

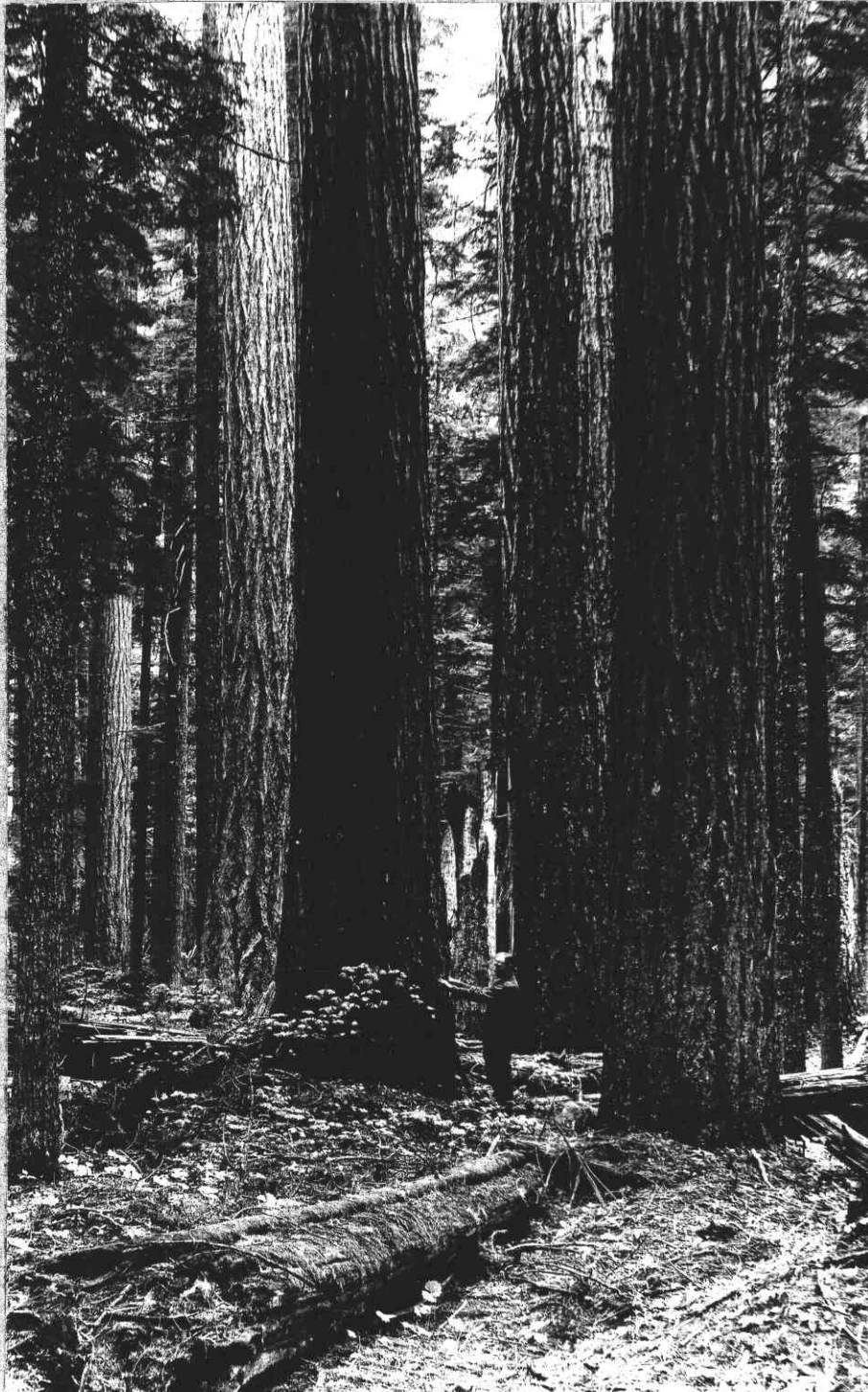
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PACIFIC NORTHWEST FOREST
EXPERIMENT STATION

THE PACIFIC NORTHWEST
FOREST EXPERIMENT STATION

PORTLAND, OREGON

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LARGE OLD-GROWTH DOUGLAS FIR

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

1937

PACIFIC NORTHWEST FOREST EXPERIMENT STATION

The research organization of the United States Forest Service in the North Pacific Region is the Pacific Northwest Forest and Range Experiment Station, one of the twelve regional experiment stations maintained by the service. This station, which has headquarters in Portland, Oreg., is making studies and surveys in the fields of economics, forest management, forest products, and range management with a view to promoting good forest and range conditions and wise utilization of forest and range resources. At present it has a permanent investigative staff of 19, and its regular appropriation for the fiscal year 1937 totals \$97,850. Emergency relief funds have made possible increased activity and increased progress in its program.

