

Kentucky Coffeetree Discovered on the Domain

Anachronism: a person or thing that is chronologically out of place; especially: one from a former age that is incongruous in the present —Merriam-Webster

Sometimes, the most exciting plants to find are the misfits — the ones that simply don't belong in the places they're found. This summer, while surveying below the bluff near King Farm, Dr. Jon Evans discovered one such misfit: the Kentucky Coffeetree (*Gymnocladus dioicus*), a new and mysterious addition to the flora of the Domain and of Franklin County. This leguminous tree is most often found in small clumps ranging from New York and Pennsylvania west to Minnesota, south to Oklahoma, and east to Kentucky and western Tennessee, yet it is becoming less and less common throughout its range. Why? Because the Kentucky Coffeetree is an ecological anachronism, a species lost in time.

Before going any further, let us take note of the scientific name of this tree, which tells us a great deal about its life history: *Gymnocladus*, "naked branch," refers to the tree's habit of putting on leaves long after most other trees have leafed out, then being one of the first to drop its leaves in the early fall. For about six months of the year, the Kentucky Coffeetree is 'naked.' The species name *dioicus* indicates that the tree is dioecious, that is, it has distinct male and female individuals and there must be interaction between the two sexes for fertilization to occur. (Humans are also dioecious.)

It would be difficult to identify *G. dioicus* when it is naked, but we found it fully leafed out, as is typical for July. The foliage (alternate, bipinnately compound, ovate leaves) gave its identity away to Evans, who recalled his first encounters with the tree in his grandmother's yard. The other tell-tale

sign of a coffeetree would be its fruit: large, flat pods 15-20 cm long and 3-5 cm wide, dark reddish-brown in color, ripening in autumn and persisting on the tree until late winter or early spring. Each pod contains four to eight seeds, which, when roasted, produce a suitable coffee substitute (hence the common name, "coffeetree").

A quick search of the leaf litter surrounding our grove of coffeetrees revealed no fallen pods, no seeds. You see, the Kentucky coffeetree is having a tough time with sexual reproduction these days, and it's not just a temporary rut. The primary way it survives today is through its ability to reproduce clonally by sending out runners. Since we found no evidence of pods (which would indicate sexual reproduction) we have reason to believe that our clump of trees is actually only one genetic individual, stranded from individuals of the opposite sex and thus evolutionarily defunct.

So, why is the Kentucky coffeetree on the decline across its range? Because it's not going anywhere. The animals that once moved its seeds from place to place are now lost to this world, extinct. There's no chance that our tiny population will come into contact with other trees of the opposite sex, so there's no chance of it producing new genetic individuals. It is, essentially, a relic, destined to fade into extinction.

The Kentucky coffeetree isn't alone; a number of other species (the osage orange, pawpaw, persimmon, and honey locust, to name a few) are also suspected to have coevolved with the extinct group of animals known as the Pleistocene megafauna. A quick glance at the fruit of some of these

species should be enough to explain the now-failed relationship: to be desirable to megafauna, you need mega-fruits! Sadly, the hefty herbivores (ground sloths, camelids, horses, mastodons, and more) that once dominated the North American ecosystem went extinct in the Holocene epoch (around 12,000 years ago), leaving stranded the big-fruited trees that depend upon big-mouthed critters for seed dispersal. In the evolutionary "blink of an eye" specialized traits that took millions of years to evolve became obsolete. Though it is uncertain which member of the megafauna once dined on the Kentucky coffeetree's giant seed pods, it's clear that the pods have no place in today's forests. Even if some clever squirrel found a way to open one, the toxic pulp inside would kill it shortly afterward. The tree is a true anachronism, a ghost of the forests of old.

So, if there's nothing moving the seeds of *G. dioicus*, what is it doing on the Domain, far from its native range? Herein lies the mystery of this misfit. There are a few possibilities. One, that the trees we saw were actual remnants from the Pleistocene, a vestigial population that was once part of a much larger, contiguous range. The Domain's population marks the easternmost

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Sewanee Campus Certified as a Tennessee Arboretum



The University of the South has long been known for its natural beauty. Generations of students and visitors have sat in the shade of a tree in the Quad, strolled through Manigault Park, and enjoyed the springtime splendor of Abbo's Alley. Now the diversity of Sewanee's trees has been documented and the campus recognized by the Tennessee Urban Forestry Council as a certified arboretum.

