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NOTES ON OBSERVATIONS IN NATIONAL FORESTS AND ELSEWHERE

DURING THE SUMMER OF 1910

J. E. KIRKWOOD

The object in undertaking this trip was to gain a knowledge of the natural features of the country, and to study the operations of the United States Forest Service. In the first part it was purposed to study the trees in their distribution, local and general, and their development under varied conditions; observations were also made upon other plants, especially under like conditions with the forests; some attention was given to the topographic features of the country. In the second place the operations of the Forest Service as carried out on the National Forests was made the object of special study, with reference to planting, cutting, protection against fire, the organization of the force, etc. To this end letters were generously provided by the Local District Forester, W.B. Greeley, and by Mr. Elers Koch, Supervisor of the Lolo Forest. The necessary funds were provided by Professor Elrod from the moneys provided for the work of the Biological Station.

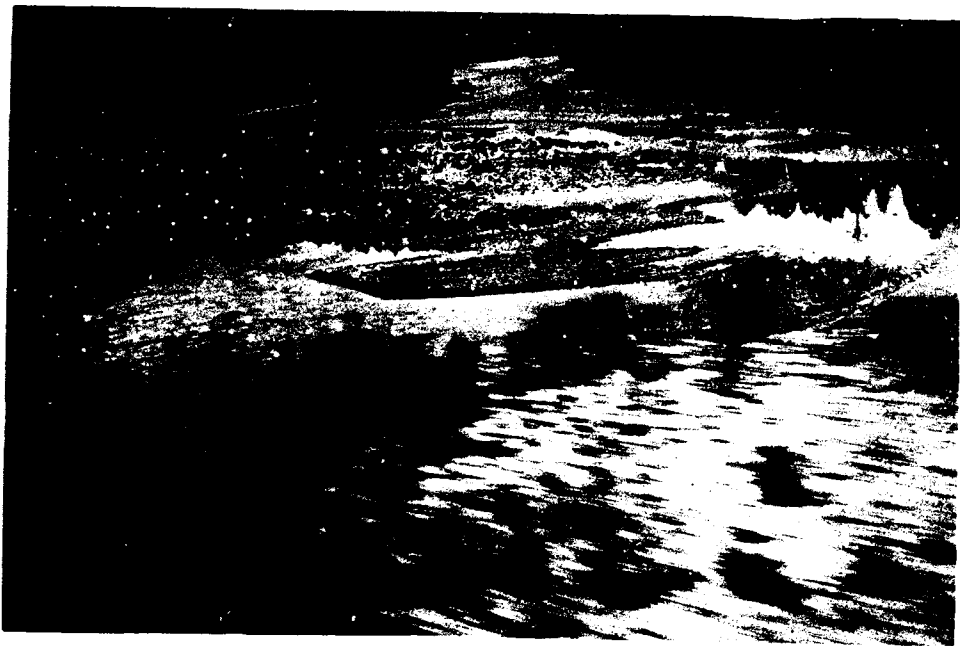
The equipment carried included blankets and a sleeping bag, a suit case containing rough clothes and heavy boots, knife, marble axe, toilet articles, a photo-developing tank, films, a 5x7 Film-pack Premo camera, etc. A .44 Winchester carbine, and a fishing rod were rolled up in the bedding. A total weight of some forty pounds.

The departure was made from Missoula, about noon on July 11th, going directly to Haugan on the St. Regis River. The country traversed showed no features especially different from those in the vicinity of Missoula. The principal growth was Yellow Pine, and some Douglas Spruce. The route lay down the interesting canyon of the Missoula River, a picture of which was secured near Chester. The country near this point is very picturesque, but there was no opportunity to study its vegetation closely.

Arriving at Haugan at 4:00 P.M., I was met at the station by Mr. E.C. Clifford, in charge of the planting operations of the Forest Service in District 1, who conducted me to Heun's Ranger Station, where he and the rest of his party were staying and where the Savenac Nurseries are situated. These nurseries take their name from the small brook which flows near at hand. The Station consists of a neat log structure of four rooms, and two or three outhouses, a tool-house, a store-house, etc. The buildings were sheltered in a small grove of Lodgepole Pine, with a good outlook to the south. A small stream of water was brought by the door and served for the uses of the house.



Haun's Ranger Station on the Lolo Forest near Haugan



The canyon of the Missoula River near Chester, taken from train moving at about 30 miles per hour. Looking down stream.

The nurseries covered about an acre of ground. The soil was of a fine sort for the work of growing seedlings, being of a fine sandy loam with enough of humus in it to give richness, and of sufficient fineness to hold water well; a difficulty we experience at Missoula is the necessity for almost constant irrigation. The nursery plot is laid out on the bottom land of Savenac Creek, or rather on a low bench at the mouth of the canyon. A head of water for sprinkling was obtained by deflecting part of the creek at some distance above and bringing it in a ditch out upon a higher bench some twenty feet above the beds, where a 3 or 4-foot cubical box was arranged to receive it; from the bottom of which, the pipe led down to the faucets at the nursery. The overflow was led off through a small spillway.

The beds were laid out about 4 x 12 feet, raised about four inches, and dressed to a fine smoothness on top. The beds were arranged in rows running about east and west, with about two feet between on the ends and sides. Lath shelters were provided for these beds by laying posts at the corners of the beds. The laths thus had a direction north and south. Over the laths and below along the sides and ends was a cover of small mesh woven wire to exclude birds and mice. The frames could be lifted off when desired.

The operations in this nursery are more fully set forth in a statement kindly furnished by Mr. Koch, so further description here is not necessary. One thing further, however, might be mentioned and that is the difference to which my attention was called in the rates of germination of yellow pine seeds from different parts of the country. Seeds from Idaho showed a slow and uneven rate of germination, those from Helena were quicker and more even, and those from the Sioux Forest were still more even in their rate of germination. This fact is probably correlated with the conditions under which they are produced. The Idaho seed probably finds the conditions similar to those they are accustomed to. The seeds from the Helena and Sioux regions, which have been used to more arid conditions respond more quickly to the condition when they appear favorable. This trait they probably have developed at home as a requisite for their survival, where it would be necessary for them to make prompt use of a rain in order to get a start at all.

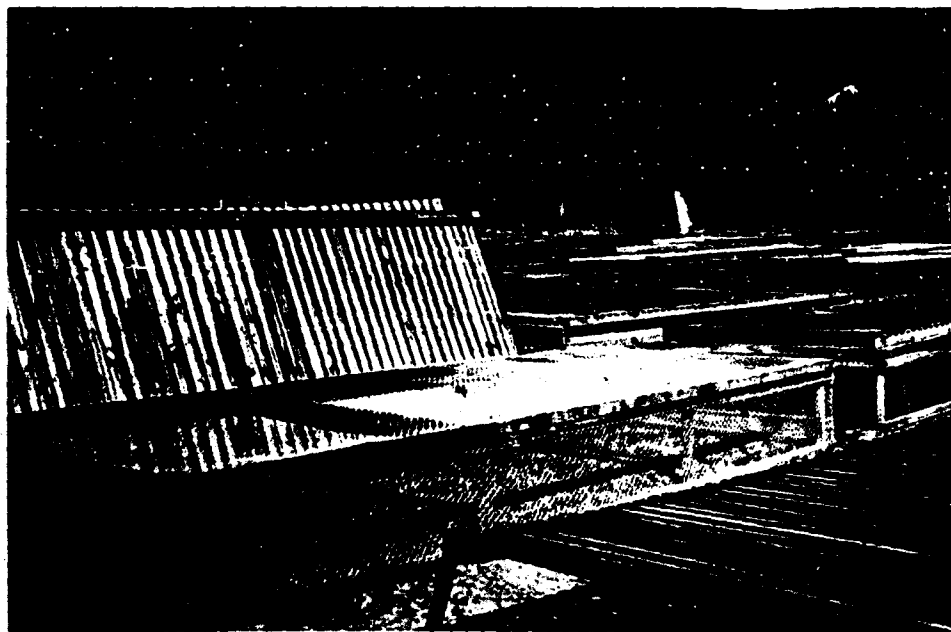
On the morning after my arrival I went with Mr. Clifford on a tour of inspection of the planted areas at some distance from the nursery. These areas were in old burns in which the natural reproduction is scant, but producing to some extent Lodgepole and White Pine, Tamarack and Douglas Spruce. The first area visited was a north slope of 128 acres cornplanted to White Pine. The cornplanting method consisted in loading a hand planter with the seed, and thrusting it into the ground



Spring seedlings of Yellow Pine - Seed from Sioux Forest



Screen over beds at Savenac Nursery



at intervals of 3 by 6 feet. The seed was deposited under an inch or less of earth. In this way one man may plant about five acres per day.



