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Old Growth -
Manuscript about Pisgah

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James M. Gaffey

November 8, 1999

Mr. James Gaffey
50 Northford Road
Wallingford, CT 06492

Dear Jim,

Enclosed is the Pisgah article with a few marginal comments and some additional notes that cross-reference to marginal notes.

Overall, I think it is excellent as it portrays much of the feel and awe of the natural wonder of the place while also capturing the somewhat ironic importance of people in its history and significance. The ecological story is sound and the facts, with minor exception are right on.

Three thoughts. One thing that seems missing is the massiveness of everything – the trees in the 1920s forest were staggering and towering; the downed trees are immense; and the uproot mounds are larger than anything anyone has seen in a regular New England forest.

Second – I'll be interested in the other suggestions that you get, but I see it as definitely publishable. If you ever go a route where they can use photos we have some spectacular ones from the 20s, 1942, and now.

Finally, here's what I've been thinking about the "5 research projects" issue. In reality, what happened was I came to my HU interview with an outline of research projects for the entire HF, with a couple geared towards Pisgah and seeking, once again, to continue the 60+ year tradition of research there and (like Fisher) to integrate it into the larger HF understanding of the rest of New England's forest, which had been heavily disturbed by people.

One thought is that page 2 where you first mention the 5 project theme that you might modify this to something like – although the naturalness and peacefulness of the site belies it that this site is a central part of one of the NE's longest and most intense ecological research programs. Then when you get to the section about the initiation of new research up there it could be just one major thrust, expanding on Fisher, Cline, Spurr, Henry, etc.

In any case it is true that essentially no research had been done there from 1968 to 1985.

Don't forget I need those archives back at some point. Let me know if I can help with anything else.

Best,

David R. Foster

Old Growth

1. My thought here is to interject some language that immediately signals to the reader that this is an unusual place, with immense dead trees – girth and length.

2. The barkless trees are strikingly bone white, which won't be in most readers' minds-eye.

3. Minor, but perhaps important, though subtle point. Silviculture is really forest management. This forestry connection may be historically correct (e.g., as one of Fisher's underlying interests) but it will turn off the environmental/ecological readership and it really isn't the major focus at Pisgah, nor its primary value. This is ecology.

4. Tricky issue. Although the history of research is very short relative to the age of the ecosystem, it is remarkably long relative to most science. This is one of the longest, continuously studied forest ecosystems in the world.

5. Fact. Better to stick to New England if you want to use the "handful" left phrase. There is lots of old growth left in the west, about ½ million acres in Minnesota, maybe 50,000 acres in the Adirondacks. But in New England there ain't much.

6. No evidence of cutting. But, although they've reached maximum old age they are still growing. They get bigger (add annual rings) every year.

7. With money, I believe coming in from as far away as California. The NY Times article and others brought in many $25-100 donations.

8. Whether you want to mention it or not, there were two major factors that impeded research besides access: WW II took all the men away and the '38 storm blew down 70% of the standing volume of timber on the Harvard Forest so attention was diverted elsewhere.

    Steve Spurr had a paper in ~ 1956
    David Henry's thesis – 1968
    Henry and Mark Swan – 1974

9. "beneath the dense hemlocks" – it is the hemlocks that make it so dark.

J. Gaffey
Hums 611
11/3/99

Old Growth

I dropped my day pack and knelt down next to the hemlock tree that died on September 22, 1938. Most of the trunk was still off the ground, held up by the root system which was upended when the tree fell over. At its base, the tree approached three feet in diameter, but as the trunk tapered toward the top, the wood met the boggy soil which was slowly digesting it.

I had read about the 1938 hurricane which devastated New England. I had seen pictures of the smashed houses and flooded city streets. I had watched television documentaries and listened to eyewitness accounts of the people who lived through it. But in the 22-acre tract of the Pisgah old growth forest, I reached out with my hand and touched the storm's destructive legacy. What I felt was a cold, soggy, moss-covered handful of rotten wood.

"They're all like this, almost every one of them," said my guide, who led me to this isolated tract of forest in southern New Hampshire. "The storm came through from the southeast (?) and knocked them all over in the same direction. You can practically set your compass by them."

As we made our way across a narrow defile and up a steep, densely wooded embankment, there were more trees lying prostrate; huge hemlocks and white pines, all in varying states of decomposition. There were other giants that were dead but still standing, their crowns snapped off by the hurricane. Their barkless trunks, riddled with woodpecker and insect holes, looked like the

bones of some colossal dinosaur. The quiet, the stillness and the decay reminded me of a cemetery. Near the top of the hill, this impression was reinforced by the sight of two hemlocks of identical size lying parallel, about twenty feet apart.

"Like a husband and wife, lying side by side, mouldering away in their graves," I remarked to my guide, as we sat among the cadavers to eat lunch. He grinned in agreement as he tossed his apple core into a tangle of rotting branches.

