

Towards Better Use

*I had a wonderful team, so all I had to do was sit and twitch the lines a little.
-Dr. J. Alfred Hall, Director, 1945-1951*

America came home from the war years of 1941-1945 to find science much more in its life than ever before. The Pacific Northwest Forest and Range Experiment Station, as we have seen, was edging into postwar planning well before the final defeat of Germany and Japan. But what ensued in Station research policy dates mostly from the appointment of a new Director and the return of Station personnel from their monthly monitoring of forest industries. Significantly, the new man in charge was a biological chemist of wartime repute.

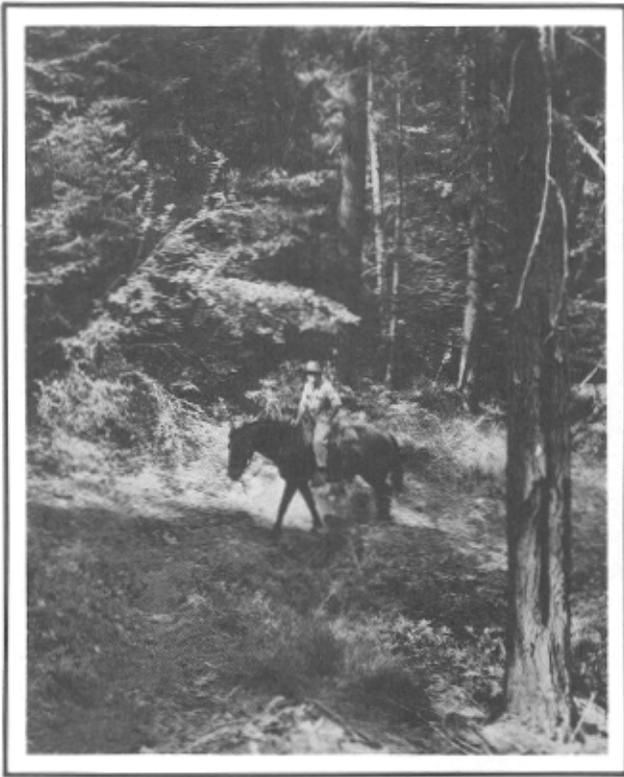
J. Alfred Hall, an Indianan who earned his doctorate in chemistry at the University of Wisconsin, came into forestry research administration by way of a crownfire in the pine woods of Georgia. Hired by the Forest Service in 1930 as a biological chemist at the Forest Products Laboratory, Hall was dispatched from Madison, Wis., to study the biochemistry of resin formation in the southern pine forests. He was doing research in the woods near Cogdell, Georgia, when a fire "blew up" and raced through some 15,000 acres in a single afternoon.

At the time, a debate was simmering within the Forest Service as to whether the policy of total fire protection within National Forests should be continued, or whether some fires should be permitted to clear out brush and perhaps prevent larger

conflagrations. Hall had talked over his observations about the possibility of brush control in the southern pines with Austin Cary of the Southern Experiment Station, a forestry researcher who was a near-legend in the region. Cary, in his best Maine gruffness, instructed the newcomer: "I want you to write that up." Hall protested the unseemliness of a newly-arrived chemist telling foresters about fire, but Cary was firm: "Nope. Fresh point of view. Foresters can't see the woods for the trees. Fresh point of view. *I want it.*"

"So I wrote it," Hall recalled, "and that was the end of my career as a bench chemist." His forestry research led in the next few years to the Associate Directorship of the California Experiment Station in Berkeley, and then in 1939 to the job as Director of the Central States Experiment Station in Ohio.

The American entry into World War II brought Hall a remarkable new role. He was called to Forest Service headquarters in Washington, D.C., given the title of "Principal Biochemist," and turned loose to troubleshoot on war-related forestry research. He spent considerable time on a California project to grow guayule plants as an emergency rubber supply, and on plans for ethyl alcohol plants in Bellingham, Wash., and Springfield, Ore. As the war drew to its



Station Director Al Hall at Coyote Creek in the Umpqua National Forest, 1950.

close in 1945 and Hall's roving assignments were over, he was named to the Portland job to succeed Stephen Wyckoff, who had been transferred to the California Experiment Station as Director.

Hall came to the Pacific Northwest at a time much changed from the early days of "cut out and get out." The cheap and available stumpage, those several-centuries-old Douglas-firs and redcedars so readily felled into high-made logs, were a tiring of the past for many timber operators. Now, National Forests and other public timberlands were becoming the principal source for some lumbermen. Conservation, too often neglected or scorned in the past, began to inflict itself as a necessity: World War II had added its own dim marks of hasty and wasteful logging. More of the tree was being used than in the past: towering stumps of earlier eras were now seen to be an unaffordable waste, and the once-scorned smaller diameters up near the crown of the tree were being used as well. Sawmill waste which might be converted into byproducts was appraised with new respect. Under Hall's priorities, the Station now shifted its research program to help the timber industry toward even more efficient utilization.

In his roving job during the war, Hall had conceived the Forest Utilization Service as a nationwide set of research units to work towards this end.

Now, as Director, he could develop such a unit at the Station first-hand. Hall's notion was to revamp areas of research into closer relationship with the Forest Products Laboratory. The Forest Utilization Service was to make the work at the Madison research center known to the timber industry and encourage its use, and in turn help to steer the Madison laboratory programs to meet current timber problems.

