



Consider the Conifers

With seasonal evergreens recently left at the curbside and our deciduous forests in their leafless state, it seems an appropriate time to consider the conifers. In the winter, the pines and cedars stand out against the general gray-brown of the trunks and leaves of the oaks and hickories that dominate the forest on top of the South Cumberland Plateau. There are a number of different species, but certain characteristics cause them to be grouped as conifers in plant classification systems.

The most common and most familiar are the pines. Virginia or scrub pine (*Pinus virginiana* Mill.) is found along roadsides and in other dry, open areas, sometimes mixed with shortleaf pine (*Pinus echinata* Mill.) in places such as the War Memorial Cross and Piney Point. Virginia pine has needles in clusters of two (like a V for Virginia) and the needles are twisted, while shortleaf pine has somewhat longer, straighter needles in clusters of two or three. Another common pine is loblolly (*Pinus taeda* L.), with much longer needles in groups of three. It is a native of the piedmont and coastal plain and has been brought to the Plateau in commercial pine plantations, from which it has regenerated in other sites. Many of these trees have been cut in recent years because of an infestation of the southern pine bark beetle.

Eastern white pine (*Pinus strobus* L.), a native of the northeastern United States and the Appalachian Mountains, is also naturalized in the area after having been brought in by planting. At Sewanee the story is that in 1904 the German Imperial Ambassador, on a visit to the University, made a gift of American white pine

seedlings which had been established in the Black Forest. Some large old trees on campus may date from this time. They were also extensively planted along fire lanes and in small plantations on the Domain since the 1950's. White pine naturalizes very successfully because of its ability to germinate and grow in the shade of deciduous trees, while other pines generally need open areas to become established. It is easily identified by needles in groups of five (for the letters in "white") and branches in whorls, one for each year of growth.

One other member of the pine family (Pinaceae), the eastern hemlock (*Tsuga canadensis* L.) occurs off the top of the plateau, down in the moist, sheltered coves, though not in the coves on the Domain. It is, however, often planted on campus and in yards in the Sewanee area, including in Abbo's Alley, where it grows well. Its needles are quite different from members of the genus *Pinus*, short and flat and growing singly along the branch, but its small cones show its kinship.

Yet another conifer native to the Sewanee area, though part of a different family, the redwood or cypress family (Cupressaceae), is the eastern redcedar (*Juniperus virginiana* L.). Common on the lower slopes of the plateau and in the valley on limestone outcroppings, on the Domain and surroundings it is usually found in open fields or occasionally on the sandstone at the edge of bluffs. The pine family has male and female cones on the same individual, but the redcedar has them on separate individuals. This is quite noticeable in the spring when pollen is produced and again when the mature fleshy blue female cones

appear. These look like berries but upon closer study are actually a type of cone like those of pine and hemlock. Young leaves look like tiny needles but older ones are more scale-like.

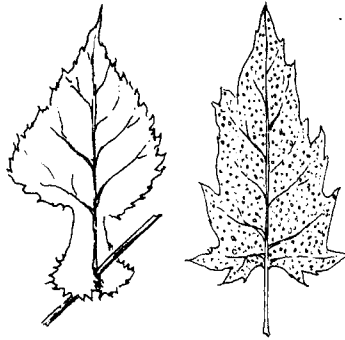
Several non-native conifers are used horticulturally on campus and elsewhere: another member of the cypress family, arborvitae (*Thuja*), and members of a third family, the bald cypress family (Taxodiaceae), dawn redwood (*Metasequoia*) and, of course, bald cypress (*Taxodium*), both of which are deciduous conifers.

Deciduous "evergreens", needles like scales, cones like berries — with so much variety, what makes a conifer a conifer? The conifers are noteworthy botanically as the largest of the various groups of the gymnosperms — the "naked seed" plants. The gymnosperms are one of two groups of seed plants, the other being the much more diverse angiosperms or flowering plants, in which the seed is enclosed in a carpel, becoming a fruit. The advent of the seed in the evolutionary development of plants made it possible for them to end their dependence on water for sexual reproduction. Even as plants made various adaptations which allowed them to move from their original aqueous environment to colonize land, groups such as the mosses and ferns still have flagellated sperm which ultimately depend on at least a film of water to travel to the egg.

