

ROOT AND BRANCH

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"Yeah, there he goes, hell-bent for Lord knows where!
Them forest rangers have it soft, I'll say."

"Yes, lots of people think so, 'till they know
What constitutes a Ranger's working day."

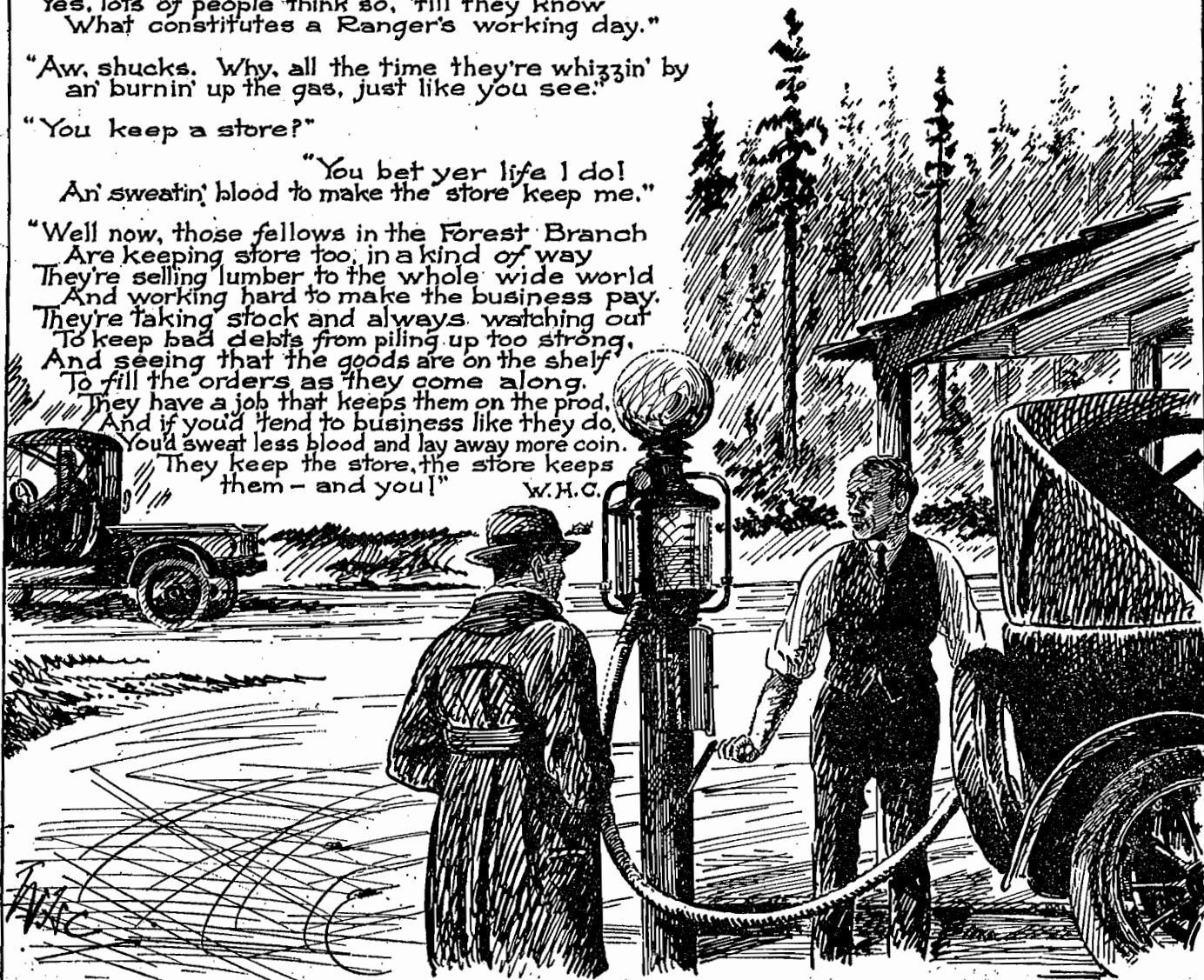
"Aw, shucks. Why, all the time they're whizzin' by
an' burnin' up the gas, just like you see."

"You keep a store?"

"You bet yer life I do!
An' sweatin' blood to make the store keep me."

"Well now, those fellows in the Forest Branch
Are keeping store too, in a kind of way
They're selling lumber to the whole wide world
And working hard to make the business pay.
They're taking stock and always watching out
To keep bad debts from piling up too strong,
And seeing that the goods are on the shelf
To fill the orders as they come along.
They have a job that keeps them on the prod,
And if you'd tend to business like they do,
You'd sweat less blood and lay away more coin.
They keep the store, the store keeps
them - and you!"

W.H.C.



This magazine is a staff publication, and is not in any sense a medium for the expression of Governmental policy.

The object of its publication is to promote discussion, foster exchange of ideas, disseminate news of "family" interest and, through the encouragement of individual initiative, to strengthen the spirit of co-operative effort.

"WOE BE UNTO YOU WHEN ALL MEN SPEAK WELL OF YOU."

The circulation of this journal is limited to a very small number of copies, but it covers a very considerable territory, and until lately the many comments which have been made upon it have been uniformly favourable. Upon our mailing list we number practically every Lumber Trade paper of international importance, several Universities, and almost all the other Forest Services on the North American continent - all of whom, by the way, conduct similar papers to our own.

Without exception these Lumber Trade papers (most of them, as we have said, of international repute) and the house journals of the several Universities and Forest Services have accorded to 'ROOT AND BRANCH' a whole-hearted and even an enthusiastic reception. We have been quoted frequently and at considerable length by most of them at some time or another; and in short, up to the present, nothing but favourable criticism has come our way.

Within the last few days, however, there has come to our notice a critic who takes us severely to task, and we cannot but be grateful for that one dissentient voice, if only it serves to avert the woe which is foretold for those of whom all men speak well.

What our critic takes exception to most particularly is the verse which appeared on the front cover of our JUNE number under the heading of 'TRAITORS.' It is absurd, says our critic in effect, to suppose that anyone could be so desperate as to deliberately set our Forests alight for the slender recompense of twenty-five cents an hour.

Oddly enough, the very verse at which he has taken umbrage was quoted on the front page of the Financial Supplement of the 'TORONTO SATURDAY NIGHT' a few weeks ago. To that paper, with all its knowledge of conditions throughout the Dominion, apparently that verse did not seem at all absurd.

"CAN HE SO DESPERATE BE?" asks our critic. We are ready to admit that it does seem incredible that such a state of mind should exist in man, but we know it does exist, and we have records to prove it. It is also a fact that it has not been so much in evidence since the rate of pay for fire-fighting was reduced to a point where it ceased to attract.

That being so, it is only natural to ask: "Then why is it not investigated?" But where is the investigation to begin and how is it to be conducted? Ought we to interrogate every casual passer-by and require him to prove an alibi? Should we place the entire neighborhood under suspicion until it proves its innocence? Obviously, the chances of catching the delinquent red-handed are exceedingly remote, but since we (the Forest

Branch, that is to say) have not the machinery for conducting such an investigation, to catch him in the act is all that is left for us.

How, then, do we know that there are incendiary fires? When a man is found murdered in an alley, how is it known that he was murdered? There lies the man, unquestionably dead, but might he not have died by his own hand? In the absence of eye-witnesses, why suspect murder and why search for the murderer?

Surgical science is rarely at a loss to lay a finger on a condition or conditions to prove which of these is the correct assumption, and in similar manner the trained observer of the conditions which give rise to Forest Fires can say that this fire, or that, had its origin in incendiarism. That, however, is as far as we can go. Still, it goes far enough to prove that this state of affairs does actually exist, and is not merely a figment of an ill-balanced mind.

If it is admitted that incendiarism does exist, is it not reasonable to suppose that the incendiary is actuated by the hope of personal gain; and if not - if he is actuated simply and solely by the wish to destroy - is his crime thereby made any less heinous? Surely not.

Well, what of it? It's a small matter, - a few small fires, a few dollars spent on a few hours of fire fighting. Not a very serious matter, perhaps, if we had any guarantee that the small fire would not become a great one, that it would not become a conflagration which would sweep away in its devastating path the patient growth of several human lifetimes, that would leave us in place of our trees and all that they mean to this Province nothing but a wilderness of blackened stumps and drifting ashes and a trail of ruined homes and blasted hopes.

It has been suggested that if this state of affairs does exist, it would be more to the point were we to devote our energies to ameliorating the conditions which make it possible. The incendiary is not a product of any conditions which are within our reach to improve. We did not infer that every man with an empty pocket chooses that particular way of mending his fortunes. WE SHOULD SAY NOT!! But we say there are some men who do it - we KNOW it - and for that type of man one does not ameliorate conditions any more than one ameliorates them for the footpad and the thug.

The EDITOR.

MOBILIZATION

Ranger J. B. Conway, (Nelson)

I have felt that being a rather young member of the service, I could derive more benefit from reading the ideas of experienced men, than by hazarding suggestions which have not been proven; but the fire season has been light, as compared with past years, and as a result we have had an opportunity to size up some of the stiff joints in the organization.

A great deal has been said on the subject of organization but something still seems to be lacking. Many articles stress the point of organized equipment and stop. Others organized service personnel. These are absolutely necessary, but at the same time they are under control, and can be altered at a moments notice.

"Chart B" organization is also valuable, but it takes uncertain labor conditions and twenty-five cents an hour to prove how unreliable even this can be. The man who builds up his chart as it should be will certainly get the man who is worth having. When summer logging slumps, this type of man does not sit down and wait for something to turn up, but moves on to other points. You find yourself forced to rebuild your chart with inferior materials at a time when you need the best.