View of an east slope near Haugan, covered with growth of *Ceanothus velutinous*. Shows difficulty of starting trees on this slope after the burn.

Other areas adjoining were planted to Douglas Spruce, Engelmann Spruce and White and Yellow Pine, both by broadcasting and by cornplanting methods, except that Yellow Pine was only broadcasted. In neither of these tracts was any seedling found alive. Some were found which had started, but had succumbed to drought, but most of these were in the shade of a log or sheltered from the sun in some way.

Some features of the vegetation in this region are of interest. The east slopes, which, like the west slopes, have at some time been burned over, are now producing little but a scattered growth of *Ceanothus velutinous*; on the north and west slopes a vigorous reproduction mainly of Tamarack, Douglas Spruce, and White Pine. The difference seems to be due to the drying effects of west winds which prevent seedlings from establishing themselves. The alternation of these conditions on successive slopes can be seen, their lines of contact clearly marked at the summits of the mountains.



Reproduction near Haugan. Lodgepole and White Pines,
Douglas Spruce and Tamarack.



Looking west up the valley of the St. Regis near Haugan.
Flat covered with Lodgepole pine.

Farther west on the same planted area south of Haugan, the Engelmann Spruce seemed to have germinated fairly well, but to have suffered somewhat on account of drought. Very few, if any, living plants were seen. Here also was an area of 30 acres broadcasted to Yellow Pine, five pounds of seed to the acre. No young plants were observed. This area is an old burn, grown up to small brush.

Another area devoted to experimental planting was visited. This area lies north of Haugan. Part of it is planted to one year-old transplants of *Pinus strobus*. These were in a fine sandy loam on an east slope. 75% seemed to be good. Adjoining this area is a tract corn-planted to Yellow Pine, in which very few seedlings were evident, and these were mostly dead.

While the drought is probably the main cause of failure in the planting operations, mice and squirrels are also responsible to a large degree. To correct this evil poisoned barley is frequently sown with the seeds. Barley is treated as follows: 10 quarts of barley, 1 ounce of strychnine, one teaspoonfull of saccharine, and one half cup of laundry starch, mixed with enough water to spread well over grain. Another method is to moisten the seeds of pines and other trees and sprinkle over them powdered red lead, mixing the seeds until the lead is spread well and then the seeds are allowed to dry. It is presumed that seeds so treated will be let alone by mice and other rodents. Treated in this manner was a considerable area of Douglas Spruce sowing (cornplanted) but neither in this nor in the area devoted to Yellow Pine were more than a few germinations found though many scars of the planter were examined.

Having stopped 24 hours at Haugan, I proceeded westward by the same train as that which had landed me there the day before. The road wound in and out around the heads of canyons at the summit of the Bitterroot Range, descending into the Coeur d'Alene Valley by a tortuous way. Arrived at Wallace in the evening, and found Weigle, after having registered at the Samuels Hotel. Later changed at his request to his room in the Cozey Corner House.

On the next day, (July 13) in company with Mr. W.W. Morris, Forest Assistant, I set out on a trip to Striped Peak, situated in the St. Joe Mts. seven miles to the SW. We left the wagon road a short distance from the town of Wallace, and proceeded by trail up the canyon of Placer Creek, (West Fork), for two miles or more, to a point where we crossed the creek and proceeded up a ridge. The sides of the canyon were rugged, almost precipitous, and covered with a dense growth of young trees, in which *P. monticola* predominated. *Abies grandis* was also represented, and *Thuja plicata*, with a

liberal quantity of shrubby willows and smaller woody plants, among which *Pachystima myrsinites* and species of *rubus* and *Vaccinium* were prominent. *Minulus lewisii* and *Sphaeralcea* sp. were common herbaceous plants along the creek. Natural reforestation in this gulch was well advanced and abundant. The young trees were 12 to 20 feet high, and formed a dense covering on the north slopes. The southern slopes were more precipitous and gave scant foothold for trees, though less favorable also on account of drought.

A conspicuous feature of the timber in the canyon was the abundance of *Thuja*, which formed almost pure stands in places; most of these were green and many of them were very good trees.



Looking up canyon of Placer Creek (West Fork)

After crossing the creek and starting up the ridge we entered a fine stand of White Pine, mixed with Mountain Hemlock, (*Tsuga mertensiana*), which gradually became more abundant as we ascended. This Hemlock grew to 100 feet in height, 2 feet in diameter, and often 40 feet in the clear. It seemed to be at its best at about 4500 to 5000 feet elevation, decreasing in size with increase in altitude, although the largest tree was found at 6000 feet. This tree was nearly four feet in diameter.



White Pine and Mountain Hemlock on Coeur d'Alene Forest.

The form of the tree is usually a narrow spire, with a nodding leader like those of the others of the genus. Its bark is coarse and hard, deeply furrowed with intersecting channels. Its fruit is about two inches in length and slender, usually produced in great abundance.

With the increasing altitude the Alpine Fir (*A. lasiocarpa*) became more and more abundant. It is associated with the Hemlock on the highest ridges and exposed situations.

The character of the soil in this locality is a leaf mould or humus in thin layer covering the rocks, either in situ or in fragments. In many places the crumbling rock has formed a "slide" or slope of coarse talus on which nothing grows; in other places the slides are covered over by accumulations of humus in which trees and other plants have taken root.



A group of Mountain Hemlocks on Striped Peak. Alpine Fir to left.

The smaller plants conspicuous in this place were several characteristic alpine species. Grasses and sedges,

Xerophyllum, Veratrum, Eriogonum, Pedicularis, Kalmia, Erigeron and other genera were represented. At a lower altitude (4500) Asarum sp. was also found.

An excellent trail has been made over this mountain. The gradient is easy except at the start, and it has been cut along the side of the hill so as to furnish a good footing. It is one of the trails constructed by the Forest Service.

The trail crosses the divide at an elevation of 6000 feet. This point we reached about noon. The summit is bare, except for a few scattering trees of Hemlock and Alpine Fir. From this point a good view could be had of much of the surrounding country. The canyon of the Coeur d'Alene River and its branches lay to the northwest; below us to the north were some small lakes at the source of Big Creek; to the west and southwest the Pine Creek and other tributaries of the St. Joe. Far away to the east and south east could be seen the Bitterroot Mountains, forming the Montana-Idaho line, and away to the north the rugged peaks of the Kootenais. To the northeast could be seen the town of Burk on a flat in the bottom of a deep canyon, and under the steep mountain side which last winter let loose upon the town a destructive avalanche.



A spur of Striped Peak

The air was clear and the day warm. Here and there in the distance thin wreaths of smoke could be seen, which were of particular interest on account of the dread of fires on which the foresters' days are spent at this time of the year. With compass and chart we located the positions of these fires as nearly as possible. Some seemed to be off the Forest, and others were thought to be already accounted for as on private property. Enjoying our lunch we sat facing the northwest and did not notice until we were through, the dark cloud of smoke which had risen to the southeast. The wind was rising, and every moment the fire seemed to increase in proportions. In less than an hour the smoke carried by the wind had spread through 90 degrees of the horizon.



