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HARVARD MAGAZINE

EIGHTY YEARS AGO, A PLAGUE OF LEOPARD MOTHS KILLED THE TREES IN HARVARD YARD. A MAJOR REFORESTATION ENSUED, IN CONTROVERSY. THANKS TO DUTCH ELM DISEASE, THE NUMBER'S UP FOR THOSE TREES, TOO. PLANTERS ARE AT WORK AGAIN. THE DEMISE OF THE TREES SHOULD NOT SURPRISE US.

HARVARD MAGAZINE

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ON THE COVER

New, little trees appear everywhere in Harvard Yard in a major replanting necessitated by the customer at left, the vector of Dutch elm disease. For more of the beetle and his work, for an account of the master rebeautification plan, for historical perspective, for cautionary notes, please see page 46.

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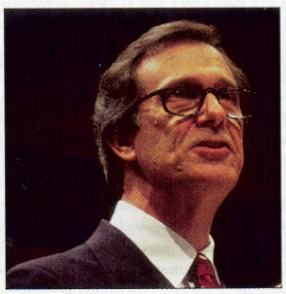


The president: page 39.

Rocker: page 54.

Opposite: Portrait of a serial killer, the European elm bark beetle, vector of Dutch elm disease. *Scolytus multistriatus* is in life about an eighth of an inch long. For a note on how this image was made, please see page 4.

Lessons from the current plague.

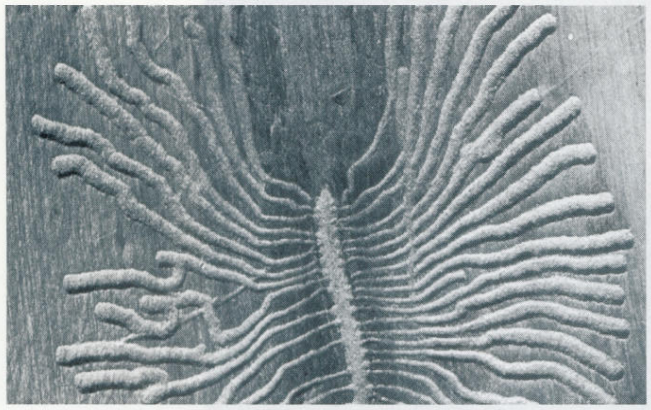
EVERY TREE DOOMED

by JONATHAN SHAW

The year was 1910, and the *Boston Transcript* carried the news. "DYING HARVARD ELMS," ran the headline. "EVERY TREE IN THE YARD SEEMS DOOMED." A similar alarm might have been raised in the 1950s when Dutch elm disease (DED) reached Cambridge after racing up the East Coast. Three plagues have descended on the elms of Harvard Yard: cankerworms ate them in the 1840s, leopard-moth caterpillars got them in 1910, and now, after forty years of slow, inexorable losses, the remaining aging elms are succumbing to DED. The days of an elm monoculture in Harvard Yard are over, but an award-winning master plan calls for a new tree canopy that draws strength from diversity.

Traditionally, the Yard has been the domain of American elms, fast-growing trees that are easily transplanted and tolerant of urban conditions. Indeed, to a lover of trees, the American elm is a monarch among plebes. The Romans sang the praises of its cousin *Ulmus campestris* over a thousand years ago. No other tree combines the soaring height, the graceful, bifurcating branches, and characteristic vaselike silhouette of the American elm. "It is an architectural beauty, a splendor of line and form," Berton Roueché once wrote in *The New Yorker.* "Elm shade is . . . an exquisite dapple of airy light and shifting shadow." Though not all the elms in the Yard are American elms, venerable *Ulmus americana* has for years defined the character of the Harvard landscape. But like most classical heroes, the elm possesses a tragic flaw. Delicious to insects, it is also highly susceptible to disease. "DED has effectively ended the usefulness of the American elm as a landscape plant," says Peter Del Tredici, assistant director for living collections at Harvard's Arnold Arboretum, "but as a species, it is not going extinct. Young trees still grow in the wild and reproduce successfully, but they rarely reach maturity. DED has effectively lowered the median age of the elm population."

