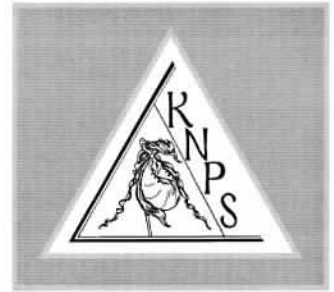


The Lady-Slipper

Kentucky Native Plant Society

Number 16:2

Early Summer 2001



Thomas G. Barnes

Rockclimbing is Damaging Cliff-dwelling Plants in the Red River Gorge

by Wilson Francis, KNPS President

SANDSTONE CLIFFS are the most unique natural features of Kentucky's Red River Gorge. Take away the sandstone cliffs, and the Red River Gorge would be much like the rest of the Cumberland Plateau in Kentucky. The cliffs are widely appreciated for their scenic beauty and natural arches, and from a distance may appear to be barren. Take a closer look and you will find that they aren't barren at all. The cliffs are covered with patches and narrow bands of green: small communities of plants that are capable of surviving in shallow sandy pockets of soil that have accumulated in cliff crevices.

The cliffs are home to eight species of vascular plants that are not found in the surrounding forest. The most famous cliffline plant in the Gorge is white-haired goldenrod, *Solidago albopilosa*, which grows in the soil

under overhanging cliffs and is endemic to the Red River Gorge—the Gorge is the only place on earth where it grows. Even there, only about 60 populations of this species are known, most of which consist of only a few dozen individual plants. White-haired goldenrod is listed as a federally Threatened species, and as such must be protected by government agencies.

Other flowering plants restricted to the rockshelters and cliffines include rockhouse alumroot, *Heuchera parviflora*, probably the most common species around cliffs; round-leaved catchfly, *Silene rotundifolia*; cliff rue, *Thalictrum mirabile*; and Lucy Braun's white snakeroot, *Eupatorium luciae-brauniae*, known from only one site in the Gorge.

Three species of ferns are restricted to the cliffline habitat. These include the

(Continued on page 2)

The only habitat in the world that white-haired goldenrod calls home is a narrow band of crevices and soil along sandstone cliffs in Kentucky's Red River Gorge. The US government lists it as a Threatened species that must be protected.

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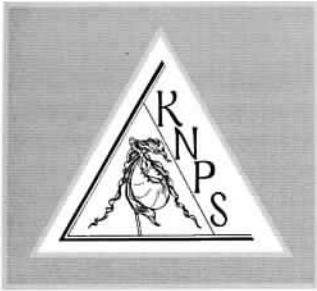
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Rockclimbing is Damaging Cliff-dwelling Plants

filmy fern, *Trichomanes boschianum*, a member of a semitropical genus that is able to tolerate Kentucky winters only by growing under the protection of overhanging cliffs. Two species of ferns are found here only in the gametophyte stage, having apparently lost the ability to produce the familiar sporophyte stage. The Appalachian gametophyte, *Vittaria appalachiana*, could easily be confused with a liverwort at first glance, yet it is a vascular plant that is almost certainly a relict from ancient times when Kentucky's climate was considerably warmer than today's. The other species that exists only as a gametophyte is *Trichomanes intricatum*, a vascular plant that resembles a clump of green thread.

There are mosses and liverworts, too. Although easily overlooked, some of them are cliffline specialties in our area. And though we know the drier cliffs are home to patches of lichens, and that many lichens are rare and very specific about their environment, we don't even have a list of species of lichens from the Gorge.

The cliffline endemics get more attention, but most of the cliffline communities are made up of a number of species that commonly grow in the surrounding forest and are able to colonize the clifflines and rockshelters under certain circumstances. Taken as a whole, the plant communities of the cliffs constitute natural hanging gardens that are an important part of the biodiversity of this area.

One secret to understanding the cliffline communities is to appreciate that the vertical cliff walls are not smooth, they are lined with narrow crevices and ledges upon which tiny amounts of soil have very slowly accumulated until there is just enough to harbor the life of a plant. Since it never rains under the overhanging cliffs, it must take thousands of years for a teaspoonful of soil to form on one of those ledges, and then that spoonful of soil may wait for many more years until by chance, a seed or a spore capable of germinating and surviving here falls into place. What we are talking about is one of the most fragile plant habitats imaginable, and thankfully, it has been relatively out of reach from impacts of recreational users, until now.

Rockclimbing has been a popular activity in the Red River Gorge for decades, but recent changes in the sport are spelling big

trouble for the cliff dwelling plants of the area. Traditional climbers that have used the Gorge for many years rely on natural fractures for handholds, and when necessary they use removable protective devices that are inserted into naturally occurring openings in the rock. Since traditional climbers can only climb where natural handholds exist, most of the plants high in the cliff-lines in the Red River Gorge have remained relatively undisturbed because many of the cliffs have been considered "unclimbable."

ENTER A NEW GENERATION OF ROCKCLIMBERS. Using battery-powered electric drills they install steel bolts into the cliffs and lay out vertical climbing routes from bolt to bolt. The object is to make climbing safer for the participants, but one of the principal effects has been to make rockclimbing much more popular and to cause serious damage to the cliffines. Without asking for advice or permission, the first bolts were installed in the



Wilson Francis

in the Red River Gorge (Continued)

Red River Gorge with little fanfare. Anyone with a portable drill could lay out a route on public land, drill the cliffs, install the bolts, write up a description to post at the climbing shop, and enjoy instant fame.



As the number of routes in the Gorge grew, word spread to other states and the numbers of climbers coming to the area began to blossom.

With increased use, the side effects of rockclimbing in a natural area became obvious.

Plant communities around the bases of cliffs were trampled, including some populations of white-haired goldenrod.

White trails of climbing chalk began to mark well-used routes. Trees as large as eight inches in diameter have been cut because they

blocked access to desirable climbs. Rhododendrons have been uprooted and cast aside. Those ledges and crevices holding spoonfuls of soil have been scraped clean by climbers feeling for handholds. Since ledges and handholds are not always just where they are needed, some climbers "doctor" the routes by chipping or drilling manmade handholds into the rock. One climbing guidebook advocates "cleaning" the rock with herbicide, bleach, and wire brushes. The cliffline plant community is under assault by a recreational user group that seems to consider the Red River Gorge an outdoor climbing gym.

ALTHOUGH THE CLIMBERS ARE INCREASINGLY AWARE of the impacts of their sport on the botanical, zoological, and archaeological resources associated with the cliffs, many insist that their recreational use should not be restricted. It is true that anyone who walks around the base of the cliffs, including hikers, birdwatchers, and yes, native plant enthusiasts will trample the soil and impact the plant communities. It is also true that climbers intensively focus their activities around the base of the cliffs, and no other user group has the ability to impact the plants on the high ledges.

It is difficult to understand why anyone would think that drilling bolts into natural cliffs is a harmless recreational

pursuit, but it is legal. The US Forest Service now allows climbing on existing bolted routes but prohibits installation of new bolted routes until they are checked for impacts on rare and endangered species or archaeological resources. The problem is that there is no protection for ordinary species that make up the bulk of the cliffline communities, so more bolted routes will be allowed on national forest land.

There are already over 1,000 routes in the Gorge area. Over 700 of them are on national forest land, and the climbers want more. They are pushing hard to ease restrictions on bolting new routes on the national forest. They are organized, they write letters, they attend meetings about access issues, and these kinds of well-organized user groups usually get the attention.

In the meantime, new bolted routes are still being installed. Some are on private land, sometimes without the knowledge or permission of the landowner. Some are on national forest land, and even though they are illegal, it is really hard to catch someone in the act of bolting. Illegal routes are found by Forest Service personnel only after the damage has already been done.

WHAT CAN WE DO ABOUT IT? We probably can't stop climbing on the cliffs, but we can make others aware that rockclimbing is damaging the cliffs and destroying fragile plant communities. If we have friends and family members who climb, we can tell them about our concerns.

Most importantly, we can write the Forest Supervisor of the Daniel Boone National Forest and express our feelings that it should be harder, not easier, to get approval to install bolted routes on national forest land. The Forest Service is getting plenty of letters in favor of bolting, now people need to speak out on behalf of the plants and the habitats.

There are important decisions to be made about visitor impacts on public land, and there should be a balance between those who believe that public lands were set aside for future generations, and those who seem to believe that public lands were set aside for themselves. If we are truly interested in native plants and the protection of natural communities, there are times when we will have to become a user group ourselves. I believe this is one of those times.

Please address your comments to:

**Ben Worthington, Forest Supervisor
Daniel Boone National Forest
1700 Bypass Road
Winchester, KY 40391**



Filmy Fern's fragile, one-cell thick fronds are sometimes found growing from the underside of protected overhangs in rockhouses.

Cliff overhangs and features that might be inaccessible to traditional climbers have become much less so to sport climbers using permanently placed bolts and hangers.