Pisgah old growth forest is anything but a cemetery, however. It is a laboratory dedicated to the science of silviculture, which is the study and maintenance and care of forest ecosystems. There are currently five (?) ongoing studies of forest dynamics taking place at Pisgah, particularly related to the forest's response to natural disturbances such as hurricanes. The studies are all under the supervision of my guide, who probably knows more about this tract of virgin forest than anyone, anywhere. Although Pisgah's natural history goes back eons, its history as a scientific specimen dates back only decades. The story of these 22 acres is a tale of nature, science, and history. Though never disturbed by humans, the story of the Pisgah old growth forest is most important a story about the people who recognized its importance. Among those people are my guide, whose personal history and that of the forest are closely linked.

Of the 950 million acres of virgin forest that existed in North America prior to the time Europeans began settling here, only a handful of old growth stands like Pisgah remain. They exist in small fragments, usually protected by natural features that prevented their economic exploitation. They are often hemmed in by rocky escarpments, for example, that made them unsuitable for habitation,

logging or cultivation.

There are many definitions of what constitute an "old growth," "virgin" or "primeval" forest but all share two criteria. First, the stand shows little or no interference from humans. There are no stone walls, no old roads, no evidence of cultivation. Second, the forest is populated by trees that are so old they have reached their maximum height and size. Though still alive, they have stopped growing. One reason old growth forests have grown old and remained untouched is because it is difficult for people to get to them. Pisgah, I discovered, is no exception.

The old-growth tract is located deep in the interior of what is now the Pisgah Wilderness State Park, a 15,000-acre forest that stretches seven miles from Ashuelot Village, near Winchester, to Spofford. Leaving the main road just outside the village, we turned up an unmarked, unpaved access road that challenged my four-wheel drive vehicle. We drove three miles through a dense forest of mixed coniferous and deciduous trees, past a beaver pond and a swamp before reaching the end of the road where there was a small parking area. We gathered our things and locked the car.

The walk into the forest began at a path from the parking area which rose quickly and made us climb for about a half hour. The path was actually a narrow road, cut into the side of the mountain. It led us to the Pisgah Reservoir, a man-made body of water created in the last century by the Dickinson Real Estate and Lumber Company to power its sawmills on the Ashuelot River. The Dickinson Company was also the original owner of the old-growth forest.

Although it was mid-October and the temperature was only in the sixties, perspiration made my shirt stick to my skin by the time the climb ended. The trail leveled off as we walked along the reservoir, which was smooth as glass and brilliantly reflected the peak autumn foliage. The state park consists of unbroken

mountainous forest, however, and our easy walk along the reservoir was brief. After a half mile, we left the reservoir trail and turned east up the Chestnut Hill Trail, another long climb. Reaching the top of the ridge, I caught a distant glimpse of the old growth tract.

Looking east through the trees, across a valley to the opposite ridge, the crown of a mammoth white pine towered 20-30 feet above the rest of the forest canopy. Unlike its brethren which now lay rotting on the ground, this one survived the withering hurricane wind. The trail descended as we traversed the valley which separated the two ridges. After an hour and ten minutes of walking, my guide stopped along the trail to check his map. He made a gesture with his hand in a general southerly direction.

40-50 I'd guess

to be honest, and in keeping with my vast experience ..., I don't actually use a map.

"It's in there, but there's no trail. We have to bushwhack from here." I tightened the straps of my day pack and followed my guide as we plunged into the underbrush.

Sometime in 1924 or 1925, perhaps on on afternoon like ours, Richard Thornton Fisher journeyed into the Pisgah wilderness area and heard something that troubled him: the shouts of woodsmen and the sound of axes. It was not Fisher's first visit to Pisgah; he had been coming to the old growth site since 1905. Fisher was not a hunter, tourist, or picnicker. He was a scientist. Fisher was studying the old growth Pisgah tract, using it as a reference to compare other forests that had been previously cut over. In 1907 he was named the first director of the Harvard Forest, a 3,000-acre research forest established that same year by Harvard University. The Harvard Forest is located in the town of Petersham, Massachusetts, about 35 (?) miles south of Pisgah and about 70 miles west of Boston.

For Fisher, the implication of the advancing loggers was clear. A

priceless and irreplaceable scientific resource was about to be converted into wooden boxes, railway ties, and lumber of every size and dimension. The old growth tract had survived two hundred years of colonial settlement protected by its rugged surroundings. But the rocky ledges and steep hillsides were no longer adequate insulation from the pressure of logging interests.

For over a century, the old growth forest and its surroundings was owned by Ansel Dickinson and his heirs, which evolved into the Dickinson Real Estate and Lumber Company. The Dickinson Company was part of a lumbering tradition in the area around Winchester that dated back to the first sawmill in 1764. By 1885, there were eight sawmills cutting more than six million board feet of lumber per year. A typical acre in the Pisgah wilderness area could yield 85,000 board feet of lumber and demand was high. Joe Roberts, a Canadian logger working nearby, licked his chops at the prospect of cutting the timber in the old growth tract.