During the application and certification process, more than 120 different species of trees on campus were identified and labeled. The size of this collection qualified the university as a "Level 4" arboretum, the state's most rigorous category. Sewanee residents and visitors can now find these trees, along with about 30 shrubs, labeled with both their botanical and common names. The trees represent many species native to Tennessee as well as trees from around the world. Some have been on campus since the Civil War, others have been added recently.

The majority of the tree specimens are grouped in three areas—the Quad and central campus, Manigault Park, and

Abbo's Alley—though others can be found elsewhere on campus. The Sewanee campus is the largest arboretum by area in Tennessee.

Trees include Sewanee's "Moon Tree," a 40-year-old sycamore that grew from a seed that was taken on one of the Apollo missions. Sewanee grad Max Young was Tennessee State Forester at the time, and he arranged for Sewanee to receive the tree. The Forestry Club, headed by president Sandy Sanderlin Baird, conducted a ceremony at the planting.

White pines planted in Manigault Park to commemorate the 1911 visit by United States President William Howard Taft are also highlighted. Mr. Taft's military aide, Archie Butt, wanted the President to see his alma mater. They rode up on the Mountain Goat train from Cowan. A horse-drawn buggy was decorated and ready to take them to campus when Mr. Sam Werner drove in from Tracy City in the only car on the mountain. President Taft, who was a good-sized man, rode up the hill in the car. His aides took the buggy. The following year, Mr. Butt went down on the great Titanic.

An interesting, but somewhat remote, adjunct to the arboretum is the bioswale. A gently sloping depression in the landscape, it was constructed as part of the renovation of the Snowden Forestry Building. The bioswale functions to keep rainwater on the land as long as possible, increasing filtration into the soil and decreasing run-off.

The bioswale has been planted in native shrubs.

A kiosk with a map of the tree locations has been installed near the corner of University and Georgia avenues, next to Convocation Hall. People are welcome to take a self-guided walking tour of any or all of the arboretum sections; look for the black labels mounted in the ground next to the trees

The herbarium is sponsoring a tour of the arboretum, led by landscape designer Margaret Woods, on Sunday, October 6. See details in the Calendar of Events.

Much of this article originally appeared on the Sewanee website, www.sewanee.edu. —MPP



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occurrence of the species in Tennessee, yet it is possible that coffeetrees once grew across the state. The second possibility is that humans (perhaps Native Americans, who drank a brew of the roasted seeds) transported the seeds and intentionally planted them along the benches of the Cumberland Plateau, where a variety of other plants were prehistorically cultivated for food and medicine. Regardless of how it arrived here, we can be sure that the

Kentucky coffeetree isn't going to be doing much travelling in the future, save for the few meters of extension it may achieve through its root system.

Ecological anachronisms like *G. dioicus* raise some very interesting questions about the past, present, and future of our flora. How can we understand our present assemblage of biodiversity without putting it in the context of the distant past (which is not-so-distant at all in evolutionary terms)? How many

North American floral-faunal interactions have been lost or destroyed since European contact? Can species in their demise (like the coffeetree) inform us on how to manage species that are on the brink? How many more misfits are out there on the Domain waiting to be discovered?

—Hali Steinmann C'15

This article first appeared as a post on the herbarium's blog: <<http://sewaneeherbarium.wordpress.com/>>

Autumn Calendar of Events

Foster Falls

Sun., Sept. 29, 1:30 PM, Mary Priestley

This has long been a favorite spot for fall wildflowers but is a first as a herbarium-sponsored walk. Meet at the Foster Falls parking area for this one- to two-hour easy walk in the power line right-of-way above the gorge. Call the South Cumberland State Park visitor center for directions (931-924-2980).

Plants and Pickin'

Sat., Oct. 5, 1:30 PM, Yolande & Robin Gottfried

Many old-timey songs have references to particular kinds of trees and other familiar plants. Yolande and Robin will lead a stroll through the campus area sharing botanical tidbits and some verses of tunes (with banjo accompaniment!) related to the plants along the way. Meet in front of All Saints' Chapel for this one- to two-hour easy walk.

Abbo's Alley

Sat., October 12, 7:45 AM, Mary Priestley

A Family Weekend tradition! Meet at the Quadrangle for this one-hour easy walk in the Abbott Cotten Martin Ravine Garden. There are a surprising number of things to see and learn on this familiar trail.