An American elm has likely grown in Harvard Yard as long as there has been a "colledge in Cambridge." The earliest authentic drawing of the Yard, the Burgis view of 1726, shows a single mature tree towering over Massachusetts Hall, with elm-like root flares and initial branching above the third-story roof line. By 1767 another view shows a second tree behind Harvard and Hollis halls, one that became known as the Class Day Elm. Such was the affection felt for this tree, reports Hamilton Vaughan Bail in his *Views of Harvard,* that when it finally died in the leopard-moth blight of 1909, it was "trimmed down,



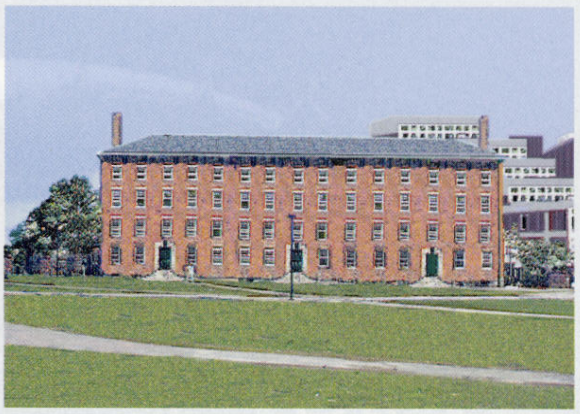
R. L. COFFIN, DEPARTMENT OF PLANT PATHOLOGY, UNIVERSITY OF MASSACHUSETTS AT AMHERST

Left: Galleries made by larvae of the European elm bark beetle under the bark of an American elm. Beetles emerge to feed just as the first leaves open, carrying spores of the fungus that causes Dutch elm disease to healthy trees.

EDWARD SELING, SEM LAB, MUSEUM OF COMPARATIVE ZOOLOGY

HARVARD UNIVERSITY ARCHIVES

Holworthy Hall, 1914. A moth killed the trees.



KRISTINA HILL AND DAVID RUBIN

Holworthy Hall, 1989. Post-DED removals imagined.

Worst-case Scenarios

David Rubin and Kristina Hill, both M.L.A. '90, were using the Yard as a living collection in 1989, to help them learn their plant species, when they noticed a facilities-maintenance crew removing a diseased elm. What would happen, they wondered, when all the elms died and had to be replaced?

Tom Vautin, then director of Facilities Management, offered to pay for a study of the visual impact the decline of the elm trees would have on Harvard's main campus. "In the fall of 1989," writes Rubin, "Kristina and I began photographing significant views of the campus while the leaves were off the trees. This allowed us to see through them to the historic architecture beyond. These slides were then digitized at the Graduate School of Design so that the images could be manipulated on my Macintosh. Using these images, Kristina and I removed particular trees or, in some cases, all of the trees, simulating a worst-case scenario."

The results are dramatic (above, right). "The Yard looked like a penitentiary," said Rubin. Hill thought it looked "like a military parade ground. The buildings are not great architecture," she says. "The grandeur of the space comes from the planes, a plane of grass below, and the plane of the tree canopy above."

Their computer study went on to simulate replacement of the elms with other kinds of trees, demonstrating that new trees should be generously sized, need to be "limbed-up," and should be planted amid older trees to create a canopy of diversified age. —*J.S.*

stripped of its bark and painted with a wood preservative in the hope that some vestige might be kept for future generations." The effort was in vain.

The first gift of trees to Harvard seems to have come from Joseph Barrell, Esq., in 1798. Barrell—whose estate in nearby Charlestown (in an area that is now Somerville) included "winding avenues of elms and poplars"—probably donated the row of poplars seen in early nineteenth-century views of the Yard. Then in 1815, around the time builders completed Holworthy and University halls, the Corporation "authorized and requested" President Kirkland "to plant trees in the college grounds between the colleges." Eight years later Harvard spent $467.51 on labor and more trees. Either these early trees didn't thrive or the Corporation loved them so much that in 1830 the body "voted that the President be authorized to cause a number of elm trees to be put in the college grounds at an expense not exceeding 150 dollars."

After all this planting, the Yard was flush with elms. In 1843 Professor Henry Wadsworth Longfellow asked for and was given "some elm trees from the college yard to be placed in front of Craigie House," his recently acquired home. The sympathies of the former owner, Mrs. Craigie, had not been with the ancient elms that grew around her house but with the cankerworms infesting them. A visitor, shocked to see the creatures hanging in "little writhing festoons from the white turban on her head" and fastened to her dress, asked why she didn't kill them. Her reply: "Young man, have not our fellow worms as good a right to live as we?" Soon after this incident, cankerworms attacked the trees of Harvard Yard itself. President Everett consulted Professor Asa Gray, then in charge of the Harvard Botanic Garden, and a program of pruning apparently kept the invader in check.