"Next winter we cut'em," he told a reporter in 1926. "Coupla men would put down six of 'em in one day. If I owned this woodlot, I wouldn't work no more all my life, and I'd buy me a nice car too." Fisher wanted to buy the tract and preserve it for scientific study, but he needed time to get the money together. Brothers John and LaFell Dickinson were willing to negotiate. They sold Harvard an option on the property which gave Fisher the chance he needed.

The forest could not have had a better guardian than Richard Fisher. Although he had chosen forest ecology as his life's work, he had been an English major as an undergraduate and possessed the zeal and eloquence needed to persuade not only scientists, but others of the importance of securing the Pisgah tract.

"Such a forest, if left to itself, will remain a forest forever," he wrote. "These trees are now from two to three hundred years old. As the oldest ones decay

and fall, the younger ones grow larger and take their places. The gradual decay of the older trees is made up for by the growth of the younger ones. If left alone, it will remain a primeval forest forever." There were twenty-two acres which Fisher determined were untouched. The price was $1,000 per acre. Aided by conservationists in Massachusetts and New Hampshire, one sizeable bequest, and his own dedication, Fisher got the money together. The President and Fellows of Harvard College voted to approve the purchase of the Pisgah Old Growth Forest on November 8, 1926. On maps, it is now designated as the Harvard Tract.

The old growth forest narrowly escaped the woodsmens' axes, but there was no escape from the 1938 hurricane. A.C. Cline, Fisher's successor at the Harvard Forest, wrote to the tax review board of Winchester in 1939, requesting a reduction in the assessment on Harvard's holdings because only 15 to 20 of the oldest trees were still standing as a result of the storm. But Cline was soon to learn that the taxes on the land were the least of his worries as far as the future of the site as a subject of research was concerned.

By the time he wrote his letter, the largest timber salvage in the history of the United States was well underway. Tens of thousands of trees killed by the hurricane were being cut up for lumber and firewood, and to reduce the risk of forest fires. Because of the fire hazard, forestry officials in New Hampshire wanted the Pisgah old growth tract cleaned out as well. Although the trees, especially the white pines, were valuable to a sawmill due to their age and size, Cline saw their value to science in leaving them right where they fell. If the trees were removed, not only would ecologists lose the opportunity to study how the forest responded to a major natural disturbance, the damage done to the land by animals or machinery needed to salvage the timber would be disastrous. An access road would have to be cut. There would be mud, erosion. The Harvard

tract would lose all its value as a site that had never been disturbed by humans.

Cline prevailed, and no timber salvage took place. Unfortunately, very little science took place at Pisgah either. The downed trees made it extremely difficult to navigate the site, even on foot. It was also dangerous. Many of the trees had not fallen to the ground but were hung up like jackstraws that could collapse without warning. Thirty-six years after the hurricane struck, only three research papers were written concerning the Harvard Tract at Pisgah.

In 1982 (?) David Foster, who had just completed a doctoral program in forest ecology at the University of Minnesota, interviewed for a research position at the Harvard Forest. Foster had first learned of the Pisgah old growth forest as an undergraduate botany major. He had read the research papers that had been written since the hurricane. Aware that Pisgah had been neglected as a site for scientific study, Foster arrived at Petersham for his interview, nervously clutching his proposal for five areas of study he felt should be applied to the Pisgah old growth forest. It was a bold move for a freshly-minted Ph.D. who had never set foot in the place. Nevertheless, his interviewers were impressed. Foster got the job, and in 1988, he wrote the first major paper to come out of Pisgah in fourteen years, "Disturbance History, Community Organization and Vegetation Dynamics of the Old-Growth Pisgah Forest."

In 1989, Foster inherited the mantle of Richard Fisher and A.C. Cline and was named the tenth (?) director of the Harvard Forest. All five of the study proposals he brought to his interview are currently underway at Pisgah. At the Harvard Forest, they call him "David" or "Dr. Foster" but I have called him "Dave" since we were in grade school and that is not likely to change. He's the guy with the muddy boots who I'm following into the woods.

A hundred yards or so after leaving the trail, my eyes were drawn to a

vernal pool surrounded by leaves and moss containing water the color of strong tea. Just uphill from the pool was a tree near three feet in diameter which seemed to erupt from the ground. Dave looked it over and made some notes.

"This is the oldest tree in the forest. A black gum, *nyssa sylvatica.* Three hundred fifty to four hundred years old." He looked up. "You can see why they didn't cut it." The trunk was gnarled and twisted as it rose up to the crown, a cluster of limbs with short horizontal twigs which spread out against the sky like an oriental *bonsai.* " The trunk was too twisted for lumber which also made it hard to split for firewood." The outer bark was rough and deeply contoured. When I felt it with my hands my fingers seemed to disappear into the woody crevices.