Site of town of Burke as seen from Striped Peak.

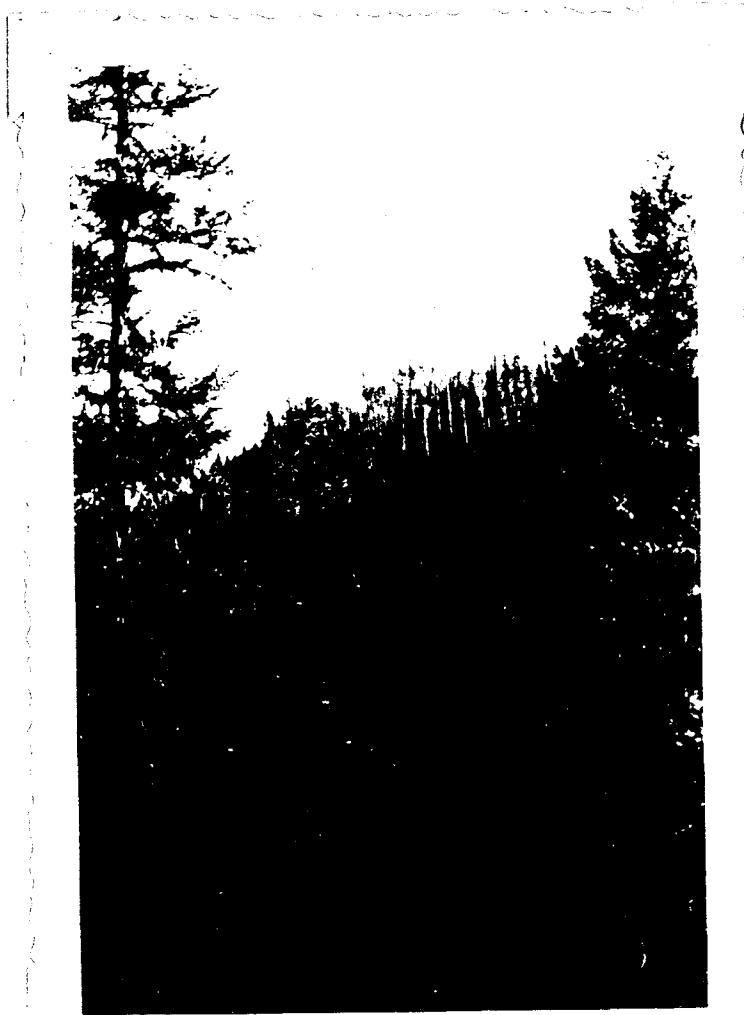
We started almost at once on our return, taking time to confer with some rangers who were building a cabin near the trail. Here we were supplied with water from melted snow. Leaving this point we made a slight detour to reach the actual summit of Striped Peak which stands a little to the west of the trail. The peak is a pile of barren rock, almost devoid of vegetation.



Pinus albicaulis on Striped Peak

Continuing our way homeward, we made good time after finding the trail. Along the lower course of the canyon, where an outlook could be had to the east, we were startled to see another heavy smoke rising, though we could not exactly locate it. Arriving in Wallace about six o'clock we found that Weigle had been informed and had gone out to the scene of another fire (Graham Creek). He did not return until two o'clock A.M. The fires thus started were not quenched until the autumn rains put them out; after they had swept over large areas and done incalculable damage. The days of Aug. 20-23 were notable for loss of property and life.

The morning of the 14th was occupied mainly with a visit to the Hercules mill, where Morris and myself observed the methods used in concentrating ore.



The Graham Creek Fire

At noon we took the train for Snider's ranger station on the north fork of the Coeur d'Alene, where we arrived between two and three P.M. R.H. Snider, the ranger, met us and we proceeded at once to the scene of the fire, which was raging in the canyons of Graham Creek. It is supposed to have originated in the attempt of a settler to burn brush on his land. It spread to the ridge eastward, and swept over onto the east fork of Graham Creek; it was also spreading northward along the ridge, descending gradually toward the bottoms where were settlers cabins. Brooks and Mason especially threatened. In this part the fire was mainly confined to the ground, but in some places ascended the trees and blazed through their crowns. Some men were already on the ground and were trenching along the hill below the fire, seeking to work around ahead of it on the ridge. We set to work with them. The undergrowth of shrubs was thick in places and there was considerable down timber, which made progress slow.



Trenching the Graham Creek fire

With mattocks we dug down through the leaf mould to the bare earth, throwing the combustible material away from the fire. In this way a ground fire may usually be stopped if care is taken to guard against flying sparks. The method does not avail much though, if the wind is blowing. The forest here consisted of an inferior stand of Douglas Spruce and Yellow Pine with a liberal sprinkling of young Arborvitae. Several hundred yards of trench were dug by nightfall, when we all repaired to Brooks' place where arrangements had been made for boarding the fire-fighters. After a substantial meal M. and I went back to Snider's where we were housed for the night. Snider's home was on the bank of the river, a house built of logs in a small enclosure. Another house stood just outside, and was provided with bunks for the accommodation of guards and other assistants whom Snider had from time to time. Snider's family consisted of a wife and small child; the place was neat and well kept. In the front room of his house, S. maintained the usual office of a ranger station. The fixtures are simple, a telephone and a desk containing the blank forms required in the operations of which he has charge, and some books pertaining to his work.

Mrs. S. provided a bed for us in the front room and we turned in to turn out again before daylight had fairly come. But S. had turned out before us and had gone to meet a crew



Trenching Graham Creek fire - Morris in the foreground

of men who were coming to fight fire. We again sought the scenes of the previous day, after stopping for breakfast at Brook's. During the night a fire of this sort, if there is no wind, usually subsides, owing to the slight condensation of moisture on the leaves and herbage, and the cooling influence of the night. The fire soon awakened however as the day advanced. It could be heard roaring through the tree tops here and there at intervals. About nine o'clock reinforcements arrived, and with the line strung along for a quarter of a mile the work progressed more rapidly. During the night the lack of precautions allowed the fire to cross the creek to the west side, and with the coming of the day it swept up the side of the mountain with great noise. A part of the force was taken to the scene in a futile effort to stem the tide. A wide trail was cut up the side to the ridge and checked the progress of the fire northward, but it turned the top of the ridge and went down the other side. About four o'clock in the afternoon our party reached the top of the ridge with its trench and started down the side of the mountain onto the east fork.

Passing another night at Snider's I bade farewell to Morris and took the morning train for Wallace. I left Nelson's Siding at 6:40 A.M., arriving at Wallace about 11 o'clock. Along the bottom lands of the North Fork are splendid groves of *Populus balsamifera*. Weigle says that *P. trichocarpa* and *P. grandidentata* are also to be found higher up. It is probable that this is all *P. trichocarpa*. I did not have an opportunity to examine it at close range. This timber was fully 100 feet tall, 2-3 feet in diam. and 50 feet or more clear.

Arriving in W. the rest of the day was spent packing up and shipping collectings, and getting ready for leaving on the morrow.

Weigle and Morris very able men and good fellows, and despite the fires my time was very pleasantly and profitably spent. Much difficulty was experienced by Weigle in getting men to fight fires. The rate paid was 25 cents per hour and board, yet considerable objection was heard to the work of fire-fighting, mainly on the grounds of its taking them away from other business, but largely also owing to apparent lack of interest in the work. There appears to be some reason for the suspicion that many of the fires are purposely set, either by prospector seeking to lay bare the rocks, or by persons interested in the homesteading of forest lands, which are withheld from entry if they bear more than 4000 feet of merchantable timber to the acre.