Illustrated Flora of the Northern United States... / Britton & Brown / 1913



Round-leaved Catchfly



Rockhouse Alumroot





At left: First graders planting and mulching "their" shrubs —St. John's Wort, New Jersey Tea and Lead Plant.

Below: Expansion and planting in progress. New plants are Tall Phlox, Compass Plant, New England Aster, Purple and Orange Coneflower, Prairie Blazing Star, Wild Bergamot, Lanceleaf Coreopsis, Rigid Goldenrod, Downy Phlox, Wild Petunia and Little Bluestem. Previously established native plants in the Butterfly Garden include Mountain Mint, Cup Plant, Upland Boneset and aromatic Asters.

Bottom: The school's front garden includes 3-year-old plantings of Obedient Plant and Blue Lobelia. Not shown are Wild Columbine, Hepatica, and Jacob's Ladder.

KNPS Native Plant Demonstration Garden Grant BALD KNOB ELEMENTARY SCHOOL, Frankfort, Kentucky


Story and photos by Katie Clark

THE BALD KNOB ELEMENTARY SCHOOL Outdoor Classroom Program has worked to complete the expansion of our Butterfly Garden. The native plants and shrubs obtained from Shooting Star Nursery were enthusiastically planted by the children in Mrs. Jones' and Ms. Lea's classes. We are more than halfway complete in placing cedar timbers and rocks for erosion control as well as laying newspapers and mulch to suppress grass and other unwanted plants.

So far, we have had the kindergarten, first grade classes, and the Webelo Cub Scouts tour the Butterfly garden to learn about the life cycle of butterflies and why it is important to provide food for all stages of their development. All of the students at Bald Knob have visited the various parts of the Outdoor Classroom such as the Butterfly garden, woods or pond as part of their life science core curriculum.

The Kentucky Native Plant Society's Garden Grant has helped the Bald Knob Elementary School reach the Outdoor Classroom's goals by providing funds for plants, shrubs, seeds and informational material to educate the children in the importance of native plants for wildlife food and habitat.

By reaching our goals, several lessons will be learned: knowing and recognizing native plants, understanding the role that native plants have in the balance of nature to provide better food sources and habitat for butterflies and beneficial insects, using organic gardening techniques for a safer wildlife environment, using natural available materials and plants for erosion control, and transplanting and selling plants for additional Outdoor Classroom funds.

We thank the KNPS for awarding our Outdoor Classroom the 1999 Native Plant Demonstration Garden Grant. 



WILD BERGAMOT – 2001 Wildflower of the Year

by Mary Carol Cooper
Native Plant Program Coordinator,
Salato Wildlife Education Center

WILD BERGAMOT (*Monarda fistulosa*) has been selected as the Salato Wildlife Education Center's Wildflower of the year 2001 by wildflower enthusiasts from all across the state. The Wildflower of the Year is chosen based on the number of nominations it receives and how well it fits the established criteria (must be native, common and widespread across the state, seeds must be readily available, must be easy to grow, and must have wildlife value).

Wild Bergamot is common in old fields, thickets, prairies, and borders throughout the state. It is a member of the mint family and has spicy-aromatic leaves that are opposite and ovate-lanceolate on a square stem. It has slender two-lipped corollas about one inch long densely aggregated in terminal clusters subtended by conspicuous bracts. The corolla is a pale lavender. Wild Bergamot ranges in height from three to five feet tall depending on the habitat. It is a short-lived perennial that rapidly forms colonies in both moist and dry soil. It is very versatile, as it will tolerate clay soils and drought and will grow in full or partial sun.

Wild Bergamot is a premiere nectar source for butterflies, moths, and hummingbirds. Indigo buntings are known to build their nests in the stems of this plant. It blooms from June through August, providing food and shelter all summer long.

Historically, physicians used leaf tea to expel worms and gas. The Native Americans used the leaf tea for colic, flatulence, colds, fevers, stomachaches, nosebleeds, insomnia, heart trouble; in measles to induce sweating, and poulticed leaves were used for headaches. The pioneers made a lotion of boiled leaves for treating pimples and skin eruptions. Today, Wild Bergamot is still used for headaches and fever and it makes a great tea. Its flavor is similar to true bergamot, the oil of a mediterranean citrus fruit that flavors Earl Gray Tea. It is also excellent cut for fresh bouquets.

Wild Bergamot seeds and plants are available from many native plant nurseries and are fairly inexpensive. It is also very easy to propagate either by seeds, cuttings, or division. Seeds sown in January should be kept moist and



Hugh Wilson, Texas A&M Vascular Plant Image Gallery

cold (40° F) for 90 days to cause germination. Since the seedlings are tiny and slow growing, they should remain in the flat for 6–7 weeks after germination before being transplanted. To propagate by cutting, take stem tip cuttings, 3–4 inches long, any time from May to August. Remove the lower leaves and all flower or seed heads, dip cutting in rooting powder and insert at least one node into a sand and perlite rooting medium. Place cuttings in an enclosed chamber and mist them several times a day. In 4–5 weeks, cuttings are well rooted and can be transferred to the garden in the early fall. To propagate by division, divide mature clumps in March before they send up stems. Dig up the plant and using a pair of pruning shears or a sharp shovel, cut the clump into sections. Replant and water the division immediately.



The WILD ONES are Coming to Kentucky – August 11

by Portia Brown

ON AUGUST 11, WILD ONES NATURAL LANDSCAPERS, a national non-profit organization formed in 1977 to promote the use of native plants in residential landscapes, will hold its annual meeting and mini-conference in Kentucky. The event will be hosted by the Louisville and Frankfort chapters of the Wild Ones. While this is a Wild Ones members-only event, we are happy to accept registrations from KNPS members as we would our own. Of course, we really hope you will all come along for the fun and join Wild Ones as well!

The meeting will bring together Wild Ones from across the country who share a concern for the stewardship of our natural heritage. Raising awareness of the grass-roots work being done by many Kentucky groups to preserve, restore, and establish native plant communities will be a major theme of the mini-conference. These efforts have made significant steps in Kentucky toward preserving our natural heritage, improving our community landscapes, and broadening our Commonwealth's agricultural horizons.

The meeting will be held near Shelbyville, KY, at Skylight Acres Farm, owned by Jerry and Portia Brown. Most of its 143 acres is wooded and bordered by creeks, with paths providing access to a variety of landscapes. Over 26 acres of the cropland are in native, local genotype, warm season grass seed production. Twelve acres are in their third year of establishment and another 14 were seeded this spring. There is a 5400 sq. foot metal barn area for the meeting.

Skylight Acres Farm is about 40 minutes from Louisville, where numerous parks designed by Frederick Law Olmsted are being restored. The Louisville Chapter of Wild Ones has an adopted site in Cherokee Park. The meeting site is also less than 20 minutes from Salato Wildlife Education Center, home to the Wild Ones Frankfort Chapter and the Kentucky Native Plant and Backyard Wildlife Habitat programs.

For those who would like to stay near the farm for the meeting, discounted rooms are available at a nearby hotel and transportation to and from the farm will be provided. Camping is available at Lake Shelby in Shelbyville. Registration includes three meals on Saturday, August 11.

MORNING PROGRAM AT SKYLIGHT ACRES FARM

Gather at the Holiday Inn Express (I-64 Exit 35) for ride to Skylight Acres Farm. Light breakfast will be served.

2001 Wild Ones General Membership Annual Meeting – 8 a.m. EDT

Skylight Acres Farm Welcome and Overview – Jerry and Portia Brown will give an overview of the meeting site. From improving accessibility and facilities, to woodland management, to designing and installing native grasslands with an artificial wetland, it is a work in progress with an eye toward the future of Kentucky's natural landscape. Jerry is Senior Engineer over the Planning and Design Team for Louisville-Jefferson County Metro Parks. Portia is a Wild Ones National Director. Both are charter members of the Louisville Wild Ones where Portia is also President.

An Overview of Kentucky's Ecosystems – Dr. Thomas G.

Barnes is Associate Extension Professor & Wildlife Specialist for the University of Kentucky Department of Forestry. He is also a Board Member of the Kentucky Native Plant Society and an award-winning writer and photographer. His publications include *Gardening For the Birds* and "Private Lands Wildlife Management: A Correspondence Course and Technical Guidance Manual."

Native Warm Season Grass Production & Usage – Jeff Sole

is Director of Science & Stewardship for the KY Chapter of The Nature Conservancy. Jeff previously enjoyed a 20-year career with state government as a botanist, ecologist, wildlife biologist, and upland game coordinator. *Randy Seymour*, the author of *Wildflowers of Mammoth Cave National Park*, owns and operates Riders Mill Farm with his son John. Together they intensively manage 1600 acres for wildlife with 300+ acres in various stages of establishment for Kentucky ecotype native warm season grass seed production. Both Randy and Jeff are actively involved in restoring native vegetation to a major portion of the upper Green River watershed to reduce agricultural runoff and restore native forest and grasslands in ways that are compatible with the landowners' farm management goals.