To a great extent, the station's work is concentrated on five experimental forests, averaging nearly 9,000 acres each, which are included within national forests but are dedicated primarily to research. Two of these represent the ponderosa pine type, which prevails in eastern Oregon and eastern Washington; the others represent, respectively, the Douglas fir type, the spruce-hemlock type of the coastal belt, and the Port Orford cedar type, the range of which is almost wholly within southwestern Oregon.

This station has pioneered in the national survey of forest resources, which is designed to facilitate planwise sustained-yield use of public and private resources and involves a complete, detailed inventory of present stands, a study of present and prospective forest growth, and a study of forest depletion from fire, logging, and other causes. The survey of Oregon and Washington is nearly completed, and its results already are being widely used.

A wide range of silvicultural problems is involved in the management of the forests of Oregon and Washington, which include 30 or more commercially important tree species. To obtain the information desired as a basis for management of the forests of the region, much study must be devoted to the growth characteristics, growth rates, and yields of forests of each of the principal timber species; methods of treating such forests so that their yields will be greater and of better quality; methods of selecting trees for cutting and of disposing of the debris left on the ground after logging so that it will not create undue danger of fire; and methods of bringing about establishment of new forests of desirable species and density on cut-over forest lands. Progress made thus far in this field includes studies of growth and yield of stands of Douglas fir, of ponderosa pine, and of Sitka spruce and western hemlock and a study of establishment of Douglas fir seedlings on cut-over and burned forest lands.

Since forest protection is the major concern of forest administrators in this region, it is a major subject in the research program. Studies are under way looking to a better understanding of fire causation and behavior and to development of more efficient means of preventing, detecting, and suppressing fires. Results already obtained from these studies are being widely used by both Federal and State fire-protection agencies. These include fire-danger-measuring equipment that can be constructed cheaply enough to be supplied to a great number of observation stations. Current projects include development of methods for classifying forest fuel types according to rate at which fire will spread and amount of work necessary to control fire; statistical analyses of fire-occurrence and fire-suppression data; studies of lightning-storm and lightning-fire occurrence; a study of the relation of weather to the behavior of fires; and correlation of forest-fuel moisture content with time of year and weather.

The station's forest products section, in cooperation with forest industries, is making investigations designed to develop more effective and less wasteful methods of timber utilization. These include studies of manufacturing costs and tree values through mill-production analyses, of the properties of wood of various species, and of methods of preserving and seasoning wood. In cooperation with the Bureau of the Census, this section annually collects data on production, distribution, and prices of various forest products. It is also studying the management and utilization of farm timber.

The economics of selective timber management, and logging methods compatible with intensive forest management, form another major line of study. The station took an active part in the development of tractor and truck logging, which has revolutionized the silviculture of the region's principal forest types, replacing clear cutting with various forms of selective logging in the case of Douglas fir and replacing a heavy zero-margin cutting with a light selection known as the maturity selection system in the case of ponderosa pine. These changes offer promise of far better forest management.

Instability of forest ownership, a major economic problem of the region largely as a result of widespread tax delinquency and destructive use of land, is being studied in 18 counties with a view to obtaining definite information as to its causes and devising remedies. Taxation research has recently been initiated, involving studies in reorganization of local government in forest regions, administration of tax laws, and sound methods of overcoming handicaps to forestry that are inherent in the nature of the general property tax.

A beginning in range-management research is being made this year, on the basis of a special appropriation by Congress. Proper use of forest-range resources, and proper integration of forage utilization with forest management, are matters of great significance here; livestock production is a leading industry in Oregon and Washington, and the forests of the region contain much valuable summer forage that should be husbanded and protected from depletion through drought and overgrazing.



