



Vol. III.

No. 2.

July?
1925.

Oliver G. Clark.

Choked and burnt in the fiery hell,
He rushed to the water's edge, and fell.
And in his hand, so tightly clasped,
We found his Badge of Service grasped
His Forest Badge as if to say,
"I've done my duty"....

Far away
The night winds whisper over the tide,
"He did his duty, and he died."
No nobler tribute could we give;
**HE DIED THAT OTHER MEN
MIGHT LIVE.**

1925

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.

THE CITATION

"OLIVER G. CLARKE, an Assistant Ranger, met his death on June 25th, in the performance of his duty.

"A fire had broken out on the day before near a logging camp and, after strenuous exertions, had been confined within narrow limits when the wind changed suddenly and carried the flames down towards a small settlement.

"Assistant Ranger CLARKE was engaged in organizing the women and children and sending them down to the Forest Service launch which was standing by. There was no time to spare as the fire swept down on the hamlet as the people were got out, but CLARKE went back to search the houses in case any children might have been left behind in the rush for safety. Unfortunately he did not mention that he was doing so, and the boat pulled out of range before he was missed. As soon as possible, his companions went back in a small boat, and found his body near the landing.

"CLARKE was a veteran of the Great War and was looked upon as a thoroughly efficient officer of the Provincial Forest Service."

... ..

So passed OLIVER G. CLARKE, and with his passing we are at once the losers and the gainers, the losers by a devoted and splendidly courageous spirit and the gainers by a glorious tradition.

CLARKE was a soldier, a soldier in war and a soldier in peace, and he met death with a soldier's calm fortitude, with his Forest Service badge tightly clonched in his hand, and in his gallant heart the consciousness of duty well done.

For his epitaph we turn to Holy Writ. "WELL DONE, THOU GOOD AND FAITHFUL SERVANT. A GREATER LOVE HATH NO MAN THAN THIS THAT HE GAVE HIS OWN LIFE."

... ..

NEW USES FOR OLD FORESTS.

Notes on the recreational problems of the White Mountains.

(P.M. Barr.)

In the White Mountain National Forest in New Hampshire and Maine the management of the recreational resources of the forests has grown to be a problem of major importance. In British Columbia, where the administration and protection of the timber in the forests are the principal objectives of management, it may be difficult to realize that the use of the woods by campers and tourists could present problems of almost equal importance.

The White Mountains have been a mecca for vacationists of the Eastern States for a great many years. With the Adirondacks of New York State and the Green Mountains of Vermont they have formed the recreational centers during the summer months for a densely populated region with millions of inhabitants and few attractive areas of forested or mountainous country suitable for camping and summer outings. The White Mountain National Forest has been established under the Weeks Law of 1911, whereby the federal government was empowered to buy land in the Appalachians and White Mountains suitable for development as National Forests, primarily for the protection of the watersheds of navigable streams but in effect for the production of permanent supplies of timber. To date about 440,000 acres have been acquired in the White Mountains and this area will be gradually increased by the addition of lands now bearing standing timber as they are cut over by the present owners, and offered for sale at low prices. The gross area of the purchase unit which it is proposed to acquire is about 986,000 acres. It has been the policy of the purchasing commission to secure cutover lands chiefly valuable for forests, and forming a unit suitable for economical management and protection. The lands which have already been secured have all been logged over several times, but still bear a scattering stand of merchantable timber, and have a fairly complete cover of second growth of various ages and composition.

Prior to the establishment of the National Forest the recreational resources of the region were largely controlled by private interests. Many of the more attractive and accessible areas were owned or controlled by summer hotels and resorts for the use of their guests. In the more inaccessible lands, owned for the most part by lumber and pulp companies, camping privileges were controlled by outing clubs for the use of their members. The Appalachian Mountain Club was the largest of these organizations, controlling several hundred miles of trails leading to the most mountainous parts of the region. These trails were well equipped with cabins and shelters, usually in charge of a keeper, where food and shelter could be obtained by club members. The hotel proprietors and these clubs have been strong advocates of the

establishment of government control of the forests of the White Mountains, for only by such a step could adequate fire protection be secured, with properly regulated logging, and the preservation of the natural beauty of the mountain slopes.

The acquisition and organization of the forests of the White Mountain region has thrown open to the public a large area in the most attractive playground of the East and this establishment of a public recreational center has coincided with three factors which have tremendously influenced the recreational problem in the National Forests, namely,- the rapid growth of the popularity of automobile travel, increased construction of new roads, and a more general desire among the people of the Eastern cities for outdoor recreation and amusement. As a result, the National Forests of the region have been literally deluged with campers and tourists during the past few years. The Forest Service reports that during 1924, 750,000 people visited the White Mountain National Forest, as many as 200,000 visitors passing through a single campsite. Several of the campsites averaged 200 visitors daily, the majority of such large numbers being auto campers. Under such conditions it can be seen that to his work of appraisal, inspection, sealing, and fire protection the White Mountain ranger has to add the qualifications and duties of a traffic cop.