Reclaiming the Legacy of Frederick Law Olmsted's Louisville Parks – Susan Rademacher

is President of Louisville Olmsted Parks Conservancy and Asst. Director of Louisville-Jefferson Co. Metro Parks. Frederick Law Olmsted's parks in Louisville are considered to be his most mature work. Over the years they fell into disrepair with degraded woodlands and eroded pathways. The Conservancy's public-private partnership has leveraged more than \$8 million to restore the park system. Susan also lectures and authors books and articles on landscape planning and garden design, and she also served as Editor in Chief for Landscape Architecture and Garden Design magazines.

SATURDAY AFTERNOON PROGRAM OPTIONS

Option [A-4]: Olmsted Parks Bus and Walking Tour (4 hrs. with boarding at 12:30 pm) – This group will travel by air-conditioned coach to Louisville to tour two Olmsted parks. A video about the parks will be shown on the bus. At Cherokee Park we'll see everything from the Louisville Wild Ones adopted site to the recently completed Baringer Spring restoration and walk through the native wildflower meadows. Then on to Iroquois Park to walk the 5-year-old savannah restoration and catch the view from Iroquois Hill. Guides will be *Susan Rademacher* and *Mike Smiley*, Registered Landscape Architect, owner of Environs, Inc. and founder of the Louisville Wild Ones.

Option [B-2]: Grassland and Meadow Walking Tours at Skylight Acres Farm (2 hrs.) – Hike the wildflower meadows and native grasslands with local experts: *Jane Harrod*, owner of Jane's Native Seeds, supplied most of the seed for the initial 12-acre installation and was the on-site consultant; *Dr. Tom Barnes* has provided invaluable guid-



ance along the way; and *Jeff Sole*, with whom we will be working to expand our grasslands with an added agricultural perspective. All three will answer questions and discuss their experiences in preserving, restoring, and establishing native plant communities in Kentucky.

- Option [C-2]: Woodland Hike at Skylight Acres Farm** (2 hrs.) – Identify Kentucky Native Trees and Shrubs and discuss related landscape concepts. *John A. Swintosky*, Registered Landscape Architect with Louisville/Jefferson Co. Parks, is a charter member of the Louisville Wild Ones and is part of the team implementing the Olmsted parks restoration. He has published and spoken extensively on appropriate use of Kentucky trees and shrubs. *Richard Wolford*, co-owner/operator of Wolford's Nursery, is also a charter member of the Louisville Wild Ones. As Chairperson for the Chance School Building/Grounds Committee, he is coordinating a 17-acre restoration on the banks of Goose Creek. This project was the first Louisville applicant and recipient of a Lorrie Otto Seeds for Education Grant.
- Option [D-2]: Salato Wildlife Education Center and Native Plant Program** (2 hrs.) – After a 20-minute van ride to the center, *Mary Carol Cooper*, Director of the Center's Kentucky Native Plant and Backyard Wildlife Habitat Programs, charter member of the Frankfort Wild Ones, and Vice President of the Kentucky Native Plant Society will lead tours of the Nature Center, wildlife exhibits, and the Native Plant Program greenhouse and gardens.
- Option [E-1]: Medicinal Herbs** – An overview on ethically harvesting, growing and using both native and naturalized medicinal plants, including a demonstration on making poultices, teas, and using tinctures and oils to preserve the medicinal qualities of plants. *Katie Clark*, an herbalist and active member of United Plant Savers, has taught herb classes, hosted an annual three-day herb seminar at her farm and is the Outdoor Classroom volunteer teacher for her local elementary school. She is also the contact person for the Frankfort Wild Ones (502-226-4766).
- Option [F-1]: Edible Plants** – Slide presentation on common edibles and the foods they make. *Pat Armstrong*, owner of Prairie Sun Consultants and Wild Ones National Director, is a long time naturalist, teacher, and native plant

consultant. A professor at the College of DuPage in Glen Ellyn, IL, she grows nearly 300 native plants (many edible) on her urban lot, and she also cultivates European and Asian weeds for eating. Her book, the *Wild Plant Family Cookbook*, is a compilation of recipes from her classes which include: "Eating the Trees," "Grazing on Greens," "Feasting on Flowers," and "Sup on Shrubs"!

- Option [G-1]: Medicinal/Edible Plant Identification Hike** with *Pat Armstrong* and *Katie Clark* – Reinforce the learning from the above sessions by going outside to see some common edible and medicinal plants.
- Option [H-1]: Shade Gardening Tips from Munchkin Nursery** – *Gene Bush* and *JoAn Riley*, owners of Munchkin Nursery in Depauw, IN, will show slides of native wildflowers and discuss their characteristics, appropriate sites, and propagation challenges. Gene, a noted horticultural writer, artist and photographer, is a shade gardener who is able to achieve pleasing color, textures, or forms year round. Gene and JoAn will also host an Open House at Munchkin Nursery on Sunday, August 12.
- Option [I-1]: Landscape Restoration Using Native Plants for Public And Private Spaces** – *Phyllis Croce*, Landscape Ecologist with Biohabitats, Inc., graduate of Conway School of Landscape Design and Environmental Planning, and charter member of Louisville Wild Ones will show slides and discuss her experiences with natural landscaping in public spaces.

LATE SATURDAY AFTERNOON/EARLY EVENING PROGRAM

Free networking time; dinner with short program to be announced; social time; 8:30 pm EDT "Time to Go" – Vans will take participants back to hotel.

SUNDAY, AUGUST 12

Breakfast on your own; National Board of Directors meeting (open to all) at 9 a.m.; Munchkin Nursery Open House with pre-registration. Guides may be available to repeat the Salato, Olmsted Park, and Skylight Acres walking tours (but pre-registration will be required and group transportation will not be provided). The Salato Center and Olmsted Parks are open to the public and all registrants will receive maps for self-guided tours.

FOR MORE INFORMATION AND TO REGISTER

For conference details and a registration form, click on the "Annual Meeting" link at <http://www.for-wild.org>

OR contact: **Wild Ones Natural Landscapers / Louisville**
P.O. Box 5512
Louisville, KY 40255-0512
Phone: 502-454-4007 (leave message)
E-mail: wildones-conference@ic.net

Registration fee (includes three meals but not accommodations) is \$75 if postmarked on or before June 30, 2001. Later registrations can be accepted through July 20, 2001 for a \$90 registration fee. Wild Ones membership (optional for KNPS members) is \$30.

HOPE TO SEE YOU THERE !!!



LEARNING ABOUT LICHENS, The Most Overlooked Cryptogamic

by Willem Meijer, Emeritus Professor, University of Kentucky

MOST NATURALISTS with some botanical training and many of our Kentucky Native Plant Society members know that lichens are cryptogamic plants (with hidden reproductive structures) living on the bark of trees, on stone fences, and sometimes even on the forest floor or desert and tundra soils. Also, lots of people already know that lichens are composed of fungi living together symbiotically with green algae or cyanobacteria (formerly called blue-green algae). In this inter-relationship, the fungi supply water and minerals, and the green and blue-green algae fix carbon dioxide into sugars with the aid of sunlight. The cyanobacteria can also fix nitrogen.

The body structure of lichens is primarily made up of fungi which generally come from the ascomycetes group. Their spore sacks (asci) are hidden in cup-shaped structures (apothecia) that are often spread over the lichens' bodies (thalli). Lichens are very likely the oldest land plants of planet Earth. In our state parks, like Natural Bridge State Park, we can find lichens on large sandstone boulders and notice that they are competing with other lichens, mosses, and liverworts. Apparently they can produce a kind of antibiotic against other organisms. That makes lichen study a fertile field for biomedical work.