I do not think our organization should consist of a selected few, but should include every individual in the district. I also realize that whatever result we get from an organization of this kind will be governed by the impression we make on it. Too many of our field men overlook the advantage to be gained by personal contact with the people of the district. Most individuals will respect your authority when you are present but how many of us can honestly say that we get that respect for ourselves and the service we represent.

Now I have no kick against the twenty-five cents an hour, I think it has served a good purpose, chief of which is, that it has changed fire fighting from a job to a public duty. But if we are not careful, we are apt to lose the good will of the people who have always been willing to help, and who are bearing the brunt of it. I think it is up to us to see that every individual in the district, who is eligible for fire fighting duty, bears his share of it, hence my scheme for next years organization.

I propose to take a census of the persons eligible for fire fighting duty, in each and every settlement in the district. Each Honorary Warden will be given a sketch of the territory for which he is responsible.

During the spring patrol, meetings will be held at each place, the organization explained, the benefits of forest protection and equalization of the work pointed out. The men will be

asked to volunteer in crews of three or four as the case may be, having regard for someone in each crew, who is familiar with the country, and fire control.

Individuals who in the past have been overlooked, due to their particular occupation, may serve their turn by substitution, but any man who substitutes, does not clear himself of his regular turn.

Crews will be lined up for fires, one, two, three, etc., or any number of crews may be used on one fire if necessary. Immediately one crew has been used, the next will be notified and their names given to the Honorary Warden. No crew will be used a second time until the district has been gone through.

Districts around which fires do not occur will be drawn on to cover the areas which are not adjacent to any settlement.

The prime object of the scheme, is to create a personal responsibility among the people of these settlements for the fires occurring close to them, to equalize fire fighting duty and eliminate the time that is wasted by the Assistant Ranger in getting on the ground and organizing a crew.

If we can get this instantaneous action, it is reasonable to hope that every fire will be stopped in its incipient stage.

I have discussed this idea with people in the district, and have been told that it cannot be done, more times than I have had people agree with me. However the same thing was said about the twenty-five cents an hour.

I would like to have the weak spots pointed out through your magazine. One point I am in doubt about is whether a written notice given to any individual that he is due for the next fire, can be construed as an order to fight fire.

"HOWDY! HALF THE ROAD IS YOURS!" - It has afforded us a very sincere pleasure this month to have received so many contributions from the Field, and we welcome this display of what we believe to be the real sentiments of the Field staff towards 'ROOT AND BRANCH.'

We hope from now on to be inundated with contributions from the Districts. Fresh topics for discussion are continually being presented, and those which have already been presented are by no means exhausted. Nor is there any reason why the Field staff should confine themselves to comments upon the articles of the Headquarters staff; we should like to see a few more of these topics originate with the field men themselves.

ANALYSIS FOR EFFICIENCY

P. Z. Caverhill.

A formidable looking title but I shall attempt an improvement in the text. You will all remember in school days how we stumbled over our first analysis. A simple sentence "I saw the cat" was not so bad but when it came to the more complex ones --- well, it was different. But there was some compensation when we had the sentence all spread out on a sheet of paper, its parts named and the reasons why given. We could then see it in a different light and our pleasure was unbounded when the sheet was returned from the teacher marked "correct". It was thus that we learned to understand the English language in a way quite impossible without this breaking-up process.

A few years later and we attempt chemical and physical analysis, found that apparently simple substances were in reality complex and that some of our most common and our most rare substances were fundamentally the same. Who had ever dreamed that carbon and diamond were virtually one in chemical relation, or that wood, chiefly cellulose, which is again almost pure carbon, is closely related to sugar and that by a chemical process cellulose may be converted into sugar. And so this analysis by showing us the inter-relation between matter enabled us to view with an entirely different light the ordinary things around us.

My suggestion is that it is possible to apply the same principal to our work. We are all busy, or should be, in trying to build up a reputation which means advancement not only for the work in hand but for the individual. The man succeeds best who has accomplished an efficient well ordered job.

Analysis of the job will show you the relationship of the various parts and the relative importance of such, just as surely as the analysis of a sentence showed us the subject, the predicate and so on. Once we know the relationship of the various jobs that go to make up our daily work we can then allot our effort where most needed and avoid waste on unimportant details.

A few samples taken from life will illustrate:-

1. In a logging inspection report I am advised that Ranger So-and-so has been getting distances etc., by chain and compass traverse of the logged areas. I am moreover informed that this ranger reports "require $1\frac{1}{2}$ man days to complete" also that in cruising his average is 57 acres per man day. This is a very much greater refinement than the average for this class of work and the question arises as to whether such refinement is justified at the present stage.

2. Bad fire situation in a certain district with special danger indicated in the near future. Ranger gets out of

touch with his organization and the situation by going off to cruise a timber sale for which there was no urgent demand. This ranger had not analysed and determined the relationship between the fire situation and his cruising work.

3. Have just received a wire asking for an increase in allotment for certain improvements. Work was originally estimated at \$85 per unit. Telegram asks for \$250 per unit. There are no plans or specifications - nothing to show why the change or what value we are getting for the expenditure. This district is not clear in the relationship between itself and head office, otherwise it would not ask us to sign what is virtually a blank cheque.

4. Fire occurs in merchantable timber. Two men are put on cutting pack trail. When trail completed 8 men put on to fight fire. Six days later this crew was substantially increased to control the fire. Evidently the ranger in charge had not analyzed the situation and did not realize the necessity of quick action in case of a fire.

Analysis means plans -- the laying out of the work and the seeing of the whole job, the allocation of tasks of importance and arrangement of effort accordingly. When the job is done the result is really the paper marked and handed back by our teacher "Experience". A re-survey is then necessary and our plan sheets should again be compared point by point with the results to see how we check out. The result, which is our experience will build up a line which is invaluable for the future advancement of our work.

"CAMP SITES OR --?" - Although we have not, up to the present, received much written comment on Mr. Wilkinson's article, we have reason to believe that it has occasioned a wide-spread interest.

The first tangible evidence of this is furnished by the Kamloops District, where preparations for the establishment of three camp sites are already definitely under way. No doubt we shall hear from the other Districts in due course.

We realize that there is a good deal of preliminary work to be done in the way of selecting the most suitable locations and that the more suitable locations there are the more difficult the selection will be; but time flies, and once the sites are selected their actual preparation will involve a considerable amount of time and labor, so that it ought not to be postponed if these camp sites are to be ready for the next Tourist Season.

FOREST FIRE WEATHER IN WESTERN WASHINGTON

George C. Joy, Chief Fire Warden, Washington Forest Fire Assoc'n.

Meeting of the Meteorological Society, and
Pacific Branch, American Association
for the Advancement of Science:
Los Angeles, September 17, 18 & 19, 1923.

In discussing the subject of Forest Fire Weather in Western Washington, I will take up only that phase of the weather which is the cause of crown fires in the Douglas fir region of our State.

The localities which are susceptible to such fires are the Douglas fir and white pine regions of North America. The Douglas fir region is located between the 43rd and 53rd degree north parallel of latitude; the summit of the Cascade mountains on the east and the Pacific ocean on the west. The center of this zone, north and south, is near the 47° degree of latitude. The zone comprises an area approximately 650 miles long by 150 miles wide.

In the white pine region the conflagration zone is central along the 47° of latitude from the foot hills of the west slope of the Rocky mountains to the Gulf of St Lawrence.

During the past 100 years, 15 great fires, of which we have more or less record, have occurred in these two regions. Six of the 15 fires referred to have occurred in the Douglas fir belt during the past 50 years. One who is familiar with the lore of the fir region can find chronicled therein, other great fires dating back beyond the discovery of America.

Our fir forests grow and thrive under the normal climatic conditions peculiar to the north Pacific coast region, west of the Cascade mountains. The whole region is wet; the prevailing westerly winds carrying the moisture in from the ocean, where it is condensed by the chain of high mountains and falls on their western slope.

As long as normal weather conditions prevail, the summer season is marked only by fires that are local in their character; their spread being due to diurnal convectional disturbances of the atmosphere, to local winds, or to a rough topography. Such fires are usually confined to small areas, and, as a rule, they are not difficult to control. I do not wish to minimise the danger from such fires, for occasionally they do considerable damage before being brought under control and they form the nucleus for larger fires.

It is when the normal weather conditions are jostled out of their equilibrium and the Douglas fir region is flooded with the

hot dry air from the arid regions of the western part of the United States and Canada, that the forest fire peril becomes imminent and fires are immediately fanned out of control, sweeping irresistibly over vast areas without regard to the topographic nature of the country. When this occurs, man is powerless, and only a change in the wind will avail to stop them.

The fact that not more than 6 great fires have occurred in the fir belt during the past 50 years will give one an idea of the irregularity and infrequency with which they occur. Our fir forests are here because of this fact. No doubt such periods of fire weather have occurred more often than the foregoing record would indicate, but they have passed unnoticed for the reason that at the time of their occurrence no fires were started where they would sweep over and destroy large bodies of timber. It should always be kept in mind, that it takes two things to cause great forest fires; viz., the right condition of the weather, and a fire in the right location. Such a combination has not often occurred in the past, but the prospects are that it may occur more often in the future. Weather conditions will continue as they always have, but the chances of fire being started have increased a thousandfold. The potential danger is increasing and the possibilities are that some day the Douglas fir region will be devastated by a conflagration far surpassing any such disaster of the past. The stage was set for such a climax on August 1st, 1922, but it did not occur as the right kind of weather did not materialize.