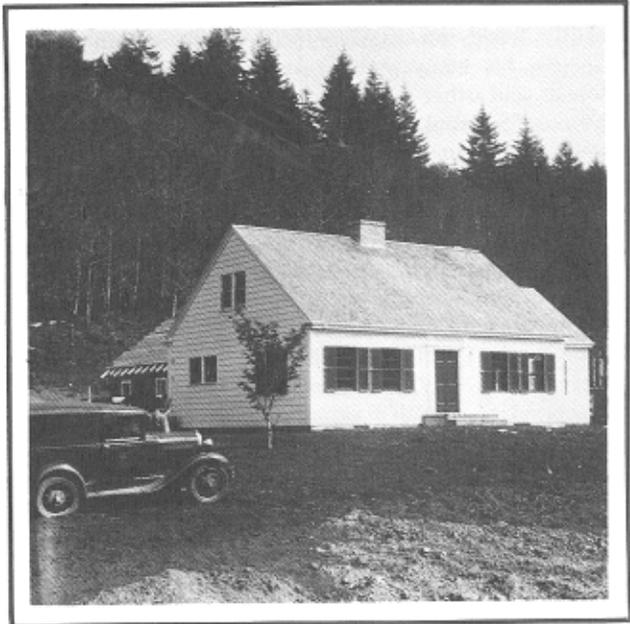
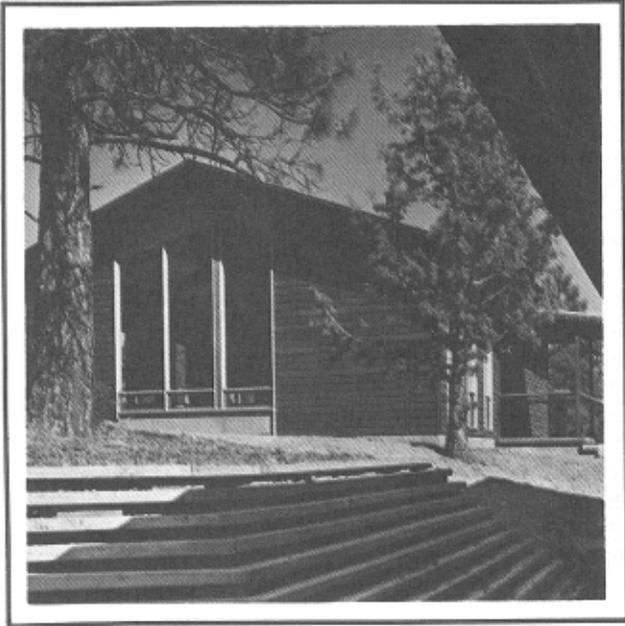
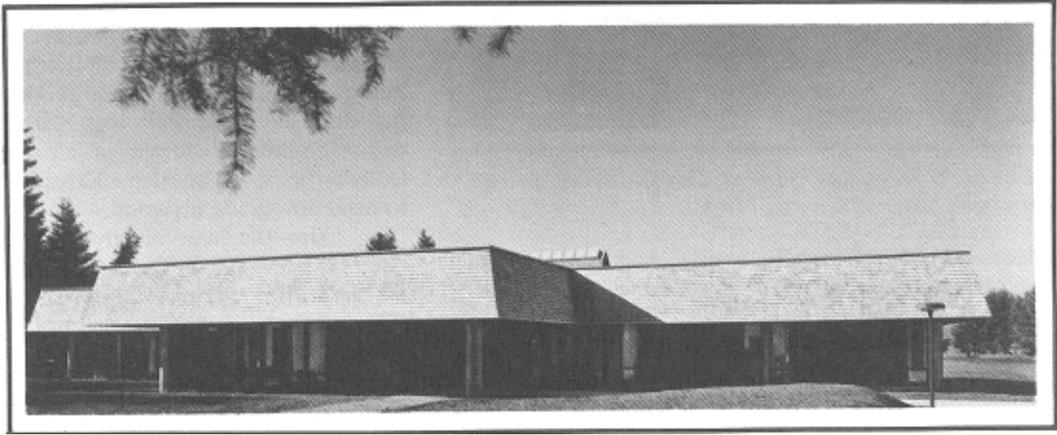
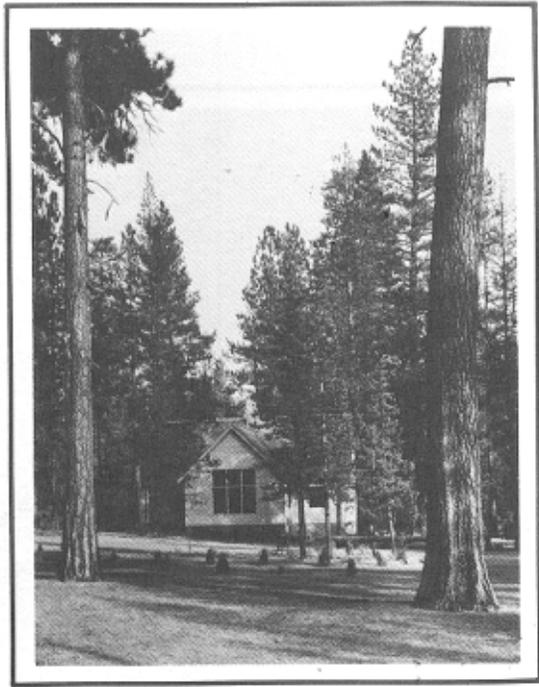
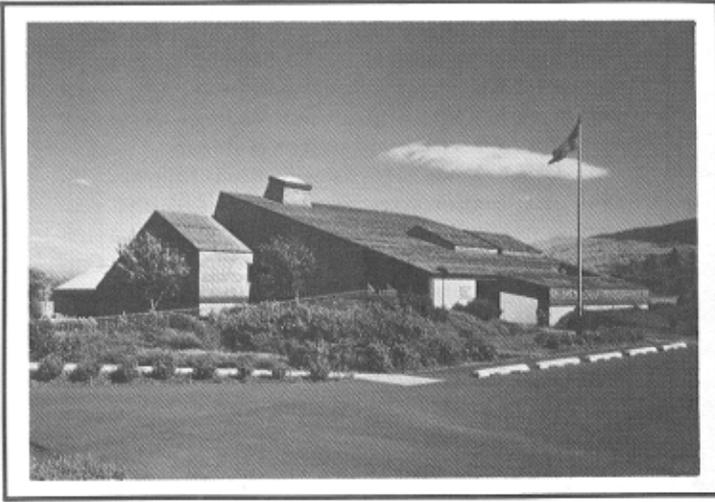
Other kinds of reorganization followed. In 1946, the Station's territory was divided into geographic areas with separate research centers. The first two were established at Olympia, Wash., and Corvallis, Ore. Others were set up in the next few years in Oregon at Bend, La Grande, and Roseburg.

Utilization projects began to mount up. There was more salvage logging of cutover lands in the Douglas-fir region and a successful pilot plant which turned mill scraps into usable boards. Douglas-fir waste was being used for fibreboard and pulpwood. The Station helped to spread information about hydraulic log barkers which used jets of wafer to peel logs for pulping, and worked with the lumber industry on less costly methods of kiln drying lumber. Research on plywood production resulted in the discovery that cull logs with white speck-a decay commonly found in old-growth stands of Douglas-fir in the southern Cascades-could be used to make low-grade plywood.

Using the huge old trees more efficiently was one new necessity for the lumber industry. Managing the generation of trees that followed the vanishing giants was the next. The Station, cooperating with timber companies which owned large stands of second-growth forest, set up three experimental tracts in the Puget Sound area to test ways to improve and harvest these stands.

Another new area of research came with the floods which swirled through the Columbia River Basin in the spring of 1948 in the watershed management study which began hurriedly in the wake of the high water. The Station contributed manpower to an interregional Forest Service team pulled together to evaluate causes of the severe flood season. Both weather and man's heavy impact were responsible. Heavy snow in the upper Columbia Basin was followed that year by a warm, late spring. But the runoff had coursed down much watershed acreage which had been denuded by fire or unregulated grazing. The next fiscal year, the Station was allotted funds for a flood control survey of the entire Columbia River Basin.

Grassland drew attention, too. Forest ecologist Joseph F. Pechanec was added to the staff to head the Division of Range Research, and a program of range reseedling was begun. A particular target was cheatgrass, the bane of many a grazer-low m



nutritional value, high in fire hazard. The ranges of central Washington, heart of the State's cattle industry, were especially plagued with cheatgrass. A 2-year program of planting various perennial grasses amid the cheat was established on a large ranch near Wenatchee. Pechanec's division next launched a study on the Starkey Experimental Range in eastern Oregon to compare the impact of different intensities of grazing on the grasslands.

These postwar years were also a time for catching up, for fitting together research done in the hectic eras of the Depression and World War II. In 1946, projects were begun for the first time under the title of Applied Forest Management. Hall explained the background: "Most of the forest management research in the Station's territory had been excellent work but had been confined to plots-growth and yield and spacing and thinning and so on." The next step was to test the results reached in the many studies of small sample plots on timber operations of commercial size.

The Experimental Forests at Cascade Head, Pringle Falls, and Wind River were used for some of the work, but other sites were needed with different forest types and conditions. In 1948, the H. J. Andrews Experimental Forest was established within the Willamette National Forest of western Oregon. This new experimental forest was keyed to the most venerable of the Northwest's timber resources-the old-growth Douglas-firs.

At that time, about 9 million acres of old-growth timber remained in the Douglas-fir region-roughly one-third of the total commercial forest land in the Pacific Northwest. Clearly, the management of this remaining prime timber demanded research attention. Across three decades-in fact since Thornton Munger's plantings of Douglas fir seedlings at test sites around the Northwest in 1912-1916-an extensive body of information about the Douglas-fir had been building. Both clearcutting and partial cutting had been studied on small experimental plots, as had artificial and natural regeneration, and growth and yield patterns. But the accumulated knowledge had yet to be tested in a big, commercial-size timber management project, and the Andrews Experimental Forest offered the chance. A harvest cut of 10 million board-feet was laid out for sale in early 1949, with the emphasis on determining the optimum size of clearcuts. This project for the next half dozen years was the site of research into cutting practices, forest roadbuilding, and siltation problems-a range of major problems of timber and watershed management.