The black gum tree stood at the northwestern (?) edge of the old growth stand, like a silent giant receptionist greeting anyone entering from that direction. Only a short walk beyond it lay the first trees we saw that had been blown down by the hurricane. We were now well inside the old growth forest and the terrain was rough and hilly, dramatically carved by the glaciers during the last ice age(?). Glacial "erratics," granite boulders the size of cars and trucks, lay strewn amongst the trees. Some of the windthrows rested on top of these boulders, their trunks eight or more feet off the ground.

I wanted to take pictures, but the light meter on my camera told me there was not enough light. I noticed that it grew progressively dimmer as we made our way deeper into the woods. Although it was a brilliant autumn afternoon, the sun managed to penetrate the forest only in slanted beams, illuminating the forest floor in dappled patches of light. Sometimes, a sunbeam would strike a patch of moss, and it glowed like an emerald. Looking up, the forest canopy was virtually unbroken fifty to sixty (?) feet over our heads, the crowns blending seamlessly together. The understory trees, those which grew below the tallest, or "climax" trees, provided a further layer of screening from the sun. The density

of growth and the dimness led me to think A.C. Cline was exaggerating when he told the tax officials there were only 15-20 trees left after the hurricane. Whether he exaggerated or not, the forest has made a remarkable recovery in the six decades since the storm, further proving itself against a theory that once dominated forest ecology.

It was an article of faith for years among forest ecologists that old growth stands, unlike other forest communities, did not change. The trees, having reached their maximum height and size, were thought to exist in a kind of permanent stasis. Studies of the the old growth forest at Pisgah were among the first to challenge this notion, beginning with Richard Fisher. His pleas to save the tract for scientific study revealed his belief that the old growth forests were not static but dynamic, in a continuous cycle of growth, death and regeneration. He reiterated this belief in 1933:

> It is a popular, if not a scientific idea that the primeval forest was almost as changeless as the hills. If, however, we study the detailed records of life history in such original forests as remain, we find evidence that there must have been over long periods, important changes.

Following Fisher's death in 1934, work done at Pisgah particularly after the 1938 hurricane, vindicated Fisher's theory. Soil studies revealed the presence of charcoal, indicating the forest had survived fires. Examination of growth rings, vegetation patterns, and changes in the distribution of species all showed the tract had gone through a number of successional stages. The evidence also showed the forest had weathered many previous natural calamities, including hurricanes, lightning and disease.

Richard Fisher never saw the forest he saved after it had been devastated by the hurricane. But he had been right about what we could learn about how

ecosystems in general and forests in particular, could adapt and recover from such calamities. Today there are new threats to the majestic trees. The two most dominant species at Pisgah, hemlock and beech, are under attack in other parts of New England. An exotic A mysterious fungus is invading beech trees. Hemlocks are being killed by an introduced insect pest, the wooly adelgid. It is inevitable these maladies will one day arrive at Pisgah. How the forest responds will be closely watched by ecologists. Fisher's legacy is not only the twenty-two acres at Pisgah. It is the sure knowledge that forests are in a constant state of change.

"There is no question he was ahead of his time," Dave said, speaking of his predecessor. "Because of him, Pisgah has become a very, very important place."

All of the trees in the old growth forest are single stemmed, a feature that was explained to me during our visit.

"A typical sign of a forest that has been previously cut is the prescence of trees that have more than one trunk," Dave said. "After it's cut, the stump starts to many sprouts grow from the stump forming a multiple-stemmed tree. grow again but it splits in two as it grows. There are none of those in here."

We moved on, heading in a southerly direction. The walking was easier than I imagined. Although the terrain was hilly and irregular, I thought there would be thick tangles of undergrowth that would make every step difficult. But except for the windthrows, there were few obstacles. The trees had no lower branches to poke or prod us as we moved about.

It was also very quiet. There were no chirping birds, no buzzing insects, no drone from a distant highway. If there was a breeze high in the trees, any sound it made did not reach us sixty feet below. We paused several times and listened to nothing. It was that kind of silence. The kind of silence you could listen to.

"Follow me. There's something I want to show you." We climbed a short hill and went down the other side. At the bottom, on a level spot of ground was a rock cairn about two feet high. "When I was doing my research here in '88 I kept seeing this thing and I couldn't figure out why it was here. I thought it was an artifact, a benchmark or something, but it wasn't shown on any of the maps. Then one day I looked at it and something about it said 'Take me apart.'" Dave leaned over and lifted off the first two or three rocks at the top of the cairn. Beneath the third stone was a neatly folded piece of birchbark. It was moist and moldy, but intact. He unfolded it and showed it to me. There was writing on it, in black ink.

Andrew Sargent
York Village, Maine
1935

"Who was he?" I asked. Dave shook his head.

"I have no idea. But if he's still around, I'd sure like to talk to him."

Since my visit to Pisgah I have thought a lot about Andrew Sargent. I have wondered what it was about the place that made him go to all that trouble of gathering and piling up stones, just so he could let someone know he had been there. The forest he saw was before the hurricane and was thus very different from the one we stood in. But in many ways, it was the same. He could have carved his initials in some tree, the preferred method of careless people who feel compelled to leave their mark behind. But the cairn, the birchbark and even the writing, so clear and legible, suggested an appreciation and respect for the place that initial carvers simply do not have. Dave took out his mechanical pencil, added our names and the date to the piece of birch bark, and carefully put it back under the stones.