What element is it that causes such a disturbance in our normal weather conditions; that changes an easy fire situation into an alarmingly dangerous one over night - for that is what does occur?

In the Monthly Weather Review of February 1914, Mr E. A. Beals, then in charge of the Weather Bureau office at Portland, Oregon, discussed the value of weather forecasts in the problem of protecting forests from fire. Since that article was written we have had time and opportunity to study and observe the effect of weather conditions as affecting fires. The result of these observations and of our experiences have been such as to convince us that Mr Beals' statements and conclusions were correct in every particular.

All of our trouble comes to pass when a high and low pressure area are in such relation to each other as to cause the wind to blow across Western Washington from off the high arid regions of Eastern British Columbia, Eastern Washington and Oregon, Southern Idaho and Utah.

A glance at the charts showing the normal relative humidity of the United States for the summer months, shows the lowest humidity to be in the great basin situated between the Cascades and Rocky Mountains, and extending from Arizona to Central Idaho. The altitude of this region is from 2,000 to 4,000 feet.

When a high pressure area is in the right position, it causes the wind to blow off this region towards Western Washington. This wind is hot and dry when it begins its journey, and in its ascent to the east slope of the Cascade Mountains decreases in temperature at the well known rate of 1.6° degrees for every 500 feet of elevation. In its descent of the west slope it increases in temperature at the same rate, but it descends so much lower than it ascends that its temperature at tidewater is considerably greater than it was when it began its journey westward. As a result its capacity to absorb moisture, has increased at an increasing rate, and this is why a fire which today is docile and easy to control, breaks all bounds on the morrow and sweeps irresistibly onward over valleys and hills, leaving death and destruction in its path. Such a situation is brought about by the dessicating effect of these winds. If this condition of weather prevailed over Western Washington for only the summer months, there would be no Douglas fir region.

The abnormal condition is brought about by the development of a high pressure area in Alaska, British Columbia, or the North Pacific ocean. Trouble begins immediately when this "high" starts on its journey southeasterly across the states of Idaho, Western Montana, Utah, Wyoming and Colorado. Coincident with this movement, a "low" develops in southwestern Arizona and usually advances northward through Central California, up the Sacramento Valley and breaks over the barrier of mountains at the California-Oregon line, flooding Western Oregon and Washington, and often extending into British Columbia.

The first effect of the "high" is felt when it appears north of the Canadian border. Northerly and northeasterly winds are prevalent. As these are descending air currents from over a hot, dry land surface, their dessicating effects are soon felt. As the "high" advances to the southeast, these descending air currents which flow spirally outward clock-wise, cause the wind to veer and come from a more easterly direction. It keeps on changing its direction until a southeasterly course is reached, when the "high" usually disappears and the atmosphere begins a new formation of its forces.

The severity of such a spell of weather is dependent upon the relative position the "high" bears to the "low", the difference in the extremes of pressure, and the length of time the "high" takes in passing.

It will be observed that the winds are first northerly, veering to the east, and then coming from a southeasterly direction. A glance at the temperature and humidity charts of the western part of the United States will serve to demonstrate why, when the wind is from a southeasterly direction our fire hazard is greatest. All of our large crown fires - real conflagrations, have spread in a northwesterly direction.

Humidity of the air is determined by the temperature,

distance from the ocean, the inclosure of the mountains, and the altitude. All of these factors are present in the direction from which our southeasterly winds blow.

One of these spells of weather occurred from May 26th to June 4th, 1922. On May 26th and 27th a large "high" appeared in Southern British Columbia. At the same time a "low" developed in Southern New Mexico and Southeastern Arizona. On May 29th the southern end of the "high" was central in Northern Montana, and the "low" had advanced to Southwestern Arizona.

On the 31st the "high" was central over Southeastern Montana, and the north end of the "low" had advanced up the coast to Vancouver Island, and seemed to be central in the Pacific Ocean just off the entrance to Grays Harbor. The isotherms on the weather map for that date show that the highest temperature in the western part of the United States, was a spot about 70 miles in diameter on Grays Harbor. At Seattle the temperature jumped to 89°, and at Aberdeen to 93°; both abnormally high for Western Washington. The prevailing winds were southeasterly, and in some localities were very strong. The relative humidity at Seattle dropped to 19 per cent.

The fires which had been fanned into life during the preceeding 6 days, now became uncontrollable. One fire covered 25,000 acres and destroyed more than half a million dollars worth of property in an afternoon. This happened six days after a heavy rain had fallen, with all forest material soaked through and through. But these six days had been hot, windy and dry. The moisture evaporated from the moss on the trees; the leaves and shaly bark; the feathery rotten wood on dead trees; the resinuous spills on the branches; the dead ferns and fireweed, all these became as tinder.

It is worth while to note that this "high" rotated clockwise that its nose first pointed southeast on the 27th, on the 29th it was a little to the southwest, and on the 31st the elongation was southeast and northwest, and on June 1st it had rolled to Northeasterly, and on June 5th had completely disappeared. It had occupied ten days in passing - an unusually long time. Its strongest effects were felt when it was central over Southeastern Montana and Northeastern Wyoming.

At the time of the great Columbia fire on September 12, 1902, the "high" and the "low" occupied the same relative position to each other.

As soon as this "high" disappeared, the weather conditions in Western Washington immediately became normal; fires died down, were easy of control, and ceased to run.

Right here I want to emphasize the statement, that the danger of conflagration is just as great, and they as frequently occur in the spring of the year when all forest material is damp and wet, as in the autumn following a dry summer. The rapid

heating of the atmosphere in the spring as the sun advances north, gives the air a greater capacity to absorb moisture, than in the fall when it is cooling off.

All of the large fires in the Douglas fir region are caused by descending winds blowing outward from a "high".

In his discussion of the subject, Mr Beals states "that in the case of the Michigan fires, and the Hinckley fire in Minnesota, the air currents were ascending and blowing inward towards a "low"."

I have not given this phase of the subject sufficient study to warrant me in making a statement as to why such a condition should cause great fires in one locality and not in another, but in passing I want to venture a guess on the matter, and that is, that it does not make any difference whether the wind is blowing from a "high" or backing into a "low" the effect is the same if it continues any length of time to come off a hot, arid land surface.

It would seem to me that the study of fire weather forecasts should include a close observation of what is taking place in Alaska and British Columbia, as there is where our trouble seems to develop. I will have to leave the question as to why the "high" develops up there, to the technician who understands that phase of meteorology. I am more concerned about where they go when they start wandering away from home.

From my own observation it would appear that an intensive study of the actions of these "high" by the U. S. Weather Bureau, supplemented and correlated with similar work done by our Canadian brothers, who are as vitally affected and interested in the subject as we are, would lead to a knowledge of the atmospheric disturbances which is the cause of all our trouble.

What we need are men versed in the technique of meteorology, who can give all of their time and attention to a study of the relationship of changes of weather as affecting forest fires. In order to render a maximum of help, they must be on the job night and day during critical periods of weather - Sundays and holidays included. They should be stationed in the danger zone where they can get first hand knowledge of what occurs and the cause leading to it. Congress could not do anything more to assist reforestation and conserve the timber resources of the Douglas fir and white pine regions, than to make the small appropriation asked for, which will enable the Weather Bureau to undertake this work.

The Weather Bureau has already done much to assist Forest Protective Agencies. We fully appreciate what they are doing.

The fire hazard on the Pacific Coast is growing worse; the potentialities of a catastrophic combination of weather and

fire conditions are here which can bring disaster and ruin unprecedented. We are powerless to prevent the atmospheric forces from assembling and venting themselves in all their might, but we may gain a knowledge of their secrets and of the effect of their movements, which will enable us to thwart their fury.

- AN ECHO FROM "FOREST PROTECTION WEEK" -

To the District Forester at Nelson, Mr. W.W. Powell, President of the W.W. Powell Co., Ltd., of that city, writes as follows -

"We wish to congratulate you upon your splendid exhibit in the Hudson's Bay Co's windows.

"Without doubt this kind of propaganda will have a wonderful effect and make a great many people realize what carelessness will do to a Forest.

"Your example showing a green forest and the after effects, when a fire has gone through it leaving nothing but burnt stubbs and trunks, is well worked out and should, indeed, make anyone realize the disastrous effects of this yearly menace to our forests.

"We sincerely wish to voice our hearty approval of this method of presenting it to the public and earnestly hope it will affect everyone as it did the writer."

Mr. Powell's letter has reference to the display arranged by the District Forester at Nelson in connection with 'Forest Protection Week.' and is distinctly encouraging, besides furnishing inspiration for the 'Forest Protection Week' of 1924.

Day by day fresh evidence is produced of the deep impression made upon the public mind by our Forest Protection Week, and more and more it becomes apparent that this must become an annual event. We can see no reason why Forest Protection Week should not become as thoroughly established and as cheerfully observed as Dominion Day, Labor Day or Thanksgiving, when one bears in mind the sentiments towards our Forests that the WEEK is designed to foster, and how tremendously important it is to the welfare of the Province that such sentiments should exist.

"PLAYING WITH FIRE."

In the June 27, 1923 issue of "The Outlook", there appeared a somewhat sarcastic article by one Captain E.C. Crossman, written after spending about a year on the Pacific Coast, in reference to the growth of brush in the Forests due, as he states, to a mistaken policy of Forest Protection. The gist of his argument is that because Dame Nature, the Indian and the early White settler had always been active in burning over forested areas the policy of the present and future should be along the same lines. His article, which is a parrot-like repetition of the usual shallow statements in favour of destroying timber by fire is aptly answered in the following article by Associate Forester E.A. Sherman of the U.S. Forest Service.