The management of the recreational resource has two objectives,- the provision of facilities for those in search of recreation, and the co-ordination of recreation with the utilization and protection of the timber. The logging operations must not destroy the scenic effects demanded by the visiting public, but in turn the visitors must not be allowed, through intention or carelessness, to destroy the forest or contaminate streams which provide a water supply for nearby communities.

In providing facilities for visitors, roads, trails, and campsites receive first attention. Heavy automobile traffic has demanded the construction of good roads, connecting the important centers of the region, and joining the principal highways of the surrounding country. This work has, in general, fallen under the jurisdiction of the various state and federal highway commissions. It is interesting to note in this connection that in December, 1924, the Boston and Maine Railroad announced the abandonment of 1000 miles of track, much of it in the White Mountain region, due to insufficient freight and passenger traffic; this decrease in traffic is due mainly to the depletion of the forest and consequent closing down of sawmills and curtailment of lumber shipments, and to the phenomenal increase of summer automobile traffic, which has greatly reduced the number of passengers carried by the railroads.

Many of the former trails of the outing clubs are in the National Forest, but it has been found necessary to alter their location in most cases to make them of use for purposes of administration. As built originally these trails were excellent for recreational purposes, traversing the most rugged country of

the region, and leading to points commanding a good view of the mountain scenery. As National Forest trails they were often too steep for use by pack horses, and were badly located to provide easy access to the main bodies of timber land.

Campsites have been located where required, equipped with camping spaces, parking areas where required, fire places, running water for cooking and sanitation, direction signs, and fire protection posters. These sites are under the supervision of the ranger in whose district they are situated. Registration books, contained in waterproof shelters with self-closing doors, are placed at the campsites and at other advantageous points; these shelters bear fire protection propaganda, and invite the traveller to register his name, mode of travel, and home town.

There is a strong sentiment against destruction of the scenic beauties of the forest by logging, and unrestricted awarding of timber sales by the Forest Service, though even on a basis of sustained yield, would arouse intense adverse criticism. It has been found that the public uses only a small part of the forest, however, restricting its travel to a few well beaten routes, a tendency which can be materially strengthened by the improvement and maintenance of certain roads, trails, and campsites, and the judicious location of direction signs. Such routes of travel have been selected by the Forest Service, and narrow belts of timber are reserved on either side, timber sales being awarded only behind these "recreation strips". Logging operations will of course be prominent from the various high observation points which are visited by thousands of people annually, but after the first two or three seasons the reproduction is sufficiently dense to create a fairly good cover, even where clear cutting has been done, and the scenery is not materially injured. In short, the policy is not to cut trees where the cutting may be seen by the public at close range; seen from a distance, logging operations will not seriously detract from the looks of the forest. Fire, rather than cutting, is the iconoclast that robs the forest of its beauty. Some comment will be excited by logging, of course, and plans are being made to establish small demonstration areas near some of the campsites or beside the main roads, where exhibition cuttings will be made, and the objects and benefits of good forestry practice explained by signboards and free literature.

Such co-ordination of the resources of recreation and timber allow the forest to furnish the greatest benefit to the largest number of people. In the preparation of management plans for handling the timber in the forest, the area of the recreation strips is classed as non-productive land, the annual cut being based on the productive capacity of the remaining timber land, and the boundaries of timber sales located accordingly. The large numbers of people visiting the forest each year provide an annual source of income to the hotel-keepers and merchants of the small towns of the region, who are in turn dependent upon the forest for their supplies of fuelwood. The management of the timber of the

forest upon a permanent basis assures a continuous supply of logs to the small mills and wood-using industries of the neighborhood, and government control assures adequate fire protection, which benefits all those who are dependent upon the forest, directly or indirectly, for wood, water, income and recreation.

Such complete utilization of the forest is not possible in British Columbia, of course, where we have a good deal more scenery than we or our visitors can ever possibly soak in for a few decades, at least; but perhaps we can learn some lessons from the experience of the White Mountains as a recreational center which can be applied to such popular areas as Mount Robson Park and the Garibaldi country.

The moral of the tale, as Aesop might say, is that forests should be handled to develop all their resources, to the fullest extent that is practicable, - and the resources include not only sawlogs, shingle bolts, fence posts, ties, and telephone poles, but also water, fish, game, recreation, -- even scenery.