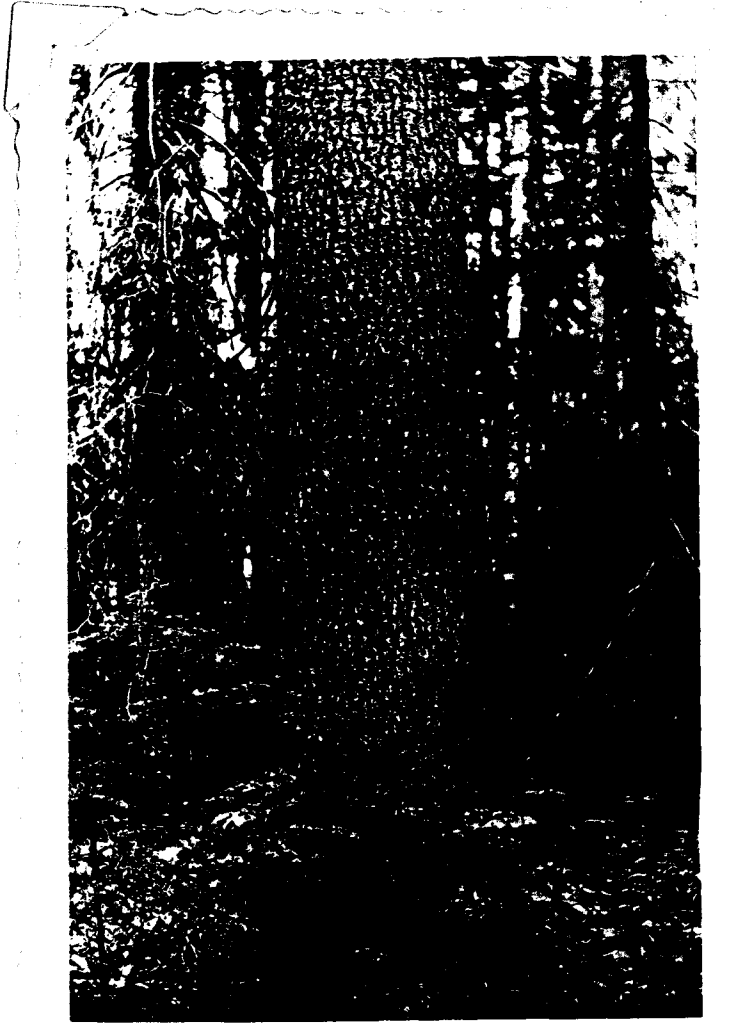
On Sunday morning the 17th, I left Wallace at 7 o'clock via Kellogg and Enaville for Harrison on Coeur d'Alene Lake. Thence by boat northward to Coeur d'Alene City, where

Along the stage road observed White and Yellow and Lodgepole Pines, Lowland Fir, Douglas Spruce, Hemlock (western), Cedar (*Arborvitae*) and Tamarack. The soil was largely sandy loam and covered with a good first and second growth. A large area extending ten miles south of the lake is a flat sandy bench (glacial lake bed) thickly covered with Lodgepole, judged to be from 15- 25 years old. Other trees were coming in, however, as I noted Lowland Fir, Douglas Spruce, Tamarack, and White Pine, in considerable numbers, though much younger. Among the shrubs I noted *Ceanothus velutinous*, *Spiraea*, *Amelanchier*, *Berberis aquifolium*, and *Pachystima myrsinites*. Among the smaller plants, *Chimaphila*, *Linnaea*, and *Cornus canadensis*.

We (myself and traveling companion Forbes of Spokane Y.M.C.A.) arrived late at the hotel but secured a scraped up lunch before retiring.

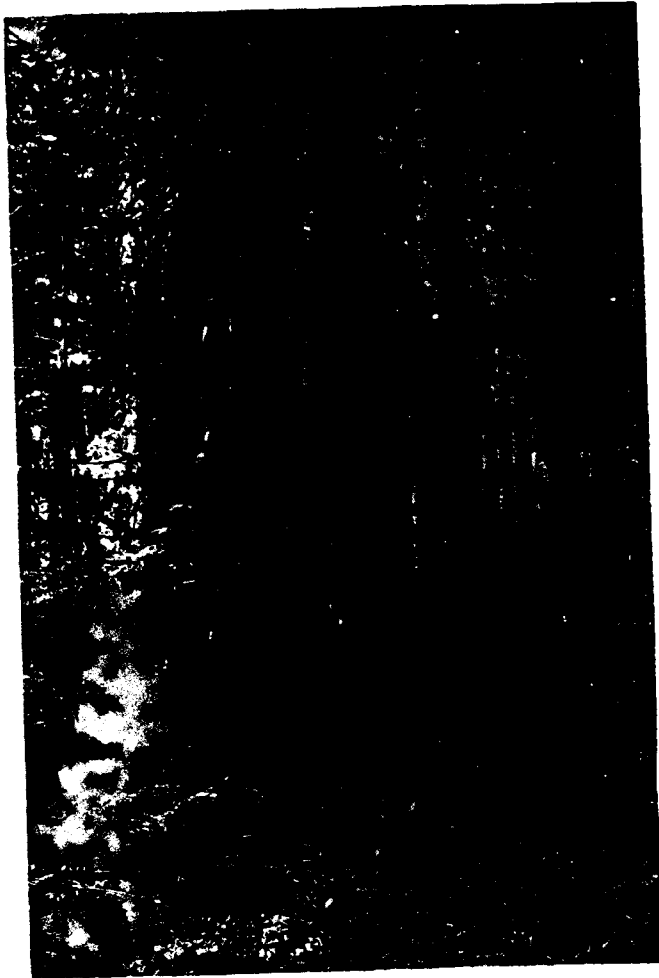
The following morning (July 18th) I sought the office of the Supervisor of the Kanisku Forest. Mr. Millar was absent, but I met Feary, Latany, and Millar Jr. Took a steamboat to Kalispell Bay several miles up the lake and came back on the launch with Feary and Mrs. Millar. In the afternoon made a brief inspection of the forest conditions south of Coolin. West of the road the ground falls toward the river. On the flat are some sinks or marsh like areas which are overgrown with sedges and other marsh plants; *Lysichiton* and *Veratrum* were common about the borders, and considerable sphagnum was noted. The paper Birch was also common. A considerable reproduction of *Arborvitae* and Hemlock was found in the neighborhood of these swamps. A number of small seedlings were collected. A great deal of excellent White Pine was found in this vicinity, mixed with Hemlock and *Arborvitae*. Outside of the Lodgepole forest the woods were open with comparatively little undergrowth except a scattering growth of young trees of the kinds named. The larger trees measured from two to three feet in diameter, and were seemingly 150 feet tall. Retracing my steps toward the hotel, I called at the office of the supervisor and obtained some information as to the location and accessibility of a timber sale, which the Fidelity Company of Newport, Wash. was working. The heliograph system for fire protection which was one of the things which I had hoped to see on this forest, had been discontinued, so it had to be given up. No other features of special interest presenting themselves, I prepared to return to Priest River by the stage on the next morning. Owing to the absence of Mr. Millar I was unable to obtain any guidance from those in charge of the office.