"Playing with Fire."

"Fire let loose in our forests is not man's servant, but his master. That is the conclusion of men who know forest fires, who have choked in their smoke, sweated in their furnaces, and afterward reckoned up the account in waste and desolation. Captain Edward C. Crossman has said in his article "A matter of Conservation," about all that can be said in favor of forest fires. Let us put over against what he has said the conclusions drawn from actual scientific investigations of the evil effects of fire in our forests.

Captain Crossman's argument is not new. Burning the ground-cover to protect the mature timber has in the past, by its apparent plausibility, made a considerable appeal to timberland owners. They believed in "light burning." They wanted to burn as often as necessary the "underbrush," leaf litter, and other debris of the forest, and thus supposedly get rid of the fuel of more destructive fires. They want to set these fires just at the right time--when the ground was neither too wet nor too dry--and then "control" them so they would not get out of bounds.

But the issue has already been fought out with them. They have found by actual test that it doesn't work and it doesn't pay. Foresters, with ample reason, have always fought the light-burning theory. They hated to see its revival, especially with the support of some well-known men. The issue was raised very sharply in California. Then the foresters got together with the timber-owners and made experiments in "light burning."

A committee was appointed representing the United States Forest Service, the State Forester, the California White and Sugar Pine Manufacturers' Association, and the University of California. After three years' actual experimenting with light burning, the committee abandoned its task because light burning was found to be impracticable. Light burning, it was found by

actual experiment, cannot be done cheaply. It cannot be done without inflicting heavy damage on the forest. It kills the young trees needed for future timber. It burns down merchantable timber. It scars the bark and permits destructive insects and tree rots to enter, thus ultimately causing more losses. So even for those who wanted merely to protect their mature timber and were willing to burn up the young growth it was a failure because of its cost and the heavy damage it caused. Unfortunately, there is not space here to give the details of the many measurements and counts on which these statements are based. The facts have been published in lumber journals and are in the files of the Forest Service. Timber-owners have abandoned the practice.

But Captain Crossman does not advocate even the "controlled" burning of the light burners; he would simply withdraw from the National Forests the organized forces for stopping fires. He would let fires burn freely, on the assumption that Mother Nature knows best what to do.

Well, Mother Nature is prodigal. She can afford to experiment and waste and delay. A century or two makes no difference to her. But for us who need food and timber the plow and the ax are vital tools, and need to be used with all the skill we can summon. A wild forest,--the prey to disease, insects, wind, drought, and, above all, fire---compares in production with a wild wheat field or a wild potato patch. We have got to cultivate our forests as well as our fields.

And one of the first steps in forest cultivation is keeping out fire. In California second-growth pine forests from which fire has been kept out are producing in fifty or sixty years from two to three times as much timber per acre as can be found in typical virgin forests two or three centuries old. Why? Because the pine forests of California have been swept for centuries by repeated fires; they have suffered what has been most aptly called "attrition," they have been gnawed by fire and worn down until they do not contain a half or a third of the timber they could grow under the forester's care. What foresters are doing is, not to slavishly imitate Nature's methods, but to improve them.

Nature, left to her own devices, has not done as perfect a job as Captain Crossman thinks. Terrific forest fires have swept the forests of the Pacific slope and the Rocky Mountains from time immemorial. They have been traced back for centuries. They have wiped out the forests from immense areas; on other immense areas they have sapped the forests' vigor and greatly cut down their productiveness. In fact, the brush fields in northern California, of which Captain Crossman complains, are themselves the final product of fire. Fire made them, and keeping fire out will turn them into forests again. Fire, gnawing century after century into the pine forests, converted millions of acres into brush fields. Within the boundaries of the present National Forests of California nearly 2,000,000 acres of pine-timber

land--one acre in seven--have by these centuries of burning been changed from magnificent forests into worthless brush lands.

The Forest Service is keeping fire out of these brush fields because young pines are starting up among the brush. These pines, if protected, will gradually form a forest that will kill off the brush. Once the forest is re-established, it will produce valuable timber for all time. And elsewhere even the forests that have not been converted into brush fields need building up so as to grow more timber to the acre. This the Forest Service is doing by keeping out fire and by conservative timber cutting.

But this building up can't be done in a day. It takes time--years and decades. Meanwhile we must fight incendiaries, careless campers, and others who set fire either from negligence or from malice or because they prefer to pit their own selfish interests against the building up of forests that will benefit all the coming generations. But the grazier who burns the growing forest to get a few weeks' grazing and the camper who fails to put out his fire are learning that Uncle Sam has a long arm and often an iron hand in what looks like a velvet glove. Fires of human origin must be excluded, and once they are excluded we can successfully cope with lightning fires.

Fire everywhere in the forests of the United States is the great menace against our future timber supply. Fires annually burn 10,000,000 acres of our forest land. Fires not only destroy immense quantities of timber ready for the saw, but--even worse--they destroy the young trees from which the future forests, if there are to be any, must come. Captain Crossman, like most other people, falls into the error of confusing these young trees with worthless underbrush. Twenty years of protection have encouraged billions of young trees to spring up in the National Forests. Shall we burn them now to prevent the danger of their burning in the future, as one might burn down his house to prevent its catching fire? This is the gist of all the arguments in favor of forest fires: Burn down the forest to prevent the forest from burning down."

OUR CHRISTMAS NUMBER - Our Christmas Number is now in course of preparation, and it is our hope and ambition to make it a thoroughly representative issue.

Please give us your assistance. The only stipulation we make is that, for our Xmas Number, 'Technical stuff' is barred. Otherwise, you may go as you please, and you need let no other consideration cramp your style.

Let's hear from you, then - and let's hear from you SOON.

MAINLY DEFENSIVE

T.A. Clarke, Prince Rupert.

An extensive visit to the Queen Charlotte Islands together with the arrival of the September-October number of "Root and Branch", by the bi-monthly (weather permitting) mail boat to these points, furnish food for thought along various lines.

It is possible that the seeming dearth of contribution to our magazine on the part of District field men can be somewhat attributed to the fact that many of the subjects and problems with which they are confronted are naturally local ones which they hesitate to put before a wide circle (geographically speaking) of readers. Climatic conditions, topography, and resultant wide variance in timber types and logging methods, cannot but greatly influence a writer with mainly local knowledge, against committing himself in print on subjects which are serious enough to him and on which he has thought deeply, but which he knows do not apply to localities other than his own, due to a variety of circumstances. Any District Forester knows that a wealth of ideas and constructive criticism are being continually submitted by his Rangers, dealing with local problems and assisting him greatly in defining District policy. Many of the ideas as submitted are well worthy of repetition in Root and Branch for general discussion where it is felt that the subject matter is applicable to a variety of conditions and not too local. Could not District Foresters either forward copies of such communications, or appropriate extracts therefrom, for publication and discussion in "Root and Branch"? Or he could advise the Ranger concerned to send a copy direct. The initiative on the part of the Ranger is already shown - co-operation with, and appreciation of this initiative will lead to further and valuable submission of ideas. There is no lack of expression on the part of field men as to policy matters - that these do not reach the pages of "Root and Branch" is certainly to be regretted but is easy of solution.

If the above few remarks constitute at least a partial defense of the field men, the object for which they are written has been achieved.

Hesitancy towards expressing matters appertaining to local conditions is of course not to be commended even if worthy of defense, but I have just stated facts as they have been observed in the Prince Rupert District. True enough, "R.H.L." has of late been moved to the depths of poetic lamentation, imagination, and passionate appeal, and "Zero" (whose name completely belies his nature) has emerged from his battles with the Devils Clubs long enough to make himself heard re several worthy subjects and - there'll be more from the far north in the near future.

"AND THEY BEAT THEIR SWORDS --"

(C. S. Cowan)

I am given to understand by very good authority - no less than Mr. Wilkinson, that the full quotation of the above, is "And they shall beat their swords into plough shares."

With the Forest Protection Service, however, the end of the fire season does not mean that we are finished with our tools. It means only that we should prepare for the next season. Part of this work is now being done in the calling in from the field the forest maps which are part of Chart "B". Some of these maps, I must say, are an absolute farce; no thought whatever could have been spent in the making thereof. There is even less information on these maps than there is on the official blue prints, and still less than there is on the official lithographed map. To us, this is a very great disappointment, and simply appears to prove the statement which I made some time ago in Root and Branch, - (to which Mr. R. V. Stuart of the Vancouver Forest District, took exception) and that was, that to some of our men the making up of Chart "B" was simply a "sop" to Victoria office. We realize fully the difficulties which you have had to face in making up this chart. We realize fully that it means work the first year, but we also fully realize that we asked that these charts should be made so that at the end of the year white prints could be struck off and information added to these maps from time to time so that ultimately a very complete and detailed map of each District was in existence, which is bound to be of very material assistance to the field.

Certain of our field men have seen fit to practically ignore our instructions, or possibly they have misinterpreted them, but even if this was so, a few moments reflection would have shown that some of the maps which were made and sent in to this office were useless. There are others of the staff who have shown considerable care, thought and hard work in making Chart "B", and to these men I give all credit and due thanks.

Before I finish with this particular subject, however, let me state that there has been considerable difficulty in arriving at the scale for a white print which would fit the back of Chart "B", and our best solution of the matter is that we are making maps to the scale of the official blue print, or 1 inch to the mile; no one map being larger than Chart "B". These maps can be laid together to form one district, the edges of each map being numbered so as to fit its fellow.

.....