Cankerworms are the larvae of a moth, and the infestation of the 1840s was a forerunner of the leopard-moth plague that would destroy the Yard's elms between 1909 and 1914. A *Boston Transcript* article of 1910 accused Walter Burke, then director of Harvard's department of grounds and buildings, of sitting on his hands. Burke first discovered yellow caterpillars with tiny brown spots in the Yard in 1909. Rapid identification of the pests as leopard-moth larvae was little help, since no known insecticide would kill the moths and their larvae. Cutting infected limbs off the trees seemed the only effective method of control. Burke balked at the idea, arguing that there would be nothing left of the trees. Professor Charles Sargent, director of the Arnold Arboretum, predicted that every tree in the Yard would be dead within five

American elm: Mrs. Craigie did not sympathize.

years. By 1914 all but eight or ten middle-sized elms in the Yard had died.

During the fall of 1913 and into the spring of 1914, readers bombarded the *Alumni Bulletin* with letters arguing for and against the replanting of elms in the Yard (for this and a poet's viewpoint, see "The College Pump," page 120). Some urged the use of a variety of species, mentioning maple, linden, ash, oak, and Lombardy poplar. Cut down the elms, wrote one alumnus. Others felt that oaks were not academic enough, that Lombardy poplars were not hardy enough. Plant young elms, and cut the old to the ground, wrote another. Several alumni debated the ideal size for planting. Grounds and Buildings director Burke gave some sage advice in an unpublished administrative report: "Groves should always be planted with several varieties of trees." But his warnings about the threat that imported pests can pose to a monoculture of native trees went unheeded. Sentiment prevailed over better judgment, and when Professor R. T. Fisher of the forestry department made his report to the president in 1915, elms had won the day.

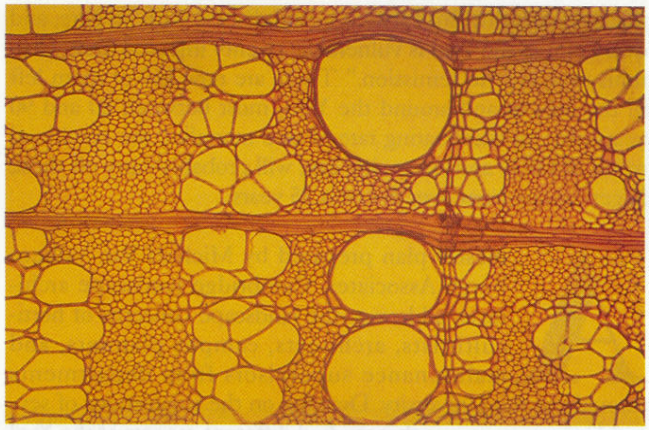
Red oak: insufficiently academic?

To prevent future moth attacks on the new elm trees, a Boston city arborist agreed to train a leopard-moth scout. "A capable man," wrote Fisher, "even by the laborious method of hand extraction, and with the handicap of much difficult climbing, should be able to keep the leopard moths in the Yard reduced to negligible numbers." In the scout's first two and a half months on the job, "five thousand leopard-moth larvae were taken out of trees and shrubs on the University grounds in Cambridge," wrote Fisher.

Just four years later in Holland, elms began mysteriously wilting and yellowing. Within two years, a Dutch scientist suggested the problem's source; a fungal infection of the trees' vascular system, probably with origins in Asia, was preventing water from reaching the crown. By 1922 a Utrecht graduate student had isolated the new fungus in a lab, and the bearers of the bad tidings were stuck permanently with the name: Dutch elm disease.

DED is caused by a fast-spreading fungus that first reached the United States in 1930 on elm logs imported from Europe. The fungus grows in living elms as a parasite but also thrives in

STU ROSNER



P. BARRY TOMLINSON / BAILEY-WETMORE WOOD COLLECTION, H.U. HERBARIA

Elms move water and nutrients through a relatively few large, long xylem vessels (above), located just beneath the bark. Feeding beetles easily wound this vascular system.

dead wood as a saprophyte, spreading from tree to tree with the aid of feeding and breeding bark beetles. Where elms grow in groves, the fungus can travel underground between trees by way of intersecting root systems. Measures taken to control its spread from the Newark, New Jersey, area in 1933 proved fruitless. In Massachusetts the state offered a reward to the first person to spot the disease. But by the late 1940s thousands of Massachusetts trees were infected, and by 1952, when DED reached Harvard Yard, it had affected 420,000 American elms in the United States. To date, at least fifty million elms across the country have died from DED.