Director Hall, who had sized up research and administrative talent during his wartime years of troubleshooting, kept adding to his staff. Phil Briegleb came back from the Northeastern Experiment Station to head the Division of Forest Management Research. Other names that would become well known in forestry research showed up on the Station roster: Edward G. Locke and James J. Byrne in forest utilization, Ralph W. Marquis to conduct a study of resource trends affecting the forest industries, Robert F. Tarrant from the Soil Conservation Service to begin a forest soils project, Elmer E. Matson and Archie C. Knauss on the applied forest management staff, Edward S. Kotok to work on forest management, and Roy R. Silen as a silviculturist working on the Andrews Experimental Forest projects.

While the new faces arrived, this period also marked the passing of the Station's original administration. In October 1946, Thornton Munger retired from the Forest Service after nearly four decades of work in the Pacific Northwest. June H. Wertz, who had been his administrative assistant when the Portland office was opened, retired at the same time. Throughout the Forest Service, retirements in these postwar years took away the last of the personnel dating from "the Pinchot era."

New eras, new faces. The array put together by Hall proved too talented to last. By the time the U.S. was enmeshed in the Korean War in the early 1950's, promotions were dispersing the Station's staff. Three of Hall's top-level hires-Briegleb, Marquis, and Pechanec-went on to head other Experiment Stations. Locke was drawn to the Forest Products Laboratory and later became Director there. Byrne became Chief of Engineering for the Forest Service in Washington, D.C. In April 1951, Hall himself left to become Director of the Forest Products Laboratory at Madison.

New facilities contributed to the growth of forestry research. Top row: Range and Wildlife Habitat Laboratory at La Grande, Oregon, in the 1970's and CCC crew house at Pringle Falls Experimental Forest in the summer of 1936. Middle: Forestry Sciences Laboratory at Olympia, Washington. Bottom: Silviculture Laboratory at Bend, Oregon, and office at Cascade Head Experimental Forest on the Oregon coast, 1936.

New Provinces for Research

*Since 'tis Nature's law to change, Constancy alone is strange.
-The Earl of Rochester, Works*

When young Bob Cowlin came up from California in 1929 to report for his new job with the Station, Director Munger greeted the newcomer and idly asked where the Cowlins had found lodging. Munger, ever the Yale man, was impressed to learn they were staying with Mrs. Cowlin's uncle, a graduate of the Yale law school. Shortly afterward, Cowlin was called into Munger's office to meet a lumberman who also had earned his degree at New Haven. Munger made the introduction: "Cowlin is not a Yale graduate, but he has Eli connections."

Cowlin had considerably more than that to commend him, as his subsequent years at the Station showed. His career concluded with a dozen years as Director; only Munger served longer in the job. As successor to Al Hall in 1951, Cowlin inherited both the thrust of research begun by Hall and the problem of replacing a talented administration being dispersed by promotion.

Cowlin had graduated from the University of California in 1922 with majors in forestry and economics, and spent the next several years in the California redwood and pine industries. But the jobs never quite suited him. "I seemed to gravitate or was

propelled into the sales end, and not into working in the woods," Cowlin soft-spokenly recalled. "I decided I wanted to practice my profession."

What helped him decide was a new job in a company town, with the pay in company scrip and not much in the way of company amenities. "That galled on me sooner or later . . . And I didn't want to bring a bride up to a company town with unpainted houses," he recalled. He returned to the University of California for a master's degree in lumber marketing. Interested in the forthcoming Forest Survey, Cowlin next took the civil service exam and lined up the new job in Portland.

Cowlin was heavily involved with the Survey of the Pacific Northwest's Douglas-fir region, and in those years became head of the Station's Division of Forest Economics. He served brief terms as Acting Director a number of times, then, with Hall's departure to the Forest Products Laboratory in 1951, became the first Director promoted from within the Station staff.

The new Director seemed to be presiding over a revolving door rather than a research staff, as promotions scattered the Hall administrative staff to

new Forest Service jobs elsewhere. Cowlin looked back on his first few months to find that the only division of the Station unaffected by personnel changes had been Range Research and promptly Joe Pechanec, head of that division, was detailed to Somaliland on a United Nations mission. Also, there was a familiar story tight funding- brought on by the Nation's latest calamity, the war which broke out in Korea in June 1950.

Cowlin's term as Director was bound to improve, and it did. New administrators for the research divisions were found, fiscal fortunes improved in 1952 as the Korean War simmered toward a truce, and new research fields were in the offing. So was the imminent growth of the Station into an agency of its present dimensions, with facilities dotting the map throughout its region.

Those dots of growth were drawn in a revamping of Forest Service research administration after World War II. The concept born of the McSweeney-McNary Act in 1928 was basic-11 geographical regions of the United States, with a Forest and Range Experiment Station for each one. Then the administrative chart was redrawn into some 80 research provinces, with each original experiment station overseeing the provinces in its region. Each province had a research center, plus one or more Experimental Forests or Ranges.

It was a formula for branching administration into the locales where onsite research was being done. Under this new charter, the Pacific Northwest Station established seven research provinces, drawing on the eight Experimental Forests and Ranges which over the years had been established on National Forest lands, and on four cooperative Experimental Forests on private lands.

Something of a scientific renovation followed. Except for elementary facilities squeezed into extra space somewhere, the Station had never had a scientific laboratory. Research work had been done primarily through field studies. Now laboratory science took on new emphasis. In 1960, Congress provided funds for a construction program. Out of that funding the Station built its Forestry Sciences laboratory at Corvallis, opened and operating in the summer of 1962. A smaller laboratory had been established at Olympia. Next came a soils and water laboratory at Wenatchee, a silviculture laboratory at Bend in the ponderosa pine region, and a range and wildlife laboratory at La Grande. Branch offices were also opened at Roseburg and Seattle. The Portland office itself had been moved in 1954 to 729 N.E. Oregon St. In May 1958, came the short move to the Station's present location at 809 N.E. Sixth Avenue.

By the end of Cowlin's term as Director, the overhaul of administration and research could be

read in the list of projects. Of the Station's 39 research projects, 20 were underway out in the branch offices or laboratories; the Portland headquarters had 19.

Well before these structural changes, an entire new field of research was inherited by the Station. In the 1953 reorganization of the Department of Agriculture, the Forest Service for the first time was given responsibility for forest insect and disease research. To the Portland office, this meant a revision of agency titles and administrative lines. What had been the Forest Insect Laboratory of the Bureau of Entomology and Plant Quarantine became part of the Station as the Division of Forest Insect Research. What had been the regional office of the Division of Forest Pathology within the Bureau of Plant Industry, Soils, and Agricultural Engineering now was reoriented as the Station's Division of Forest Disease Research.

The newcomers actually were many years senior to the Experiment Station as research staffs. The Office of Investigations in Forest Pathology was organized in 1907, and an agreement was reached in 1910 to establish a branch office of Forest Pathology at each regional headquarters of the Forest Service. The Federal entomologists go back even earlier. Serious research on forest insects of the Pacific Northwest seems to date from Prof. A. D. Hopkins, who in 1902 became the first chief of the Division of Forest Insect Investigations. In 1899,

The Oceanlake Garden Club gathers for a show-me trip in the Cascade Head Experimental Forest, 1954.



when Hopkins still was professor of "economic entomology" at the University of West Virginia, he made a 2-month trip through California, Oregon, Washington, and Idaho, and is reported to have returned home with 4,363 specimens of insects.