On the following morning (19th) Forbes and I finally got out of Coolin by the 2nd installment of the stage. The hotel had just changed hands and the ex-keeper was moving out with



White Pine near Coolin, Idaho

his family and baggage and hogged the whole of the regular conveyance. After waiting some time for the second rig to turn up, we went in search of it, and found its driver in bed and no preparation made for the start. After rousing him and assisting in the hitching up we were finally off in a buckboard. The team was a lively little pair and the driver a comical fellow, so that the delay and inconvenience of the trip was somewhat compensated for. We reached the half-way house about noon and stopped for dinner. The place consisted of a few log buildings in a small clearing, a mess house and stables. The meals were ample in the simple manner of the woods, abounding in meats, vegetables and canned fruits. While waiting for the call to dinner, a reconnaissance crew came in, and among them I was surprised to see A.F. Bishop, one of our students. This crew was busy with a timber survey in the vicinity. Two others of the party, John Somers and R.A. Hungerford, the former a student

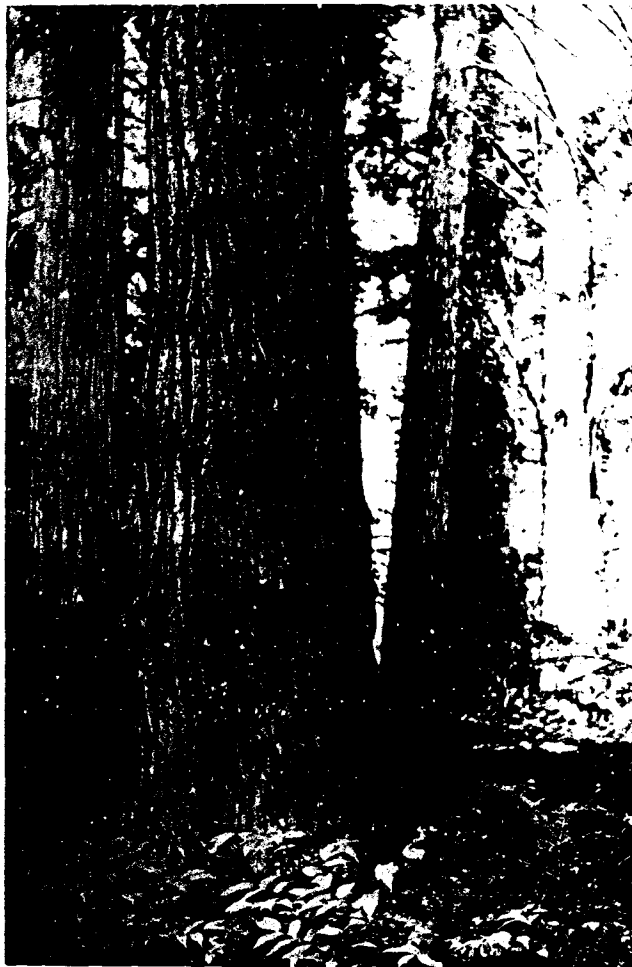


White Pine on the Priest River

from the state College of Wash., the latter from the Univ. of Idaho. I was urged to remain with the party for a day or two, but pressure of business compelled me to go on. The crew was temporarily engaged in fighting a fire in this vicinity, though not one that threatened to be serious.

Proceeding on after dinner I left the stage where Falks road leaves the main route. My baggage I consigned to the care of the driver with instructions to leave it at the hotel, and started across to the Camp of the Fidelity Company on the West Fork. A few rods from the main road I came to Falks place and had no difficulty in being set across the river, which at this point is not wide and apparently not deep, but the clearness of the water is such as to make guesses at its depth hazardous. It is a beautiful stream.

The way to the camp lay over the low ridge separating the main river and the west fork. It was merely a trail but was in good condition, and very plain most of the way. Through this region I saw the best White Pine I have yet seen and the other trees of the same situation, Arborvitae, and Hemlock were of unusual size and form. It is a beautiful body of timber, fine, tall and straight, and lots of it. Here and there, however, fungi showed on the trees, especially *Trametes pini*, and I suspect that there is relatively little of this timber that is not affected by rot. Ascending the ridge from the bottom lands, the size of the timber diminishes to one to two feet on the average.



Hemlock and Arborvitae on Priest River

The soil in this section seems remarkably good, and much of it might well be used for homesteads, as it lies well and is not too hilly.

Arriving at the scene of the logging operations, I met Messrs. Jacobson and Pearson, the latter being camp boss. The place had suffered a fire in the early part of the season and some of the standing trees had been killed. These were being cut clean, but elsewhere groups of trees 100 yards or more in thickness were left standing for the purpose of reseeding the cut over areas 400 feet cut clear between. Concerning the practicability of this method there was some skepticism in the midst of the men above named. It seemed to them that the value of the timber thus sacrificed would more than equal the expense of planting by hand. Concerning the cost and probable success of such an operation they asked some questions, which in the light of my observations on the Lolo, could not be answered in a way to support their views, though it seems to me that they are right.

The cutting in this operation was mainly in White Pine of the small size above noted, and Cedar. They were taking off about 40,000 feet to the acre. The logs averaged 100 feet BM and were mostly of the 14 and 16 foot lengths. A great deal of young Cedar, (*Arborvitae*) was left standing, in size from 10 to 40 feet in height.

The logging operations here were very simple as the logs were of small size. A single team of horses were used for yarding out the logs and delivering them to the landing at the head of the chute.



Logging - Fidelity operations



Black Cottonwood and White Pine - Priest River

Two of these teams were at work, with a crew of six men including scalers and exclusive of those engaged in felling the trees and sawing the logs. The chute was built in a shallow draw leading down to the creek, a distance of two or three hundred yards. It was built of logs, hewn on one side, the hewn sides forming a trough when laid side by side and end to end. These were well greased, and had sufficient slant to run the logs at a moderate pace. The lower end of the chute opened at the top of the creek bank some forty feet above the water, and the logs were dumped from the end of the chute into the creek. As this is but a small stream the logs have to be moved in it by means of splash dams, until they reach the main stream.

As it was only about four o'clock in the afternoon, and Priest River was 8 or 10 miles distant, there being little more here worth stopping for, I concluded to push on and try to get in before night. A short distance from the clearing I struck the main road and turned southward. Shortly afterward I met a carriage containing Secretary Wilson and his son Jasper, and Mr. Grealy. The latter introduced me to the Secretary, and we passed some remarks relative to reforestation operations in the country. The Secretary says that the greatest problem before the country today is that of reforestation. How can it be done on a large scale and practically? He says we cannot reforest with a spade.



Logging Chute - Fidelity Operations



Seed group on Fidelity Operations

The road to Priest River had been cut out much of the way 100 feet wide, and seeded to Timothy. The timber for the first few miles below the camp was mainly White Pine and Tamarack, about a foot in diameter, and 100 feet tall. Further along it was larger and older, with some Yellow Pine and Douglas Spruce.

Arriving at Priest River about sundown, I found that my stuff had arrived safely.

On the morning of July 20th I took a train for Newport, Wash. a few miles to the west in order to visit the mills of the Fidelity Company. The capacity of the mill is about 70,000 feet. It is an economical plant, cutting logs down to 6 inches, trimming close, using slabs and edgings for laths, and burning the saw-dust under the boilers.



Running logs into the creek - Fidelity operations

It is a very fast rig, and apparently a very efficient plant. I called at the office for Mr. Willis the president, whom I had met in Missoula but failed to see him.