Early efforts to fight the disease at Harvard focused on controlling its two vectors, the European and American elm bark beetles. "Officials still believe that only a small proportion of the University's seven hundred elms in Cambridge will be lost," stated a University press release in 1952. Thirty years later, only 252 elms remained on the campus in Cambridge. The pages of this magazine have contained a litany of "elm obituaries," beginning in the fifties and continuing into the early seventies, when efforts to control DED shifted toward control of the fungus itself.

Tuliptree: Up-and-comer in the Yard.

"The fungus acts by inhibiting the flow of water and nutrients through the tree's vessels," says the Arnold Arboretum's Peter Del Tredici. "When the trees are younger, the vessel diameter is greater. As the tree ages, vessel diameter shrinks, and the vascular system becomes more susceptible to clogging."

Since 1979, when Harvard began keeping detailed records of its trees, only about "16 percent of the Yard elms have succumbed to DED, compared with 80 percent of the elms in contiguous Cambridge," says Arthur Costonis, a plant pathologist who has prescribed a regimen of care for the trees since that time. Sanitation (pruning of diseased limbs), injections of fungicide administered by tapping quarter-inch capsules into the trees (a prophylactic method known as the Mauget system), fertilization, and pest control all play a part in keeping

Left: Peter Del Tredici, assistant director for living collections at the Arnold Arboretum. A grove of American elms at the arboretum all died of Dutch elm disease but for a single specimen of the cultivar "Princeton" planted in 1935, shown behind him. Originally selected for resistance to elm leaf beetle, it also shows high resistance to DED.

the trees healthy. But DED is a fatal disease with no cure, and every elm in the Yard is vulnerable; twenty infected trees, Costonis says, are "in remission." There are now 160 of them left in the area in and around the Yard, most between 80 and 90 years old. An accelerating rate of tree mortality, the combined result of DED and advancing age, will probably carry off these larger canopy trees over the next 25 years.

A master plan prepared by Michael Van Valkenburgh Associates, Cambridge landscape architects, addresses the landscape concerns of horticulturists, architects, campus planners, and maintenance supervisors from departments throughout the University. Drawing on the suggestions of several University groups that studied different aspects of the Yard landscape, "the plan provides a set of guidelines for coordinating their work," says Harvard Planning Group (HPG) project manager Sara Oseasohn. Two important projects now incorporated into the plan were a list of trees that the Harvard Yard Tree Committee chose as suitable for Yard planting, and a traffic study commissioned in anticipation of Memorial Hall's conversion to a freshman dining area. Most striking among the plan's features are recommendations to plant 250 new trees over the next five years and to remove foundation plantings—shrubs growing around the bases of buildings—from the main spaces of the Yard.

"The task at hand," says Michael Van Valkenburgh, chairman of the landscape architecture department of the Graduate School of Design (GSD), "is that we've been asked to tinker with a masterpiece. We're going to be stitching [the Yard landscape] back together in a way that is going to be quiet and powerful and very inspiring, but not more than that." Bits of history have been recreated and embedded in the master plan, says Van Valkenburgh, and yet it is not a historical plan, but one "truly contemporary in its diversity." The elm monoculture of yesterday's Yard was beloved of many, but planting a variety of trees from across the country and around the world will greatly reduce the likelihood that a single flood, famine, or plague could destroy all the trees at once, ever again. As in the student body, there is strength in diversity.

Phase one of the project began this spring with the planting of 68 trees in the Old Yard and Tercentenary Theatre, ranging from 3.5 to twelve inches in trunk diameter and from fifteen to forty feet in height. Funded by the President's Office, the initial phase has a projected budget of $239,000 to cover the cost of the trees, their transportation from New Jersey nurseries, planting, and follow-up care. The entire replanting will cost $1.5 million over the next five years. As funds become available, Harvard will implement subsequent phases of the master plan, says HPG director Kathy Spiegelman. Of the master plan's many recommendations, "Harvard is making planting the priority," says Van Valkenburgh. "I think it's the right choice, and it's definitely where they're going to make the investment in the beginning. Let's not wait any longer."