It was getting late. There were no more oblique sunbeams coming

bushwacking the two miles through the trees, just a diffuse ambient light that was growing dimmer. There was still over an hour of walking to get back to the car. Dave got out his map and compass. He wanted to take a different route back so we would not have to retrace our steps.

While he checked his bearings, I took a final look back at the darkening woods. A few windthrows were visible through the trees. Like the others, they were mossed over, wet and punky. I was tempted more than once to dig my fingers into one of them and rip off a hunk of bark just to see how far sixty-one years of rot had penetrated the wood. But in the end, I decided to just leave it alone.

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I drop my day pack and kneel down next to the immense hemlock tree that died on September 22, 1938. Most of the trunk is still off the ground, held up by the root system upended when the tree fell over. At its base, the tree approaches three feet in diameter, but as the trunk tapers toward the top more than a hundred feet away, the wood meets the boggy soil which is slowly digesting it.

I had read about the 1938 hurricane which devastated New England. I had seen pictures of the smashed houses and flooded city streets. I had watched television documentaries and listened to eyewitness accounts of the people who lived through it. But in the 22-acre tract of the Pisgah old growth forest in southern New Hampshire I can reach out with my hand and touch the storm's destructive legacy. What I feel is a cold, soggy, moss-covered handful of rotten wood.

"They're all like this, almost every one of them," says Dave, who led me to this isolated tract of forest. "The storm came through from the south and knocked them all over in the same direction. You can practically set your compass by them."

As we make our way across a narrow defile and up a steep, densely wooded embankment, more trees are lying prostrate; huge hemlocks and white pines, all in varying states of decomposition. When first measured, many of

these trees measured over one hundred forty feet, tall as a twelve-story building. There are other giants that are dead but still standing, their crowns snapped off by the hurricane. Their barkless trunks, riddled with woodpecker and insect holes, are bleached white by the sun and look like colossal bones. The quiet, the stillness and the decay remind me of a cemetery. Near the top of the hill, this impression is reinforced by the sight of two hemlocks of identical size lying parallel, about twenty feet apart.

"Like a husband and wife, lying side by side, mouldering away in their graves," I remark to Dave as we sit among the cadavers to eat lunch. He smiles in agreement as he tosses his apple core into a tangle of rotting branches.

Pisgah old growth forest is anything but a cemetery, however. It is a laboratory dedicated to the science of forest ecology which is the study of the structure, function and conservation of forest ecosystems. There are currently a half-dozen ongoing studies of forest dynamics taking place at Pisgah, particularly related to the forest's response to natural disturbances such as hurricanes. Dave, who probably knows more about this tract of virgin forest than anyone, anywhere is supervising these studies. He is the director of the Harvard Forest in Petersham, Massachusetts which owns the Pisgah old growth tract. At the Harvard Forest, they call him "David" or "Dr. Foster" but I have called him "Dave" since we were in grade school and that is not likely to change.

Although Pisgah's natural history goes back eons, its history as a scientific specimen dates back only to the beginning of this century. Nevertheless, Pisgah is one of the longest, continuously studied forest ecosystems in the world. The history of these 22 acres is a tale of nature, science, and history. Though never disturbed by humans, Pisgah old growth forest is largely about the people who recognized its importance and worked to keep it in its natural state.

Of the 950 million acres of virgin forest that existed in North America prior to the time Europeans began settling here, only a handful of old growth stands like Pisgah remain in New England. They exist in small fragments, usually protected by natural features that prevented their economic exploitation. They are often hemmed in by rocky escarpments, for example, that made them unsuitable for habitation, logging or cultivation.

There are many definitions of what constitute an "old growth," "virgin" or "primeval" forest but all share two criteria. First, the stand shows little or no interference from humans. There are no stone walls, no old roads, no evidence of cutting. Second, the forest is populated by trees that are so old they have reached their maximum height and size. One reason old growth forests have grown old and remained untouched is because it is difficult for people to get to them. Pisgah, I discovered, is no exception.

The old-growth tract is located deep in the interior of what is now the Pisgah Wilderness State Park, a 15,000-acre forest that stretches seven miles from Ashuelot Village, near Winchester, New Hampshire to Spofford. Leaving the main road just outside the village, we turn up an unmarked, unpaved access road that challenges my four-wheel drive vehicle. We drive three miles through a dense forest of mixed coniferous and deciduous trees, past a beaver pond and a swamp before reaching the end of the road where there was a small parking area. We gather our things and lock the car.

The walk into the forest begins at a narrow road cut into the side of a mountain. It rises quickly from the parking area and makes us climb for about a half hour. It leads us to the Pisgah Reservoir, a man-made body of water created in the last century by the Dickinson Real Estate and Lumber Company to power its sawmills on the Ashuelot River. The Dickinson Company was also

the original owner of the old-growth forest.

