



Our guide David Funderburk treads ever so lightly through unseen wonders.

Of dog hobble, sow
bugs, papaw,
bloodroot, blaspheme-
vine and other . . .

SECRETS OF THE FOREST

The path is wide, clearly marked and laid out to favor the forest's prettiest views. David Funderburk can't bring himself to stay on it. He veers left and heads through the dappled sunlight into a gully, stepping as lightly as he can. An ecologist, Funderburk knows that human footprints mashed into the floor of these Georgia woods could subtly damage them for decades. He drops to his knees and carefully digs a hole in the leaf litter.

Soon he reveals a tiny plant, shorter than his index finger, hardly thicker than a hair and topped with four still-enfolded leaves, each about an eighth of an inch long. The pale stem almost disappears in his pale palm. "This little thing is a perennial called rue anemone," he says softly. "I found it here in 1966. I visit it. I take pictures of it. It's amazing that nothing has happened to it in all that time. It's sort of my secret."

Back on the path, 100 yards up the slope, he veers off again, pushing aside a tangle of catbrier known as blaspheme-vine, "because that's what you do when you run into it." This time his digging reveals a gorgeous clump of leathery, purple-flecked flowers that emit a spicy, head-clearing smell as he breaks them open—wild ginger. "Some people call these little brown jugs, because that's what they look like before they open, or piggies, because after they open they look a little like a pig's snout. You can boil the root to make a gingery drink." He turns away and before long is marveling at another small wonder—red maple flowers, each bunch but a half an inch across.

The Chinese sage Lao-tzu said that seeing the small is insight. If so, Funderburk is a profoundly insightful man. Even modern jaded Americans can find drama during a walk in the woods by focusing on the biggest trees and showiest flowers. Although Funderburk appreciates them too, he is a particular friend of the small and subtle.

Even the tiniest plant in the woods, he says, earns its place: The rue anemone guards a teaspoonful of soil from erosion, the catbrier is a haven for small animals, the ginger decays into fertilizer for other plants, the red maple flowers are a juicy bite for



Buried treasure: A rue anemone nestles among the leaves.

PHOTOGRAPHY: GARY BRAASCH



Hardly thicker than a hair, the perennial rue anemone has been a harbinger of spring to Funderburk for a quarter century.



Wild ginger flowers can fill a room with their heady, spicy aroma.

birds. "It never ceases to amaze me that they work together so well."

For 24 years Funderburk has been nothing but amazed by Fernbank Forest, a 65-acre preserve in suburban Atlanta that is leased by the De Kalb County school system. A mile east of city limits, it is a forest set aside for school children to see what used to cover the land now occupied by their schools, homes and streets.

Funderburk, 50, heads Fernbank's horticultural teaching staff. Also a taxonomist, he has spent half his life studying these woods. His caring for the place is palpable. In Funderburk's view, we cannot save forests unless we love them, and we cannot love them unless we see them in intertwined, minute detail. "It's not hard; it just takes time," he says. "My favorite quote is from Yogi Berra: 'You observe a lot by watching.'"



A double bouquet of red maple flowers spans only about an inch.

The Fernbank forest is protected from the spread of suburban Atlanta by an eight-foot-high chain-link fence topped with three strands of barbed wire. A security guard lets visitors in with a twist and yank of a brass padlock. Down the hill from the entrance the forest is 10 degrees cooler, and the sound from nearby roads is suddenly swallowed. The only obvious sound is of dried, curled beech leaves rustling in the wind. They have clung through the winter and won't fall until they are pushed off by spring growth. When they join the thick leaf litter on the floor, they will help keep the soil warm and wet, a perfect environment for soil-conditioning bacteria, germinating seeds and the big trees themselves.



They have hung on all winter, but these beech leaves soon will be pushed off their branches by spring growth and will fall to the forest floor, becoming part of the rich litter that keeps the soil warm and wet.



Seeking more light, a loblolly pine grows in a corkscrew shape.

When Atlanta burned during the Civil War, the smoke drifted through the branches of some of the trees we are passing. They are not ancient on the order of the California redwoods, but they have dignity, gravity. Quiet voices, respectful attention—church behavior—is in order.