SAVE THE SCENERY!

(Extracts from "The Buzzer" published by the B.C.E.R. Co.)

From time to time we read and hear about the smoke nuisance and the elaborate and expensive precautions that are taken by various industries to abate it. The result is that today the smoke nuisance is practically confined to the street cars, because a certain few people will not take the precaution to do their smoking on the back platforms, and to our forests, because many people will not take the precaution to be careful where and how they throw away lighted matches, smouldering tobacco, or make sure their camp fires are really out.

The former are just plain, selfish nuisances who really know better, while the latter, in addition to being nuisances by fogging the landscape with smoke and spoiling the scenery for the tourists we invite to come along, are incendiaries into the bargain - not deliberately, perhaps - but that's just about what they are, and each one of us has to foot the bill, sooner or later, to the extent of millions of dollars' worth of depleted natural resources; a legacy

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LOPPING AND SCATTERING IN PRINCE RUPERT DISTRICT.

(E. T. Calvert)

In the Tie Operations of the Prince Rupert District, the majority of which are situated in the Burns Lake Ranger District absolutely no attempt was made to dispose of slash during construction of the Railway or until 1923. At that time initial steps were taken in various methods in which lopping and scattering was the principal one, as it was thought that although the fire danger might be the same for two or three years, after that period it would so rot and decompose, that this Ranger would be materially reduced. It therefore, was the method most generally adopted and has, so far, met with varied success.

There are three distinct types where ties are cut - the pure Lodgepole, the Lodgepole Spruce and the Lodgepole Spruce Fir at the East end of the District. In the open parklike Lodgepole stands, this method of slash disposal can be carried out according to the requirements of the Branch, that is, debris removed from around all standing timber, but these areas are very small. In the pure Lodgepole stands there is invariably a dense growth of repressed and young timber. This condition obtains also in the Lodgepole Spruce which runs from 10% to 80% Spruce, as well as in the Pj-Sp-Fir type. In all these stands lopping and scattering away from live reproduction is an impossibility due entirely to the said density of the stand, it being a physical impossibility to get the slash away from reproduction. The most that can be done is to lop the tops and get the limbs as close to the ground as may be.

On some areas, due to the density, the amount of small stuff knocked down and cut in Road making, there is really no appreciable difference after the lopping has been done. This can be seen along Francois Lake where the timber is comparatively clean, it being often 35 or 40 ft to the first limbs, as well as along the Railway where the timber is very scrubby and limbed from the ground. To actually scatter this slash it must, in the majority of cases, be carried or hauled considerable distances to open Poplar or to a swamp or Lake. Due therefore to the impossibility of scattering the slash away from live reproduction, the inclusion of this part of the clause is asking the Operators to do something that they cannot do.

The question of the benefit of lopping is a moot point. Academically, the tops after being lopped are supposed to be pressed down by the weight of snow during the Winter, and to absorb moisture from the earth during the Summer and so rot that much quicker. As to practicability, it must be remembered that Lodgepole invariably grows on a dry sandy and well drained soil. The snow pressure is there to a certain extent. In the Spring

for possibly six weeks there is plenty of moisture, but after that the forest floor of a Lodgepole stand, due to its sandy nature, seems to emit very little moisture, and it is doubtful whether there is any decay to the slash any more, in fact, than if it had not been touched. So far, there appears no difference, but it is possibly too early yet to state definitely.

The principle benefit from lopping, would appear to be in case of fire to keep the fire to the ground and reduce the hazard of Crown Fires.

From actual studies, the cost of lopping would appear to be 1¢ per tie, and lopping and scattering up to 2½¢ per tie. This work being done by day labour.

It is questionable, however, whether this country gets a commensurate improvement of hazard which is worth while by this method of disposal, as against some other form, such as piling and burning 50 ft. strips along Main Haul Roads and the construction of fire lines with a fire trench dug to mineral soil about 2 ft wide, placed at strategic points.

The economic barrier at the present time prevents piling and burning, which is undoubtedly the only real method of disposal. The tendency is now to get the Operators to build these fire lines. These can be built for the same cost as lopping and scattering, and as these lines will last for years with very little expense for upkeep, I firmly believe, that the country will be far better protected in case of fire than it will be by lopping. These lines would be lines of defence and control against ground fire and an excellent means of fighting a Crown fire by back-firing from them.

Several of these lines are being built and various other operators are prepared to get started in the Spring as soon as snow will allow of the work being done efficiently.

With the improvement of economic conditions in this country, such as an increase in the price of ties, together with the establishment of a Pulp industry, other forms of slash disposal such as burning could be undertaken, as the 40 to 60 ft of timber now left in the woods would be utilized, the debris correspondingly decreased and slash reduced to a minimum. The Fire lines would still remain of inestimable benefit.