There is bound to be, during the winter, amongst some of you at least, certain periods when work in the field cannot be undertaken and you will be engaged in what the Summary of Service

terms Miscellaneous Executive duties. When these moments are upon you, I would ask you to please give a thought once in awhile to these charts and put in the trails which you know exist and delete those trails you know do not exist; map in your hazard areas and do all those things which you know you ought to have done earlier in the year.

.....

As a further piece of information I might add, that we have been in negotiation with the different fire hose manufacturer, and at last we believe we have come across a hose coupling that will suit even our fastest moving men. The general idea of the coupling is the same as a Railway air hose coupling in that is a half turn and the coupling is made. We sent this up sometime ago to have it tested, but received an answer from our Mechanical Inspector that he would do it as soon as it stopped raining.

We also believe that we are on the track of a specially treated hose which will not show pin holes or stiffen up when wet. This we do believe will be a blessing.

The thought has occurred to me that now the fire season is over, possibly some of you will have a little time to drop in to the schools and keep up the interest in forest protection and the forests of British Columbia generally. What arrangements have you made towards this? You Mr. Ranger, who were so keen on Victoria doing it? While we are on the subject of handing the odd jobs over to Victoria, we will confess that we are in the course of actually writing a small book which we hope to spread throughout the different schools of the provinces and to our Rangers so that we may be able to treat Forest Protection propaganda in a little more organized way than we did last year. The general idea is that it should become the basis of the Forest Protection essay, which according to all accounts was such a big success in 1923 that it should certainly be continued in 1924. Possibly our method of conducting the competition will be subject to changes, but the main thing is that the competition will probably be in existence.

By this time you will have stored away your tools for the winter. You will possibly have given a thought to the fact that we have several thousands of dollars invested in tools and equipment, and that a little care on the part of each field man in storing equipment will mean that he enters the new fire season with a better outfit than he would otherwise have; that he would know in time what should be replaced or what the probable life of said equipment will be, having due regard for its condition. It will allow you to make an inventory of what you have so that you may report to the District Forester in lots of time to be fully equipped on April 1st, 1924.

We are, as a Forest Protection Service, in better shape today than we have been for years. We have had a little bigger breathing space this year, and there should be no excuse for poor equipment next year. You ought to know your problems, both material, and I almost said spiritual - but the spiritual problems I mean are the personal ones - those little matters which perhaps have been sores with the public for some time and which you can adjust if you care to go after in the right way.

And the season generally! How has it been? You have the best answer to that, but from the broad Provincial point of view it has been a favorable one, and we are now beginning to find out how to prepare for meeting all seasons - thus we have been delving into the mysteries of Relative humidity, and it is the hope of the Department that we may be able to place in your hands the means of getting information that would help you to fight fire, with the fullest knowledge of conditions that science can let you have, so that fire fighting may be lifted from the realms of guess work.

The whole story of the foregoing is: that we cannot afford to rest on our laurels - our equipment needs attention, our cars need storing away, as do our launches and speeders; hose need drying, pumps overhauling and in the few spare moments that you may have from management work during the winter that you cannot spend at your own fire-side, perhaps you may like to call on the different Boy Scout organizations, Girl Guides or schools.

The biggest advertisers of national products apparently work on the basis that they cannot afford to let the article they are selling drop from the public eye for one moment. If they do somebody else steps in. I heard a short time ago that the manufacturers of "Apples" Soap decided that after advertising for over one hundred years, their product was so well known that during the period of deflation they could afford to cut down on their advertising. They did for one year; and they now believe that the stopping of such advertising cost them several millions of dollars. Their sales dropped off to a surprising amount and only their steady customers who bought "Apples" Soap from force of habit kept up the demand. We are in the same position. We cannot afford to let our goods drop from the public eye for any period. We are selling Forest Protection, and we must push it at every opportunity, in winter no less than in summer.

Mark Twain once said that "everybody talks about the weather, but nobody does anything about it." Forest Protection should have everybody talking about it in order that somebody will do something about it, and to make use of a well posted colloquialism - this means YOU.

THE "CONS" OF "CAR COSTS"

Supervisor H. Smith.

There are several statements in Mr. Blake's article, entitled "Cut down the car costs", in the September-October issue of "Root and Branch", with which I should like to take friendly issue.

To begin with, it should be borne in mind that the mileage records shown on the monthly fuel report sheets are only estimated, so that the figures are sometimes far from being accurate. These estimated distances may be consistently high or low; especially in the "short run" districts, where the distances are not definitely known.

In order to make accurate comparisons, it would be necessary to equip all cars with speedometers, because the basis of all car comparisons must be correct mileage.

The "reduction per car per month" in Mr. Blake's paper evidently refers to repair costs, and this, I presume, is worked out on a mileage basis.

Now it is quite possible that in the absence of reliable data, the district which made such a good showing this year, may not have been so much ahead of the adjoining district after all, and in order to get the full value from this comparison, it is necessary to know the total mileage of new and of second year cars in each district for the two seasons, also the amount of running the cars had, between the six month periods for which the comparison was made.

In my opinion, the only fair way to make comparisons of this kind, would be to equip all cars with speedometers and take the mileage cost for repairs during the lifetime of the cars in the Service, plus the difference between the original cost and the residual value.

To my mind, the article by Jimmy Murphy is irrelevant, as highway travel is indulged in by Field Officers neither for the purpose of speed duels, nor as a pleasurable mode of transportation.

There may be certain Field men who are habitual speed fiends, and who are deserving of severe criticism and censure, but I do not think these aspersions should be cast over the whole Service. A speed fiend has no place in our Organization, as he cannot maintain an efficient patrol while careering through the country at a reckless rate of speed.

Again, I cannot agree that "a few minutes would not make much difference" when hastening to a fire, and I am confident that very few of the Field Staff entertain that mistaken idea.

When we get a fire, there is a real emergency, the one we have been preparing to meet for so many months, and it is up to us to get there in a hurry. Not of course at the sacrifice of our nervous system, or by jeopardizing the car and the lives of anyone and everyone whom we may encounter.

There is always a time in the history of a big fire, when it could have been extinguished at little or no cost, and it is our object to get action before the turning point is reached. A few minutes may mean the difference between a small fire and one which would cost the country many thousands of dollars.

The people who are prone to write criticizing letters regarding the speed at which our cars are driven, are just the ones who sit in judgement on "sane and conservative" methods if an outbreak of fire threatened to put them to any loss or inconvenience.

In conclusion, I would say that 6,500 miles without having to put a wrench on the engine is a record to be proud of indeed. No carbon and not even a dirty spark plug! Some "Lizzie"!! Let us hope that Henry will turn out more of them.

THE ULTIMATE IN QUIETNESS : "What do you think of our city?" we asked a newly-arrived Scot the other day.
"Man, it's a bonny place an' I like it fine," he said, "But it's awfa' quiet. D'ye ken, I took a walk the ither nicht, an' the place was as deserted as the streets o' ABERDEEN on a tag day."

IMPORTANT TRADE JOURNAL ANNOUNCES CHANGE OF TITLE

Beginning with its issue of January, 1924, the title of the "Pacific Coast Lumberman" will be changed to the British Columbia Lumberman."

The "Pacific Coast Lumberman" is the official journal of the Timber Industries Council of British Columbia, and we feel that the management is to be congratulated on the choice of a title which makes it even more distinctively British Columbian.

U N I F O R M S

J.B.Scott (Queen Charlotte Islands)

Mr Browne in his article in the September-October publication of "Root and Branch" on the above subject expresses my opinion in regard to uniforms, which, to have the desired effect of advertising the Branch before the general public would have to be always neat and well kept. This condition would be difficult to maintain in the North country, where a heavy and persistent rainfall makes the wearing of "tin" pants and rain test clothing necessary. This type of clothing is not of material which is conducive to neatness and does not aid the wearer in having a smart appearance which seems so necessary in wearing a uniform.

Thick and heavy brush must leave its mark, also the crawling under refractory "Fords", if this is still done, or making hasty repairs on and around launches and engines. The most up to date and swagger uniform would under the above conditions be a retrogression of the desired effect.

Rangers in districts that come in contact with numbers of the touring public, through patrolling highways etc. uniforms of a standard pattern would seem estimable and appropriate, but in districts where these conditions do not exist and logging inspections the chief work, believe the money expended could be put to a more useful and needy purpose.

Perhaps some distinctive buttons could be cast, such as the present "Forest Service" badge made round and fitted after the style of a batchelor button that could be put on Mackinaws and the various top coats.

If uniforms are inevitable, please, oh please do not let us have brass buttons.

The tendency as exhibited by the troops in the late War of parting with their buttons to lady friends for certain considerations should not be disallowed but discouraged.

"Might I as one who has spent a considerable part of his life in a uniform of one kind or another be allowed a word on the subject," writes T. G. Martin, (Smithers).

"In the first place all the discussions that I have seen on the subject betray the workings of the civilian mind, which is never able to get away from the idea that all that is necessary

to make a man look smart in a uniform is to put him into it. Any one who had anything to do with the training of recruits during the late unpleasantness in Europe will remember the horrible appearance of the men who were putting on uniform for the first time.

Nothing in the world brings out with such startling clearness the little faults in carriage and bearing of a man as a uniform. The Royal North-West Mounted Police is the classic example of the impressiveness of a uniform when properly worn; yet only those who have had the honour of belonging to that celebrated force know the hours and weeks and months of intensive training that is necessary before the average man is fit to appear in uniform in public; and more important still that training has to be repeated at frequent intervals in order to keep the men up to the required standard of smartness. Unless the uniform is worn with the dignity that comes only from severe physical training the impressiveness of the uniform is immediately lost.

