

# The Language of Trees

By Gabriel J. Welsh

*Editor's note: This article and the following sidebar "Enemies and Allies of the Elms" are provided courtesy of Gabriel J. Welsh and the Penn Stater Magazine. These articles illustrate the tremendous value trees have in our landscapes.*

**A**t 7:00 a.m. on the Penn State mall, when the sun still lies behind the low buildings flanking Allen Street and only the occasional car passes on College Avenue, the sounds of the elm trees surprise early risers who stroll beneath them. The lightest breeze tosses the canopy into a series of knocks, a high clatter as the branch tips rub and collide 80 feet above the sidewalks. If it is fall, the percussion heralds a blaze of gold skittering down to the sidewalk, but even in summer the sound calls attention to the trees in a different way than does the visual splendor of their canopy. In the morning, before most are out on their way to work or class, the elms shudder with the advent of day, until the language of the trees is shushed by the murmur of people below.

For decades, generations of Penn Staters have known the shade offered by the arching trees and breathed lighter air beneath the leaves on summer days. The trees so deeply affect people who see them, so define the spaces of campus, that even the nation has committed them to memory, placing the trees on the National Register of Historic Places alongside more typical icons like Old Main and Schwab Auditorium.

Yet all the attention to the grandeur of the elms may not be enough to save them from the cumulative effects of age and disease. In November 1995, in the worst event of its kind since the 1950's, a brutal snowstorm felled 140 trees on campus.

The storm struck so early that many trees still carried their leaves, and the combined weight of ice, snow, and foliage cracked limbs and crotches and, in the case of the elms, sheared whole sections of trees from their trunks. By the next day, beneath a false calm of unspoiled snow, fallen branches stacked so deep that walking was impossible on parts of the Allen Street mall. In some cases the bark was torn open from shearing limbs, exposing the creamy white wood underneath.

Jeff Dice, arborist and supervisor of grounds maintenance for the Penn State Office of Physical Plant, was a member of the University tree crew in 1995. Lanky and broad, his own limbs long, Dice says the damage from the snowstorm could have been much worse, "If all of us hadn't spent the time that we did in those trees," Dice says, "maintaining them to withstand wind and weather, we'd have had a lot more damage done." Dice has spent 12

years in climbing ropes, hard-hatted and booted, harnessed to the elms, and has touched virtually every limb.

Recent threats to the elms are part of a longer history of challenges the trees have faced. In the 1950's, a series of harsh winters caused structural damage similar to that caused by the blizzard of 1995, but the trees were then at their prime age, better able to withstand such buffeting. The stand weathered those years and ran straight into the crisis of Dutch elm disease in the 1970's and 1980's. Fortunately, Dice says, "Penn State had a tradition of fantastic tree people since long before it was cool to have tree people." Dutch elm disease claimed casualties, but a tree program in existence since the 1940's, as well as geographic isolation and a lot of luck, kept the losses to a minimum. The stand persevered, retained its stature on campus, continued to shade the walkways.

What now concerns the arborists, the University Tree Commission, the Office of Physical Plant, and even the President of Penn State is the age of the trees. At over 100 years old, many of the elms stand more than 100 feet tall with branch spreads anywhere from 100 to 150 feet. Any tree of that stature requires significant maintenance. Several elms are overmature, beyond their ideal age, and more susceptible to damage, failure, and structural problems. Although the majority of the trees possess fine forms and a clean bill of health, the few warning signs have caused

*Students and alumni love the Penn State elms.*



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brow-wrinkling for the future, raising the question of what the campus will look like in 50 years.

It is not hard to conceive of what the University Park campus would feel like without elms: walk through East Halls, stroll through the winter winds or baking sun by the Bryce Jordan Center, consider the low trees in those newer quads and spaces. Then, consider that Penn State's elm population, believed to be the largest elm stand left in a country ravaged by Dutch elm disease, rests at a critical juncture, a point where disease and the age of the trees foretell a change in the landscape.

Anyone familiar with Penn State knows the view from Allen Street looking up toward Pattee Library: the elms meet like a cathedral ceiling, and the trunks buttress one of the University's most photogenic assets. With trees, just as much of the plant resides below ground as does above. Imagine inverting those lofty canopies. If asphalt weren't in the way, the trees nearest College Avenue could conceivably have roots under the Corner Room.