The first solution is to find a means of utilizing the 50 ft. of timber to a 3" top now left in the woods, a most appalling and fearsome waste. When that is done the disposal of slash will easily look after itself.

FOREST INSECTS

Lower Coast and Vancouver Island

(J. L. Alexander)

Tree killing insects are always found in the forest but under normal conditions a balance exists between the injurious species and their parasitic and predaceous enemies. This equilibrium which keeps the damage at a minimum, may be upset through the activities of man in harvesting the forest crops, in the improper use and control of fire in his undertakings, or through uncontrollable natural agencies such as windstorms, dry seasons, etc., all of which offer more favourable food or breeding conditions for the injurious insects. Their enemies reproduce comparatively slowly and the bugs not being held in check multiply rapidly thus the infestation changes from an endemic condition where only scattered trees are attacked, and a comparatively small damage occurs, to an epidemic condition which often causes a serious loss in timber resources as well as an increase in fire hazard.

The normal annual loss caused by the killing of scattered trees over extensive areas is beyond control, except at cost greater than the value of the timber saved. On this account injurious insects cannot be exterminated and will always be a menace which, under favourable conditions, may become epidemic and continue to increase for indefinite periods during which part or most of the timber in the region may be killed. Sooner or later, either through natural enemies or lack of suitable food and breeding places, the infestation will be reduced to an endemic condition.

Where there is a marked increase in the number of infected trees, or the trees are killed in groups, it usually indicates an epidemic and the only alternative to direct control measures, is to stand a severe loss. Artificial control should be justified when the job is small, especially where there are valuable stands at stake, but where an epidemic covers large areas, the advisability of adopting direct control measures depends on the relation between the cost of control and the value of the timber saved. Direct control measures aim at destroying the broods, while in the process of development. Peeling the bark and exposing the insects to the sun and air while in an immature condition, is sufficient to kill many of the species but where the larvæ are formed partly in the bark or in the wood, it is necessary to burn the infested portions. The method of control varies with each insect, but the underlying principle is to reduce the numbers of insects to a point where their natural enemies can hold them in check, rather than to wait for the infestation cycle to run its course.

Direct control measures, while reducing the number of insects, may also destroy large numbers of their enemies and often do not bring the balance of nature to normal unless all the infested trees are treated. The successful solution of the insect problem follows the same principle as that for fire and depends mainly on the prevention of outbreaks. This may be effected through proper forest management. When an epidemic occurs, it should be detected at an early stage and hit hard at the start when control measures will usually be profitable. Ground thus gained, should be held until conditions become normal. This necessitates the greatest outlay at the beginning, with smaller expenditures until the attacks are reduced to an endemic condition. Where extensive areas are infested and it is impossible to carry out control measures on the whole area, it may be profitable to establish a line of defence, consisting of a strip so worked as to confine the epidemic within definite limits.

Bark beetles, although the most destructive of our forest insects, prefer fresh slash or dying trees, and where a supply of this food is available will not usually attack healthy trees. The prevention of epidemics largely depends on this characteristic. It is necessary either to avoid an accumulation of green slash or to keep the annual supply continuous so that the insects will not be compelled to attack green timber in the search of food. Piling and burning would destroy the slash, but is expensive and broadcast burning is usually ineffective, as the Douglas Fir Bark Beetle prefers the thick barked sections and the bark on these is only scorched. Closer utilization of the timber crop would remove a large percentage of the material which now increases the epidemic hazard. Since slash burning is costly or ineffective the solution depends mainly on cutting, regulated so that the operations will be continuous and contiguous, and so that the bugs will have a continuous supply of food without doing damage to commercial forests.

There are two opposing influences which bear on the insect problem. Man is upsetting the balance of nature more and more in cutting the Virgin Tracts, but on the other hand, more effective methods of control are being worked out and the value of the forest products are increasing, which make the expenditures for intensive control through forest management possible.

Until 1923, the coast timber in British Columbia was considered free from epidemics, with the possible exception of the powder worms in Cedar, but during the last two years several outbreaks have been reported and in some parts the insect problem is now considered greater than that of fire.

Douglas Fir.