Now in our work there would be considerable 'sergeant-majoring' required to preserve the standard of neatness in a uniform in which the wearer was tearing through windfalls and devil-clubs and fording rivers and repairing autos and speeders, etc., and I am quite sure the Branch is not ready to incur the additional expense necessary to provide anyway adequate training.

Then again in a large section of the Province there would be great difficulty in suiting the uniform to the different times of year. Two complete sets of clothes would be needed for the men in the field in the North. The temporary help would provide another difficulty as the uniforms would get shabby but not worn out in the summer season, and the next man would not want to put on a partly worn outfit particularly if the previous wearing had been done by someone else.

I should suggest that the Branch provide a standard type of hat, soft felt, with a moderate width brim, and a leather hat band with the Forest Branch Badge in place of the buckle to come to the left side of the head. These would be comparatively inexpensive if bought wholesale and would be very serviceable for the men in the field, as well as providing an adequate means of identification. For those who were unable to wear this type of headgear during the winter months knitted toques could be provided of standard type and colour.

GRAZING FEES IN THE UNITED STATES

T. P. MacKenzie.

The first definite announcement of the increase in grazing fees on the National Forests of the United States has been made by the Chief Forester from Washington D.C.

Increases from 100 to 300 per cent are to be made as a result of the work of re-appraisal of forage values ordered by Congress three years ago. It is proposed that these fees shall become effective with the the grazing season of 1925.

The first announcement covers the eight forests or Grazing Districts of the Utah and eighteen of Idaho. The figures for other districts will be given out shortly.

The rates on the United States ranges vary in accordance with the character of the forage.

Utah.

Present Fees Per head per Month.	Increased Fees Per head per Month

2½¢ and 3¢ Sheep	7¢ Sheep
10¢ and 12¢ Cattle	29½¢ Cattle

Idaho

2½¢ and 3¢ Sheep	4½¢ Sheep
10¢ and 12¢ Cattle	22-1/3¢ Cattle.

Oregon and Washington increased fees will probably average:-

7¢ per head per month for Sheep
30¢ per head per month for Cattle

British Columbia ranges produce just as good forage in most cases better than those of Oregon and Washington and can be more advantageously used owing to their proximity to the ranches. The grazing charges in British Columbia are:-

Sheep 1 $\frac{1}{4}$ ¢ per head per month
Cattle 5¢ per head per month.

The new grazing fees for the United States are based on the marketable value of the forage. British Columbia fees cover merely the administrative cost of grazing and a substantial fund for range improvements.

The commercial value of the forage in British Columbia may be based on the present lease-hold rates in operation. British Columbia has thousands of range lands leased at 15¢ per acre. On the basis of 15 acres per head of cattle this is equivalent to \$2.25 per head. As the season of use is about 7 months at the most \$2.25 is equivalent to a per head charge of 32¢ per head per month.

The grazing for 1000 head of cattle annually on the Kamloops Indian Reservation is leased for \$3.50 per head. The season being not more than nine months makes the grazing fee close to 40¢ per head per month.

The rental for large leases in the Railway Belt of British Columbia is 4¢ per acre and 10¢ per acre is charged for small tracts. The large leasees are hampered with many restrictions and are required to keep one head of cattle on each 20 acres. As this is seldom done charges come high, probably around 20 cents per head per month.

It will be noted from the above that the grazing fee charged in British Columbia is extraordinarily low.

Simpson considered himself a humourist. He sent a selection of his original jokes to the editor of a newspaper and confidently awaited a remittance. His excitement ran high when he received a letter, obviously from the newspaper office.

He opened it in feverish haste. There was no cheque, however; just a small note, as follows: "Dear Sir, Your jokes received. Some of them we have seen before, and some of them we haven't seen yet."

CAPITAL AND INTEREST

Dean Inge in "Outspoken Essays" quotes a statement to the effect that "there is much truth in the saying of Diogenes that a man's wealth may be estimated in the terms of the things he can do without." The author believes that modern industry is consuming too rapidly the raw materials of nature and that this consumption is based on an exaggerated idea of the needs of mankind.

Pre-mechanical man lived on the interest of his environment; mechanical man lives very extravagantly on the capital.

If the dean lived in Canada he would probably be astounded at the destruction of Canada's forests, not only by forest fires but by methods of manufacture which destroy the chance of a future crop and only utilize a portion of that which it has taken centuries to produce.

He would wonder why owners of timber lands will continue to mine their forest wealth by cutting young trees at their period of greatest development and using them for poles, posts and props when there are thousands of acres of fire killed timber more suited to this use, and he would no doubt be deeply puzzled by the state of mind that can view the forests of Canada as something placed here by Divine wisdom to be exploited and utilized by the present generation. He would see on every hand evidences of departing forest wealth and despite these warnings would find a populace still viewing the forest wealth of Canada as inexhaustible. He would see men and women toiling and struggling against adverse conditions, to the end that their children might be endowed with the possessions created by their thrift and skill and he would see these self same people unmoved while thousands of acres of young forest growth, the heritage of their children, was destroyed through indifference and neglect.

The time has come when we must realize that our natural resources are not inexhaustible; that a nation, like the individual, cannot get something for nothing; that poverty and waste are different ends of the same thing and just as surely as we waste today we must want tomorrow.

I believe one of the greatest lessons which the Canadian people have yet to learn is "that we cannot garner a crop in the fullness and wealth of its maturity if we destroy it in the blossom." We cannot hope to derive interest if the capital is squandered in riotous living.

"BUSH LEAGUES"

Supervisor W.R. Flumerfelt,
(Nanaimo)

With a feeling of envy I have noted the experience of Mr. Naden and Mr. Caverhill with cheery fire, smoke rings, slippers and comfort. My last experience of the former was when in the interior of Vancouver Island, but we were short of the slippers, comfort and sigh of relief.

The trip just referred to was one from Nootka, on the West Coast, through Vancouver Island to Campbell River. Luckily, Asst. Dist. Forester R.V. Stuart and myself were accompanied by the District Forester. He claims that it never rains when he is on an overland trip, and I am beginning to think that he has a special stand-in with the weather regulator. Rain poured the day before we started and also on the day after we got at Campbell River, but not a drop of rain fell during the time we were packing through.

The trip was very uneventful, with the exception of the few incidents which generally accompany such trips. Major Andrews fell into the river and showed real agility in getting out; I got blisters on my heels which caused me some unpleasant hours; and Stuart learned how to cook mowitch steaks.

We were due at Campbell Lake by dark on the third night and were to be met by the Ranger with a boat. Being an hour after dark, he had given us up, and all our visions of coil springs and a hot meal, were shot. The ground was soggy, the grub was almost gone, and we were tired. After a glorious spread of one cup of soup each, we wandered back into the woods and found a big split cedar. Shakes were made, a lean-to erected, a floor put down, a roaring fire built and the long night eventually passed. No slippers though, little comfort and only sighs for relief.

Next morning the Ranger came on the scene with the boat and we completed the last stretch of the journey. For a whole day we travelled through one of the most beautiful park-like forests that can be imagined; giant fir and cedar, and lots of it. Side valleys of heavy timber reached out for miles on both sides and made one wonder about the talk of timber shortage. Naturally, one feels small while surrounded by a vast country and big timber, but a look at the map and a mental reminder of the yearly cut, brings back realities.

Diverting from that trip, in the September issue, Mr. Caverhill mentioned that "Lizzie" did better than ever before. This should make the Mechanical Inspector shudder with the horrible thoughts of the frazzled nerves of the driver and the terrible strain on the frail engine.

It brings back one incident last summer, when after a night of very little sleep and a lot of work, I drove 240 miles the day following and attended a number of fires. Many of the boys had similar strenuous times, and I have yet to see one whose nerves were seriously frazzled.

If it is permissible, I would ask if the comparison, drawn between the 6,500 mile man with no repairs and car like new, is with another new car of the same stamp, and if they both carried pumps and equipment and men to fires in any locality. One or two cars in my District cost upwards of \$300. for repairs. They were second and third year cars though, and they certainly worked. My own car was new this year, it ran about 12,000 miles in less than six months. The upkeep was upwards of \$160. It certainly had many wrenches on the engine and body and steering gear. As far as was humanly possible, nothing was left to chance and the car was always ready for a run anywhere.

I would be sorry to think that the Department would have a very poor opinion of any operator whose repairs had amounted to \$300. without first making sure that it was carelessness that was the cause, and am prompted to say this because of what the "\$300. repair bill men," who are not to blame, are thinking.

"HULLO, CENTRAL!"

"I would like to say a word of commendation to the Long Distance Telephone girls", writes Supervisor Flumerfelt.

"Throughout the past season on the Island, I have learned a little better the meaning of co-operation. There was no instance that I can recall throughout the summer when Long Distance was not on her toes for us. She was always cheerful and eager, and many times has gone a long way past what her regular duties would call on her to do. Citing one or two instances; I have had occasion to call a ranger who is on the road somewhere between Nanaimo and Union Bay. Long Distance would be given the facts: He is on his way to Union Bay from here. In about five minutes she would reply that ten calls had been placed for him along the line and we should have him in a few minutes. She was usually right too. Another time, we were trying to get Duncan, and after a wait of some ten minutes, Long Distance apologetically announced that she had connected with the party and was sorry for the delay as the line was down between Nanaimo and Duncan, and she had to route it through Vancouver, Bellingham, Victoria and thence to Duncan.

"This branch, which so vitally concerns our organization, deserves the highest praise, and we can show our appreciation in some small measure by extending every possible courtesy when using the lines."

ELEMENTS OF RADIO TELEPHONY

G. Porter

(Water Rights Branch)

The production of sound in general depends upon creating vibrations in the air.