The most familiar lichens among lay people are probably species of *Cladonia* (Reindeer Moss), and *Peltigera*. Both are found on the ground layer of forests or heath lands. The most impressive lichens are species of *Usnea* (Beard Moss) which hang from branches of trees in secluded ravines of creeks or cloudy mountains. In countries like Holland, which has a lot of air pollution, they are all extinct now. Here in Kentucky we can find at least one species of *Usnea*

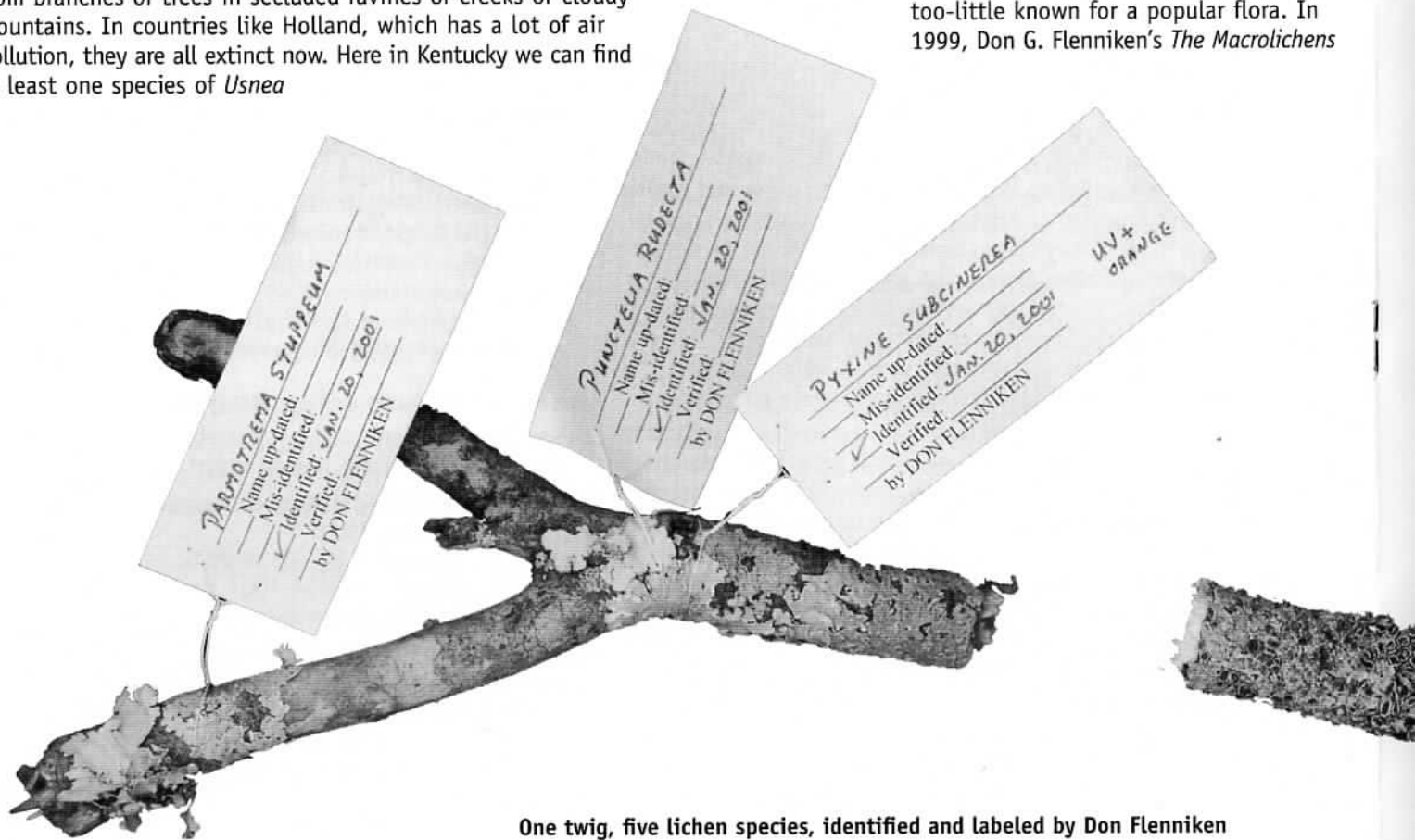
along Raven Run Creek where it joins the Kentucky River only 20 miles southeast of Lexington. The so-called rock tripes (species of *Sticta*) are rather spectacular on steep rock cliffs like those in Pine Mountain State Forest. They are supposed to be edible. At McConnell Springs near downtown Lexington, we can find the thalli of a species of *Dermatocarpon* on vertical shady and wet limestone banks just above the water level of some of the limestone springs.

The greatest abundance of readily accessible lichens in the United States occurs in the temperate coniferous rainforests of Washington and Oregon and some parts of Northern California and the Rocky Mountains. Also, the moist temperate climate of our Appalachian Mountain area creates a favorable habitat for lichens.

SOME RESOURCES FOR GETTING STARTED WITH LICHENS

The best introductions to the lichens of North America are "Lichens: More than Meets the Eye," an article by Sylvia and Stephen Sharnoff in the February, 1997, issue of *National Geographic*; various worldwide web sites (see especially http://www.ac.wvu.edu/~fredr/Lichen_resources.htm for links to many sites); and the second edition of the late Mason E. Hale's *How to Know the Lichens*, (1979, William C. Brown Co.).

Mason Hale's book leaves out the so-called "crustose" lichens which grow totally glued to their substrates. The various patches of color you might notice on the surface of city sidewalks are often crustose lichens, and they are still too-little known for a popular flora. In 1999, Don G. Flenniken's *The Macrolichens*



One twig, five lichen species, identified and labeled by Don Flenniken

Amic Plants in Kentucky

in West Virginia (published by the author) appeared. It also covers the non-crustose lichens. The author began collecting lichens under Mason Hale in 1962, but it wasn't until much later, and four years of intensive study, that he published his book.

Here at the University of Kentucky library we can find a few lichen references that deal more specifically with Kentucky: a study by Margaret Fulford, "The *Cladonias* of Eastern Kentucky," in *Lloydia* (December, 1938); the 1951 masters thesis of Lionel Howell Prescott, "Preliminary studies of lichens of Kentucky, I"; and the 1978 masters thesis produced under my guidance by Martha Jane Simpson, "The epiphytic lichen flora of the Bluegrass region of Kentucky and its relation to air pollution."

Prescott's thesis enumerated around 200 lichen species and varieties from Kentucky including about 80 species of reindeer lichens (*Cladonia*). He made many collections near Wilmore in Jessamine County and in Powell County in the Red River Gorge area. The famous lichenologist Alexander W. Evans assisted with the identifications. Prescott also mentioned that lichens were used in the formulation of dyes and in the manufacture of litmus paper for measuring acidity.

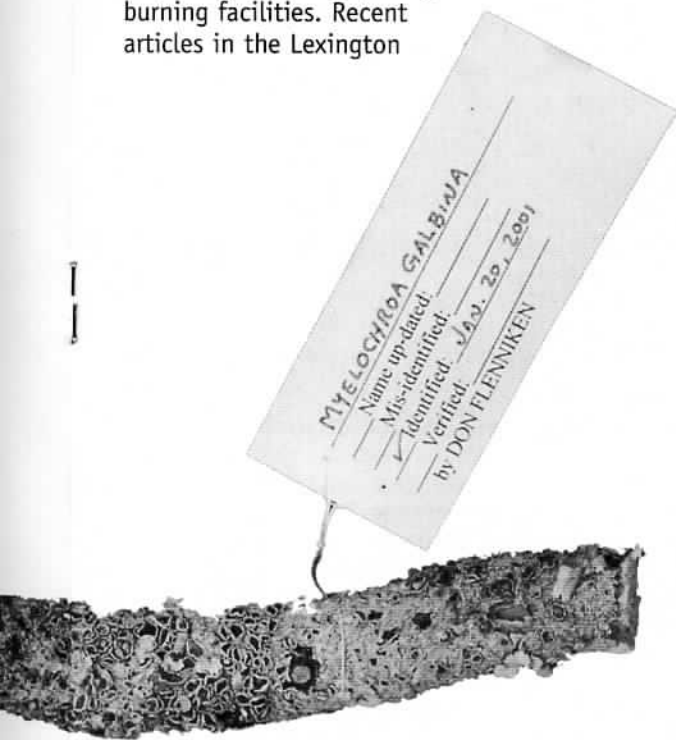
Martha Jane Simpson, who is now chairperson of the Biology Department at Elizabethtown Community College, compared the lichens of the Bluegrass with adjacent areas of the Knobs and part of the Appalachian Mountains. As mentioned before, it has been long known that many lichens are scarce or absent in areas of strong air pollution. Although some crustose lichens actually thrive in polluted air, most lichens can be killed by sulfur compounds and the exhaust gases of cars and trucks, or power plants and garbage burning facilities. Recent articles in the Lexington

Herald-Leader (18 October 2000, 19 April 2001), rank Kentucky among the top ten states in pollution from power plants and first in the nation in the rate of deaths caused by soot from coal-fired power plants. In 1978, Martha Jane Simpson's study of lichens in the Bluegrass could already demonstrate that the northwestern part of Fayette County was suffering the most from air pollution. It will be interesting to compare our recent collections from Jessamine Gorge with Prescott's thesis to see how many lichen species may have suffered from air pollution over the last 50 years.

IT IS CLEAR FROM THE MORE RECENT BOOKS mentioned above and from the studies of William and Chicita Culberson published in *The Bryologist* since 1966 that new chemical studies of the coloring substances of lichens have changed their names and classification (taxonomy) rather drastically over the last 50 to 60 years. As a result, much of the literature about Kentucky's lichen flora is somewhat outdated. Eight species of *Parmelia* mentioned in the Prescott and Simpson theses are now reassigned to the genera *Punctelia*, *Flavoparmelia*, *Myelochroma*, *Canoparmelia*, and to different species of *Parmelia* itself. I always thought that I could recognize the genus *Parmelia* in a wider sense, but I never carried out all the chemical tests.