It is clear why research on forest insects was funded long before other kinds of forestry research were given serious considerations. The insects killed trees and terrified lumbermen. In 1910, for instance, an infestation of mountain pine beetle hit the forests near Baker, Ore. Lumbermen promptly formed the Forest Protective Association and cooperated in a beetle control project with the Bureau of Entomology and the Forest Service. That tussle was only the first of a succession: there followed campaigns against the Douglas-fir bark beetle, the hemlock looper, the spruce budworm, and many other forest pests up through the Douglas-fir tussock moth problem in 1970-74.

The lumberman's detestation of insect epidemics may not have changed over the years, but much else about the Pacific Northwest lumber scene had. The Douglas-fir region supported two different forest economies by the mid-20th century—one still based on the old-growth timber, the other on the smaller second-growth trees. Both kinds of logging posed nagging questions about the long-term timber supply in the area. By the early 1950's, the figures looked bleak; about 300,000 acres were being clearcut each year in the Pacific Northwest, but only about 75,000 acres were being planted. A considerable portion of the logged-over area would restock itself naturally. Other areas would not, and there were scars from the past, too-old cutovers and burned regions that were not growing back. It was in this era that log exports to Japan began to increase and developed into an economic controversy which is still going on. Then, as the 1950's drew to a close, a slump in the demand for construction lumber and plywood pinched the timber industries of the Pacific Northwest. By the end of 1960, seasonal shutdowns were being lengthened, workweeks shortened, and marginal mills and plants shut down.

Threaded through the economic ups and downs was the trend toward merger, which during the 1950's affected the lumber industry even more rapidly than it did other manufacturing fields. Cowlin later recalled that "of the 20 largest lumber producers, 8 disappeared through mergers, 3 went out of business, and 1 became a cooperative." He pointed out, too, that despite the mergers, "there remained a high degree of competition in the industry nationally."

In response to these trends; the PNW Station added several new projects and reorganized old ones. In 1954, forest genetics became a full-fledged research project. Genetics research had begun back with the establishment of the Wind River Arboretum in 1912 and in Thornton Munger's test site plantings in the next few years. Now facilities were obtained at Corvallis through the forestry school of Oregon State College, and research intensified on the production of better tree seed and improved timber species.

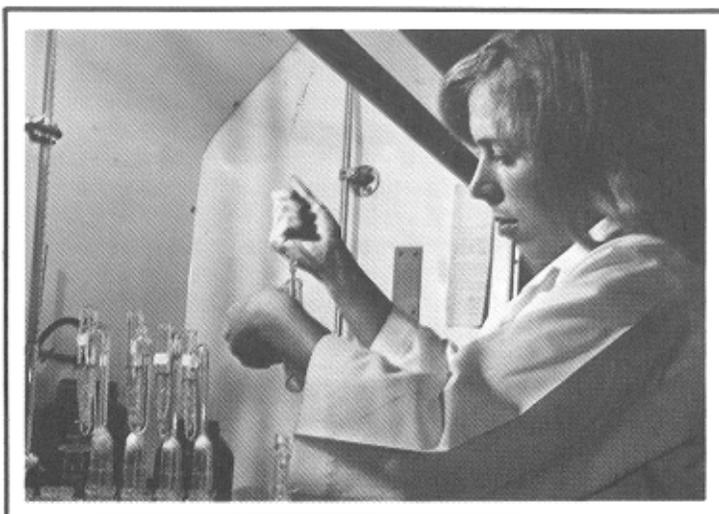
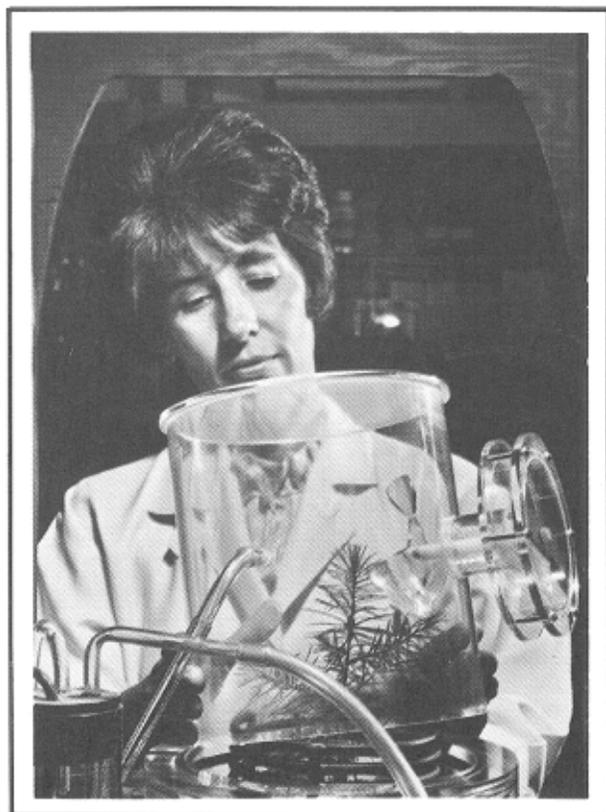
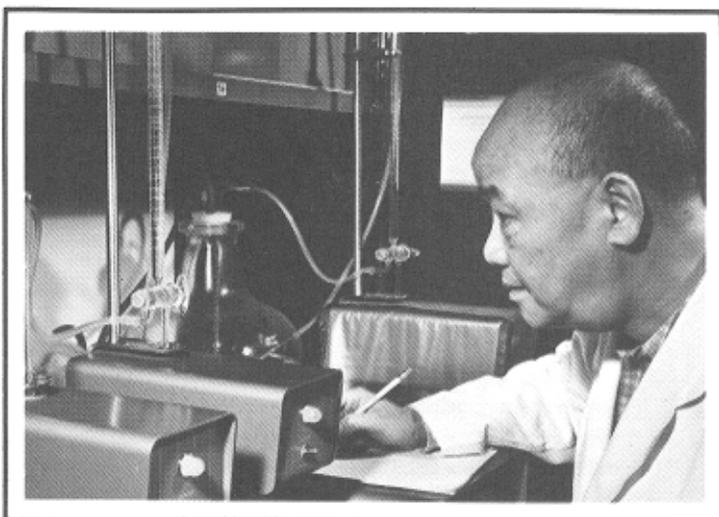
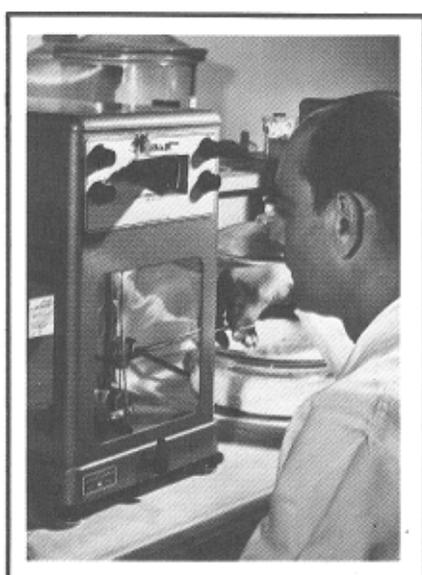
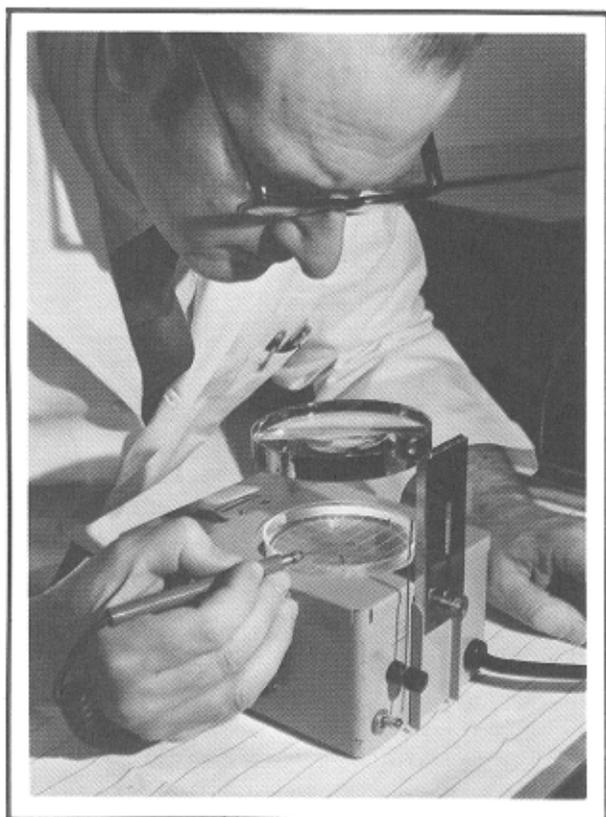
Cowlin had been drawn to the Station in 1929 to work on the Forest Survey. That timber inventory had been updated several times; in the decade following World War II, the Station reinventoried some 31 million acres. In 1958, a new computation the timber trends study—was begun on the quantity and quality of timber supply in the Douglas-fir region. This time, ownership patterns and policies were the focus—an analysis of who owned the forest lands, and their management of the resource.