"We need to preserve the look for the Mall that is known worldwide," says John Joseph, senior landscape architect with the Office of Physical Plant. Joseph is an affable man, who, like Dice, adopts a graver tone when discussing the future, optimistic about the outcome while concerned about the means. He adjusts his glasses when he considers the ages of the trees. As a landscape architect, his concern for the unique form of the trees and how they define campus fuels his search for a way to insure that alumni 100 years from now will remember the same campus we do.

William G. Waring, Penn State's first landscape architect, planted some of the first trees on Penn State's campus around 1880, when the Allen Street Mall was an access road and the campus consisted merely of a few buildings. Waring sought to reflect the lushness of Pennsylvania's natural landscapes in a place so dependent on the state, and subsequent landscape architects, horticulturists, foresters, and botanists sought to diversify the campus garden as a teaching landscape.

Some of the trees planted in the late 1800's were elms, while additional elms were planted after 1910. Crews planted the elms along the Mall to replace a stand of

## Enemies and Allies of the Elms

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The problems of American elms are fairly well known nationally: few plant diseases can claim the household cachet of Dutch elm disease. Since the introduction of the European elm bark beetle to the United States in the 1930's, its populations have moved swiftly through millions of elms, infecting the trees with fungal spores carried on their bodies. The fungus clogs vascular tissues in portions of the tree, causing wilt-like damage, and eventually moves through the entire tree.

Penn State has dedicated hundreds of people over the years to fighting the disease. As a result, the University Park campus has retained so many more elms than other communities that Penn State now possesses one of the finest stands of American elms in the country. But the disease hasn't been eliminated. A vigorous spray program and routine inspections help to control it, but as the trees age, they develop structural problems that make it easier for the disease to spread. Penn State loses several elm trees each year and, according to Kelleann Foster, a landscape architecture faculty member who chairs the University Tree Commission, Penn State is losing more trees than it's planting.

Researchers have not found a cure for the disease, and preventative measures are expensive both in time and money. According to Jeff Dice, supervisor of grounds maintenance for the Office of Physical Plant, the elms are a disproportionately expensive tree. "I have 11,000 trees on my inventory," he says, "and 300 of them are elms, and a four man tree crew spends 42 percent of their time working on them."

Replacement trees constitute another major expense. American elms are now rare, so Penn State must either purchase healthy and expensive replacements from nurseries, or else raise the trees from cuttings in University greenhouses. Recently, two plant geneticists at the U.S. Department of Agriculture, Alden Townsend, '64 For, and Lawrence Schreiber, developed and introduced two disease-resistant strains, or cultivars, of American elm named New Harmony and Valley Forge. One of the cultivars came from an elm tree in Ohio that seemed to be the only survivor of elm disease in its region. The University owns cuttings of both varieties and Larry Kuhns '68 Agr, professor of horticulture and a member of the University Tree Commission, is growing them but the saplings are not yet old enough to transplant.

"No one has seen these trees at maturity," says John Joseph senior landscape architect with the Office of Physical Plant. "We have tried to go see the parent tree, but it is now gone, so no one really has an idea of what they will look like. We have tried other trees in the past, trees touted as the solution, but they were the *Zelkova serrata* or European Siberian elms, and the results just weren't the same. None had the graceful, open canopy of the American elm. We have more confidence in the aesthetics since these new trees are actually varieties of American elm, but we still don't know what to expect for sure in the long term."



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dying maples. The elms along the Old Main and Pugh Street malls are the best known, but elms also can be found near the power plant along Burrowes Road, near the Nittany Lion Shrine, next to University House, between the HUB lawn and College Avenue, and near North Halls, among other settings. Two of the most photogenic elms frame the front of Old Main.

The trees planted before the turn of the century are approaching the end of their life cycle, and until recently, there were no younger trees grown to replace them. Arborists and landscape architects use the term "pathological rotation" to refer to the time a population of plants takes to go through its life cycle. In a natural forest, when a group of a species approaches the end of its rotation, younger generations succeed the older trees. In most parts of an urban forest, successive generations rely on planning for tree planting.