There is some urgency to the planting, as tree removals have left major gaps in the Yard's tree canopy over the last few years. Looking upward in the North Yard, bounded by Stoughton, Holworthy, and Thayer halls, blue sky predominates. To a certain degree, this window on the firmament is a happy coincidence, says Philip Parsons, Faculty of Arts and Sciences director of planning. Renovations in progress have wrapped Holworthy in canvas sheets; the absence of trees has allowed for the laying

JIM HARRISON

Michael Van Valkenburgh with the master landscape plan of the Yard. It calls for the planting of 250 new trees during the next five years and for the removal of foundation plantings from the Yard's main spaces.

of a temporary tarmac service area that facilitates the work of construction crews. When renovators finish their work, Harvard will plant new trees.

Several tree committee members say that Harvard should have acted sooner to replace the dying trees. Over the last twenty years, Facilities Maintenance Department (FMD) crews removed many large specimens, victims of disease, storms, and the usual campus wear and tear. Few were replaced. Building renovations had a higher priority.

Until now, "there's been no consistent overall plan for managing the Yard," says Del Tredici. "Nobody was in charge of it. Even [FMD grounds manager] Bernie Keohan didn't know everything. One day he'd be walking through the Yard, and suddenly he'd notice a new tree had been planted." The problem has historical roots; the Yard has traditionally been common property. An oft-repeated anecdote asserts that the Boylston professor of rhetoric and oratory still retains his cow-grazing rights to the Yard; Harvard archives finds no factual basis for this legend, but the sentiment that the Yard belongs to everybody has survived to the modern age. Says Del Tredici, "Certain individuals just felt it was their turf and took it upon themselves to plant trees. That's the part that really had to stop." Harvard officials declared a moratorium on planting in the Yard as Del Tredici and other members of the Harvard

Yard Tree Committee developed a list of species suitable for the urban space.

"One of the problems, I think, from a philosophical point of view, is that people judge plants not on their own merits but on how they compare to the American elm," muses Del Tredici. Like honey locust and certain species of oak, the elm is a canopy tree that forms a high, rooflike layer of leaves when competing for light in closely planted groves. Often the columnar trunk of a canopy tree will rise thirty feet before initial branching. In the Yard, elms created a vaulted, cathedral-like ceiling that gave the space a cloistered grandeur. Its high-branched habit has allowed generations of Yardlings to see beneath the tree limbs clear from the Holworthy steps south to Grays Hall. "Being able to get a sense of distance looking under trees with filtered light is one of the great visual delights in life," says Parsons.

Skirting the impossible task of finding a substitute for the matchless elm, Del Tredici, Van Valkenburgh, and the commit-

Who's next? The Dogwood? The Hemlock?

"A healthy tree is a meal, an ecological niche waiting to be filled," says Peter Del Tredici, assistant director for living collections at the Arnold Arboretum. This is basic biology; it should not surprise us. But when a new pest or disease destroys a majestic native that defines the American landscape, it nevertheless saddens us. Imported fungal diseases have destroyed two of America's most magnificent trees. The once-ubiquitous American elm, whose lofty canopy shaded many a Main Street, is such a tree. The American chestnut is another.

The elm will not become extinct. A few select disease-resistant cultivars are being grown, several of which may even be planted in the Yard if suitably sized specimens can be found. Del Tredici points out that "there is a tense dynamic between a host and a predator. It's not in the predator's interest to kill the host, so there is strong evolutionary pressure against being heavily pathogenic. Evolution punishes that track rather severely."

Take the case of the American chestnut. The tree and the fungus "seem to have reached a kind of stasis," says Del Tredici. The chestnut blight, caused by an airborne fungus that appeared in this country around 1900, killed nearly every American chestnut to the ground. "Chestnuts are continuing to sprout from the base and [the tree] is in the process of becoming a shrub," Del Tredici says.

BETTMANN ARCHIVE

The American chestnut as shown in this undated engraving no longer exists. The blight has turned a tree into a shrub.

American dogwoods are currently being attacked by a fungal disease of their own. Like the elm, older specimens seem to be most vulnerable, and Asian varieties are relatively resistant to the disease.

Not only fungi but insects, bacteria, and a recently discovered class of mycoplasmal-like organism (dubbed MLO's) depend on certain plants for their survival. The smallest known living cells, MLO's are responsible for the ash dieback that has affected many of the trees in the Northeast over the last fifteen years. At the Arnold Arboretum, where MLO's made significant inroads into the lilac collection, staff members had to destroy huge numbers of plants in order to stop the disease's spread. The same MLO that affects lilacs is suspected of attacking ash trees. "We've lost a lot of our ash collection as well," says Del Tredici. "Shrubs I don't mind ripping out and replacing, but the trees are much more difficult to deal with."