In the seed plants, the male gametophyte has become contained in a pollen grain, which can be transported by air, thus finally

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New Conservation Easement on the Plateau



Rare plants that grow on the Fesmire tract, eared goldenrod (left) and Cumberland rosinweed (right) have distinctive leaves.

The Herbarium was involved in an important conservation effort this fall: the protection in perpetuity of two hundred wooded acres on the side of the Cumberland Plateau. The land, owned by Jim Fesmire, is adjacent to the Hawkins Cove State Natural Area, which the State of Tennessee purchased several years ago for protection of the globally endangered Cumberland rosinweed (*Silphium brachiatum* Gattinger). Mr. Fesmire donated a conservation easement on the property to the Tennessee Parks and Greenways Foundation, virtually doubling the acreage preserved for the rosinweed.

A conservation easement is a contractual agreement between a landowner and an organization, in which the owner agrees to permanent restrictions on the future uses of his property to protect its natural resources.

The easement is donated by the owner to the organization, which agrees to enforce the terms of the easement forever, even if the land is sold.

The beautiful boulder-studded Fesmire tract, carved by several wet weather streams, lies on the lower slopes of the Plateau. Its upper boundary is formed by a portion of the bed of the historic Mountain Goat railroad, now used for recreational purposes. The land will in effect remain in its natural state always, with only minimal logging of trees planned.

As part of the process of donating a conservation easement, a baseline data report, describing the property at the time of donation of the easement, is prepared. It consists of a description of the forest types, soils, and geology; an inventory of plants and animals; supporting maps and photos; and copies of legal documents.

And that is where the Herbarium comes in: we teamed up with the Landscape Analysis Lab to prepare the baseline data report for this easement. So, recent graduate Brett Scheffers (C '05), biology major Alfire Sidik (C'09), Herbarium Associate Curator Yolande Gottfried, and I spent several days this fall crisscrossing the property to document the plant community types and find and list the plant and animal inhabitants. (A very nice way to spend one's autumn days!) Landscape Analysis Lab Fellow Nick Hollingshead supplied the maps and other technological

expertise needed to compile the report.

On the tract we recorded 135 species of plants, representing 66 plant families, a good number given the season. We found populations of the Cumberland rosinweed, as well as another plant that is rare in Tennessee, the eared goldenrod (*Solidago auriculata* Shuttlew. ex Blake). Happily, we found very few invasive exotics; the forest is ecologically intact.

Conservation easements are new in our part of the Cumberland Plateau, but as Herbarium Director Jon Evans put it, "Easements beget other easements. We hope there will be a confluence of the [conservation] groups that have an interest here to build on Jim's conservation easement so we can conserve large blocks of land. There's so much at stake. If we don't do this sort of thing on the Plateau, it's going to go. Our research shows that we are losing natural habitat on the Plateau at an accelerated rate. Easements are critical conservation tools in this period of rapid change."

According to Kathleen Williams, Director of Tennessee Parks and Greenways, "Our goal is to preserve Tennessee's treasures and link them with greenways. . . . Jim's generous gift is a model for good conservation, good partnerships and generosity – we plan to work on more projects like this in the coming year."

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Thanks to all our contributors in 2006!

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Winter Calendar of Events

Bridal Veil Falls: Hunt for the First Hepatica Sat., Feb. 3, 1:00 PM, Yolande Gottfried

Instead of looking for groundhogs to poke their heads out of the ground, come look for any early wildflowers that may be poking up through the dead leaves. Meet at Morgan's Steep for this 2-hour moderate walk. Come prepared for muddy, wet, and/or rocky conditions.

Shakerag Hollow: Early Signs of Spring Sat., Feb. 24, 1:00 PM, George Ramseur

Global warming? El Nino? Normal Sewanee weather? A month before the vernal equinox, explore Shakerag with retired botany professor George Ramseur and see whether flowers are really blooming earlier than usual, based on records from past years. Meet at Green's View for this moderate 2-mile walk that may include a steep rocky section of the trail.