The Station's Forest Utilization Service meanwhile was working on logging technology. The FUS staff played a major part in the installation of the first big Wyssen Skyline Crane in this country. The Wyssen system, developed by a Swiss company, was an experiment in taking logs out by crane and cable to save the watershed soil and to cut the costs of roadbuilding. In this same period, also with the Station's encouragement and participation, helicopter logging was first tested.

By the first years of the 1960's, the Station had taken on a modern gleam in facilities, organization, and research orientation. Change had been the hallmark of the past dozen years, and the Station had gone far from its origins in a small set of offices. Two small facts from this era may sum up what was happening:

-In more than three decades with the Experiment Station, Leo Isaac had become a nationally known expert on Douglas-fir regeneration. Isaac was the old type of foods-roaming researcher who thrived by his wits, as in his imaginative studies using kites to study the dispersal of tree seeds. His strong personality and affection for the Douglas-fir species were known almost as widely as his scientific achievements. It was Isaac the Douglas-fir champion who asked ponderosa pine researcher Ernest Kolbe how Kolbe went about finding the logs of this lesser species "when they got lost in the tall grass." On a day in 1956, Leo Isaac retired.

-On another day that same year, the Portland office became the first of the federal experiment stations to use the computer.



The Age of Ecology

I thought that job on the Forest Survey... was the best possible job in the world. It was exploring an unknown resource, in beautiful places, with some wonderful timber-and getting paid for it.
-Philip A. Briegleb, Director, 1963-1971

During this era, the words ecology and environment passed from their customary usage in the biosciences into the national vocabulary. A sizable number of Americans turned to the ethic of the late conservationist Aldo Leopold, himself once an eager young forester in the U.S. Forest Service: "Like winds and sunsets, wild things were taken for granted until progress began to do away with them. Now we face the question whether a still higher 'standard of living' is worth its cost in things natural, wild, and free. For us of the minority, the opportunity to see geese is more important than television, and the chance to find a pasque-flower is a right as inalienable as free speech."

The endless debate over environmental quality versus economic and industrial considerations began in earnest, and some notions which before had suffered little criticism were now argued hotly.

For the Station, perhaps no words uttered during the 1960's held more consequence than this single sentence: "The most alarming of all man's assaults upon the environment is the contamination of air, earth, rivers, and sea with dangerous and even lethal materials." Rachel Carson's best-seller *Silent Spring*, published in 1962, became a power unto

itself, and the use of pesticides in this country has been affected by it ever since. The Station's Division of Forest Insect Research had behind it some 60 years of research on tree-destroying pests, and at least 20 years of work with effective chemical insecticides. Some research already had been done on biological control of insects, but now in the 1960's there was-a major change in this direction at the Station.

The surge of environmental concern also brought up topics such as erosion and siltation on wildland watersheds, points of research by the Station for a number of years. As a result of past research and increased public interest, the complexity of the forest ecosystem became better known. Now it was more widely realized that it was the chainsaw that felled the timber that denuded the slope that lost the silt that clogged the stream and killed the salmon. And beyond the chainsaw was the demand for lumber in our economy and style of life.

Federal forestry in the Pacific Northwest long since had undergone its own debate about the most controversial logging method-clearcutting. Opinion had been sharply divided even within the Station in the late 1930's, when the point at issue was largely

economic. Now, with clearcutting targeted as an environmental issue and such matters as timber supply again coming into question, the public interest was again looking over the shoulder of research.

Along with the environmental concern came increased use of the forests for outdoor recreation. The number of backpackers and families at campgrounds multiplied with the availability of leisure and a new appreciation of the wild heritage remaining in America. The chronic dilemma of the National Forests-how to provide multiple use of landscape coveted both for natural beauty and for economic resources-became even more severe- The Station's 1963 annual report soberly mulled the national trend of the past half-century: "Recreational visits to our National Forests weren't accurately counted in 1913, but probably they didn't much exceed 100,000; the count for 1963 will probably approximate 12,000,000 an indicated increase of over a hundredfold."

Into the rising force of such trends stepped a new Director for the Station. When Bob Cowlin retired in March 1963, his successor was another veteran hand in Pacific Northwest forestry-Philip A. Briegleb.

It is hard to think of Phil Briegleb in any occupation other than forester. Tall, taw-boned, a look of the outdoors in his manner, he talks in a measured drawl about the profession as a way of life: "Forestry is partly a science, but the application of it is an art." Then, more measured yet: "Some of the artistry has been a little slow in coming along."

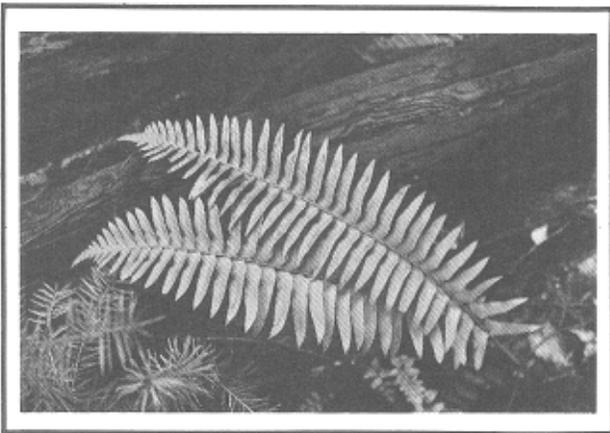
Briegleb, like Cowlin, had hired on at the Station in 1929 for the Douglas-fir Forest Survey. He came west, fresh out of Syracuse University and his hometown in Missouri, in a brand-new Model A. A few days after he arrived, Thornton Monger sent him north to a timber survey party on the Middle Fork of the Snoqualmie River in the Cascade