The most serious and alarming outbreak is that of the Douglas Fir Bark Beetle. (*Dendroctonus pseudotsuga*) Both mature and young stands of Douglas Fir are in a state of epidemic

infestation from Sechart along both shores of Jervis Inlet, as far north as Vancouver Bay. Particularly bad epidemics occur on Nelson and Texada Island and spot infestations have been located on the Second Gordon Pasha Lake, Powell Lake, Road Bay, and in the mountains west of Chemainus. The epidemic is more or less in patches, but very widespread. Real epidemics of the Douglas Fir Bark Beetle in standing timber have not existed as far as is known in the past. There have been small outbreaks which have quickly subsided or have been controlled, but forest Entomologists have not looked upon this beetle as being a particular menace to our Douglas Fir stands. The present outbreak is therefore something of a surprise, but seems to be an epidemic which may equal our epidemic in Yellow Pine. Most of the area around Jervis Inlet has been more or less logged, and there is every indication that the infestation has gained strength where logging has ceased for two or three years. The logging supplied the needs of the bark beetles, which prefer recently felled timber, but when logging in certain areas decreased or stopped, the beetles have been forced to attack standing timber, and having become epidemic are increasing. The epidemic is so widespread that the cost of control over the whole area would be prohibitive and any efforts at control should be confined to stands of merchantable timber, especially with natural boundaries, or an effort made to confine the main outbreak to the regions now epidemic. Every effort should be made to prevent the damage from increasing on Vancouver Island where the main reserves of Douglas Fir is found.

Most of the virgin stands of Douglas Fir are about two hundred and fifty years old, with an occasional very old veteran. It is very seldom that fires in virgin fir kill such a large percentage of the trees as is found in this age class. It seems that the fires must have been accompanied in their destruction by some other agency and it is not improbable that this agency was insect epidemics. What has happened in the past may happen again in the future. Very little is known, however, about widespread Douglas Fir epidemics on the Coast, because they have not previously existed within the history of logging.

The beetles pass through several stages in their life history. The adults emerging from the host trees during the summer usually fly a short distance and bore into the bark of live trees of the same species as the host. Some beetles may attack several species, but the Douglas Fir Bark Beetle confines its activities to Douglas Fir. They usually attack in large numbers. The adults bore a channel partly in the cambium and partly in the bark and lay eggs at intervals in groups alternatively in each side of the galleries. The eggs which are white and smaller than the head of a pin, hatch into small white grubs which begin digging channels in the living wood at right angles to the main galleries. The grubs grow as their galleries lengthen and if sufficient insects are present, the tree is finally girdled, causing its death. When the larva is fully grown, it has a resting or pupa stage and eventually develops into the adult beetle, which is about the size of a grain of wheat. These beetles usually emerge in June and July, and after flying about for a brief period, attack new trees.

The presence of beetles in newly infested trees is indicated by the red boring dust which collects on the cobwebs during the Summer. On closer examination, small round holes will be noticed and when the bark is chipped away, the adults will usually be found. When the Fall rains begin the cobwebs are washed away and newly attacked trees are more difficult to detect. Trees which are attacked in the Summer are usually girdled the following Spring and the foliage dies and turns yellow and finally red. The presence of groups of these red tops is the best indication of beetle damage, as very often trees which are not attacked near the ground may be infested in the upper portions. The presence of small white blister like bodies on the trunks of dead or dying trees show that they have been killed by the Douglas Fir Bark Beetles.

Flat headed borers under normal conditions attack only dying or dead trees but where epidemics of Douglas Fir bark beetles occur the borers multiply rapidly in the dying trees and having gained impetus infest healthy trees and rival the Douglas fir bark beetle in their destructiveness. Very often individual trees are attacked by both flat headed borers and Douglas Fir bark beetles, the former working in the lower portions of the stem and the latter in the upper portions or sometimes both species may be found working together.

The adults are half an inch in length and flattened oval in cross section. They bore oval shaped holes in the bark and lay their eggs in irregular shaped galleries. These on hatching develop into grubs, half an inch in length, with flat heads wider than their bodies. The tracings show no regularity as the individual galleries merge into each other forming a continuous cavity between the bark and the wood.

The general indications of infestation are the same as for Douglas Fir bark beetle. Very often however infested trees may be detected through the workings of woodpeckers where the bark has been chipped away in the search for grubs.

Considerable loss is caused in Douglas Fir by ambrosia beetles (pin-hole borers). These work in the sap wood and attack only dying or freshly killed trees. The beetles which are very small, bore little holes in the sap wood, and lay their eggs. The larvae on hatching, mine small lateral galleries in which a black fungus develops. This fungus serves as food for the larva and also stains the wood around the galleries. Although these beetles in a few years make the sap wood unmerchantable, they do not attack living trees or heart wood. Logs which remain in the woods or are stored in booms may become attacked by pin hole borers, but storage in loose pockets or occasional turning should prevent damage from this source. This insect is so prevalent that direct control measures are impracticable.