It is mid-October and the temperature barely in the sixties, yet perspiration makes my shirt stick to my skin by the time the climb ends. The trail levels off as we walk along the reservoir, which brilliantly reflects the peak autumn foliage. The state park consists of unbroken mountainous forest, however, and our easy walk along the reservoir is brief. After a half mile, we leave the reservoir trail and turn east up the Chestnut Hill Trail, another long climb. Reaching the top of the ridge, I catch a distant glimpse of the old growth tract.

Looking east through the trees, across a valley to the opposite ridge, the crown of a mammoth white pine towers 40-50 feet above the rest of the forest canopy. Unlike the others now decaying on the ground, this one survived the withering hurricane wind. The trail descends as we traverse the valley that separates the two ridges. After an hour and ten minutes of walking, Dave stops along the trail. He makes a gesture with his hand in a southerly direction.

"It's in there, but there's no trail. We have to bushwhack from here." I tighten the straps of my day pack and follow Dave as we plunge into the underbrush.

Sometime in 1924 or 1925, perhaps on an afternoon like ours, Richard Thornton Fisher journeyed into the Pisgah wilderness area and heard something that troubled him: the shouts of woodsmen and the sound of axes. It was not Fisher's first visit to Pisgah; he had been coming to the old growth site since 1905. Fisher was not a hunter, tourist, or picnicker. He was a scientist and professor at Harvard University. In 1907, he was named the first director of the Harvard Forest, a 3,000 acre research forest in Petersham, Massachusetts. The Harvard Forest is about 35 miles south of Pisgah and about 70 west of Boston.

Fisher had been studying the old growth Pisgah tract, using it as a reference to compare other New England forests that had been previously cut or otherwise disturbed by human activity.

For Fisher, the implication of the advancing loggers was clear. A priceless and irreplaceable scientific resource was about to be converted into wooden boxes, railway ties, barrel staves and lumber of every size and dimension. The old growth tract had survived two hundred years of colonial settlement protected by its rugged surroundings. But the rocky ledges and steep hillsides were no longer adequate insulation from the pressure of logging interests.

For over a century, the old growth forest and its surroundings was owned by Ansel Dickinson and his heirs, now the Dickinson Real Estate and Lumber Company. The Dickinson Company was part of a lumbering tradition in the area around Winchester that dated back to the first sawmill in 1764. By 1885, there were eight sawmills cutting more than six million board feet of lumber per year. A typical acre in the Pisgah wilderness area could yield 85,000 board feet of lumber and demand was high. Joe Roberts, a Canadian logger working nearby, licked his chops at the prospect of cutting the timber in the old growth tract.

"Next winter we cut'em," he told a reporter in 1926. "Coupla men would put down six of 'em in one day. If I owned this woodlot, I wouldn't work no more all my life, and I'd buy me a nice car too." Richard Fisher wanted to buy the tract and preserve it for scientific study, but he needed time to get the money together. Brothers John and LaFell Dickinson were willing to negotiate. They sold Harvard an option on the property which gave Fisher the chance he needed.

The forest could not have had a better guardian than Richard Fisher. Although he had chosen forest ecology as his life's work, he had been an English major as an undergraduate and possessed the zeal and eloquence

needed to persuade not only scientists, but others of the importance of securing the Pisgah tract.

"Such a forest, if left to itself, will remain a forest forever," he wrote. "These trees are now from two to three hundred years old. As the oldest ones decay and fall, the younger ones grow larger and take their places. The gradual decay of the older trees is made up for by the growth of the younger ones. If left alone, it will remain a primeval forest forever." There were twenty-two acres that Fisher determined were untouched. The price was $1,000 per acre.

From his office in Petersham, Fisher launched a campaign to raise the money. He wrote dozens of letters to anyone he thought would be sympathetic to his cause. He seldom asked for donations outright, focusing instead on the importance of preserving the Pisgah tract. A letter to the author Henry James, a Harvard classmate of Fisher's, typified his approach:

November 2, 1925

Dear Harry:

About the Pisgah Forest: the tract is in the town of Winchester N.H. about four miles northwesterly from the state road between Northfield and Keene. The stand in question is perhaps the best sample remaining of absolutely primeval forest such as once covered the whole tract and still covers various areas aggregating perhaps 600 or 700 acres. Personally, I do not know of any other absolutely authentic original forest except for small areas, left in New England. If there is to be any surviving specimen of the original forests preserved for the enjoyment and study of the present and future generations, I do not know where it could be secured except here. I hope very much that we can raise a reasonable sum toward its purchase.

Sincerely yours,

Richard T. Fisher

The New York Times learned of Fisher's work, and wrote a story about

the preservation effort. Small donations, most less than one hundred dollars, were sent from as far away as California.

Further aided by conservationists in Massachusetts and New Hampshire, one sizable donation, and his own dedication, Fisher got the money together. The President and Fellows of Harvard College voted to approve the purchase of the Pisgah Old Growth Forest on November 8, 1926. On maps, it is now designated as the Harvard Tract. But it remains difficult to find.