Funderburk begins to introduce the trees by age and rank, starting with the big ones, some of them more than 130 feet tall and 200 years old: loblolly and shortleaf pines, white and northern red oaks and pignut hickories. These, he says, seal in evaporating water, creating a humid environment for the whole forest. Next in height under the oaks and pines is an understory of flowering dogwood, redbud, basswood, black gum, black cherry, winged elm, red mulberry and sourwood, which in turn arch over waist-high papaw, sweet shrub and dog hobble. The latter is a tangle of brush that earned its name because during the hunt, “bears crash through it, coons shimmy under it, but the dogs get tangled in it,” says Funderburk.

Fernbank is probably the largest “relatively undisturbed” piece of the Piedmont forest in a suburban location; it has never been logged and was fenced in by farsighted conservationists more than 20 years ago. The Piedmont—“foot of the mountain”—is a mixed woodland spread over much of the warm, moist, rolling hills of the Southeast that peaks at about 1,800 feet above sea level. This parcel has, on occasion, undergone dramatic changes. Armies of southern pine beetles that swept Georgia in the mid-1970s killed more than 400 big pines here, opening the forest floor to sunlight and giving the hardwoods, particularly the American beeches, an edge over the soft-



Raccoons have stopped at a creek in search of a tadpole supper.

woods. Funderburk says now that the more robust hardwoods are monopolizing the sunlight, “it will take a catastrophe, a fire or a tornado, to bring the pines back. And those things do happen.”

But the most significant change here has been at ground level, where marauding ornamentals—daylilies, Oregon grape, Japanese honeysuckle and especially English ivy—blanket the hummocks. Funderburk says 30 percent of the species in the modern Piedmont forest are not native. These plants, bred to be tough and prolific as low-maintenance cover for suburban yards, simply escaped to the forests and grabbed an empty environmental niche. “It’s pretty,” he says, frowning at a north slope completely buried in ivy, “but it’s not historic. We’d get rid of it, but it helps hold the soil, and we don’t have the manpower anyway.”

It is tempting in these old growth stands to gaze upward, following the line of the soaring trees, and Funderburk does his share of this. He spots a swooping red-tailed hawk and barred owl dens in a tulip poplar snag. Hawks and owls, he says, improve

the bloodlines of rodents by picking off the weak, slow and foolhardy. Hawks have the day shift, owls the graveyard duty. He points out a loblolly pine that bobbed and weaved as it grew, seeking light, “just like a flower turning toward the window.” Such a tree grows in a helical or corkscrew shape and has almost no commercial value, which may explain why Funderburk has designated it “one of my ten favorite trees in Fernbank Forest.”

Still, the small and close attractions continue to draw him. We cross a creek and a sandbank imprinted with raccoon tracks the size of a toddler’s handprints—the raccoons have likely been munching on tadpoles and minnows, incidentally policing the stream’s ecology by keeping its population in check. Funderburk picks up a sweet gum fruit and rolls it in his palm.