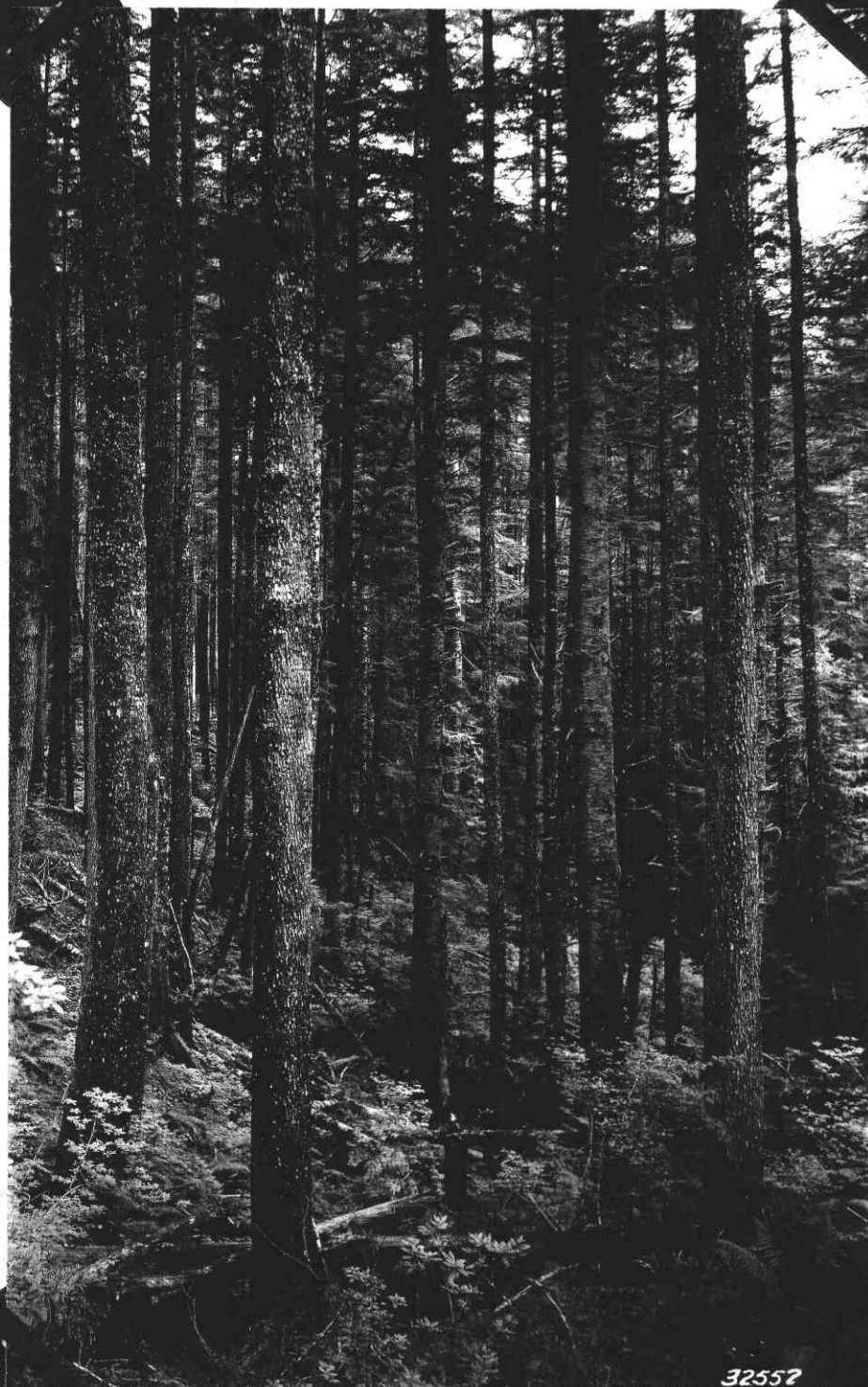
Headquarters of Wind River Experimental Forest and Wind River Forest Nursery, Columbia National Forest, Wash. Here forest research in the Pacific Northwest had its beginning in 1912, with studies of Douglas fir silviculture, including nursery technique, and of forest fire control.



Sample plot in a ponderosa pine forest of eastern Oregon on which an experimental selective cutting was made, as it appeared (above) immediately after logging and (below) 20 years later.