Many lichen species described by Don Flenniken and illustrated with color plates in his West Virginia book should also occur in Kentucky. His distribution maps give the impression that species can not cross the state boundaries simply because on our side of the border so few collections have been made. We should now send the author of this book our unnamed collections from Kentucky, and deposit the duplicates in the Smithsonian Herbarium. Professor Allen Risk, from Morehead State University is also including lichens in his collections, and we

(Continued on page 10)



LEARNING ABOUT LICHENS (Continued)

hope very much that Mr. Flenniken will expand his work over the whole Appalachian Mountains.

A new book on the *Lichens of North America* by Irwin M. Brodo and the Sharnoff couple is due to be published later this year (Yale University Press). For the present, we have a recent popular book called *Lichens* (2000, Smithsonian Institution Press) by William Purvis. He is the principal author of the *Lichen Flora of Great Britain and Ireland* (1992, Natural History Museum Publications) and he has worked at the Natural History Museum in London as a lichenologist since 1988. For a mere \$15, the paperback edition of this book, lavishly illustrated by very good color pictures, is a steal. It does have some funny geography and inconsistencies: on page 49, a photo caption locates a carpet of "*Cladonia* and *Stereocaulon* spp." in a "Northern subantarctic Woodland in Canada"; and although the author's color photograph on page 11 correctly identifies a *Trentepohlia* sp. as a member of the green algae (even though its orange carotenoid pigment masks the green color of its chlorophyll), the same photo reappears on page 60 where it is incorrectly identified as a blue-green cyanobacterium of tropical lowland rain forests. Notwithstanding these lapses, this is an excellent book.

Many questions arise from the study of lichens. In addition to those already mentioned, we are curious also about which of our lichens also occur in Western Europe and how far their distribution extends in North America and Mexico. How useful could they be for monitoring air pollution or climatic change, or for research into modern plant products or for human health benefits? Although lichens are so easily overlooked, there is no end to the curiosity they inspire once we start to notice.



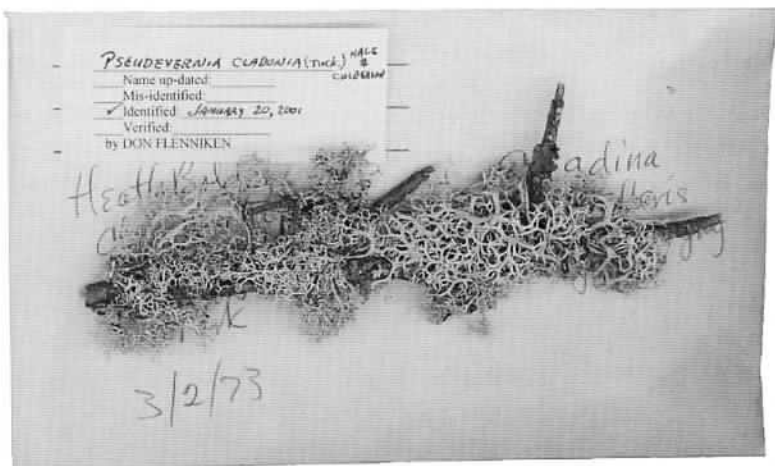
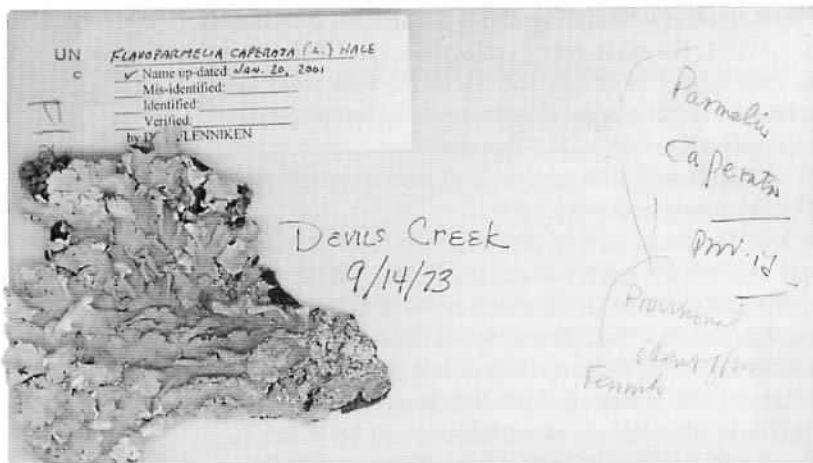
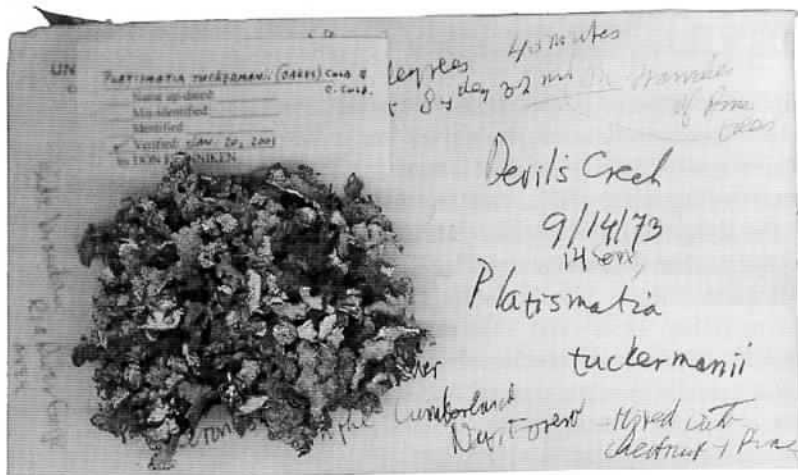
ACKNOWLEDGMENTS AND SOURCES

The production of this paper has been supported by some funds from the Meijer Foundation, a gift from an old friend of Mason Hale at the Smithsonian, Mr. Flenniken's gift of a review copy of his book, the typing assistance of Sharon Cox who is the secretary of the Kentucky Paleontological Society, and the University of Kentucky Library facilities.

All the books mentioned in this article are available through local or on-line bookstores with the exception of *The Macrolichens in West Virginia*.

Editor's Note: The following is a newsletter release concerning *The Macrolichens in West Virginia*, by Don Flenniken, published in 1999 —

This identification manual covers 284 species found or reported in West Virginia. The volume is 8.5" x 11", soft



Charles Chandler

bound, and covers all 55 counties with dot-map distributions. Each species is illustrated in color photographs contained on 26 plates. Keys to genera and species within each genus are provided along with species descriptions, chemistry, and ecological notes. Although regional, its scope covers nearly all species common to the surrounding states, including Kentucky.

This book is available only from its author. Checks or money orders for \$31.90 (includes priority mail shipping) may be made out and sent directly to: Don Flenniken
2273 Blachleyville Rd.
Wooster, OH 44691

The Medicinal History of PRICKLY ASH (Toothache Tree), *Zanthoxylum americanum*

by Robert Paratley
Curator, University of Kentucky Herbarium

"The bark of the prickly ash is efficacious for allaying the toothache."

—Thomas Nuttall, 1819

PRICKLY ASH IS A THICKET-FORMING SHRUB to small tree (occasionally to over 20 feet high) found scattered in rich sites in Kentucky. Found both on rich deep soils or on limestone bluffs, it is found in the understory of mature forests or in hedgerows and other second-growth. It ranges north to Minnesota and southern Quebec, west to eastern Kansas and Oklahoma, and south in very isolated locations in Alabama, Georgia, and South Carolina. In Kentucky, Max Medley reports it to be "rare to locally distributed" in most sections of the state, being especially rare in the Shawnee Hills and Cumberland Plateau (Medley, 1993).

The very dark green leaves are alternate and pinnately compound, with five to eleven leaflets, and the stem is beset with paired prickles near the leaf bases. This is undoubtedly the source of the common name prickly ash.

Prickly ash is not a true ash (genus *Fraxinus*) at all, of course, and may be easily distinguished from the ashes by its prickles, and by its alternate (rather than opposite) compound leaves, as well as by flower and fruit characters. *Zanthoxylum* (also sometimes seen printed in older sources as *Xanthoxylum*) flowers in early spring shortly before leaf-out, producing small, short-stalked clusters of yellowish-green flowers on the twigs of the previous year. Flowers are of a single sex, only one type occurring on a given individual (dioecious). The fruit is a small reddish-brown follicle, commonly referred to in the herbal literature as a "berry," splitting late in the season to reveal 1–2 large, glossy black seeds.