"Birch trees also have insect problems—the bronze birch borer and a leaf miner, for example. We lost seventeen birches [at the arboretum] this year," says Del Tredici, who also points out that last summer was very dry; birches like moisture. Pests and diseases often affect trees that are otherwise weakened.

The latest menace on the scene threatens hemlocks. A woolly adelgid that wipes out entire stands of hemlock "appeared rather suddenly," says Del Tredici. Nobody knows where it came from or how it got into the country. The adelgid, an aphid, "arrived in the Mid-Atlantic region about twelve years ago and has been moving northward at an alarming rate," finally arriving in Massachusetts over the last couple of years, according to Del Tredici.

Intercontinental trade on a massive scale has played a role in the demise of several native trees, but could other factors be at work? Del Tredici points to the use of salt in urban environments. "The advent of the automobile in a massive way, starting in the thirties, has resulted in tremendous amounts of salt pollution, and trees tend to be relatively sensitive to it. Salt creates an osmotic stress that makes it harder for trees to pick up nutrients. Then they become susceptible to many diseases. Maybe acid rain results in dieback. There's no one single cause to many of the problems we see," Del Tredici says.

Overplanting of certain species in urban environments also aids the spread of pests and diseases. Many oaks are being planted as part of the master plan, but within the oaks, explains Del Tredici, "there is a diversity of species, and each species behaves differently; so if you get a disease in one, it doesn't necessarily affect the other species." Del Tredici's one concern in the Yard is honey locusts. "Honey locusts are the best choice for replacing the American elm. They're the same size, they have the same growth habit, but they're all one species, *Gleditsia triacanthos;* so if a disease comes along that the honey locust is susceptible to—and there are some indications in the South that massive plantings are succumbing to disease—honey locust trees are vulnerable," says Del Tredici. Consequently, only six honey locusts went in with the most recent planting. —*J.S.*

tee came up with a list of appropriate species that could tolerate the Yard's urban conditions and, with judicious pruning of their lower branches, create an elmlike appearance. Dense, low-branched trees like little-leaf lindens were disqualified. "In the Yard they would look like little lollipops," says Del Tredici. As primary canopy trees, the planners chose red maple, honey locust, tuliptree, swamp white oak, scarlet oak, pin oak, red oak, and Japanese pagoda-tree (also known as the Scholar's Tree). The master plan designates some species as "secondary canopy trees" insofar as they "possess some characteristic that causes maintenance problems, are slow-growing, are difficult to transplant, or are hard to locate in nurseries." The committee chose as secondary canopy trees sugar maple, Kentucky coffee tree, cucumbertree magnolia, willow oak, and hybrid hackberry. "Periphery trees," including river birch, katsura-tree, yellowwood, European beech, ginkgo, European larch, sweetgum, tupelo, pendant silver linden, lace bark elm (a Chinese elm resistant to DED), and zelkova will be used near buildings or around the edges of the Yard to lower the canopy.

Honey locust

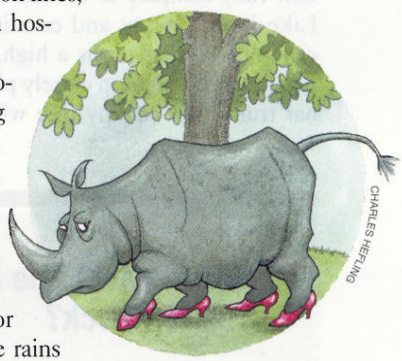
"When you make this kind of commitment to diversity," notes Van Valkenburgh, "you have a broader range of sensitivities to microclimate." Therefore, he has positioned tree species within the Yard according to their specific tolerances. In locations with poor drainage, he has placed trees that grow well in wet soil. "The Old Yard, for example, drains toward the middle and the south [an area in front of Weld Hall]," he says, "so there we're planting trees such as tupelo that naturally occur in river bottoms and areas where soils are saturated.

"We didn't lose sight of the more traditional visual factors," Van Valkenburgh adds. Fall color, the presence and timing of flowers, and canopy density all played a part in the selection process. "Pin oak and honey locust have the benefits of having slightly lighter canopies," he says. "The honey locust is a finely cut leaf and the pin oak is a deeply cut leaf, and so light gets through and grass will thrive under those trees when they're mature."