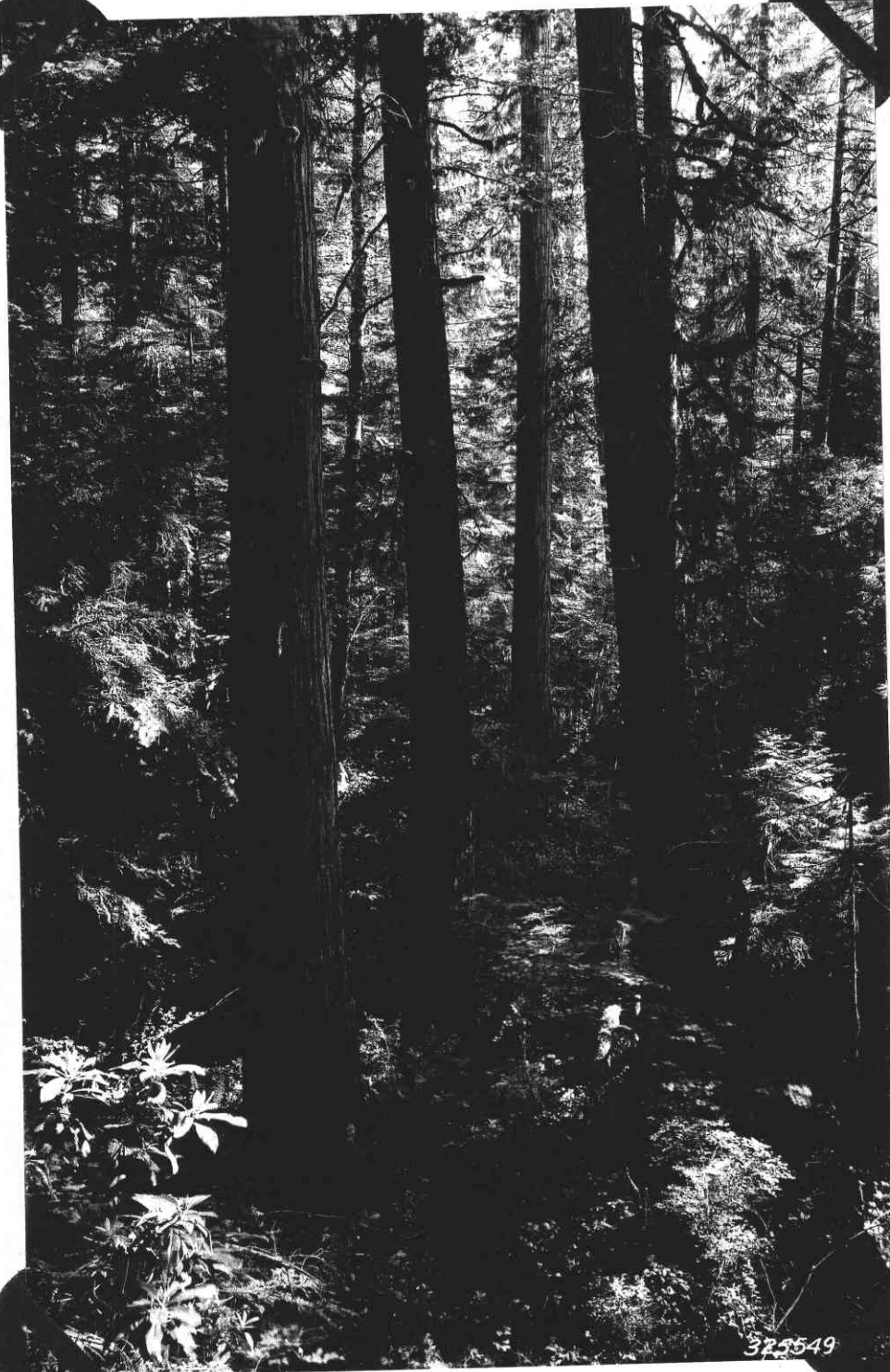


In many ponderosa pine forests, tree development and wood production are retarded because the trees are too closely spaced. These views of the Pringle Falls Experimental Forest, Deschutes National Forest, Oreg., show plots on which tree growth is being studied and methods of thinning over-dense stands are being tested.