When speaking or singing, the vocal chords located in ones throat vibrate, and set the column of air in the throat into vibrations, and these vibrations are transmitted into the surrounding air.

These vibrations are in the form of air waves which resound upon the membrane of one's ear, and cause it to vibrate in unison with the vocal chords which produced them. The vibrations of the ear membrane or drum, as we commonly call it, affect the nerves of the ear, and the sound is in turn transmitted to the brain.

Radio telephony and the transmission of sound over a wire system, are quite similar in theory to the above procedure, but instead of air waves being produced, waves of electricity are employed. The telephone transmitter consists of a thin sheet of metal called the diaphragm, which is set so that as the air waves impinge upon it, it is made to vibrate, and a variable resistance connected to an electric circuit is operated by these motions, which according to the strength of the motions, vary the electric current passed by the resistance into the electrical circuit. The receiver consists of a thin sheet of soft iron arranged so that it is very readily affected by an electric magnet. The electricity passing through this magnet is fed by the electric current flowing through the variable resistance connected to the transmitter.

The louder one speaks into a transmitter, the greater the electric current is passed by the variable resistance, and in turn, the greater vibration of the receiver, the louder one hears the message. The essential features in wire telephony are the source of electric power, the transmitter, wires for transmitting the electric impulses from the transmitting to the receiving station, and finally a receiver to change the electrical impulses back to sound waves so that they can be heard by the human ear.

The operation of radio telephony requires corresponding units to those enumerated for wire telephony, with the exception of transmission wire, and have practically the same functions. The principal point of difference is that to transmit radio through the ether, which is employed in place of wires, high frequency electric current has to be employed. Thus for radio work the telephone battery is replaced by a high frequency electric generator, the line wires by aerial wires, the intervening ether and the ordinary receiver by special receiving

apparatus sensitive to high-frequency electricity, often referred to as a Radio Set.

The electric current used in a wire telephone circuit, is what is known as direct current, since it always flows in the same direction. Electric lights are usually supplied with alternating current for certain technical reasons. Alternating currents, as their name infers, do not flow in the same direction, but reverse their direction many times per second.

The number of alternations passed through per second, is the frequency of the current. The frequency most commonly used for light and power purposes is 60 cycles per second, i.e., the current changes its direction 120 times per second. The hum heard, as given out by an electric heater, toaster, etc., is caused by the frequency of the current.

The frequencies used in Radio work, vary from as low as 15,000 cycles per second, to several millions of cycles per second, and it is for this reason Radio transmission is referred to as by high-frequency current.

Sound waves are alternating or vibrating air currents in the air, while Radio waves are alternating electro-magnetic waves in the "ether". Electro-magnetic waves produced for the transmission of sound for Radio purposes can, for explanatory purposes, be likened to mechanical waves. Suppose we set up a wave in a pool of water by working a stick up and down in the water. The first thing that happens is, that as the stick is thrust down into the water, a wave or ripple is produced by the water which is displaced by the stick. When the stick is withdrawn, most of the water that was displaced flows back into its original position, but in addition a displacement wave is sent out in all directions. The case of the Radio Aerial is quite similar.

The high frequency current flowing into the transmitting aerial causes electro-magnetic and electro-static disturbances in the surrounding "ether" which finally impinge upon the receiving aerial. Radio waves have the power of setting up the same kind of disturbance in the receiving aerial as that required to produce them in the transmitting aerial, and the purity of the sounds reproduced depends upon the apparatus employed in the receiving set.

Waves of "Ether" travel at the speed of Light, (light being an Ether wave) which speed is 186,000 miles per second.

ELEMENTS OF RADIO

Electro-magnetic energy broadcasted from the Radio Broadcasting Station, is in the form of Electro-magnetic waves.

The Receiving Station absorbs through its Aerial these passing waves, and transforms them into electrical energy, which energy operates the receiving apparatus.

This electrical energy by transformation finally is reproduced into mechanical energy, and is heard by the ear in the form of sound, i.e., talking, singing and music.

The electro-magnetic waves broadcasted by the Transmitter, travel through the medium of Ether, which is the name given to the all pervading "something" which exists everywhere.

Ether waves travel at the same speed as light (light being an Ether wave) which speed is 186,000 miles per second.

Christmas Shopper:- "I would like to look at some cheap skates, please."

Saleslady:- "Wait a second, I'll call the boss."

"ALL IN THE DAY'S WORK"

(By ZERO)

Scene: A ranger's "office" anywhere in B.C.

Time: The Good Old Summer Time.

Dramatis Personae: A Ranger, a road foreman, a pre-emptor, Etc.

Ranger enters "Office" and catches sight of 'Black Hand' on table.

"Ha! Must write something for "ROOT & BRANCH" - sometime."

(Sits down, and starts on Diary. Catches sight of man passing.)

"Hullo, Arthur. C'mon in."

Enter Arthur Carter, the road foreman:

"Hullo, Bill. Haven't seen you for weeks."

Ranger: "Nope. Have to keep moving. Out of town most all the time. Haven't even had time to call on you yet about that slash. Do you think there'll be any chance of getting the worst of it burned up along the roadside this fall, or maybe next Spring?"

Road Foreman: "Sure. I guess so. Let's know when you're ready. (Catches sight of Calendar) "Fourth of August, by heck. What d'ye know. Nine years ago, eh. Well, it sure has made a difference to most of us. Not many of our old outfit around now." (They were both machine-gunners.) Well, now, 'bout that Slash ----- (A few more remarks and exit Arthur Carter.)

Ranger resumes writing. Enter Henri Bleufontaine.

"Morning, Herri. How's she coming.?"

Henri : "Say, 'bout dat timber sale. You tink I get heem, yes? I send in dat tender, an by gar I hear someone else talk about heem. What you tink I better do?" (Ranger opines that if Henri does not think he has bid enough to cinch it, he had better bid some more.) "No, I guess it's too late to write now. She close today noon." (Ranger suggests a wire; Henri explains that the cheque he sent would only cover the cost of cruising and advertising.) "How much will dere be to send?" (Ranger asks how much he is willing to bid and figures it out, drafts a wire and sends him off to the Bank Manager to do the rest. Resumes writing.)

Enter little girl, age about ten years, wearing a guileless expression which proves to be a delusion and a snare.

Ranger: "Good morning, Ella. Looking for me?"

Ella: "Good morning, Mr. Forest. A long, long time ago I wrote an essay on "OUR FORESTS AND WHY WE SHOULD PROTECT THEM FROM FIRE", and about a month ago they told me I had won a silver medal. Now, seeing it has to do with Forests, I think it would be nice if I got it in time to hang it on my Christmas Tree." (Ranger explains that she's not supposed to get it until school re-opens, but that he'll take it up with the District Forester, and how will that do?)

Enter Assistant Ranger : "G'morning, Bill. How's she loggin'?"

Ranger : "Morning, Jim. How's everything at the Lake? All O.K., eh? There's a mail in this morning. Fetch her over, Jim, will you, and let's see what's doing."

Enter Settler, looking for a fire permit. "When did you want to burn, Mr. Salvus?" (Mr. Salvus says he isn't ready yet, and won't be ready for a week. Ranger tells him that he can only issue a permit for a week at a time, so to give him one now would do him no good.) "But I'll ask Moss to step in at your place when he's on patrol, and if it looks safe to burn he'll give you a permit."

Exit Settler, and enter Al Jolson: "Say, Bill. Have you a blue-print of the Antimony River you can let me see?"

Ranger : "Sure, Al. Here she is. After some timber?"

Al : "Yeah. Want some cedar, an I just heard about some up the Antimony." (Ranger advises him, if he wants cedar alone, to try to pick an isolated patch, as the Department weren't strong for sales over areas where all the product wouldn't be logged. Finally digs up old pre-emptor's map for Al, who leaves, intent on his timber.)

Enter Mr. Stamp. "Good morning. Not much for rangers to do this year, what? The regular rains we are having must be keeping the fires down pretty well." (Ranger wonders how many more people are figuring how little he has to do, and if folks think putting up posters, giving talks to the school children, interviewing nearly everyone in the district, and talking Fire Prevention at every opportunity, to say nothing of a few prosecutions, have nothing to do with "keeping the fires down!")

Mr. Stamp : "And, by the way, I hear that Bagman is trying to get the use of the Forestry Branch telephone line for the cost of

repairing it. How's that going to affect our Company?" (A long explanation follows regarding the history of the line, etc. Finally, Ranger - who doesn't care much which way it goes, so long as the line is put in shape, - says : "Well, I guess if you were to talk it over with Bagman, you could arrange it between you. What'll suit you 'll suit me." Exit Mr. Stamp.)

Enter Assistant Ranger, with the mail. First - "Please report on Lot No. 1234 as quickly as possible. Applicant for P.R. states the timber is all burned off." Next - "Mr. W. desires to purchase an area along the Oo-la-la River, commencing at etc., etc."

Mill Manager bursts in : "Say, looka here, Bill! What the blank blank is the matter with them down there? Here's a saucy letter from Scribe asking for our returns for April, May and June. We sent 'em in months ago - well, anyhow, quite a while ago. Now, what - etc., etc." (Ranger waits until the flood-time of the M.M.'s wrath has subsided, and suggests that this is a circular letter, and if his returns have gone in he needn't take it to heart. Scribe is a pretty good fellow, but like the rest of us has his work to do. Exit M.M., feeling much better for having expressed himself.)