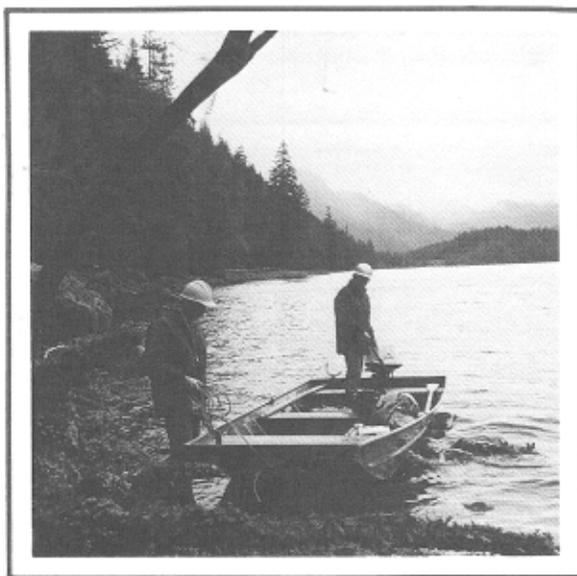
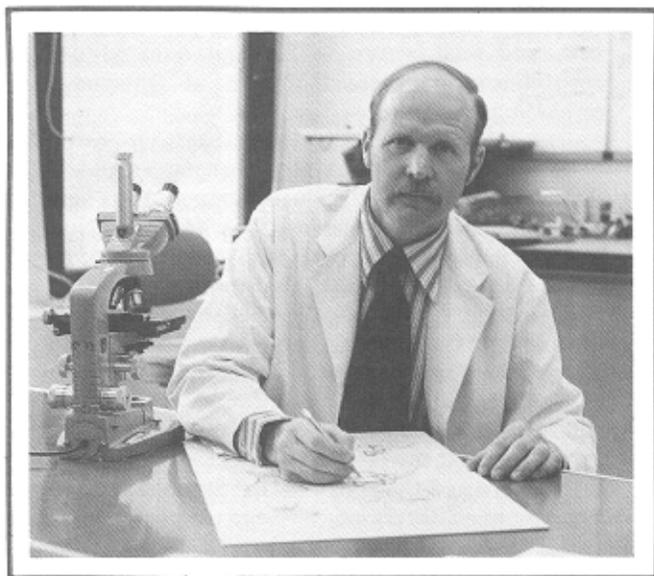
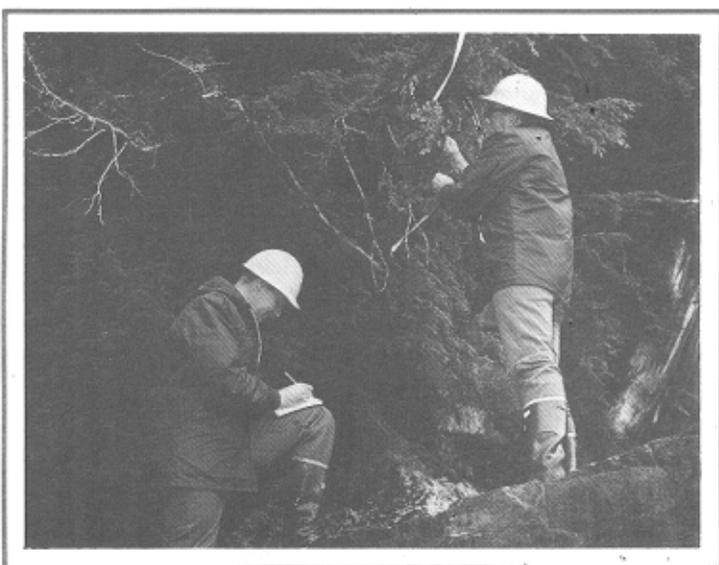
Mountains east of Seattle. "I drove the Ford up to the end of the road and parked it there, and shouldered my packsack, with my belongings and bedroll-and a brand-new pair of calk boots and hiked to the camp, which was 12 miles up the trail." Briegleb spent about 6 weeks on the timber cruise there, then was sent into the Olympic Mountains for a survey project near the headwaters of the Wynoochee River.

That season in the Northwest woods was the beginning of what Briegleb would remember as a deeply rewarding period of work. The Forest Survey, he said, "was a thrilling job. We had a feeling that the information we were collecting was going to result in the better protection and management of a very valuable resource." The enthusiasm even overwhelmed matters of the pocketbook "When I came to from that first summer in the field . . . some of the fellows who had been in the Forest Service longer asked me if I was going to turn in an expense account. This was the first time I had heard there was such a thing as an expense account in the Forest Service."

Briegleb worked on the Forest Survey until 1935 and then began training as a mensurationist, a specialist in forest measurements. From 1936 on, he divided his time between the Forest Survey under Cowlin and mensuration studies under Monger. When World War II came, Briegleb was chosen for a team which was to survey the timber resources of Chile. "I had the experience of sketch-mapping the forests of Chile from the gunner's blister in the back end of a Catalina flying boat." In the autumn of 1944, another Forest Survey project beckoned. This one in the Northeastern States. He came back to Portland in 1946 to succeed Monger as head of the Station's Division of Forest Management, then went on to direct first the Central States Station in Ohio and next the Southern Station in Louisiana. His next, and final, return to Portland came with his appointment to succeed Cowlin as Director in early 1963.

Briegleb had seen, during his quarter-century of Federal forestry research, a changing attitude to the lumber industry. "Gradually some of the skepticism developed into tolerance," as he put it. So, with the lumbermen more amenable, segments of the public were skittish about the Forest Service. The first annual report of the Federal Council on Environmental Quality bespoke such concern: "Good forest management is no longer synonymous with timber production." Yet, despite the push and pull of stronger environmental and recreational demands, timber production had to continue. Briegleb charted the policy for the Station "Mostly, more intensive forest management practices met in





need-such as genetics research, fertilization, precommercial thinning, more intensive protection of watersheds."

In terms of specific research projects, a study of the residual effects of pesticides was begun in the fall of 1964, and the emphasis began to shift toward biological and silvicultural measures to control insects. The computer came more and more into research. Through one dramatic piece of computer programming, different perspectives of the landscape could be drawn electronically to show the visual impact of proposed timber cuts. Thinning experiments showed that the lodgepole pine, one of the region's frailest lumber producers, could be made to grow in much more productive dimensions. An alternative to clearcutting was studied at the Cascade Head and Hemlock Experimental Forests: it was found that a system called "shelterwood," which left enough trees to shade the site, could be used to reforest the carefully logged areas of Douglas-fir, western hemlock, Sitka spruce, and red alder.

Meanwhile, the 1960's also saw the growth of research facilities and projects in the vast northern frontier of the Station's territory-Alaska. The Institute of Northern Forestry, with headquarters at Juneau, became part of the Station in 1967. Two Experimental Forests already had been set aside in coastal Alaska, another was designated in the interior, and the new Forestry Sciences laboratory was established at Fairbanks.

Some of the basic research in Alaska read like a new edition of earlier projects carried out in Oregon and Washington. In a survey of the timber stands of this final wilderness, the figures were big ones: 28.2 million acres of commercial timber land, more than in any other state; a total volume of sawable timber estimated at 215.5 billion board feet, more than three-fourths of it in the Sitka spruce and western

Along with these traditional research areas, the Alaskan ecology posed some specific new problems. Erosion was a particular concern. It was found, for instance, that firelines cut to control forest blazes in areas of permafrost grow into deep ruts, and a study was begun. Another focused on fish habitats which, vital as they were to the fishing industry and recreation, had to be protected from logging and construction near the streambeds.

It is too early yet to know just how far and where the levers of environmental concern and recreational demand will move the Forest Service and its research aims. As late as 1970, Forest Service Chief Edward P. Cliff said ruefully that "our programs are out of balance to meet public needs for the environmental 1970's and we are receiving mounting criticism from all sides. Our direction must be and is being changed." Phil Briegleb, himself a man of deep feeling for the loveliness of forested slopes, found some hard cross-pressures in his 8 years as Director, such as "the preoccupation with an unwanted war" which perpetually tightened budgets.

This era of ecological outcry crested with the celebration of Earth Day on April 1, 1970. By then, the Station, along with the rest of America, could well ponder the environmental priorities of coming years-and what the right balance might be.

Field work is especially hard in Alaska where winters are long and travel is difficult. Boats and planes are the usual methods of getting to research locations.