Sewanee Arboretum

Sun., Oct. 13, 1:30 PM, Margaret Woods

Tour our newly-designated arboretum. Margaret Woods is a George Washington University-trained landscape designer whose practice focuses on the use of native plants and the importance of environmental stewardship.

Meet at the arboretum map kiosk at the corner of University and Georgia Avenues, near Convocation Hall, for this leisurely stroll.

Botanical Watercolor Workshop

Sat., Nov. 2, 9:00-11:30 AM, Margaret Patten Smith

This workshop led by Chattanooga watercolorist Margaret Patten Smith gives people of all ability levels an opportunity to try their hand at capturing some of autumn's beauty in watercolors. Participants are invited to bring in botanical or other natural objects to paint, or choose from a variety provided. Bring your own painting materials and meet in the herbarium on the first floor of Spencer Hall. The workshop is free, but space is limited, so reservations are necessary (see below).

Nature Journaling

A group meets for nature journaling Thursday mornings 9-11. Come try it out — stick with it if you like. Bring an unlined journal (or a few sheets of unlined paper) and a pen or pencil. No experience needed. In nice weather, the group gathers at Stirling's Coffee House; otherwise, they meet in the Herbarium, Spencer Hall room 171.

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.

THE SEWANEE PLANT PRESS

The Sewanee Herbarium
Dr. Jon Evans, Director
Biology Department
Sewanee: The University of the South
735 University Avenue
Sewanee, TN 37383

WEBSITE

<http://lal.sewanee.edu/herbarium>

EDITOR

Mary Priestley
marypriestley@bellsouth.net

CONTRIBUTOR

Hali Steinmann
steinhj0@sewanee.edu

CALENDAR

Yolande Gottfried
yogttfri@sewanee.edu

COMPOSITOR

Tammy Elliott

Drawings, by Mary Priestley, are of a Kentucky coffeetree leaf, flowers, and fruits; yellow-fringed orchid; black-eyed Susan; and white oak.

For more information on these events or to reserve a spot in the watercolor workshop, call the Herbarium at 931-598-3346. Directions are available at the Herbarium website, <http://lal.sewanee.edu/herbarium>.

Friends of the Sewanee Herbarium

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.

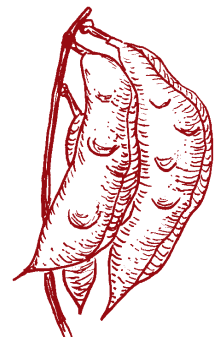
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Upcoming Certificate in Native Plants Program



The Chattanooga Arboretum and Nature Center (CA&NC), Tennessee Valley Wild Ones, and the Tennessee Native Plant Society are teaming up to establish a Certificate in Native Plants course of study. Patterned after programs offered by the State Botanical Garden of Georgia and the

Birmingham Botanical Garden, it will consist of a set of courses in botany, conservation, and plant communities, and native plant gardening. The course will take place at CA&NC.

The goal is to teach and promote native plant gardening. As Dennis Bishop, curator of the Chattanooga Arboretum and spearhead of the program puts it, "We want the students to take this stuff home and put it into practice in their communities. However, to do that they need to first come to know our native plants and how they work in the natural world."

Courses in botany, plant conservation, plant communities, and designing with native plants will form the core curriculum. Electives will include a variety of classes, such as those on wildflowers (spring, summer, and fall), trees, shrubs, and bird and butterfly gardens. Field trips to local Chattanooga natural areas to see native plants in their communities, as well as to native plant gardens to show how native plants can be used in landscaping, are also in the works.

The New England Wildflower Society was the first to offer a Certification in Native Plants curriculum, more than 20 years ago. Like theirs, this new program will emphasize hands-on learning, and participants will proceed through the courses at their own pace.

The cost per class is still being worked out, but it will be in the range of \$10 per hour of instruction. Eight-hour core classes would be \$80 per student; four-hour electives and field trips \$40.

Herbarium curator Mary Priestley is serving on the planning committee. For more information,

contact Mary <marypriestley@bellsouth.net> or Dennis Bishop <dbishop@chattanooga.org>. If all goes according to plan, the first classes will be offered in January of 2014. Look for details soon on the CA&NC website <http://www.chattanooga.org>.

—Mary Priestley



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ADDRESS SERVICE REQUESTED

Herbarium, Biology Department
735 University Avenue
Sewanee, TN 37383-1000

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