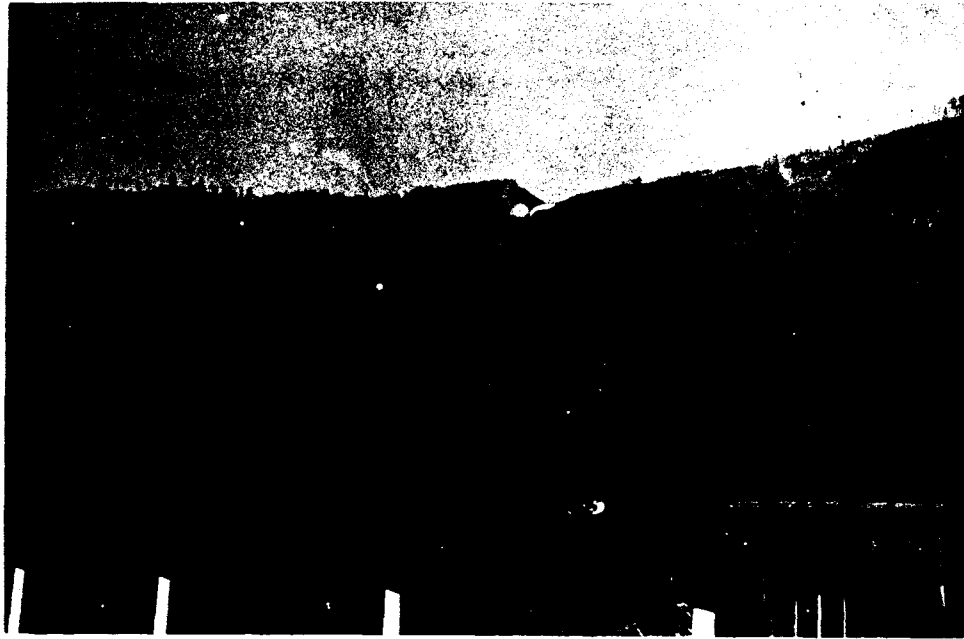
After lunch at the hotel in Newport I spent a dull hour or two waiting for the east bound train. Mr. Silcox and Supervisor Millar happened along on their return from

the woods, and I had a short talk with them. the train arriving at about three o'clock I got aboard, picked up my baggage at Priest River, and continued on to Sand Point, where I put up at the Idaho Hotel. I found Mr. J.E. Barton, Supervisor of the Pend Oreille Forest in his office, presented my letter, and was invited to accompany the party of Secretary Wilson on the following day, and himself on the day after on a visit to fires in the neighborhood of Bonner's Ferry.



Young Douglas Spruce - Priest River

On the morning of July 21st the party, consisting of the Secretary, his son, Mr. Greeley, Mr. Barton, and myself took train for Eastport on the Canadian boundary. Our way was over the line of the Spokane International Ry. through the Moyie Valley. The purpose of the Secretary's visit was primarily to see something of the lands which were claimed to be agricultural but which are still part of the National Forests and not open to settlement.



Looking over into Canadian country at Eastport, Idaho

The Secretary is anxious for reforestation experiments to be carried on. He said that sowing pine seeds on the snows as they were going off in the spring in the Black Hills gave fine results. He approved my suggestion of fall sowing and thought that planting on contour ditches on dry slopes was worth a trial.

Concerning the homesteading of forest lands the Secretary is very conservative. While admitting that lands plainly agricultural should be listed for entry, they should only be open to settlement with the timber removed, except sufficient for the settlers own use. He does not tolerate the claim for timber on the land in order to help the settler. Says they sell out to lumber companies and desert the country. Besides other persons in the country are entitled to the same or similar help which cannot be granted. The Act of June 11th, 1906 provides that agricultural lands on the National Forests not bearing more than 4000 feet of merchantable timber to the acre may be immediately listed for settlement, and other lands on the forests suitable for agriculture but bearing more than 400 feet per acre may be opened to entry when the timber has been removed. He says that settlers with genuine agricultural intent do not care if the timber is removed. Questioned as to free use permits for summer homes, etc., he said that the matter was under consideration.

Greeley said that the timber is given for building a house. To this the Secretary objected; thinks user should pay for it. Says the government will not give free timber with the land and people need not waste their breath asking for it. He approves setting aside 80 acres for ranger stations wherever it seems necessary to have one, and the ground is advantageously situated for it. Mr. Barton said that in this section of his forest that ranger districts about equalled a township, which was thought to be about the right area. A ranger station should include a tract of land sufficient for the needs of the ranger and his family, in field, pasture and woodlot. The ranger is to be regarded as a settler with family and stock.

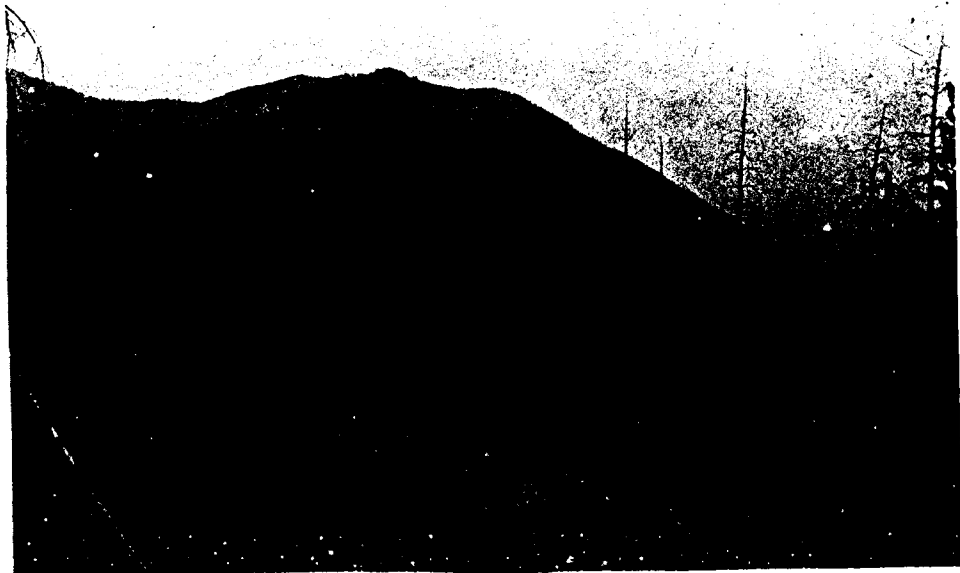
Speaking of certain persons, he says that Senator Heyburn has little following. Taft is the most maligned man in the country, fine and just president and good lawyer. Pinchot wholly altruistic and unselfish (irony).

After a pleasant picnic lunch on the banks of the stream at Eastport we returned to Bonner's Ferry. The lapse of an hour or two between trains was spent at the Hotel West. Hearing of the presence of the Secretary several citizens came in: Judge Anderson, A.J. Kent, and - - Dolan, with a grievance because of the non-listing of certain lands which lay along the Kootenai and which they affirmed to be agricultural. Kent protested against unfairness of the district office and the supervisors in "running settlers off". He claimed that "agricultural" lands were being held by the Service and development retarded. Strong feeling was expressed that the timber on the land should be left for settlers' use. Wilson reiterated the arguments stated above. Dolan wanted the timber removed from the mountains here to let the snows go earlier than was their wont, so that they might not contribute to swell the annual June flood which forced the Kootenai out of its banks and did much damage. Wilson suggested the possible need of this water in the future for irrigation, but the men stoutly averred that no irrigation was needed anywhere in this region. It seems that Lake Kootenai lies on the international boundary, part in the U.S. and part in Canada, and that its outlet is so narrow that flood waters can not find a sufficiently rapid discharge, and the water consequently overflows for some miles above.

The statement was made by the Secretary that the total receipts from the National Forests of the country amounted to \$1,800,000, and that the appropriations expended amounted to \$5,000,000 annually.

With the arrival of his train the Secretary departed with his son and Mr. Greeley for the next point on their journey, Libby. Mr. Barton and myself remained and prepared for a

On the morning of the 22nd Mr. Barton and I took a team and buggy with driver to a fire camp in the Moyie Valley near Deer Creek. Crossing the river above the town we passed through a gorge which the Kootenai had cut down through deep deposit of sand. About this point we entered a strong Yellow Pine belt. The road climbed gradually to the top of the bench and a survey of the country showed that the sand deposit was probably an old glacial lake bed. Further on the timber was scattering, and mixed to a large degree with Tamarack. The vegetation along the way was marked by the numbers of Paper Birch trees, and Aspens especially along the streams.



Looking up the Kootenai Valley from near Troy, Mont.