Today and Tomorrow

Fragrant little chips of history spewed from the saw cut, and accumulated on the snow before each kneeling sanyer. We sensed that these two piles of sawdust were something more than wood: that they were the integrated transect of a century; that our saw was biding its way, stroke by stroke, decade by decade, into the chronology of a lifetime, written in concentric annual rings of good oak.
-Aldo Leopold, *A Sand County Almanac*

Chips of history, and the give-and-take strokes of those who make them, accumulate into a record we can read as the recent past of Pacific Northwest timberland and grassland, and the Federal research centered on them. But the accumulation continues even as we size up the past; already the Station is more than halfway through the decade that opened with the environmental push of 1970.

A new Director presided over most of the first half-decade of the Seventies. Robert E. Buckman, a silviculturist with a research background earned in the conifer forests of the Northern Rockies and the region of the upper Great Lakes, came into the Portland job when Philip Briegleb retired on May 31, 1971. Buckman had served as assistant to the Deputy Chief for Research in the national office at Washington, D.C. He saw the new complexities of Federal forestry: "The problems of forestry today concern not so much the lack of knowledge about single uses and single commodities; they concern not fully understanding the interrelationships of multiple uses-water and recreation or timber, wildlife, and livestock."

A reorganization of research began under Buckman. In 1971, four projects at Fairbanks, Alaska, were welded into a single interdisciplinary team-entomology, botany, silviculture, and forest management-to study the forest ecology of the Alaskan interior. Since then, many of the Station's scientific projects have been retooled into research work units which combine several areas of expertise.

The experimental areas the Station had drawn on for decades also were used in new ways. In late 1974, the handsome set of headlands and estuaries midway along the Oregon coast which had been the Cascade Head Experimental Forest became the country's first scenic-research area. Even before that, in 1972, an inventory of the Federal government's Research Natural Areas in Oregon and Washington was published-there are now about 60 of them under various agencies with the Station administering the research use of 34.

Alaska was given increased research emphasis. The global scramble for natural resources has coincided with the apportionment of 220 million acres of public domain lands in the Alaskan vastness



Six directors of the Experiment Station were living in Portland at the time this photograph was taken in 1974. Standing, left to right: Robert F. Tarrant, 1975-; Philip A. Briegleb, 1963-1971; and J. Alfred Hall, 1945-1950. Seated, left to right: Robert W. Cowlin, 1950-1963; Thornton Munger, 1924-1938; and Robert E. Buckman, 1971-1975.

among Federal agencies, the Alaska Natives, and the State government. One of the concerns has been the effects of logging white spruce from interior Alaska's fragile ecosystem: studies of harvest methods and regeneration were started on the Bonanza Creek Experimental Forest near Fairbanks. Outer Alaskan projects have included research on the effects of log dumping and rafting in southeast Alaska, and on techniques to increase spawning areas for salmon.

Even as new research ventures were planned, an old subject pushed into prominence again—the forest insect, this time the Douglas-fir tussock moth. By 1973, the Forest Service was calling the tussock moth outbreak "the worst epidemic of the destructive forest defoliator ever recorded," calculating that the pest had spread through some 800,000 acres of forest in eastern Oregon and Washington, Idaho, and

Montana. Studies on the tussock moth dated back to 1927, long before Federal entomology research was transferred to the Forest Service. But now the environmental risk of chemical insecticides has been added into the research equation, and a number of Station researchers worked on nonchemical remedies, such as the virus that often contributes to the natural collapse of tussock moth outbreaks. And during 1974, the entomologists identified the sex attractant, or pheromone, which lures the tussock moth. Using this synthetic attractant in caps may provide an early-warning system to signal a growing infestation.

Buckman's 4-year Directorship concluded in June 1977, when he was named to the Washington, D.C., post of Associate Deputy Chief for Forest Service Research. His successor, Portland-born and

the first native Northwesterner to head the Station, is Robert F. Tarrant. Tarrant came to the Station from the Soil Conservation Service in the fall of 1946, and in his career as a research soil scientist headed up a project on forest soils and regeneration, and then-in the post-*Silent Spring* days-the project which studied the impact of chemicals on the environment. He became an Assistant Director of the Station in 1971 and Director on July 10, 1975.

By the end of 1975-a half-century since the wonderworker of the gooseberry bush dropped by to see what the Station was doing-the Pacific Northwest Forest and Range Experiment Station had a complex family tree of current and past research. Sorting out the lineages might produce some of these conclusions:

-An agency is pushed and pulled by the times. The Station has felt the Depression, three wars, the growth of environmental concerns, the burgeoning of science in the nation's everyday life, and the effects of inflation and concerns about Federal spending.

-The bloodline of an agency is its people. The decades of research by a man such as Leo Isaac-a painstaking observer as well as inventor-yield priceless information, the foundation for improved forest management practices and new research. In the eras of the six Directors who have headed the

Station can be read, not surprisingly, some guiding notions of each man: Munger's brisk administration and his emphasis on the great Douglas-fir species; Wyckoffs delegation of authority amid the many demands of war; Hall the biochemist focusing on better methods for using the forest's wood; Cowlin the economist presiding over the growth of scientific facilities and administrative units; Briegleb's attention to more scrupulous forest management; and Buckman's retooling of research projects into interdisciplinary teams.

-The five decades of the Station have produced several thousand publications on a spectrum of research from insect control to watershed protection, from grazing management to forest inventories. New trends already have been shaped by the environmental and recreational demands of recent years. But the principal timber species of the Pacific Northwest-the great Douglas-fir tree-has been the focus of the most significant research accomplishments at the Station.

-And finally, the forests and grasslands thrive or wane according to the heartbeat of our society. The patterns on the Pacific Northwest horizon, whether the close-textured green slopes of selectively cut timber or the patchwork of clearcuts, whether rangelands gullied with erosion or unbroken stands of grass, reflect our current values. Tomorrow will be written there, too. Somehow over the years, the trees have continued to green and grace the mountain slopes, the grass has whisked its eternal wind dance across the valleys and prairies. Not for nothing are such scenes called horizons.

Sources and Acknowledgments

The source notes listed below are meant to document quotations and, in special instances, specific points of history. A copy of the manuscript fully annotated with sources is on file with the Pacific Northwest Forest and Range Experiment Station, and another with the author.

This history has drawn heavily on the 459-page manuscript compiled by former Station Director Robert W. Cowlin, "Federal Forest Research in the Pacific Northwest." The Station files yielded a useful year-by-year summary of projects and personnel. The first of these typescript volumes is titled "A Record Concerning the Wind River Forest Experiment Station, July 1, 1913-June 30, 1924, and the Pacific Northwest Forest and Range Experiment Station, July 1, 1924-December 30, 1938," with supplements for 1939-43. The second is "The Pacific Northwest Forest and Range Experiment Station History Supplements 1944 through 1953." The annual reports published by the Station, beginning in 1935, provide a summary of research activities and publications.

For detailed documentation, the archival material on deposit at the Federal Archives and Records Center in Seattle is highly valuable, especially the monthly reports written by the Station Directors.

The files of the Forestry Sciences Laboratory at Corvallis contain two brief mimeographed histories: "The Evolution of Forest Insect Research and Its Present Status in the Pacific Northwest," a 1956 conference paper by V. M. Carolin and K. H. Wright, and "History of the Division of Forest Disease Research, Pacific Northwest Region," dated 1958 and listing no author.

As for personal recollections, it is extraordinary luck that four of the Station's first five Directors were available for interview. (Stephen N. Wyckoff, Director from 1938-45, died in 1959.) Thornton T. Munger, who died in 1975, was interviewed in 1967 by Amelia R. Fry of the Forest History

Society, with the results published under the title *Thornton T. Munger, Forest Research in the Northwest* (University of California Library, Berkeley, 1967). Three former Directors were interviewed by the author in the spring of 1975: Philip A. Briegleb, Robert W. Cowlin, and J. Alfred Hall.