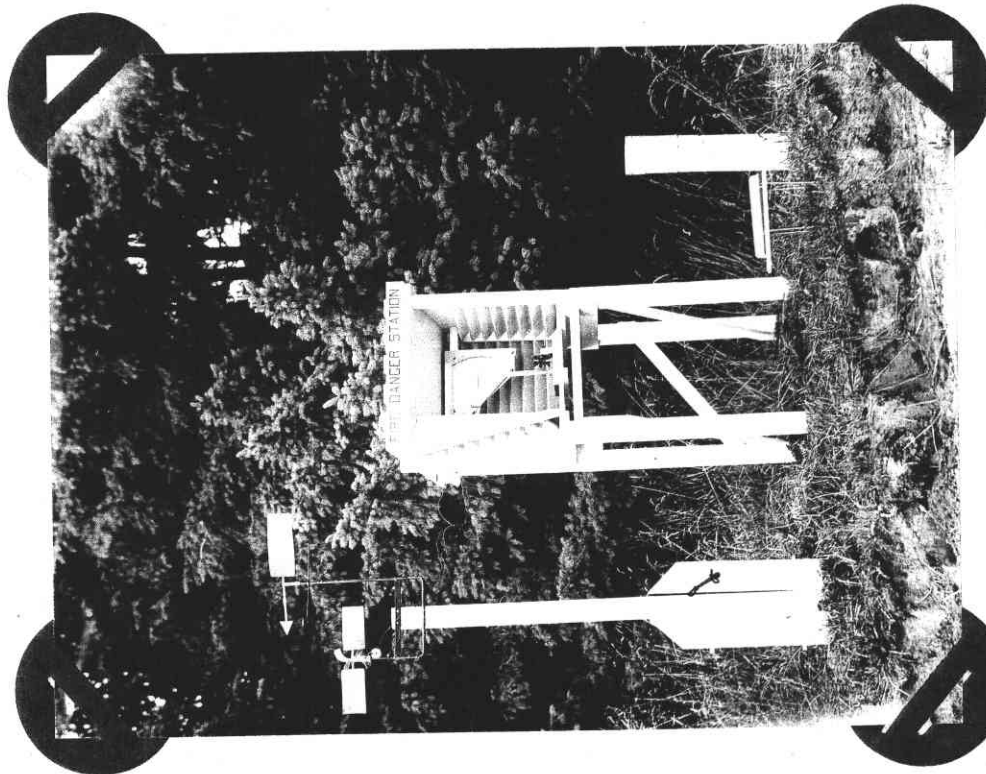
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In the fog belt along the Oregon and Washington coast Sitka spruce and western hemlock largely replace Douglas fir, forming the most productive forests of the Northwest. Sample plots in this 83-year-old spruce-hemlock stand on the Cascade Head Experimental Forest, Siuslaw National Forest, Oreg., have a timber volume of 150,000 board feet per acre.