White Pine

There is a serious outbreak of the White Pine bark beetle (*Dendroctonus Monticola*) in the Nimpkish Valley. Trees weakened by a light ground fire in 1922 were first attacked in 1923 and the beetles passed to the timber beyond the line of fire damage in 1923 and 1924. This infestation was first noticed last Fall and a survey shows that eleven thousand trees are infested in an area of half a square mile. This species differs from most other bark beetles in that it will pick out individual pine scattered sparsely in the stand, and where epidemics are not controlled will usually make a clean sweep of all the pine in the region. These insects are similar in general appearance to the Douglas Fir bark beetle, but somewhat smaller. They work between the bark and the sapwood, killing the trees by girdling. The sapwood of infested pine is rapidly attacked by a fungus which turns it a blueish colour.

Freshly attacked trees exude resin through the entrance holes made by the beetles. The presence of globules of pitch on the bark which forms conspicuous white streaks when washed by the fall rains is the most apparent sign of early attack.

This epidemic is destroying a stand of Pine 110 years old, but unmerchantable under present conditions except for ties. There is only a small amount of white pine in the Nimpkish Valley and it is doubtful if the cost of control would be justified by the timber saved.

Sitka Spruce.

A large percentage of the Spruce reproduction on an area in the lower portion of the Salmon River Valley is attacked by a spruce weevil (*Pissodes*). This is a small insect with elbowed antennae which bores into the leaders of the small trees. The larvae work in the stem, killing the tops above the point of attack. One or more of the lateral branches will form new leaders. Although the young trees may not be killed they are apt to become forked or deformed or will suffer a severe set back. This outbreak is small and could be cheaply controlled by cutting off the infested leaders and burning them in the Winter or in early Spring.

The Western Spruce gall louse (aphid) (*Chermes Cooleyi*) is widespread and abundant, especially where the trees are isolated. This insect develops in twigs, causing them to form cone-like galls. On cutting into these abnormal swellings the small larvae are usually found. This insect, although damaging isolated trees is not of much importance in the commercial forests.

The Sitka Spruce at Alert Bay has been attacked every Spring for several years by a defoliating insect which has not been definitely identified. The trees are more or less stripped

of foliage in the Spring, but usually send forth another crop of leaves during the Summer and thus withstand the attack. A few have been killed either through the work of the defoliators or secondary attacks by bark beetles which have been found in dying trees.

Cedar:

The Western Red Cedar borer (*Trachykele blondeli*) causes very extensive damage to Red Cedar. It attacks the living trees and the larva continues to work even when the trees are cut or die. The grubs excavate very long oval shaped or flattened tunnels through the wood of living or dead trees. Galleries of the grubs have been traced for forty feet. The adult insects lay their eggs at the base of a limb and the larva enters through the knot. They prefer sunlight to shade, which accounts for stands having Southern exposures being more heavily infested than those on slopes with a Northerly aspect. The borers very often attack small trees and in the Sechelt Peninsula and portions of Vancouver Island, cause extensive damage to cedar pole stands. It is claimed that the bark of infested trees is smoother and lighter in colour than those free from borers. This insect has been epidemic in some regions for many years and although a partial control of the depredation would be accomplished by burning cull logs and tops, the epidemic is more or less beyond control.

Hemlock.

The hemlock on the Coast of B.C. is apparently free from insect damage, but millions of feet were killed in the U.S. by the hemlock looper which remained epidemic for only a short time. This, however, shows that hemlock is not immune from attack.

Balsam.

A small group of Balsam was killed near the Oyster River Campsite in 1923. Bark beetles were found in the dying trees. No further development has been reported this year. Until recently most foresters on the Coast have looked upon insect epidemics as a necessary evil and something beyond their control, but now the prevention of these epidemics is acknowledged a very important part of management.

Our aim is to prevent epidemics where possible, and to detect the early development of outbreaks caused by agencies over which we have no control so that they may be suppressed when small. In order to achieve satisfactory results it is essential that field men report abnormal conditions as soon as they develop so that the entomologist may make an immediate examination and recommend the remedy to be applied.

The insects on the coast are a serious menace to our timber resources, but may be successfully combatted by adhering to the policy of prevention, early detection and rapid control and suppression.

WHY NOT "DISPATCHERS"?

(R. C. St. Clair.)

