral reefs and snails in the Amazon that display reversible gender. Some orchid species are reported to function as females when growing in sunlight and males when growing in shade. Among



Female Jack-in-the-pulpits have two leaves; males have one

-- Elizabeth Ellison

North American plants, striped maple (*Acer pensylvanicum*) is another species that has been reported to practice sex reversal, primarily from male to female when the plant is stressed by crown closure.

Individual Jacks you examine can be male, female, male-female (monoecious) or without neuter. Males produce tiny flowers at the base of the spadix that consist of a cluster of

creamy white or purplish pollen-bearing anthers. Females exhibit green spherical structures on the spadix capable of producing seeds. When plants are monoecious, the male (staminate) flowers are located above the female (pistillate) flowers on the spadix. Plants that are immature or for some reason extremely deficient in nutrient resources will produce a leaf but no flowers.

Monoecious plants are relatively uncommon in the wild (perhaps three in every 100 you examine will have both male and female flowers), but their presence indicates that Jacks sometimes have an intermediate stage between the male/female phases that is often not cited in scientific accounts. This is one of the least understood aspects in the plant's reproductive strategy. (See Clay, p. 775.)

In general, rootstock that is large with lots of stored food produces the larger two-leaved female plants. A female Jack that loses stored energy can become a one-leaved male plant the following year or even revert to being a one-leaved plant without neuter. Conversely, a male that develops its storage supplies can then change sex and become a seed-bearing female.

This ability to reverse sexes enables Jacks to respond to changing environmental factors. And it allows a female that has simply put a lot of energy into fruit bearing one season to take a little time off the next year as a male. In regard to energy expenditure, producing pollen is light duty when compared with producing fruit.

Where the spathe overlaps at its base, there is a small gap left open on male plants. This allows the small insects (often fungus gnats) that visit the male plants to escape from the chamber bearing pollen. Dead insects

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Excursions Cont.

can often be observed at the base of the female chambers, which have no gap. There is no evidence Jacks absorb any nutrients from these insects. The closed opening apparently forms a trap that insures the insects will thrash around and fully distribute any pollen they might be carrying.

One further observation. Thin-walled panels in the spathe act like windows, creating a special filtered light inside the enclosure that is most intense at the bottom of the spadix where the flowers are located. This chapel-like lighting system helps to attract insects down into the pulpit where either Jack or Jill reside. Look closely and you may even find them — from time to time — living together.

During the 1980's numerous articles regarding Jack-in-the-pulpit's capacity for sexual reversal appeared in both scientific journals and the popular press; indeed, it became so hot a topic that the Newsweek magazine issue for May 17, 1982, contained a piece entitled "Changing Sex Nature's Way." See the bibliography in Keith Clay's "Size-dependent Gender Change in Green Dragon (*Arisaema dracontium*; Araceae)," American Journal of Botany, 80 (1993), 769-777, for a listing of relevant scientific articles. Interesting theorizing about the plant's sexual habits can also be found in George Constantz's Hollows, Peepers and Highlanders: An Appalachian Mountain Ecology (Missoula, Mt.: Mountain Press Publishing Co., 1994) and Stephen Jay Gould's The Flamingo's Smile (N.Y.: W.W. Norton Co., 1985).

**"Collect only what you need,
Leave some plants to go to seed.
When gathering yarrow lops,
Leave the roots to grow more tops.
Mints and such you'll find abundant,
Flowers and leaves are the most
redundant!**

—Marie B. Mellinger, Roadside Rambles, undated, p. 4.

Far Flung Plants

(Reprinted with permission from the Indiana Native Plant and Wildflower Society News 1(4) Winter 1994.)

In late July, I did some wetland botanizing in northern Indiana. Among the places I visited were the Nature Conservancy's Swamp Angel Preserve, and Nasby Fen in the Pigeon River Fish and Wildlife Area. At both sites, I found a plant that I hadn't seen previously, White Camas (*Zigadenus elegans*, in the family Liliaceae). A few weeks later, I was in the Colorado Rockies participating in a workshop at the Rocky Mountain Biological Laboratory. Although most species and many genera of the high-elevation flora were new to me, I was surprised to find my new acquaintance, White Camas, among them. It was even more surprising to contrast the habitat of this species in Indiana with that in the Rockies. In the Midwest, this is a plant of wet, calcareous sites such as the Nasby and Swamp Angel fens. In the Rockies, it grows on open, dry alpine slopes and sub-alpine meadows.

Further observation in the Rockies revealed several other plants familiar from the Midwest. One of the associates of the camas in both areas is Shrubby Cinquefoil (*Potentilla fruticosa*, Rosaceae). Like the camas, it grows in fens in Indiana, but is found on dry soils in the Rockies. More old friends turned up in sub-alpine forests in the Rockies; examples included False Solomon's Seal (*Smilacina racemosa*, Liliaceae), Starry Solomon's Seal (*S. stellata*), Red Baneberry (*Actaea rubra*, Ranunculaceae) and Cow-Parsnip (*Heraclium lanatum*, Umbelliferae).