Several researchers at the Forestry Sciences Laboratory in Corvallis also took time to talk about their projects: Robert K. Campbell, Jerry F. Franklin, Robert H. Ruth, Roy R. Silen, Ronald E. Stewart, and Douglas N. Swanston. Charles Sartwell was especially helpful concerning the history of forest insect research. Much information about research in an earlier era was drawn from Amelia R. Fry's interview with the late Leo A. Isaac, published as *Leo A. Isaac, Douglas Fir Research in the Pacific Northwest, 1920-1956* (University of California Library, Berkeley, 1967).

For background on the history of Americans and their forests, two books are indispensable: Thomas R. Cox, *Mills and Markets: A History of the Pacific Coast Lumber Industry to 1900* (University of Washington Press, Seattle, 1974), and Richard G. Lillard, *The Great Forest* (Alfred A. Knopf, New York, 1947). And the author was fortunate to be able to read in manuscript Harold K. Steen's history of the U.S. Forest Service.

A number of persons helped considerably by commenting on the first draft of the history: Philip A. Briegleb, Robert E. Buckman, George Garrison, J. Alfred Hall, Frank Harmon, Louise Parker, Charles J. Petersen, Robert M. Romancier, Harold K. Steen, and Robert F. Tarrant. And finally, after sharing his own manuscript and sources and sitting for an extensive interview, Bob Cowlin still had the good grace to improve this version with further information and advice.

Source Notes

A Beginning

Page 1 **"One caller, name unknown"**: PNW Forest Experiment Station monthly report, Jan. 1925, p. 2.

The Skein of Research

Page 2 **"America had the virgin West"**: Wallace Stegner, *Beyond the Hundredth Meridian* (Boston, 1962), p. 117.

Page 2 **"...species which grows"**: Reuben Gold Thwaites, ed., *Original Journals of the Lewis and Clark Expedition* (New York, 1904), vol. 4, p. 41.,

Page 2 **"The wood may be found"**: Murray Morgan, *The Last Wilderness* (New York, 1955), p. 58.

Page 3 **a Seattle newspaper remarked**: cited in Thomas R. Cox, *Mills and Markets* (Seattle, 1974), p. 229.

Page 4 **"Boss loggers and lumbermen"**: Stewart H. Holbrook, *Holy Old Mackinaw* (New York, 1939), p. 248.

Page 4 **established the Wind River Experiment Station**: Annual Report of Wind River Experiment Station for 1913, p. 1.

Page 4 **"it was then a sad affair"**: *Leo A. Isaac: Douglas Fir Research in the Pacific Northwest, 1920-1956* (Forest History Society interview by Amelia R. Fry, Berkeley, 1967), p. 49, p. 53.

Page 4 **allotted \$26,060**: PNW Forest Experiment Station Record, 1924-1938, p. 13.

Page 4 **blueprinted the regional Experiment Stations**: *U.S. Statutes at Large*, 70th Congressional Session 1, 1928, p. 701-702.

Getting Underway in Portland

Page 5 **"We had ...a bicycle tire valve"**: Richard E. McArdle letter to Robert W. Cowlin, Oct. 18, 1973.

Page 5 **"From the start"**: Thornton T Munger: *Forest Research in the Northwest* (Forest History Society interview by Amelia R. Fry, Berkeley, 1967), p. 45.

Page 7 **the "awful blow"**: *Munger* interview, p. 58.

Page 7 **"People who have gone through"**: *Munger* interview, p. 49.

Page 7 **"...As a surprise to me"**: *Munger* interview, p. 99.

Page 7 **"October has been divided"**: PNW Forest Experiment Station monthly report, Oct. 1925, p. 1-3.

Page 8 **"remodeled with hinges"**: McArdle letter to Cowlin Oct. 18, 1973.

Page 9 **"I got a piece of spruce"**: *Isaac* interview, p. 71. Subsequent quotes about the kite experiment are from the same source, p. 64-74.

Counting the Trees

Page 10 **"The Arkansas day"**: PNW Forest Experiment Station monthly report, June 1931, p. 5.

Page 12 **records "continue to be gathered"**: PNW Forest Experiment Station monthly report, July 1930, p.3.

Page 12 **"In those years"**: interview with Philip A. Briegleb by Ivan Doig, Portland, April 30, 1975.

Page 12 **"They did a lot"**: *Munger* interview, p. 138. Details of projects by the CCC and other New Deal work forces can be found in the year-by-year summary in the Pacific Northwest Forest Experiment Station Record, 1924-1938.

When Forestry Went to War

Page 15 **"A large part"**: PNW Forest and Range Experiment Station monthly report, Dec. 1941-Jan. 1942, p.6.

Page 15 **the research agency was renamed the PNW Forest and Range Experiment Station**: The Station Record doesn't note the name change, but the title on the Station's monthly reports was changed in February 1938.

Page 17 **"the most urgent need"**: *Report of the Chief of the Forest Service*, 1943, p. 1.

Towards Better Use

Page 18 **"I had a wonderful team"**: interview with J. Alfred Hall by Ivan Doig, Portland, May 1, 1975. Subsequent quotes and information about Hall's early career are from the same source.

Page 21 **"Most of the forest management research"**: Hall interview.

New Provinces for Research

Page 22 **"Cowlin is not a Yale graduate"**: interview with Robert W. Cowlin by Ivan Doig, Portland, April 29, 1975. Subsequent quotes and information about Cowlin's early career are from the same source.

Page 23 **The Office of Investigations in Forest Pathology**: History of the Division of Forest Disease Research, Pacific Northwest Region, p. 1.

Page 23 **Serious research on forest insects**: Information in this paragraph and the subsequent one is from an unpublished paper by V.M. Carolin and K.H. Wright, "The Evolution of Forest Insect Research and Its Present Status in the Pacific Northwest."

Page 24 **Cowlin later recalled**: Cowlin manuscript, p. 434.

Page 24 **"when they got lost"**: *Isaac* interview, p. 70.

The Age of Ecology

Page 26 **"I thought that job"**: Briegleb interview.

Page 26 **"Like winds and sunsets"**: Aldo Leopold, *A Sand County Almanac* (New York, 1966), p. xvii.

Page 26 **"The most alarming"**: Rachel Carson, *Silent Spring* (Boston, 1962), p. 6.

Page 27 **"Recreational visits"**: PNW Forest and Range Experiment Station annual report, 1963, foreword.

Page 27 **"Forestry is putty a science"**: Briegleb interview. Subsequent quotes and information about Briegleb's early career are from the same source.

Page 27 **"Good forest management"**: *Environmental Quality, The First Annual Report of the Council on Environmental Quality*, 1970, p. 164.

Page 29 **"our programs are out of balance"**: Quoted in Daniel R. Barney, *The Last Stand* (New York, 1974), p. 133.

Page 29 **"the preoccupation with"**: Briegleb interview.

Today and Tomorrow

Page 30 **"Fragrant little chips"**: Leopold, *A Sand Count Almanac*, p. 9-10.

Page 30 **"The problems of forestry"**: PNW Forest and Range Experiment Station annual report, 1971, p.1.

Page 31 **"the worse epidemic"**: PNW Forest and Range Experiment Station annual report, 1973, p.5.



For additional information contact:

Information Services
Pacific Northwest Forest & Range Experiment Station
P.O. Box 3141
Portland, Oregon 97208
503/234-3361, ext. 4992
FTS: 429-4992

Credits:

J. Louise Parker
Karen Esterholdt

Forest Service
U.S. Department of Agriculture
November 1977