The old growth forest narrowly escaped the woodsmen' axes, but there was no escape from the 1938 hurricane. A.C. Cline, Fisher's successor at the Harvard Forest, wrote to the tax review board of Winchester in 1939, requesting a reduction in the assessment on Harvard's holdings because only 15 to 20 of the oldest trees were still standing as a result of the storm. But Cline was soon to learn that the taxes on the land were the least of his worries as far as the future of the site as a subject of research was concerned.

By the time he wrote his letter, the largest timber salvage operation in the history of the United States was well underway. Millions of trees killed by the hurricane were being cut up for lumber and firewood, and to reduce the risk of forest fires. Because of the fire hazard, forestry officials in New Hampshire wanted the Pisgah old growth tract cleaned out as well. Although the trees, especially the white pines, were valuable to a sawmill due to their age and size, Cline saw their value to science in leaving them right where they fell. If the trees were removed, not only would ecologists lose the opportunity to study how the forest responded to a major natural disturbance, the damage done to the land by animals or machinery needed to salvage the timber would be disastrous. An access road would have to be cut. There would be mud, erosion. The Harvard tract would lose all its value as a site that had never been disturbed by humans.

Cline prevailed, and no timber salvage took place. Unfortunately, very

over the last few decades

little science took place at Pisgah either. The downed trees made it extremely difficult to navigate the site, even on foot. It was also dangerous. Many of the trees had not fallen to the ground but were hung up like jackstraws that could collapse without warning. Personnel at the Harvard Forest was preoccupied with the aftermath of the storm which destroyed 70 percent of the forest in Petersham. Thirty-six years after the hurricane struck, only three research papers were written concerning the Harvard Tract at Pisgah.

OR should you say Dave Foster?

My friend David Foster, who led me to the old growth tract, first learned of Pisgah as an undergraduate botany major. He read the research papers written after the hurricane and was impressed with their message for they emphasized the [illegible] character of [illegible] nature. At the time, he had no way of knowing the role Pisgah would play in his own life.

In 1983, he interviewed for a research position at the Harvard Forest, after just completing a doctoral program in forest ecology at the University of Minnesota. Aware that Pisgah had been neglected as a site for scientific study, he arrived at Petersham for his interview, nervously clutching his proposal for five areas of study he felt should be applied to both the Harvard Forest and the Pisgah old growth tract. It was a bold move for a freshly minted Ph.D. who never set foot in either place. Nevertheless, his interviewers were impressed. Foster got the job and in 1988, he wrote the first major paper to come out of Pisgah in fourteen years, "Disturbance History, Community Organization and Vegetation Dynamics of the Old Growth Pisgah Forest."

In 1989, Dave inherited the mantle of Richard Fisher and A.C. Cline and was named the seventh director of the Harvard Forest. All of the study proposals he brought to his interview are currently underway at Pisgah.

A hundred yards or so after leaving the trail, my eyes are drawn to a woodland pool surrounded by leaves and moss containing water the color of

throughout New England

strong tea. Just uphill from the pool is a tree nearly three feet in diameter which seems to erupt from the ground. Dave looks it over and makes some notes.

"This is the oldest tree in the forest. A black gum, *Nyssa sylvatica.* Three hundred fifty to four hundred years old." He looks up. "You can see why they didn't cut it." The trunk is gnarled and twisted as it rises up to the crown, a cluster of limbs with short, horizontal twigs spreading out against the sky like an oriental *bonsai.* "The trunk was too twisted for lumber which also made it hard to split for firewood." The outer bark is rough and deeply contoured. When I feel it with my hands my fingers seem to disappear into the woody crevices.

The black gum tree stands at the northwestern edge of the old growth stand, like a silent giant greeting anyone entering from that direction. Only a short walk beyond it lay the first trees we see blown down by the hurricane. We are now well inside the old growth forest and the terrain is rough and hilly, dramatically carved by the glaciers during the last ice age. Glacial "erratics," granite boulders the size of cars and trucks, lay strewn amongst the trees. Some of the windthrows rest on top of these boulders, their trunks eight or more feet off the ground.

I want to take pictures, but the light meter on my camera tells me there is not enough light. It grows progressively dimmer as we make our way deeper into the woods. The sun manages to penetrate the forest only in slanted beams, illuminating the forest floor in dappled patches of light. Sometimes, a sunbeam strikes a patch of moss, and it glows like an emerald. Looking up, the forest canopy is virtually unbroken fifty to sixty feet over our heads, the crowns blending seamlessly together. The understory trees, those growing below the tallest, or "climax" trees, provide a further layer of screening from the sun. The density of growth and the dimness lead me to think A.C. Cline was exaggerating when he told the tax officials there were only 15-20 trees left after the hurricane.

Whether he exaggerated or not, the forest has made a remarkable recovery in the six decades since the storm, further proving itself against a theory that once dominated forest ecology.