I was initially surprised to see familiar plants in unfamiliar environments. How can the occurrence of the same species in distant locales be explained? The distribution pattern of a species is determined by many factors. Primary among them are the environmental tolerances of the plant, which include the range of light, temperature, soil moisture and soil nutrients over which it can grow. One thing that the presence of these plants in areas as far-flung as northern Indiana and Colorado tells us is that the environments of both

regions lie within the tolerance range of the plants. Although it is a bit surprising to find species that we consider wetland plants in dry sites in the Rockies, the plants may be responding to light levels and soil factors rather than to moisture per se.

History is a further factor involved in plant distribution patterns. All of the species mentioned have broad distributions in the northern part of North America, and most are circumboreal, i.e. they are also found in the corresponding geographic regions of Eurasia. The ranges of northern species were displaced by many hundreds of miles during the Pleistocene glaciation. Populations in the Appalachians, Midwest and western mountains thus represent relict populations that have hung on in areas of relatively cool, moist climate.

Consideration of a longer time scale suggests that populations isolated for thousands of years might diverge evolutionally. This is indeed the case for some of the plants mentioned. For example, *Z. elegans* of the Rockies is recognized as a variety different from that of the Indiana plants. Our plants belong to var. *glaucus*, while the yellow-flowered western plants are put into var. *elegans*.

—David J. Hicks, Associate Professor of Biology, Manchester College, Indiana.

[Ed. note: Your mention of the divergence is correspondingly evident in our southern Appalachian alpine or northern disjuncts, such as *Juncus trifidus* var. *carolinianus* and *Scirpus cespitosus* var. *callosus*, but perhaps even more so with those now classified as separate species such as *Geum radiatum - peckii* and *Huperzia selago - appalachiana*. I wonder: Are the habitats in the "far flung" areas, especially for northern disjuncts, more likely to be in wetter or calcareous habitats than the more continuous ones of the main range?]

Apple cont.
ous mechanisms of dispersal and it has no known natural enemies in the USA. This weed grows well in both shade and full sunlight, on diverse soil types and in competition with native and other weedy plant species. A single plant has the capability of producing up to 100,000 seeds during a single growing season. Tropical soda apple plants also produce long, enlarged lateral roots that give rise to additional plants. Although the foliage is unpalatable, livestock and wildlife such as coyotes, deer, feral hogs, fox, raccoons and opossum eat the sweet-smelling mature fruit. Scarification of the seed by the digestive systems of livestock and wildlife enhance germination. Seeds also adhere to and are dispersed by animals and other objects because of a sticky substance produced in the fruit. Composted manure and contaminated soil, sod, hay and seeds are also a major means for tropical soda apple seed dispersal.

Based on surveys during 1994 and 1995, tropical soda apple is not yet a

widespread problem in Alabama, Georgia, Mississippi and South Carolina; however, the total number of acres infested in these states is similar to the acreage infested in Florida five to six years ago where it now infests nearly a million acres. During 1994 in Florida, tropical soda apple cost the cattle business over 11 million dollars. Damage to natural habitats and forest lands is difficult to determine, but the problem has become so great in Florida that recreational horseback riding may be prohibited in several state parks and recreational areas.

It is apparent that tropical soda apple poses a real threat in the southeastern USA through the potential for personal injury, competition with native plant species and destruction of natural habitat through displacement of native flora and fauna. Early detection and destruction is paramount to eliminate the threat of this pernicious weed which has the potential to infest millions of acres in several states. The best means of control varies according

to the size and location of the population. Individual plants and small populations of tropical soda apple should be pulled up and burned completely including all fruit. Larger populations require repeated mowing and/or one or more applications of an effective herbicide.

Individuals who find tropical soda apple should contact their county forester, county agent or the authors to verify the identity, document tropical soda apple spread in the USA and begin control measures.—Charles T. Bryson, Southern Weed Science Lab, Stoneville, MS and John D. Byrd, Jr., Mississippi State Univ., MS
[Ed. note: I think this species, as is true for most weedy ones, will likely spread throughout the region, but how far north? Here is a problem where genetic engineering might be effective. Is there a section in its specific genome that might be viralized? We need to arm our extension specialists with better control measures than broad-based herbicides.]

SOUTHERN APPALACHIAN BOTANICAL SOCIETY
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Send To: Charles N. Horn, Secretary-Treasurer
Newberry College
2100 College Street
Newberry, SC 29108

Calendar of Events

Assoc SE Biol/SABS annual meeting
Statesboro, GA
Apr 10-13, 1996
(912) 681-5954

Spring Wildflower Pilgrimage
Great Smoky Mountains, TN
Apr 26-28, 1996
(615) 436-1262 (See inserts)

Wildflower Weekend
Natural Bridge, KY
May 3-5, 1996
(800) 325-1710

Spring Wildflower Pilgrimage
Georgia (Savannah in '96)
May 3-5(404) 378-1920

Spring Wildflower Symposium
Wintergreen, VA
May 10-12, 1996
(804) 325-2200 ext 992

Bowman's Hill Wildflower Week-
end
Washington Crossing, PA
May 1996
(610) 862-2924

Cullowhee (Native Plant)
Conference
Cullowhee, NC
July 24-27
(704) 227-7397

Complimentary addressed issues: Please share with your interested friends who might wish to become members of SABS. Thank you--Ed.

Charles N. Horn
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