Arriving at the camp we found a collection of old buildings which had apparently served at one time for a logging crew. The day was marked by drizzling showers and some of the men were lounging about camp, the fires having been about subdued by the rains. About 100 men were employed on this fire and fed at this camp. The camp was in charge of Ranger McKay whom we met. We also met Galbraith, Guard, and Gillis, students. At the summons to dinner, the men gathered about the crude board tables constructed in the yard and furnished with tin plates and cups. They were a mixed crowd of various sorts and conditions. We were informed that the crowd

included a graduate from Boston Tech., a deserter from the regular army (how this was known I cannot say), Kin Lavigne, a prizefighter, an ex-sailor and others.



Looking SE from near Troy Mont. Kootenai Mts.

They were drift picked up in Spokane, but withal were an orderly crowd. For this crew potatoes were cooked in a wash-boiler and meat in a fub, but there was enough and it all tasted good, as we could testify by experience.

Having been well served with lunch Barton, Galbraith, and myself went out to look over the fire lines. We followed up the small stream on which the camp was situated, and on the bottomlands of which were several fine meadows, and ascended the ridge to the east of the creek. This ridge was a spur of the mountain running down into the fork of the stream; it was high and steep, but when we reached the top we had a fine view of Boundary Peak, which stands on the line between Idaho and Montana, and sometimes called the Yakt. The huge mountain was timbered to its summit, and far up its side a light smoke could be seen where the fire had traveled. We passed along over the ridge and down into the canyon of the other branch. The timber of this section consists of Yellow Pine, some White Pine and Lodgepole, and Tamarack. The efforts of the men had availed to stop the spread of the ground fires running up the ridge and



Yellow Pine near Troy, Montana



Yellow Pine near Troy, Montana

Finishing our inspection of the fire we returned to camp and prepared to return to town, which we reached about 9 P.M. after a somewhat tedious and cold drive.



Lodgepole Pine near Troy, Montana

On the morning of July 23rd I walked down to the Bonner's Ferry Lumber Company's mill a mile or less below the town. This mill is the property of the Weyerhauser interests. It runs two double edged band saws, cuts down to 8 inches, uses up the waste pretty well in lath, etc. but does not burn saw-dust under the boilers. The double cutting band-saw, according to some, saves only 5% in the time of cutting logs. While this saving is less than one would think, it is argued that there is in this type of mill as well as in the other, a considerable loss of time in the sending back of the carriage without cutting for reloading, or for turning the logs and for other reasons, and that the speed with which

a carriage can be thrown back to the starting point when not cutting goes a long way to minimize the advantage of sawing both ways.

In the afternoon I took train for Libby, and upon arrival put up at the Hotel Richards.



Reduction of rock and advancement of vegetation -
Near Troy

Sunday the 24th, was spent in some general observations of the town and surroundings. The Kootenai mountains to the SW form a rugged and precipitous chain, upon which some snow was still visible. The main timber of this region is Tamarack and Yellow Pine the former leading, also a little Engelmann Spruce and White Pine. The lower hills visible from Libby are well covered with timber. I walked east along the railway, In a pool not far from the track was a good growth of Hippuris in bloom, also a ranunculus form of aquatic with dimorphic leaves with yellow flowers, stems 2-3 feet long; the upper or entire leaves were 1.5 " across, the dissected leaves were 2-2.5" across.

connection was made with an electric car for Spokane, arriving at 11:30. As the train from the west was late I had an hour or two to wait at the G.N. depot, but finally got the east-bound train for Priest River, arriving there at about 3 P.M. On this train found the conductor to be an old acquaintance of Forest Grove days, W.T. Glaze.

Coolin is located on Priest Lake, 25 miles to the north, and transportation thither is by stage, operated by Beardmore.



On the sand flat south of Coolin, Id. Lodgepole Pine

This stage is devoid of comfort. It is a two-seated hack for freight, baggage and passengers, drawn by two ? horses with a change half way. The road was very dusty and we collected about all of it that could find lodgement upon us arriving at Coolin about 9 P.M. and long after dark.

On Monday morning I called at the office and presented myself to the Supervisor Mr. Dorr Skeels, having previously left my letter of introduction at his house. Ranger W.A. Raymond was also at the office, and several other men. They were busy with papers and matters especially pertaining to settlements and homesteads under the act of June 11th. A thorough survey of the lands along the Kootenai River with reference to this business was then under way. Looking over their papers and records the points seem to be these: (1) application must be made for a tract by the settler. This application must give (a) the description of the survey if one has been made, (b) the quality and location of the soil, (c) the timber, its kind, quantity and value, and (d) a map of the tract is made by the office on the back of the application sheet. (2) applicants are given numbers as they come and are given precedence in the order of the numbers. (3) Squatter on unsurveyed land has sixty days prior right in filing. (4) Agricultural land is valued at least \$20 per acre. If the timber value is less the land is listed, if more, it is reserved. If land bears less than 4000 feet of merchantable timber to the acre, it is listed at once; if more, settler is allowed to move onto land and make improvements necessary for living, timber being removed before filing is allowed.



Hotel at Troy, Mont.

On this forest yield tables have been compiled, so that expectation value may be computed.

No good mill sites occur on the Kootenai River in Montana. Mills therefore must be situated on tributaries; hence no local mills can use the timber which must be logged into the river.

In the afternoon I ran back to Troy. Bening was to be at the station but on account of fire was detained elsewhere and had not received the message. I occupied the time with a walk to a small rock butte east of town, took some pictures and made some observations on the vegetation.



Pontoon Ferry on the Kootenai River near Troy

In the evening I walked up toward Bening's Station and overtook him on the road. His Station consists of a good house and barn and other small outbuildings in a fenced clearing of about five acres. After an evening spent in conversation I sought the hotel and my room only to find the proprietor had gone to bed. Upon enquiry was told that the bar-keeper would "fix me up". The bar-room was occupied by a crew of roisterous river drivers who invited me to spend their money for them, but I declined, and registering was assigned to room 25 which I was to hunt for, and which, when found proved to be occupied. I was then assigned to another which was

small and poorly furnished. This place mainly is a stopping point for railroad men, being a division point.

On the following day (July 26), Bening secured some horses and we made a short excursion across the river and up a mile or two to O'Brien Creek, fishing. We had some good sport but did not have long to stay. The trail over which we passed was one constructed by the Forest Service, and was a very good one; in places blasted out of the rock. The cost of building a trail under average conditions Bening said, was about 100 dollars to the mile. We saw some fine open, park-like stands of Yellow Pine. I observed also Tamarack, Lowland Fir, Douglas Spruce, *Betula fontinalis* and *papyrifera populau trichocarpa*, *Prunus demissa*, *Alnus tenuifolia*, two species of *Ceanothus* and the usual low vegetation.



On the Forest Service trail along the Kootenai

On the following morning, (July 27) I set out in the morning with Bening for Bull Lake. We each had a saddle horse, and the camp outfit was carried on a third horse, a very knowing animal, which could be depended to follow up without leading, though often quite a distance in the rear and out of sight.



Bening and horses on road to Bull Lake

Bull Lake lies south from Troy, some 18 miles, and the way thither lies over mostly level ground following the valley of Lake Creek which is the outlet of the lake. Along this road much of the way is a dense second growth of young Larch. One stump about 3.5 inches across showed twenty rings. Most of the trees are about thirty feet high.

We reached Stanley's place about 5 P.M. This is a fine place at the foot of the lake and the mouth of Stanley Creek, with fine large meadows and good outlook to the south. The outlet of the lake is crossed by a rickety old pole bridge, with gaping holes where the poles had rotted out. It was with some danger that we crossed, but here the old pack-horses's instincts showed themselves. With nose to the floor of the bridge he edged along with senses alert for the weak places, and made no mistakes; so we got across safely.