Honey locusts figure prominently in Tercentenary Theatre, where two new trees have joined the existing grove at the center of the space. The honey locusts, says Van Valkenburgh, create "that filtered light in the center, which is very magical to see at graduation—a dappled light."

Toughness complements beauty in an urban space like the Yard, particularly at Commencement. Nobody knows that better than Thomas Perry '47, Ph.D. '52, professor of forestry emeritus at North Carolina State University. His lecture, "101 Ways to Kill a Tree," is well known among arborists. "The two main tree-killers in the Yard are soil compaction and rototilling to plant grass," says Perry. In fact, the master plan includes a number of Commencement photographs revealing the stamp that ten thousand marching feet of Harvard can leave behind in Tercentenary Theatre. Over the course of Commencement Day, the morning's grassy lanes among the chairs devolve into packed dirt, then into footpaths by afternoon. The photographs "really speak to the abuse the trees have to survive," says Van Valkenburgh.

Compacted soil reduces the amount of oxygen that reaches tree roots and can leave trees with a lasting hangover. "It's pounds per square inch that count, and a woman's high heel or a chicken's foot causes more compaction than a bulldozer," says Perry. "Misconceptions about the structure and function of tree roots abound. Why else would the City of New Orleans keep a rhinoceros caged above the root system of its symbolic Centennial Oak?" Soil compaction and rototilling aren't the only problems that Perry cites in the Yard: "Throw in de-icing salt and continuing construction activities for water, sewer, cable, gas, telephone, electricity, and irrigation lines," and the Yard starts to become a hostile environment for a tree.



Than which nothing could be worse.

Grounds manager Bernie Keohan, whose full-time job is looking out for the Harvard landscape, tries to mediate the onslaught. He uses a minimum amount of salt and, when conditions demand its use, puts baffles on his trucks to prevent it from spraying out into the shrubs or onto the lawns. Then when the rains come or the snow melts, Keohan says, the salt goes down the drains. Some soil compaction is inevitable. "We landscape architects see landscape as a place for living," says Van Valkenburgh. "If the Yard isn't full of people, what's the Yard? If you don't have graduation in the Yard, well, who cares if we have [June-blooming] yellowwoods there particularly? There wouldn't be anybody there to appreciate them." Commencement will go on, and soil compaction with it. Keohan admits to some rototilling, primarily in the top two to three inches of soil adjacent to the walks, which are badly worn at the end of winter. Grounds crews also use aerators on compacted soil, but "we keep away from the trees as much as we can," Keohan says.

As a member of the Landscape Advisory Committee—which, as part of its work, took a walk through the Yard to decide which trees to remove in preparation for the spring planting—Keohan was a strong advocate for the trees. In the end, only five went down: three diseased elms, an injured oak, and a dying sugar maple. He tells the story of one elm and a sewer-project trenching that was to cut its roots, necessitating its removal. "Big, beautiful tree," says Keohan, who favored running the trench away from the tree. "After a lot of discussion we took a vote, and it was six to one in favor of removing the tree. I accused one of them of being Jack Kevorkian," he jokes. After a lot of discussion, the committee decided to leave the tree. "As we walked along and people were quiet, I turned around and I looked at the tree and I said, 'You owe me one. Saved your life for another couple of years.'" Keohan smiles. "People all have their own ideas, but in the final analysis we're all looking for the same thing: what's in the best interest of the University. That's the bottom line."

Keohan's grounds crews will play a crucial role in the care of the trees. A long-term program of management will follow careful selection of high-branched specimens in the nursery. "By incrementally removing the lower branches of the newly planted trees," writes Van Valkenburgh in the master plan, "the evolving canopy can be gradually established to create a grove similar in form to that of a planting of American elms."

A high-branched canopy is particularly important in the Old Yard, but Van Valkenburgh uses trees with varying effects in mind throughout the plan, which considers not only the space enclosed by the wrought-iron fence encircling the Yard but also the Memorial Hall and Science Center area, as well as Quincy

Pin oak

and Prescott streets. "We really wanted to develop a vernacular for the whole area, because this has become part of the Yard now," says Philip Parsons. With the addition of Werner Otto Hall to the Fogg Art Museum and the upcoming conversion of the Freshman Union to a humanities center, Prescott Street has become less a service street and more a front street, he says.