Ranger resumes the study of his mail. Copies of several letters to various Mill Managers (signed by the Old Man himself!) asking them regarding returns, also notes at the bottom calling the Ranger's attention to the fact that checking up Mill returns is an important part of his job. Ranger thinks with a wry smile of the long night he spent checking up B's returns, and wonders if he ever will get them finally checked. Turns to Assistant Ranger:)

"Where were you going today.?"

Assistant Ranger: "Well, Brown and Grimsby were after me for permits and I figured on going along the road as far as NEMO on patrol."

Ranger : "Well, I have to go over to R's mill today, but come in tomorrow and we'll test out the pump again."

(Starts getting things together for his trip and catches sight again of the 'Black Hand.' "Why don't we write something for 'ROOT AND BRANCH' - !!!!!-!!!!!!")

ROCKING THE BOAT ! - "Earthquake occurred at 8.12 p.m. tonight (Nov. 15th.)" writes Ranger W.B. Penney from the Queen Charlotte Islands. "Caused brick chimney to fall in YMCA. thirty feet away from house my family are living in. No other damage done, beyond scaring the four ladies living at Thurston Harbour - and me! But if this happens again, may ask for transfer."

MORE SCHOOL-ROOM PROPAGANDA - As a means of interesting the school children of the Province in Forestry, by making them familiar with the principal commercial trees of B.C., the following suggestion has been offered.

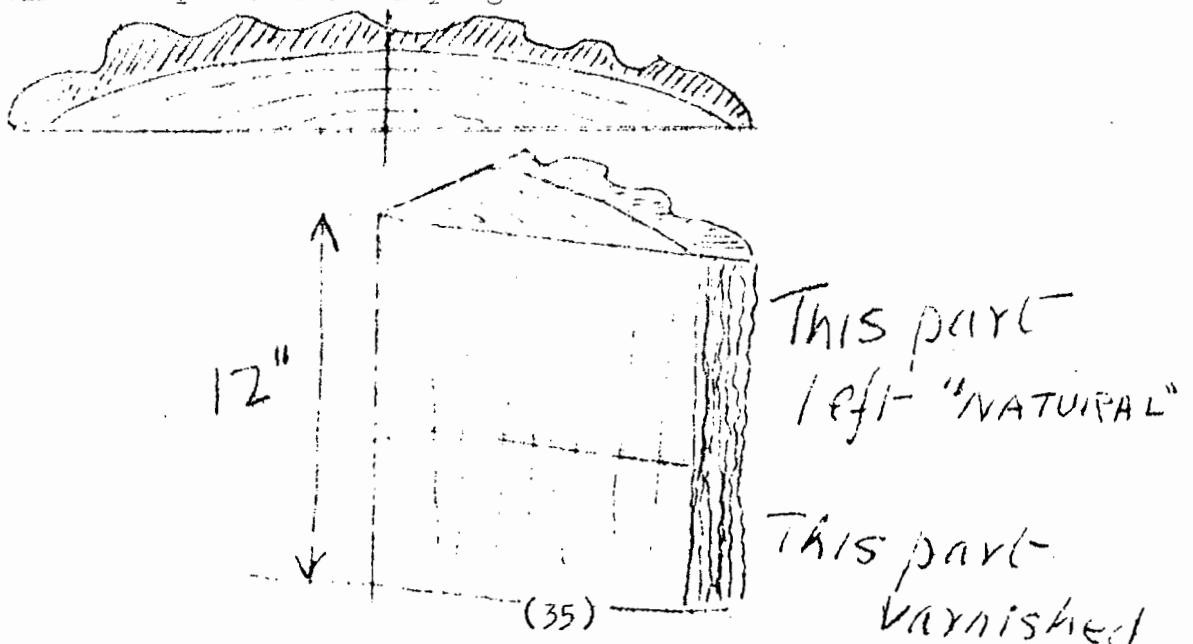
Let each Ranger secure from a mill in his district enough slabs of Douglas Fir, Cedar, Spruce and Hemlock to present a set of four samples to each school in his district. The samples should be of uniform size and large enough to show clearly the peculiarities of the bark. Each sample should be fitted with a couple of screw-eyes so that it can be hung upon the schoolroom wall, and properly and clearly labelled. Uniform printed labels for this purpose could be supplied from Victoria.

Below is a rough diagram of how the samples should be made up, to show both the radial and the flat grain. They should be surfaced on both faces and might be varnished half-way up. Of course, the more attractive they are made the more likely they are to be properly displayed and the less likely to find their way into the stove!

The suggestion is quite favorably entertained, but before proceeding further with it we would like to hear from the field, with their comments and suggestions. Some minor difficulties may arise - for instance, it might be difficult in the Interior to secure a representative sample of Douglas Fir - but none of them is likely to be insurmountable.

In the larger centres, the collection and distribution of the samples would have to be carried out in some other way, but that is a detail of no importance at the moment.

It seems to us that this would afford an excellent and certainly not a costly way of educating the children to distinguish one tree from another; and that, we think, should be one of the first steps in our campaign.



PERSONAL PARS

Several times lately this column has been threatened with extinction for lack of news, but invariably someone comes to its rescue at the eleventh hour.

Last time it was Mr. Mulholland who saved the situation - this time we are indebted to Mr. C.B. Peterson.

In tones vibrant with paternal pride, C.B.P. announced "An item for 'ROOT AND BRANCH', Mr. Editor. It's a boy - eight and a half pounds."

C.B.P. is an extremely reticent person, and we were struck all of a heap, as the saying goes. However, we were able to stutter our congratulations, and now take it upon ourselves to speak for all his many friends who have not had the opportunity of extending their felicitations personally. We wish the little chap the best of Good Luck, and trust that there is opened up for him a long and sunny vista of happy years.

(By the way, isn't it usual on such occasions, to -- Oh, er, When! When!! No, no water, thanks! Well, here's how.)

Below will be found some more of "SPARK PLUG's" maunderings:-

... ..

It is rumoured that Mr G.H. Smith ("Harold") will give a house party on or about December 25th. The distinguished Willoughby-de-Broke brothers are to be the guests of honour.

Mr. Garman reports that his speed-boat "Question Mark" makes much better time between the "Bay" and the "Rock" than either the COTTONWOOD or the ALANBEE.

Mr. J.B. Howes, who was a guest at Polarine Lodge, Thurston Bay, reports that excellent hunting was enjoyed early in the Season.

We have been led to understand that Mr. Reginald Whattayagot is preparing a manual on 'How to Hike Across the Island on Two Green Onions.' We have heard of one or two old-timers endeavouring to cross Malaspina Straits on a raft in 1862, with nothing to eat but two raisins, so naturally we look forward to the new booklet with considerable interest.

Mr. William Carey (of Hemlock fame) has just returned from a motor trip to the Mexican border. Bill informs us that grub is free on the other side - provided you can climb fences. He also states that the Lizzie can be operated at a cost of .0000003 cents per mile in that country.

We hear that Gloomy Gus recently laid down the fourth card in a crib game, pegging twelve holes. As he gazed at the result on the board his face relaxed, and expert observers believe that there were traces of a smile on his face. But probably that report is exaggerated.

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GRAZING AND EROSION - Similar to fire in respect to erosion is grazing. Erosion damage by grazing is due to overgrazing and trampling. When an area is overgrazed the plants which are dependent upon seed for their continued existence in the association are often eliminated through their inability to head out, and poorer species usually take their place. The plants are eaten closer to the ground, some are entirely pulled up by the roots, while the continued tramping over by the hungry stock injures and finally kills the root stock. Trails to water holes, salt logs, bedding grounds and better feeding areas result in cutting through the root system and permitting water to run in the furrows so that soil cutting follows. Where the quality of the site is poor, the erosion may ruin the grazing through lowering the water table and rendering the area almost non-productive. Many areas which under conservative handling would support a good growth of grass and range, are now non-productive and essentially waste lands.

Too many stockmen do not realize the evil effects of overgrazing from this standpoint, but there has been a gradual reduction of the carrying capacity of much range land during the last twenty-five years, and this reduction is still going on at the present time. How much this has amounted to in total carrying capacity is not known, but some of the farm advisors in counties where grazing is important believe that it has amounted to as high as ten or twelve per cent of the present grazed live stock.

(Extract from Report to the Legislature on
Senate Concurrent Resolution No.27 (1921) by
the California State Board of Forestry.)

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"OUR BOOK SHELF"- Applications are beginning to come in from the field for the publications listed by us from month to month under this heading. It is a fact, of course, that the majority of our field men are themselves subscribers to one or other of these journals but, since it is reasonable to assume that it is not the general practice to subscribe to them all, many extremely valuable articles would be overlooked were there not some means of drawing attention to them.

It was with that idea that this feature of "ROOT AND BRANCH" was instituted. Please do not hesitate to take advantage of it.

OUR BOOK SHELF

Relative Humidity and Forest Fires.

(U. S. Forest Service Pamphlet.)

A Study of Decay in Douglas Fir in the Pacific North West.

(U.S. Dep. of Agric., Bulletin No.1163)

An Objective in Forest Fire-Fighting.

(Ill. Can.Forest and Outdoors., Oct.'23)

Inferior Species in White Pine.

(Journal of Forestry, October, 1923)

American Forest Regulation.

Timber Taxation.

(West Coast Lumberman, Nov.15, 1923)

Division of National Forests into Working Circles.

Investigation of Taper as a Factor in Measurement of Standing
Timber.

(Journal of Forestry, October, 1923)

Taxation and Some Aspects of our Forest Problem.

(U.of W.Forest Club Quarterly, Nov.'23)

The Durability of Fence Posts.

(U.of Missouri College of Ag., Circ.#108)

The Engineer in the Lumber Business.

(West Coast Lumberman, Nov.15, 1923)