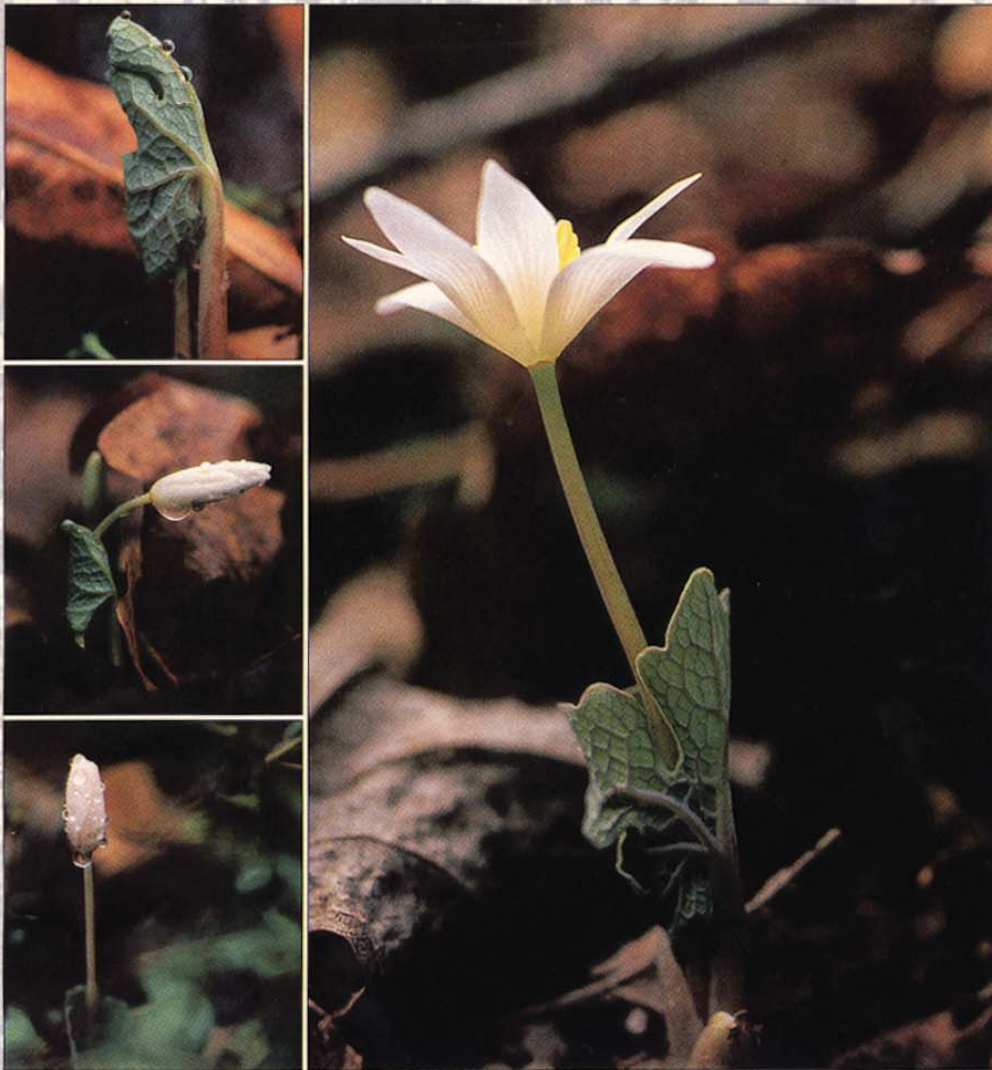
Ahead the first bloodroot has bloomed. The delicate white flower earned its name because its



A tree falls, a cascade is created, and oxygen—which will support new schools of spring fish—bubbles into a stream.



After dropping its seeds, a prickly dried sweet gum fruit has fallen.



The elusive bloodroot remains hidden for nearly a year, suddenly emerges to flower for a single week, then disappears again.



Wild wood violets struggle to poke through leaf litter.

rhizome, or underground stem, bleeds a crimson sap when cut. "It's one of my favorite flowers because it appears almost by magic. You know where it is supposed to be, you dig for it, but it's not there. Two days later, there are bloodroot flowers everywhere. It's almost instantaneous." It is also evanescent, disappearing in a week. "Then you have to wait fifty-one weeks to see it again. That's another thing I like about it."

Just past a delicate wood violet is one of the forest's ubiquitous sights: a downed log. Funderburk appreciates rotting logs in general and this decaying northern red oak in particular. "I happen to know this tree fell sixteen years ago," he says, poking around the

termites with the tip of his umbrella. "My daughter is nineteen. I've got a picture of her when she was three, sitting on this when it had just fallen down."

While they are standing and growing in the sun, trees gather energy, every day, for as long as two centuries in the case of those in this forest. When they fall, the energy immediately becomes available to "fungi, bacteria, molds, salamanders, earthworms, millipedes, centipedes, beetle larvae, sow bugs, a great variety of things," Funderburk says. Eventually, the rotted tree becomes part of the humus mat, which is six inches thick at Fernbank and riddled with dens for mice, voles and countless other animals. That porous mat slowly turns into soil, the foundation of the forest.