Prickly ash twigs and fruit are lemon-scented when crushed (Leopold, et. al., 1998), another good identifying field character setting it apart from true ashes. The scent is also a tip-off to its family affinity, being a member of the citrus family, Rutaceae, a family of great commercial importance but poorly represented in our flora. Many Rutaceae have aromatic stems, foliage, or fruit. They contain often conspicuous oil glands, responsible for the burst of fragrance of the fruit of the family's high-profile genus, *Citrus*. Prickly ash leaves and bark also possess an aroma, but a rather more pungent one. The bark of the stem and root, the most frequently used plant part by herbal healers, is quite bitter-tasting. It is worth noting

that a number of other members of the Rutaceae have long been held in high regard as medicinal plants, valued for essential oils (i.e. *Citrus*) or as "bitters" (i.e. rue, *Ruta graveolens*) (Evans, 1996). The Southern Coastal Plain species Hercules-club, *Zanthoxylum clava-herculis*, is not hardy here in Kentucky, but has been used similarly in that region as a medicinal. The two are often discussed together in the herbal literature. It should also be noted that an unrelated species, devil's walking stick, *Aralia spinosa*, is also referred to in some places as prickly ash or Hercules club, and, while not nearly as widely employed as *Zanthoxylum*, has some similar uses recorded.

NATIVE AMERICANS AND EARLY EURO-AMERICAN CONTACT

When Europeans and Americans came in contact with Native American tribes, they recorded many uses over a wide area of eastern and central North America: the eastern edge of the Great Plains (Comanche, Meskwaki, Pawnee), the northern Great Lakes (Chippewa or Ojibwa, Menominee), the Northeast (Mohegan and, especially, Iroquois), the Mid-Atlantic region (Delaware), and the deeper South (Cherokee, Creek, Alabama). The Southern tribes certainly used Hercules's club as well, and many records don't specify the species. The range of use by native peoples is actually larger than that of the plant itself, because some of people living north or south of its range would trade for the bark or fruit, or collect it when on long trips into areas within the plant's range (see especially the Ojibwa tribe, below).

Listed most frequently and often first is the use of the bark as a toothache remedy, hence the alternate (and original) common name. In general, the bark was mashed (or whole pieces chewed) and then placed right around the hurt tooth. Relief was apparently rather rapid

for the sufferer (Millsbaugh, 1892). In addition, prickly ash was used to treat a number of different complaints: rheumatic ailments, digestive disorders, and assorted body pains being the most frequently mentioned. Accounts from a number of Euro-Americans with early contacts with natives record some of these.

In the Southeast, John Lawson, an early medical historian of the Carolina region, was unusually attuned and sympathetic to native culture for his time. In his *History of North Carolina* (1714), he recorded dramatic effects of prickly ash on the gastrointestinal tract, "The root of this tree is

(Continued on page 12)

Illustrated Flora of the Northern
U.S.... / Britton & Brown / 1913



The Medicinal History of PRICKLY ASH (Continued)

Cathartick and Emetick [emptying the bowel and stomach, respectively].“ Forty years later, Mark Catesby (1754) called the seeds and bark aromatic, hot, and astringent, and said they were used for toothache by people inhabiting the seacoasts of Virginia and the Carolinas [possibly referring here to *Z. clava-herculis*] (Vogel, 1970).

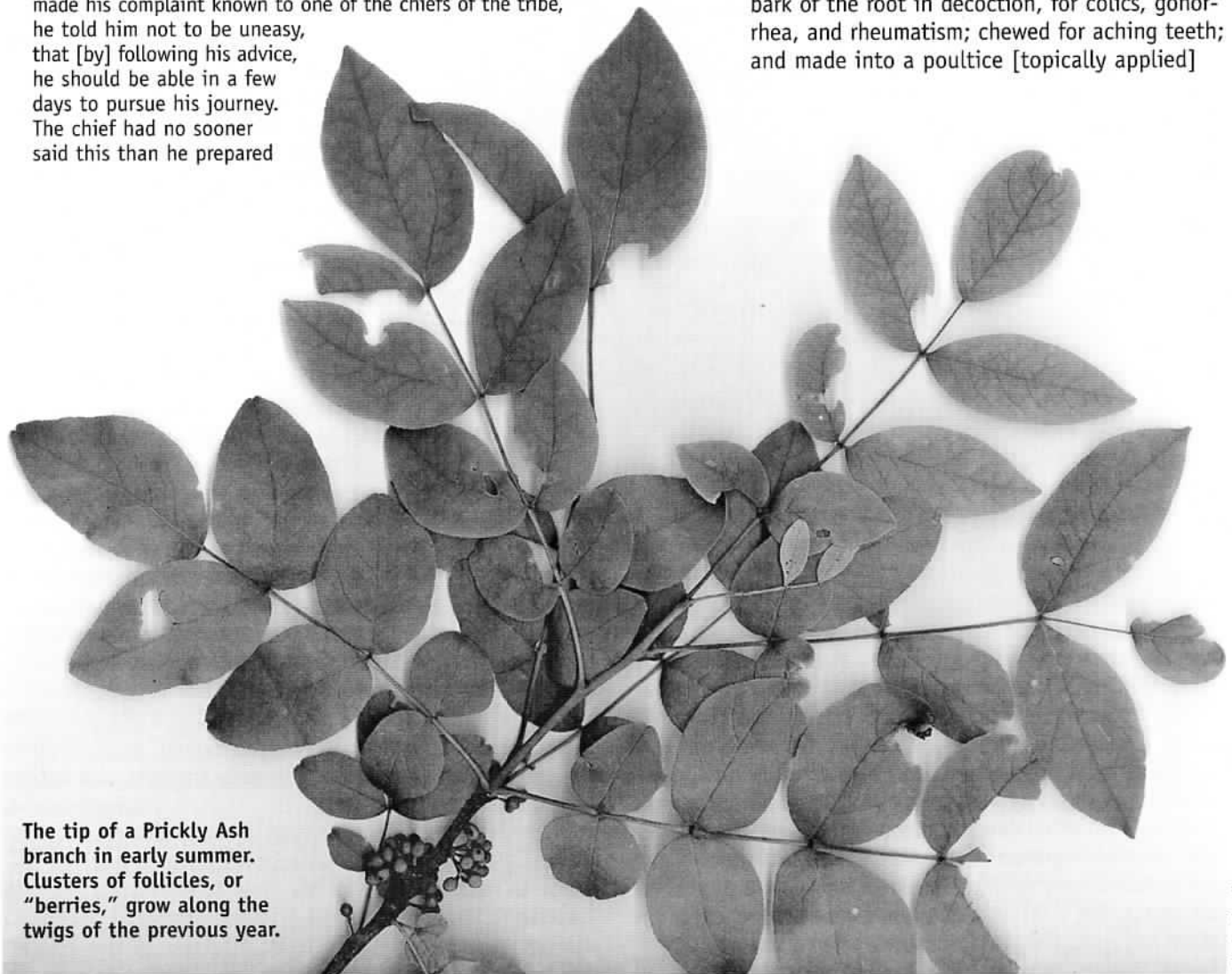
In the Great Lakes region in the 1760s, Jonathon Carver was a British agent sent to assess and report on the vast northern territory recently ceded to Britain by the French as a result of the so-called French and Indian War. He claimed that prickly ash was highly esteemed by the Native people for its medicinal qualities and claimed, in grand overstatement, that “it would radically remove all impurities of the blood.” Some of his self-proclaimed exploits apparently have been called into question. One claim for prickly ash may be an example of a tall tale. In the same report (*Travels through the interior part of North America*, 1779) he claimed that a Winnebago [Wisconsin tribe] doctor had cured gonorrhea using prickly ash:

...one of the traders whom I accompanied, complained of violent gonorrhoea with all its alarming symptoms... Having made his complaint known to one of the chiefs of the tribe, he told him not to be uneasy, that [by] following his advice, he should be able in a few days to pursue his journey. The chief had no sooner said this than he prepared

for him a decoction [treating the more durable plant parts in boiling water for a length of time] of prickly ash by use of which, in a few days he was greatly recovered. (Vogel, 1970)

Andre Michaux, in Illinois (1795), found the natives there used the plant for “obstructions of the liver and spleen”. Into the 19th Century came more statements of the role of prickly ash in native medicine. Dr. Benjamin Barton, a botanist and physician at the University of Pennsylvania, was another researcher very interested in Native American medical practices, incorporating much Native wisdom in his *Toward a Materia Medica for the United States* (1810). He made this claim for the bark of both species of *Zanthoxylum*: [They promise to be] “very useful medicine in cases of paralytic infections of the tongue, or of the muscles concerned in deglutition [swallowing].” He also mentioned using the bark for rheumatic affections and for ulcers.

Thomas Nuttall, reporting on peoples in the Arkansas territory early in the 1800s, recorded its use there to relieve toothache (see opening quote) (Nuttall, 1819). Rafinesque mentioned the shrub's bark in his *Medical Flora* (1828), claiming “the western tribes used principally the bark of the root in decoction, for colics, gonorrhoea, and rheumatism; chewed for aching teeth; and made into a poultice [topically applied]



The tip of a Prickly Ash branch in early summer. Clusters of follicles, or “berries,” grow along the twigs of the previous year.