Wildflower Identification

Sat., Mar. 10, 10:00-11:30 AM, Mary Priestley

The hottest wildflower book to hit the stands recently is the Tennessee Native Plant Society's *Wildflowers of Tennessee, the Ohio Valley, and the Southern Appalachians*. Mary will be using it, as well as her own key to Sewanee's spring wildflowers, in this early spring workshop. We will provide copies for use that day, but both books are available at the University Book and Supply Store. While you are there, pick up a hand lens to further your enjoyment of these natural beauties. Meet in Woods Labs room 121.

All times are CST or CDT.

Wear appropriate shoes on all of these walks. Risks involved in hiking include physical exertion, rough terrain, forces of nature, and other hazards not present in everyday life. Picking flowers and digging plants are prohibited in all of the above-mentioned natural areas.

For more information on these or other Sewanee Herbarium events, please contact Yolande Gottfried at the Herbarium (931.598.3346) or by email at ygottfri@sewanee.edu.

THE SEWANEE PLANT PRESS

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*Drawings are by Mary Priestley.
Those not labelled are of white pine (cone),
hemlock (branch), and Thermopsis mollis.*

Conifers, continued from page 1

making the ultimate transition to life on land. In gymnosperms, this pollen grain lands on or near the ovules which are exposed on the surface of cone scales or other structures. When fertilization occurs, the "naked" seed then develops on these structures. In pines, this structure is the familiar pinecone, and

pinces and their relatives form the group called conifers.

—Yolande Gottfried

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Membership Application/Renewal

The Friends of the Sewanee Herbarium support the work of the Herbarium: education, research, and conservation. A \$10.00 annual contribution would be very much appreciated. The date of your most recent contribution is printed on your address label.

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Others who might like to receive *The Sewanee Plant Press*: _____

Easement, continued from page 2

Jim has invited us to return to the property this spring when the woodland wildflowers pop up. It is a pleasure to know that these plants and their habitat are secure and that the Herbarium was involved.

—Mary Priestley

Individuals can realize tax savings after donating a conservation easement. A new federal bill, applicable for 2006 and 2007, gives donors additional significant federal tax benefits for protecting the land they love, as well as our natural heritage. For more information about the Tennessee Parks and Greenways Foundation and conservation easements, see www.tenngreen.org.

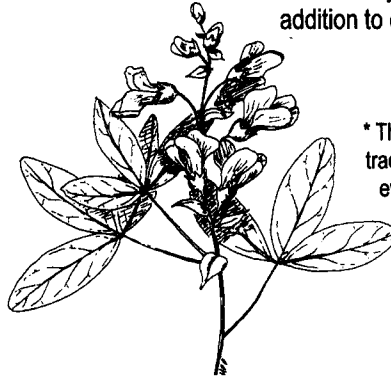
New Rare Plant for the Domain

Tennessee's Rare Plant Advisory Committee meets every three years to update the list of plants that are threatened, endangered, or of special concern in the state. Dr. George Ramsey, Herbarium Director *emeritus*, was one of the original members of the committee when it was formed in 1980. He recently stepped down, and I was appointed to take his place. I attended my first meeting this past December at the University of Tennessee.

Among new additions to the list is Allegheny Mountain goldenbanner (*Thermopsis mollis* (Michx.) M.A. Curtis ex Gray), which grows on the Domain in forests overlooking Shakerag Hollow. It is known from only six counties in Tennessee. The committee decided to designate it a plant of "special concern," with the idea of raising its status to "threatened" or "endangered," based on sightings over the next couple of years.

With the *Thermopsis*, we can now count ten rare plant species found on the Domain. Ten species (and counting) for 10,000 acres—not bad!* The Herbarium and the Tennessee Native Plant Society will co-sponsor a hike this spring to see this new addition to our rare plant list. Plan to join us!

—Mary Priestley



* The state of Tennessee, with an acreage of 26.9 million acres, tracks approximately 535 rare plant species, an average of one for every 50,200 acres. On this basis, the Domain has 50 times the number of species of rare plants per unit area than the state taken as a whole. This is probably not surprising, given the variety of unspoiled native plant communities that the Domain encompasses. To download a copy of Tennessee's rare plant list, go to www.state.tn.us/environment/na/pdf/plant_list.pdf.

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