It was an article of faith for years among forest ecologists that old growth stands changed little over time. The trees, having reached old age and their maximum height, were thought to exist in a kind of permanent stasis. Studies of the the old growth forest at Pisgah were among the first to challenge this notion, beginning with Richard Fisher. His pleas to save the tract for scientific study revealed his belief that the old growth forests were not static but dynamic, in a continuous cycle of growth, death and regeneration. He reiterated this belief in 1933:

> It is a popular, if not a scientific idea that the primeval forest was almost as changeless as the hills. If, however, we study the detailed records of life history in such original forests as remain, we find evidence that there must have been over long periods, important changes.

Following Fisher's death in 1934, work done at Pisgah particularly after the 1938 hurricane, supported Fisher's theory. Soil studies revealed the presence of charcoal, indicating the forest had experienced and recovered from numerous fires. Examination of growth rings, vegetation patterns, and changes in the distribution of species all showed the tract had gone through a number of successional stages. The evidence also showed the forest had weathered many previous natural calamities, including hurricanes, ice storms and disease.

Richard Fisher never saw the forest he saved after it had been devastated by the hurricane. But he had been right about how ecosystems, particularly forests, could adapt and recover from such calamities. Today there are new threats to the majestic trees. The two most dominant species at Pisgah, hemlock

and beech, are under attack in other parts of New England. A mysterious fungus is invading beech trees. Hemlocks are being killed by an introduced insect pest, the woolly adelgid. It is inevitable these maladies will one day arrive at Pisgah. How the forest responds will be closely watched by ecologists. Fisher's legacy is not only the twenty-two acres at Pisgah. It is the sure knowledge that forests are in a constant state of change.

"There is no question he was ahead of his time," Dave said, speaking of his predecessor. "Because of him, Pisgah has become a very, very important place."

All of the trees in the old growth forest, I learn, are single stemmed, a feature Dave explains during my visit.

"A typical sign of a forest that has been previously cut is the presence of trees that have more than one trunk," he says. "After it's cut, many sprouts grow from the stump forming a multiple-stemmed tree. There are none of those in here."

We move on, heading in a southerly direction. The walking is easier than I imagined. Although the terrain is hilly and irregular, I thought there would be thick tangles of undergrowth that would make every step difficult. But except for the windthrows, there are few obstacles. The trees have no lower branches to poke or prod us as we move about.

It is also very quiet. There are no chirping birds, no buzzing insects, no drone from a distant highway. If there is a breeze high in the trees, any sound it makes does not reach us sixty feet below. The shouts of woodsmen and the sound of axes are long in the past. We pause several times and listen to nothing. It is that kind of silence. The kind of silence you can listen to.

"Follow me. There's something I want to show you." We climb a short hill

and walk down the other side. At the bottom, on a level spot of ground is a rock cairn about two feet high. "When I was doing my research here in '88 I kept seeing this thing and I couldn't figure out why it was here. I thought it was an artifact, a benchmark or something, but it wasn't shown on any of the maps. Then one day I looked at it and something about it said 'Take me apart.'" Dave leans over and lifts off the first three rocks at the top of the cairn. Beneath the third stone is a neatly folded piece of birchbark. It is moist and moldy, but intact. He unfolds it and shows it to me. There is writing on it, in black ink.

Andrew Sargent
York Village, Maine
1935

"Who was he?" I ask. Dave shakes his head.

"I have no idea. But if he's still around, I'd sure like to talk to him."

Since my visit to Pisgah I have thought a lot about Andrew Sargent. I wondered what it was about the place that made him go to all that trouble of gathering and piling up stones, just so he could let someone know he had been there. The forest he saw was before the hurricane and was thus very different from the one we stood in. But in many ways, it was the same. He could have carved his initials in some tree, the preferred method of thoughtless people who feel compelled to leave their mark behind. But the cairn, the birchbark and even the writing, so clear and legible, suggested an appreciation and respect for the place that most carvers simply do not have.

Dave takes out his mechanical pencil, adds our names and the date to the piece of birch bark, and carefully puts it back under the stones.

It is getting late. There are no more oblique sunbeams coming through the trees, just a diffuse ambient light that is growing dimmer. There is still over an hour of walking through the woods to get back to the car. Dave gets out his

map and compass. He wants to take a different route back so we will not have to retrace our steps.

While he checks his bearings, I take a final look back at the darkening woods. A few windthrows are visible through the trees. Like the others, they are mossed over, wet and punky. I am tempted to dig my fingers into one of them and rip off a hunk of inner bark just to see how far sixty-one years of decay has penetrated the wood. But in the end, I decide to just leave it alone.

I'd like to hear you read this before I give you my final comments. Please make certain you give me a clean copy for my files. There are many markets for this and I'll try to squeeze in as much as I can about this topic next week. Certainly Yankee, The Smithsonian, Harvard's Alumni or School of Forestry publications come to mind. Exemplary piece of research and writing. (A+)