In order to assure a canopy on the Allen Street Mall for posterity, the University Tree Commission has enacted a block replacement strategy in what is referred to as the Elm Management Area. The Elm Management Area covers the space from Burrowes Road to the Pugh Street Mall, and from Pattee Library to College Avenue, the space where the elms are felt to be integral to campus identity. Any elm lost in that area is replaced with another American elm, while elms lost in other areas of the campus are replaced by lower-maintenance shade landscape trees such as oak, ash, hickory. When replacing elm trees lost to damage or disease, the University replants designated areas with blocks of trees all of the same age. According to Joseph, the University expects to plant a block including six to 12 elms every five or six years, and it will remove trees that have incurred sufficient damage or that pose safety threats due to weakening structure or other factors.

"Of course, we're not going to be rigid about it," Joseph says. "If, once five years pass, there has not been enough damage or disease threat to warrant cutting down a block of trees to replace them, then we won't. Sort of, 'If it ain't broke, we won't fix it.'"

Some block replacements have already occurred. The group of American elms in

front of Schwab and Willard resulted from a class gift in 1986 and later, in 1994, a block was replaced near the obelisk between Willard and the north end of Sackett. In the past, American elms would be replaced with similar American elms, but today more disease-resistant elm cultivars are becoming available.

The tree crew frequently attracts spectators drawn by the smell of sawdust and the noise of engines and chippers and saws, the layperson's thrill at watching a tree climber stroll out along the airy branches, the sway of a branch being lowered to the ground. "We often get people wanting to know why a tree is coming down, or why branches have to come off, and the crew tries to explain the needs of the trees," Dice says. "And once explained, people are satisfied that we're helping the trees." Many people assume the workers in the trees and on the ground are the only judges of the fate of the trees, but with a resource as sensitive as the elms, the network of people is much more far-reaching. The work on the elms involves the President's Office, the University Tree Commission, the Office of Physical Plant, and the Borough of State College.

In 1996, the class of graduating seniors chose to give an endowment to the University that would provide money toward the preservation of the elm trees. The interest in the elms spurred a record turnout of students (1,350) to vote on the class gift. The result totals more than \$125,000. "The endowment brings a great sense of well-being, that students thought to endow the program to maintain the trees," says Dice. "In a time of thinning budgets, it's good to have some future security for the elms." Dice understands the importance of the elms to the campus and their status as virtual trademarks, botanical ambassadors, one of the last stands of elms in the country, and he wants to preserve it.

"For those trees that inevitably have to go for safety reasons, we will mourn their loss," says Dice. "But what is so important about the endowment is that it allows us to get under way on starting new generations, to assure a long presence of elms at Penn State." Joseph, like Dice, appreciates the students' involvement. "The students' endowment and cooperation are such posi-

tive motions that they will have a big impact on the future of this place. I just hope that spirit carries into other areas, where we'll have bigger decisions to make. For instance, and I know this won't be popular, but we should start thinking about what kind of damage is done to the roots of those trees during the traffic of the Central Pennsylvania Festival of The Arts, when vendors set up under the trees, and the soil is so compacted we've had to aerate three times to get it to an acceptable consistency. We need to think about being more careful with construction, with how we build near the trees. Things look so good now, so we have to concentrate on doing all we can."

On a cool day this June, a handful of men in ties meet by the obelisk near Willard Building to discuss placement of concession booths during the Central Pennsylvania Festival of the Arts. As one man outlines the dimensions of the booths in hot pink surveyor's string, Dice stands in the shade of the elms north of Sackett and nods to himself. People from Housing and Food Services want to move the booths to an area away from elm surface roots so that none of the trees will be damaged. For the meeting, they step into the shade of the trees they are trying to protect. The entire discussion takes about five minutes with some handshaking and a note or two jotted down, but the result of those five minutes is cooperation on small matters to protect the longevity of Penn State's resources. Dice's version of the history of the elms is full of those moments, and that cooperation is something he hopes to foster so that there will always be a high clutter in the canopy of the elms on still morning.

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