So life in the forest depends upon death. It is an ancient, exacting bargain; the living organism draws against its account to survive and starts making payments the moment it dies. The bill is paid only when the corpse is utterly dissolved by the next generation. Logging breaks that bargain, says Funderburk, by hauling debt-laden trees to parts unknown. The loss of each tree results in losses of habitat for animals, insects and plants. "The forest is so complex, we really don't know how it works," he says. "Losing one [more] minuscule species could make it die, but we don't know how far it can bend before it will break." As the dusk settles, we head toward the gate. Funderburk drops



A net-winged beetle lurks, patiently awaiting its next meal.



Termites and many other insects have flourished in this rotten red oak, which fell 16 years ago. Nothing in the forest goes unused, and each fallen tree and dead leaf is an essential part of the ecosystem.

tidbits of information: Lichens in a forest mean air pollution is low, as smog kills them first. In summer the Piedmont becomes a forager's delight, a feast of blackberries, wild plums, papaws and muscadine grapes. One of the forest's worst enemies is soil compaction—a settler's trodden yard can inhibit growth for decades after the homestead is abandoned. That's why Funderburk keeps his own veering off the trail to a minimum, and the 35,000 yearly visitors are cautioned not to do it at all.

A net-winged beetle waits on a twig stub near the gate, ready to tune up the ecosystem by eating the least agile of the nocturnal bugs that are starting to fill the air. We exit. Funderburk waves to the man in the guardhouse. It's hard to miss the fact that this forest survives only because it is fortified like a minimum-security prison. If you ignore the poetic but firm warning on the gate sign and carry out so much as a single leaf, the guard will escort you back inside and watch you return it. Funderburk wishes such care were more common.

"The tragic thing in the Atlanta area is that even where there is a little forest of four, five, six acres, it is being destroyed as surely as the rain forest in the Amazon," he says. To many of us, this is an abstract tragedy, but to Funderburk it is a detailed death, the specific destruction of a type of forest he knows as well as he knows his children. His only defense is his enthusiasm for Fernbank. "I can only hope," he says, "that it rubs off on people."



At Fernbank Forest, when they say no, they mean it.

A FEW PARTICULARS, PART II

- ♣ Trees are the largest living creatures. The world's biggest specimen, a California sequoia named General Sherman, stands 274.9 feet tall and measures 82.3 feet in circumference. It grew from a seed that weighs one six-thousandth of an ounce.
- ♣ The world's tallest tree, another California sequoia, Harry Cole, measures 371 feet from base to crown—the height of a 37-story building.
- ♣ The fattest tree ever reported, a chestnut known as the Tree of One Hundred Horses,

grew on Sicily's Mount Etna and measured 190 feet in circumference.

- ♣ The longest-branched tree is a 550-year-old banyan near Gutibayalu, India. It is called Thimmamma Marrimanu, and its canopy covers 5.2 acres—an area the size of 6.3 football fields.

- ♣ Trees are nature's air-conditioning units. In one year an average tree inhales 26 pounds of carbon dioxide—the amount emitted by an automobile during an 11,300-mile trip—and exhales enough oxygen to

keep a family of four breathing for a year.

- ♣ Hurricane Hugo toppled five million acres of woodland—more than hurricanes Camille and Frederic, the eruption of Mount St. Helens and the Yellowstone fire combined.

- ♣ Every 60 seconds 100 acres of tropical rain forest are felled, a kill rate that every year destroys 27 million acres of jungle (equal to the size of Tennessee) and over the next five decades would entirely erase the Amazon wilderness.

- ♣ America's most endangered species of

tree? It's a tie. Saginaw Forest, Mich., boasts the only known Murray birch, and the island of Molokai, Hawaii, has the single remaining *Pritchardia munroii* palm.

- ♣ There are now 230 billion trees in the U.S. If there were only 10 billion more, trees would absorb almost all of the three billion pounds of CO₂ we annually pump into the air.

- ♣ Last year three billion trees were planted in the U.S. Yet if you live in an urban area, you may not have noticed. For every tree planted in an American city, four die.