Not long ago a manual of instructions issued by the U. S. Forest Service covering Forest Protection came into this office and I was struck with the following paragraph:-

"When proper organization for fire control makes it necessary to have a man continually at the phone to receive reports and start action on fires, this service should be performed by one dispatcher for the entire Forest, or for several ranger districts which can be handled together. When, because of the communication system or for any other reason, it is not practicable to employ a single dispatcher for the entire Forest or any group of ranger districts, it is approved practice to employ an assistant to the district ranger who will act as dispatcher for the ranger district. In no cases of this character is the district ranger justified in acting as his own dispatcher for more than temporary periods. The district ranger's work is in the field, and his work should be so organized that he can carry on his protective and other field duties throughout the season. If there are parts of a ranger district not equipped with telephone lines, it may be inadvisable for him to go there; at least during the worst of the fire season; but in those parts of his district which are served by telephone lines he can, by using a portable telephone, keep in daily touch with the fire situation and can go to fires himself as may be desirable. This paragraph does not apply to ranger districts where the fire danger does not warrant a dispatcher system, but where, nevertheless, it may be necessary during a few days or a few weeks of acute fire danger during the year, to keep the district ranger where he can make a quick get-away to fires."

It occurred to me that there might be a thought here for us. I found on my trip during the past summer a tendency on the part of some rangers to stick close to home and office during bad fire days or periods. For example, in a certain district where there is a ranger and two assistant rangers there were five distinct fires burning. The assistant rangers were each tied up on fires, one in the extreme north end of the district and one in the south end. The other three fires were being handled by the ranger. He had foremen and crews on the fires, but felt that he could not go out to the fires himself, a days trip from his headquarters, because he was leaving no one to take action in case of further fires being reported. In other words, the ranger hung around town with fires actually burning in the woods simply to be on the job in case of reports of further fires coming in. Under the conditions of organization I could not advise him to do otherwise.

In another case I found that the ranger had completed an almost perfect paper organization and that he had enlisted the support of his wife as dispatcher, and I want to say here that I do not believe that we give as much credit as we should to the wives of our forest officers, who in a great many cases by their loyalty and assistance materially help the forest officer to successfully carry out his work. In this case the ranger required each of his assistant rangers and patrolmen to furnish him on Monday morning with a plan of the week's work showing where they planned to be, morning, noon and night, for each day in the week. This was entered on a table attached to his district map. If alterations became necessary during the week the assistant rangers or patrolmen notified the ranger's office of the changes to be made. All of his honorary fire wardens and reliable foremen in different parts of the district were listed and plotted on the district map and telephone or telegraph communications given. The ranger in charge with this plan in operation, was able to leave his home on Monday morning and carry on his work in the field during the week. He was never worried as to whether reports of fires would receive prompt attention. Upon report of a fire coming into the ranger's office, and most of them were reported directly to him in that district, his wife took the call, and looked on the chart to see where the nearest assistant ranger or patrolman would be according to the weekly plans which he had previously sent the ranger. If it was possible to get the forest officer on the 'phone she called him. If the plan showed that he was not within telephone call she looked on the chart and found the nearest Honorary Fire Warden, called him on the 'phone and asked him to start action on the fire. She would follow up with the telephone until she was able to get in touch with the nearest forest officer and finally with her husband. This strikes me as excellent service - service which should be paid for and which undoubtedly results in very great increased efficiency in fire suppression organization. Due to fiscal regulations and to the varying domestic arrangements in the different rangers homes it may not be possible to enlist the wife of the Ranger into the service and therefore it seems to me that this service should be given by an officer termed a "Dispatcher", at least in those districts which have a long fire season and where our records show a large number of fires are liable to start. The duties of the "Dispatcher" would be to remain constantly in touch with the telephone and telegraph at the ranger's headquarters, to start action in case of fires reported, to take messages and forward them to the ranger or other forest officer by the quickest possible means, to forward orders for men, equipment and supplies and to keep the ranger constantly informed by telephone when away from his headquarters of developments in the different parts of his district. During the slack periods the Dispatcher could be employed making out pay rolls, copying reports and general assistance around the ranger's office. The success of this scheme would depend very largely upon the complete and proper paper organization plans of the entire ranger district. If the pre-organization work was carefully and thoroughly done and the proper plans made and charted the Dispatcher would not have to be an experienced fire fighter - any bright University boys would be able to fit the job.

The main advantage of this scheme, it seems to me, would be to give the ranger more freedom to get away from his headquarters and carry on the work of his district during the summer and particularly during the hazardous periods. The position of Forest Ranger is essentially a FIELD job and unless our experienced fire suppression men are actually giving suppression on the fire line, we are not making the best use of the brains and man power at our disposal.

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of carelessness that will be handed down to our great-grand-children in all probability.

95 PER CENT. OF ALL FOREST FIRES ARE PREVENTABLE.

Just think that over for a few minutes. It seems that practically all forest fires, with their attendant waste of our natural wealth, are the result of carelessness - campers leaving their fires improperly quenched or not even quenched at all, smokers who are careless where they throw lighted cigar and cigarette butts and lighted matches. Yes, we're all more or less guilty!