A flowering branch of Prickly Ash



American Medicinal Plants / C. F. Millspaugh / 1892

with bear's grease and applied to ulcers and sores (Millspaugh, 1892). John Hunter was an early 19th Century explorer, whose *Manners and Customs of Several Indian tribes west of the Mississippi* (1823) was the result of several decades of trade and extended stays (voluntary and as a prisoner!) with tribes there. He noted

that the Indians valued prickly ash for a rheumatism remedy and took decoctions of the boiled root as a sudorific [induce sweating] and internal remedy. The inner bark, seethed in bear grease, was used externally as an embrocation and poultice and in powdered form was applied to ulcers by Indians and settlers. (Vogel, 1970).

The northeastern Iroquois are among the best-documented tribes using the shrub. They used a decoction to induce miscarriage (a not uncommon method of birth-control) or to rid themselves of intestinal worms. Both uses suggest strong-acting and very specific toxicity. The bark was smoked or chewed or placed into a tooth to relieve toothache. An infusion [steeping or soaking in hot water] was used as a "diuretic [increases urination] when the water stops due to gonorrhea and kidney trouble." Here we see a use which, while not a cure for the sexually transmitted disease, at least alleviated an important symptom. Infusions of prickly ash were also used to combat back pain or sharp cramps, either in the lower gastrointestinal tract or used by Iroquois midwives to alleviate labor pain in their patients (Moerman, 1998).

Another well-recorded tribe is the Menominee of Wisconsin. They used not only the bark but the "berries" as well. The following quote demonstrates the rigors of many healing practices, as well as the lengths some Native healers would go to obtain a plant medicine they deemed particularly useful:

The ripe berries, thrown in hot water, made a medicine used in the mouth to spray on chest and throat in bronchial diseases and sores. It was also a seasoner in mixtures. The root bark was used in poultices and, combined with other medicines, was often put on swellings. The teeth of garfish moistened with the medicine were used to open swellings so that pulverized or liquid medicine might enter, then the poultice was applied. The liquid of the berries was often drunk for minor maladies. The Flambeau and Pillager Ojibwas [syn. Chippewas] made trips farther south to get this bark, which does not grow near them. They used it to treat quinsy [inflamed tonsils] and sore throat, while the berries were used for sore throat and bronchitis. (Vogel, 1970)

Other mid-western and northern tribes similarly used an infusion to relieve cold and flu symptoms (Moerman, 1998).

A few interesting oddities are also recorded. The Pawnee (Missouri River region) employed the bark as a diuretic for horses (it is unclear how it was administered). Another veterinary note mentions the use by the Creek (Georgia) of an infusion of prickly ash bark to be rubbed on a dog's nose to

improve its scent! The Ojibwas employed a decoction as a wash for paralysis and to strengthen legs and feet of weak children. Moerman also records a use against gonorrhea, again with no clarification of efficacy (Moerman, 1998).

COLONIAL TO EARLY 20TH CENTURY MEDICINAL USE

Interest in prickly ash by American settlers was very localized and sporadic in colonial times, but by the 1800s it was being used as a toothache remedy in various tonics. In mid-century, John Lloyd, owner with his brothers of the Lloyd Brothers Pharmaceutical Company in Cincinnati, recorded that prickly ash was used against Asiatic cholera [an often fatal bacterial infection of the gastrointestinal tract] in Cincinnati in 1849. Dr. John King, a Cincinnati physician, introduced a decoction of prickly-ash to treat cholera as well as tympanitis [infection of the bowel causing inflammation of its lining]. He stated, with some hyperbole, "In Asiatic cholera...it was much employed by our (Eclectic) physicians in Cincinnati, and with great success; it acted like electricity; so sudden and diffusive was its influence over the system." Equal enthusiasm was given to prickly-ash "berries" as a cure for typhoid fever and typhoid pneumonia (Millspaugh, 1892).

It was acclaimed in L. Johnson's textbook on medical botany (1884), [It] "powerfully stimulates secretion from mucous surfaces, causes a sensation of warmth in the stomach, and undoubtedly exerts an eliminant influence." He mentioned treating rheumatism, syphilis, jaundice, chronic sore throat, and toothache. Johnson also recorded its appearance at Shaker markets and in Shaker catalogs (Crellin & Philpott, 1990). One catalog called it "a valuable tonic in low typhoid fevers, used in colic, rheumatism, scrofula [a form of tuberculosis of the neck lymph glands], etc. The berries are a most valuable agent against Asiatic cholera" [echoing Lloyd and King]. (Miller, 1976).

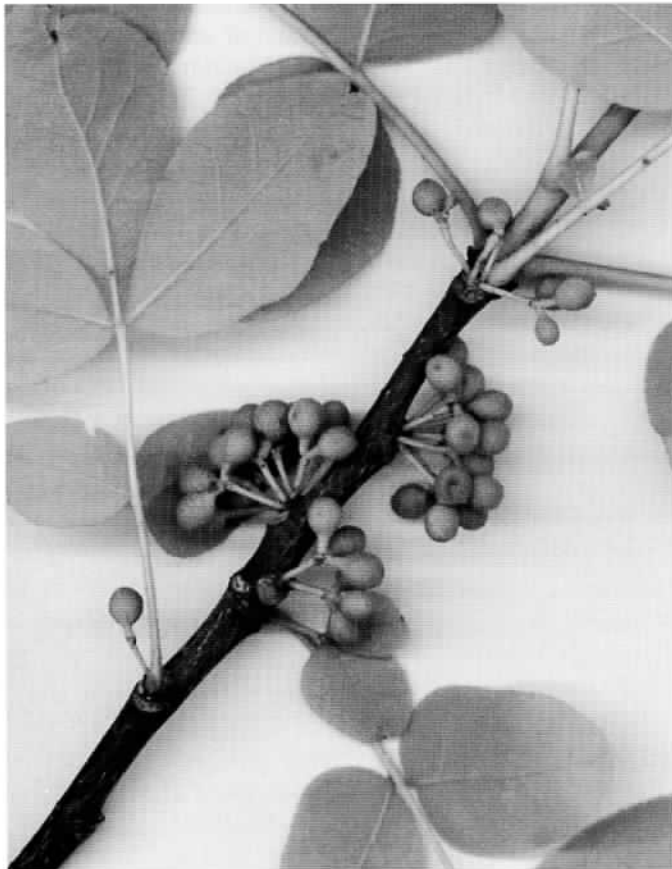
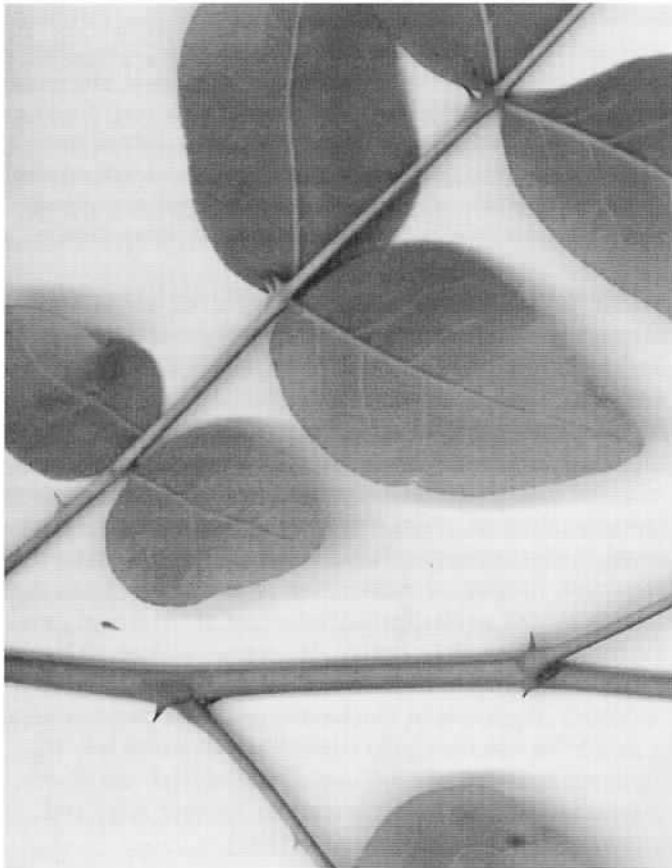
Millspaugh gave this personal anecdote on the immediate efficacy and unpleasantness of chewing the bark, in his entry on "*Xanthoxylum*" in *American Medicinal Plants* (1892):

From personal experience one day in the woods while botanizing, I found that, upon chewing the bark for relief of toothache, speedy mitigation of the pain followed, though the sensation of the acrid bark was nearly or fully as unpleasant as the ache, and so painful finally in itself that I abandoned its use, only to have the toothache return when the irritation of the bark had left the mucous membranes. (Millspaugh, 1892)

A later text (1928) echoes many of these actions and adds use as mouthwash, relief of toothache, and inducer of salivation. Its action as a local anesthetic is questioned. The bark was listed in the Pharmacopoeia of the United States from 1820 to 1926. (Chevallier, 1996).