In the Old Yard, landscape contractors Hartney/Greymont have planted trees in four existing rows stretching from north to south between Holworthy and Grays Hall. "A fifth row at the east side [in front of Thayer and Weld] is outside of the perimeter walk and is interrupted by the placement of University Hall," says the master plan. "The distance between each of the rows is not the same, and the individual trees in each row are not at regular intervals. This placement of the trees adds a sense of casual design that is highly contrived." An inherent advantage of this design is that if a tree starts dying or needs to be removed, the uneven spacing within the rows will allow planting of a replacement tree near the original specimen without destroying the overall look of the grove. At the request of the Cambridge Historical Commission, white pines were added to the plan to "recall the primeval forests of New England," says Van Valkenburgh, though their historical use was to screen the college privies (see "Vanished Monuments, Part I: University Minor and the Problematic Pine," by Mason Hammond, *Harvard Magazine*, November-December 1988, page 96). He has placed the pines and a few deciduous trees outside the rows, describing them as "renegades in the overall system. I didn't want to come back in forty years and find all the trees in rows," Van Valkenburgh adds.

Perhaps the most striking change in the Old Yard has been the removal of the foundation plantings, which from a preservationist's point of view were historically inaccurate. Their removal has revealed what the plan calls "the unencumbered beauty of the building mass resting on the ground." Says Parsons, "The problem with the foundation plantings is that they obscure how the buildings hit the ground, and these buildings hit the ground hard. And if, really, architects had wanted buildings to be shorter, they would have designed them that way." Parsons feels that foundation plantings are very important for the interstitial spaces at the periphery of the Yard, like the area between Wigglesworth and Widener, which is more intimate and gardenlike. Areas at the Yard perimeter still need a lot of work. But in the main areas, foundation plantings "tend to trivialize the space," Parsons says. "Van Valkenburgh has a vision of the Yard that is very simple. It accords very much with my notion of the unpretentiousness of the space."

The planting of tulip trees between Johnston Gate and the John Harvard statue is the "most formal gesture" in the plan, as Parsons sees it. The positioning of the new trees will strengthen an existing sight line along what was once a cart path, creating a subtle visual allée that is difficult to pick out from any of the four corners of the Old Yard.

JIM HARRISON

Bernie Keohan confers with a workman as a tuliptree goes into the ground.

In Tercentenary Theatre, the part of the Yard bounded by Widener Library and Memorial Church, Van Valkenburgh arranged the trees in a pattern that will not become apparent until this fall. A rectangular perimeter of red maples hems an irregular placement of honey locusts at the center of the space. In autumn, when the leaves turn, "the yellows of the honey locusts will be framed by the spectacular scarlet foliage of the red maples," according to the master plan. At Del Tredici's suggestion, Van Valkenburgh also placed June-blooming yellowwoods within the grove and near the Widener steps to add interest during Commencement Week.

Harvard has postponed most of the planting in Sever Quadrangle, another part of phase one, until work there on a sewer project has been completed. Contractors will eventually plant new trees at the periphery of the space, avoiding blocking the view of the Fogg Museum. The museum lies outside the Yard fence, but Van Valkenburgh doesn't want to compromise its role as a defining part of the quadrangle.

Just a few days before the spring replanting of the Old Yard and Tercentenary Theatre, construction crews behind Grays Hall piled heavy steel pipes at the foot of several trees, one an enormous old oak. Snow-fencing had been erected around one of the smaller specimens, presumably to protect it, but construction crews mistook the space for a storage area. "That can kill a tree," notes one person close to the project. Van Valkenburgh would like to see Harvard establish an endowment for the Yard canopy, and a full-time arborist to care for the trees. "I hope we don't ever reach the time again where we've made the mistake of waiting," he says. "Harvard, for all its wisdom about investment, is now deepening its understanding that the landscape is another kind of investment, and you can't just decide one day you want to buy it back. Benign neglect is the worst enemy of landscape, because trees eventually will die."

Van Valkenburgh muses on the role of trees in the landscape: "The buildings have been restored to their period in their architectural detailing—colonial, neoclassical, and Victorian—but the trees are the timeless elements that link it all together," he says. Parsons sees tree planting as an altruistic act. "Planting trees is such a gesture toward the future, I think. That's why this project appeals to me. It's really an affirmation of your confidence in the institution when you plant trees. When you see a tree cut down or dying, it's the end of somebody else's dream of a very long time ago. That's what's so moving about it. Somebody just the other day was pointing out a tree that she remembered her father planting when she was a child. [Trees] measure time, so this is a very powerful act, this replanting of Harvard Yard." ▽

Jonathan Shaw '89 is production editor of this magazine. For more about him, please see page 4.