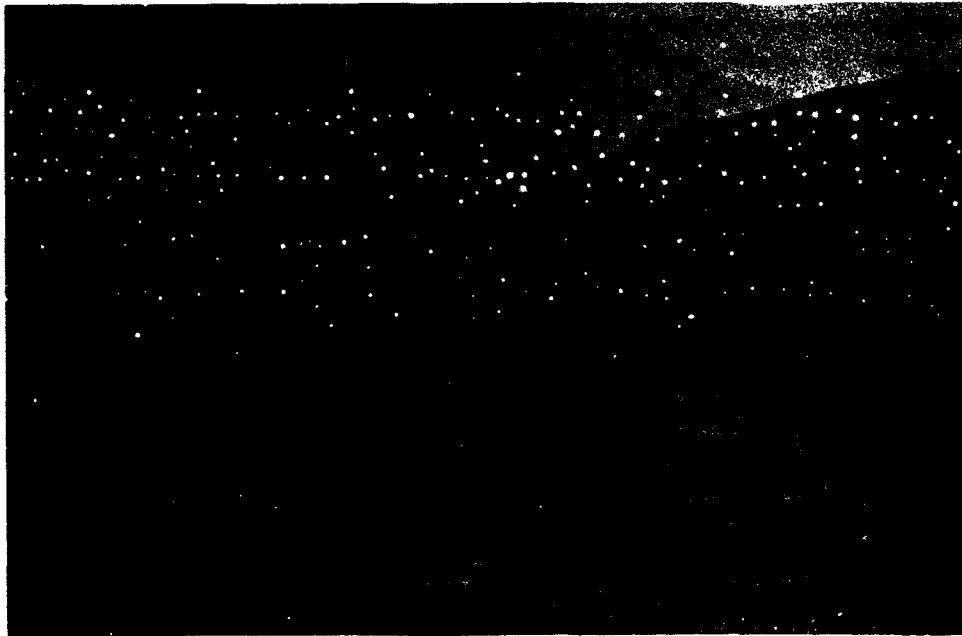
After staking our horses and preparing supper which was soon disposed of, we borrowed a row boat of the Stanley's and started off up the lake to look out a proposed site for a ranger station. The bed of the lake is very near the surface for some distance and is grown up to bull-rushes and the like, so that it was with some difficulty that we made our way through it. The place which we visited was a point on the east side a mile above the outlet. It was the abandoned

claim of one Lawrence formerly of the Forest Service, but said to have defaulted by a sum of money received from the sale of U.S. lands. Place desirable location for cottage, except for myriads of mosquitoes. Along the shore of the lake at this place was some fine white pine, Cedar, Engelmann Spruce-Hemlock, and some of the finest *Populus trichocarpa* yet seen.

Returning to Stanleys^a we put our goods in shape, and under shelter for the night and went to the barn, where we made our beds in the new hay, which was very soft and fragrant, but we sagged almost out of sight in it before morning.

We took breakfast with the Stanleys. Mrs. S. posed seeming piety and is said to be a Mormon. After breakfast when packing up, we discovered the loss of 5 loaves of bread which apparently the dog had carried away and secreted. Search failed to reveal them.

We continued our way southward, and on the road met Guard W.B. Milnor, who at Kening's suggestions accompanied us. Near the upper end of the lake on the east side from whence we had a fine view of the lake over its entire length. On the opposite shore the chimney rocks stood up in prominence on precipitous wall.



A clearing in the Lodgepole

Below the precipice lies a long low hill said to have been split off from it. Indians are said to regard this place with superstitious awe. Legend has it that a slide once occurred here burying an Indian village. That a slide did once occur is perfectly evident by the gorge lying between the low hill and the mountain. This fault or rift in the mountains extends farther south and is visible for some distance. Looking south the land seems to fall away directly to Bull River Valley, draining into Clark's Fork. Bull River was once erroneously described as the outlet of Bull Lake. It is probable that before the slide occurred it was the outlet. To the east rise high and rugged peaks. The area in the pass and to the westward is an old burn; the slopes to the east are covered with scattering Yellow Pine.

Descending from the lookout we again took up our way; rounding the head of the lake, we proceeded up the canyon of Lightning Creek. After a journey of an hour or two we came to an old cabin, where we found a little grass for the horses. As it was about noon, lunch was prepared and we enjoyed it. This creek flows from the west and empties into the lake at its head. After lunch B. and I took a walk of about a mile up the stream and found some very large Eng. Spruce and some Alpine Fir. The presence of the Fir here is the lowest altitude at which I have known this species. The elevation here can not be much over two thousand feet, if Troy is only 1800. This may be as much as 2500. This stream provided us with some very fine fishing.

Preparing supper out of the abundance of good trout, we started homeward at about 7 P.M. and reached Wheeler's place after dark. Mosquitoes fierce!

Wheeler accommodated us in his bachelor quarters with bed and breakfast. Breakfast over we set out for Troy. We met Kelsey and Hyat, settlers, who showed us some fine specimens of drift, lead pure enough to melt into bullets. Passing the home of a rancher whom B. knew we were hailed and asked to stop for dinner. We accepted the invitation and spent a very enjoyable hour, resting and talking with the people. These people were busy getting out ties which they run down Lake Creek to the railroad.

We returned to Troy by another route after leaving the place where we had had dinner. This road led more to the east and took us through some splendid Yellow Pine parks, and a region of large Lodgepole. Arriving at Troy, I took leave of Bening, whose very generous treatment had made the trip pleasant and profitable. I returned to Libby, and took up quarters again at the Richards.

The next day (30th) at noon I left Libby in company with Ranger Raymond to visit the camp of some men engaged in a survey of agricultural lands along the Kootenai. This camp was at Warland, and as no regular passenger train was on hand we took a freight and rode in the caboose. Barret and Holt were in charge of this camp, but they were busy with a fire which had broken out a few miles up the river.



Mill at Warland

On Sunday the 31st, in company with Raymond, I visited the scene of the fire. Messrs. Hess and Ziegler were on the ground, and as the air was quiet, and a good trench had been dug, it was decided to backfire. This was done and for some time all was well. But the wind arose and changed so as to threaten the woods beyond the trench. As it became stronger and the day grew warmer, the fire got into the tops of the trees and was carried across the line in a number of places. It required the united efforts of us all to keep the fire from breaking out in the woods across the trench. The wind was not very strong, and as we had access to a spring for a limited supply of water, we managed to keep down the fire until it burned itself out. The timber here was a scattering growth of Larch. It had been cut for ties some years before leaving on the ground a lot of hewings, branches, and other debris, which made good fuel, and owing to the fact that the sun had free access to it, became very dry.



A trench for ground fires

Backfiring seems always to be a risky business. One can never tell when the wind is going to turn, and if it does the chances are very thin that the fire can be controlled

I returned to Warland in the afternoon with Raymond, and prepared to spend the night at the camp. Raymond had to return to Libby.

On the following morning (Aug. 1st) I took train at about six o'clock for Kalispell. No points of special importance were noticed along the way. The timber is about the same as that already noted. Several interesting lakes were seen near Whitefish, and these should prove interesting collecting grounds.

We had a long wait at Columbia Falls where we were to change cars for Kalispell. Finally the change was made and we were soon landed at our destination. Here I made a point of visiting the forestry offices to meet the Supervisors of the Blackfeet and Flathead forests, Haines and Bunker respectively. Bunker especially had his hands full with fires, and Haines also had some trouble of a similar nature.

I made use of the rest of the time in gathering up some supplies for the continuation of my journey with Prof. Elrod and party through the Glacier Park. I met Elrod on the

street, and after concluding my business joined him and Marcus Jones of Salt Lake at the Station.



Backfiring near Warland





Fire a few miles above Warland