(Continued on page 14)

The Medicinal History of PRICKLY ASH (Continued)



Mrs M. Grieve, in her *Modern Herbal* (1931) had this to say on the multiple uses of prickly ash:

On account of the energetic stimulant properties of the bark, it produces when swallowed a sense of heat in the stomach, with more or less general arterial excitement and tendency to perspiration and is a useful tonic in debilitated conditions of the stomach and digestive organs, and is used in colic, cramp, and cholera, in fever, ague [malaria], lethargy, for cold hands and feet and complaints arising from bad circulation.

and

The pulverized bark is also used for paralytic affections and nervous headaches and as a topical...either in powdered form, or chewed, has been a very popular remedy for toothache.... (Grieve, 1931)

CONTEMPORARY HERBAL MEDICINE

Contemporary herbal medicine sources summarize a variety of actions of prickly ash, in most cases echoing the records of their predecessors of the past three centuries. While *The Professional's Handbook of Complementary and Alternative Medicines* (Fetrow & Avila, 1999) states plainly, "The pharmacological activity of prickly ash is relatively unknown," most modern herbalists consider prickly ash to be an important remedy for painful inflammatory conditions like rheumatoid arthritis and arthritis. (The latter is any inflammation of a joint; the former is an inflammation caused by an immune complex disease, a reaction by the body to some foreign material, Lewis & Lewis, 1977).

Prickly ash is considered a warming, stimulating herb good for circulation and an aid for rheumatic and arthritic conditions. It "improves conditions where arteries of the limbs have narrowed, preventing sufficient blood flow. It stimulates blood flow to painful and stiff joints, promoting the supply of oxygen and nutrients to the area and removing waste products." Records of contemporary use are given for leg ulcers, chronic pelvic inflammatory disease, and as an aid to digestion [an herbal "bitter" in the traditional sense] (Chevallier, 1996). The *PDR for Herbal Medicines* (1998) adds, perhaps contradictorily, that prickly ash may lower blood pressure. Other contemporary claims include diuretic; diaphoretic (induce sweating); tonic, increase salivation, and carminative (eases digestive gas and its cramping), many of these echoing Native American and other traditional uses (Hocking, 1997; PDR, 1998).

Two examples of herbal recipes using prickly ash, both from Chevallier's *Encyclopedia of Medicinal Plants* (1996) —

For cold extremities:

Mix 5g of prickly ash and 10g of crampbark (*Viburnum opulus*), and make a decoction using 750ml of water. Take three doses a day.

For back pain, especially tense neck:

Make a decoction using 15g of crampbark and 5g of prickly ash bark to 750ml of water, Strain and rub into the affected area, or use 1 tsp. of tincture [soaked in alcohol] and apply the same way.

Although no records of human poisoning could be

found, Fetrow and Avila (1999) have intimated a connection between prickly ash and toxicity in animals:

Ingestion of parts of the northern prickly ash [*Z. americanum*] has been suspected of causing death in sheep and cattle in Indiana. Ingestion of the bark of southern prickly ash [*Zanthoxylum clava-herculis*] has also caused death and symptoms of toxicosis (blindness, dysphagia [blockage in esophagus making swallowing difficult], high-stepping gait, inability to drink water) in beef cattle in Georgia.

A final note of caution from their *Professional's Handbook*—"Despite its many uses in folklore medicine, there is very little clinical information to support the use of prickly ash in humans. At this time, its use cannot be recommended for any condition." (Fetrow and Avila, 1999).

Nevertheless, the genus *Zanthoxylum*, some 250 woody species found on four continents, has a long history of economic use, particularly as medicinals. Hocking (1997) records uses for almost forty species of *Zanthoxylum*. In Africa and India, twigs of *Zanthoxylum* species have been used as "chewing sticks," used as tooth cleaners for their antiseptic value. Others have been part of traditional herbal medicine in China, Japan, and India, put to many of the same uses as seen in North America, as well as some others—peppery condiment, aphrodisiac (Japan, China), fish poison (India), deodorant (Himalayas). A few species of *Zanthoxylum* are even larger trees whose timber has been used for cabinet work and other commercial timber (West Indies, Far East).



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The Chemistry of Prickly Ash

ALTHOUGH THE SECONDARY CHEMISTRY of *Zanthoxylum* has not been well studied, several metabolites have been identified, particularly in the bark. These include derivatives of coumarin called xanthyletin and xanthoxyletin. Coumarin (itself a product of the phenolic acid cinnamic acid) is reported to be anti-inflammatory, as well as lowering blood sugar. Xanthoxyletin is recorded to have an inhibitory effect on seizures (Duke, 1986).

Perhaps more telling are prickly ash's alkaloids. Alkaloids, characteristic of the family Rutaceae and reasonably abundant in *Zanthoxylum*, affect the central nervous system in many ways. Certainly, the pain-killing properties ascribed to prickly ash must derive from its alkaloids. Isoquinoline alkaloids like berberine have a number of pharmacological actions, including fighting infections and stimulating the immune system (bacterial, fungal, amoebal, parasitic worms) and many effects on the nervous system. Most telling for the prickly ash record is berberine's reported anti-inflammatory effects. Other more complex alkaloids—chelerythrine (Chevallier, 1996), nitidine, magnoflorine, and laurifoline (Mabley, 1988)—have also been isolated. Laurifoline lowers blood pressure; magnoflorine is associated with neuromuscular blocking activity (Fetrow and Avila, 1999).

Other constituents include tannins, resins, and a terpene-rich, acrid volatile oil (PDR, 1998). None have been specifically studied for prickly ash, but in other contexts these generally exhibit a wide range of pharmacological effects, some of which have been reported for *Zanthoxylum* (i.e. some terpene-rich oils stimulate digestion and ease gas cramping). The fruit contains a volatile oil with citral, the same terpene in the rind of a lemon and orange. (Hocking, 1997).

Kentucky Native Plant Society MEMBERSHIP FORM

Memberships are for the calendar year (January-December).

Name(s) _____

Address _____

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KY County _____

Tel.: (Home) _____ (Work) _____

Add me to the email list for time-critical native plant news.

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Membership Categories: Annual - \$7/Individual \$10/Family

Lifetime - \$100/Individual \$140/Family

This is a renewal. This is a new membership.

Membership \$ _____

Gift (optional) \$ _____ Gifts are tax deductible. [IRC 501(c)(3)]

Total \$ _____ (payable to Kentucky Native Plant Society)

Return form & dues to:

KNPS MEMBERSHIP, P.O. Box 1152, Berea, KY 40403

KNPS 2001 CALENDAR of Native Plant-related Activities

Mary Carol Cooper, KNPS Field Trip Coordinator

AUGUST 11, Sat. / National Wild Ones Annual Membership

Meeting hosted by the KY Wild Ones Chapters. Contact Portia Brown, 502-454-4007 or <oneskylight@earthlink.net> for membership and program details, or to participate in planning See story on page 6.

SEPTEMBER 21-22, Fri.-Sat. / Second International Pawpaw

Conference. Frankfort, KY. Contact Kirk Pomper, Kentucky State University, 129 Atwood Research Facility, Frankfort, KY 40601; 502-597-5942; fax 502-597-6381; <kpomper@gwrmail.kysu.edu>; or <<http://www.pawpaw.kysu.edu>>.

OCTOBER 7, Sun. / Service Trip at Floracliff Nature Preserve,

Fayette Co., KY. Come join in the fight against Invasive Exotics!!! This will be a bush honeysuckle extravaganza. Bring gloves, loppers, and bow saws to help eradicate this exotic from

one of the most unique nature preserves in the state. The service trip will also give you a chance to hike around this beautiful preserve donated by Mary Wharton. Registration required. Please call Mary Carol Cooper 859-277-0656.

OCTOBER 20-21, Sat.-Sun. / Colorfest at Bernheim Arboretum & Research Forest,

Clermont, KY. Information: 502-955-8512.

NOVEMBER 10, Sat. / KNPS Fall Meeting & Program at Shakertown

at Pleasant Hill, Mercer County, KY. All KNPS members are encouraged to attend and participate in an open Board meeting (10 am ET) at the West Lot Family House that has been restored for use as a conference center. For all those who RSVP, a catered lunch from Shakertown will be provided (12:30 pm). An afternoon program will follow at 1:30, and then a hike on one of Pleasant Hill's new trails at 3:00 pm. *More details in the next newsletter!*

THE KNPS WEBSITE HAS MOVED TO:

<http://www.knps.org>

Check out the new look, the updated info and news, and the new discussion forum!

- If you could help distribute KNPS brochures or watch over the KNPS booth at environmental events in your part of the state, please contact any of the officers or board members listed on page 2.
- If you would like to be notified by e-mail of last-minute native plant rescues or other time-critical native plant-related activities, send your e-mail address to Michael Thompson at: KNPS_events@hotmail.com

*(Newsletter return address only.
See p. 2 for contact information.)*

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