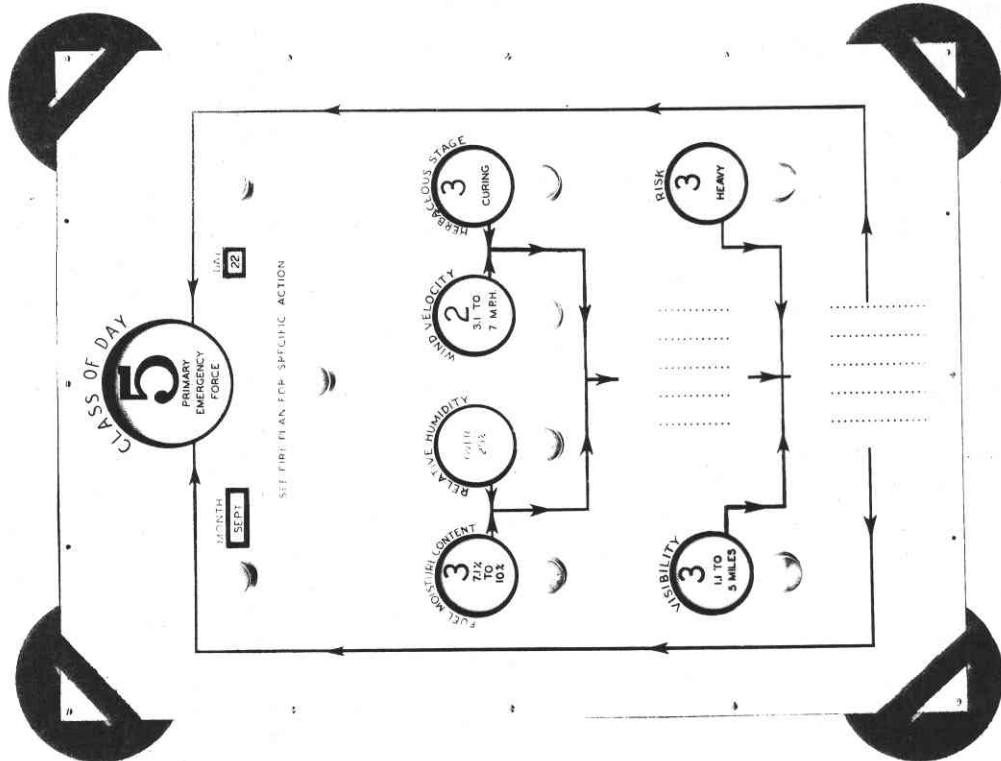


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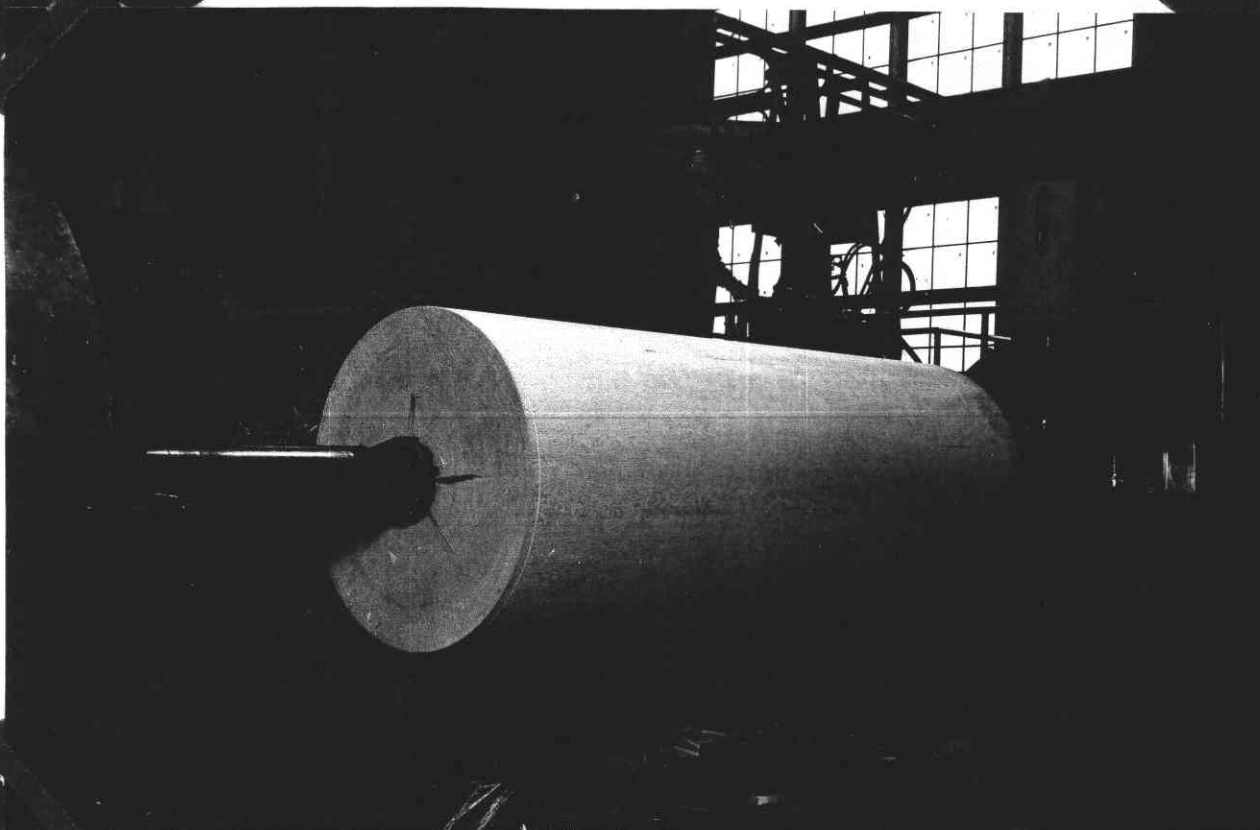
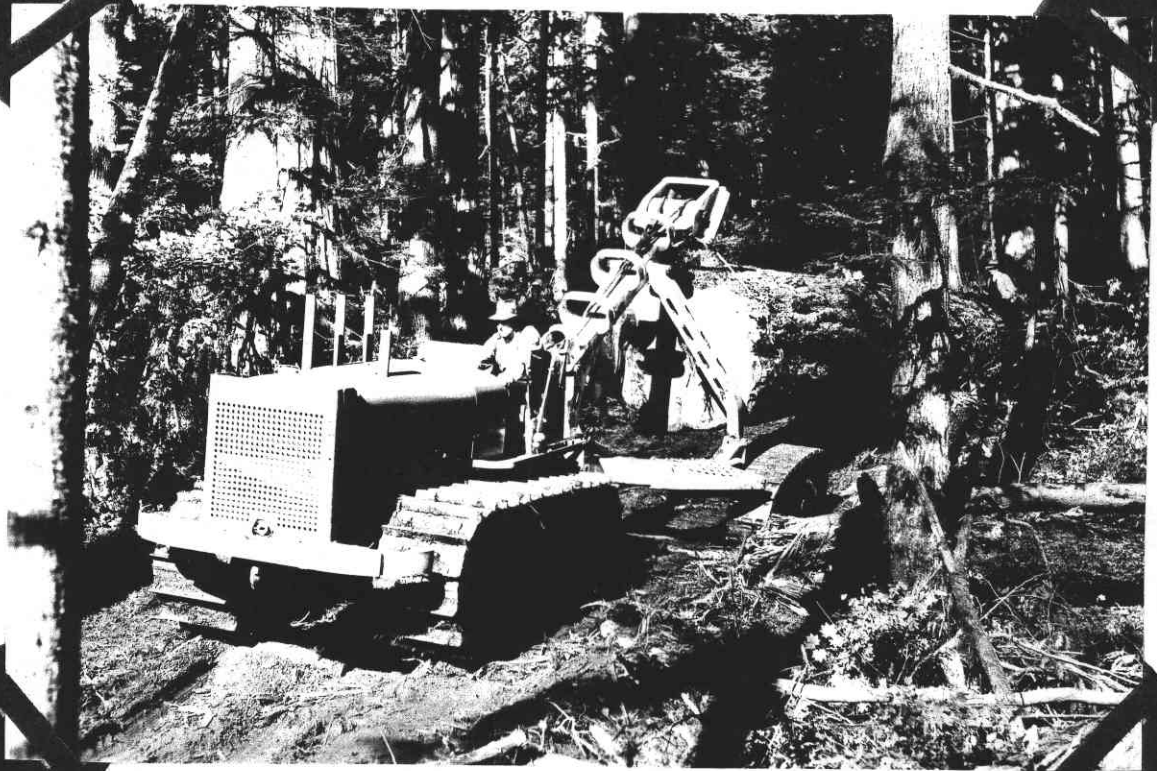
Port Orford cedar stand typical of best stands on Port Orford
Cedar Experimental Forest, Siskiyou National Forest, Oreg.



Fire danger-measuring equipment designed and built by Pacific Northwest Forest Experiment Station, assembled for use. On mast at left, anemometer for measuring wind velocity and wind vane. At right, set of fuel-moisture-indicator sticks mounted on wire supports and rain gage mounted on post. In shelter, fan-cooled psychrometer for measuring atmospheric dryness, revolution counter for anemometer, and scales for weighing moisture-indicator sticks.



Fire-danger board designed by experiment station to present current measurements of variable factors of fire danger and ratings of current fire danger by means of dial settings in seven openings. Tables for integrating measurements into rating of fire danger appear on board. Settings indicate classification of each factor and of fire danger by number and also by color. Such a board has been installed at every district ranger's headquarters in the region.



The Diesel tractor has made it possible to remove overmature elements of the stand without serious injury to the trees that are not yet ripe for cutting.

Douglas fir veneer log on lathe. After removal of bark the log has been turned until perfectly round, and is now ready for rapid conversion to veneer.