Campers and smokers share responsibility for the prevention of forest fires with loggers and people engaged in land clearing operations. But the latter usually realize the risk and danger, and therefore take every precaution to prevent a catastrophe.

Besides, it is possible to keep the operations of such people under close and experienced supervision, and should damage be occasioned through carelessness on their part, they can be located and made to compensate in some measure for the mischief they have done.

It is quite different in the case of the camper or careless smoker. It is next to impossible to keep any kind of tabs on him. He is here one minute and somewhere else the next. Hot tobacco ashes or lighted matches thoughtlessly thrown from a moving automobile can do untold damage. And who is more surprised than the thoughtless motorist himself when he reads that a bad forest fire is raging in the very district he passed through a few days ago. "My, it's a shame people are so careless," he says as he reads the account. "Something ought to be done about it!" It never strikes him that he probably is the individual whose carelessness is responsible for the destruction he is so grieved to read about.

"WHAT FIXES MEN'S SALARIES"

(Bruce Barton in Good Housekeeping for January.)

Nature is obviously not impartial in the distribution of her gifts. A crowd of infants in a nursery is living proof of that; some are instantly attractive, some completely lacking in appeal. Yet those same children, twenty-five or thirty years afterward, may show a marvelous reversal of form. The girl who was such a homely, awkward baby is regarded as "such an interesting woman"; the boy whom everybody passed by has become an authority whom every one likes and respects. Personality, in other words, is not a fixed thing, wished on us at birth and henceforth changeless. It is the sum total of our living, our reading, and our thought. Webster said, "The man I like to talk to is the man who can teach me something." The ability to convey something interesting is the open sesame to the private offices of big men, all of whom are restless-minded, eager of acquisition, constantly reaching out for the new idea. And many a man who has a grudge against nature for not endowing him with a richer personality, could vastly improve his position by the sort of reading and study that would tend to make him interesting to these men higher up.

Initiative is closely linked with personality - and both are quite capable of development. Mr. Loren Deland, one of the first and most effective of the efficiency engineers, was once visited by a young man who sought his advice. "I have been in the same business, at the same salary, for three years," he said. "Won't you take me in charge and tell me how to win promotion?" Mr. Deland agreed, on condition that for thirty days the boy should follow his orders exactly.

"For the next thirty days," he said, "I want you to give your entire thought to this question, 'How can this company, which employs me, increase its sales next year by \$500,000 or \$50,000 or even \$5000?'"

The boy went away, and at the end of the thirty days he returned, saying that he could think of nothing which the company might do to accomplish this result.

"All right," said Mr. Deland, "we will try it from another angle. For the next thirty days ask yourself this, 'What can the company do to decrease its expenses \$100,000 or \$10,000 or even \$1000 in the coming year?'"

A second time the boy returned empty-handed, and at this Mr. Deland surrendered.

"I can not help you," he said regretfully. "Think what a confession you have made to me. You are on the inside of a great enterprise. It has grown by leaps and bounds; every year the men at the head of it find ways of adding several million

dollars to its total sales. Yet, familiar as you are with its operation, you are not able to suggest any way of making even a tiny increase. The company is under tremendous expense. It has grown so fast that it must necessarily be wasteful; yet - with all your inside advantage - you are unable to save it a single dollar. Young man, my advice to you is to lie low. Let not the manager discover that you are around; for if he finds that he is carrying on his payroll an employee so utterly lacking in resource, far from raising your pay he will probably cut you off altogether."

That is one of the best business anecdotes ever recorded. Men give various reasons to themselves, and to their wives, for expecting their salaries to be raised. "I have been two years on the same job without an increase," they say. Or, "My family has grown; and I need more money," or "The cost of living has gone up." Such arguments may result in routine promotions, but they will never achieve the heights of earning power. The man at the top is interested in men who can add to his volume or decrease his expense, and to these, and these only, he pays the really big sums.

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It is the same with the casual camper and picnic party. They are here today and gone tomorrow, but the camp fire they forgot to put out, or they thought was out, remains smouldering, eating into the moss and roots until fanned into a blaze that licks up the countryside, leaving it burned and charred, a monument to carelessness.

LET'S GET TOGETHER ON THIS

The dry season is ahead of us. Already the fire risk is apparent and all primed to burst into life at a no greater effort than a moment of carelessness or thoughtlessness on the part of somebody. Let each one of us resolve to do all we can to prevent forest fires this year by being careful ourselves and by warning other people to be careful, too.

IT PAYS TO PREVENT FOREST FIRES AND THEY CAN BE PREVENTED IF
EVERYBODY WILL CO-OPERATE TO THAT END.

SNAG FALLING IN CONJUNCTION WITH CURRENT
LOGGING OPERATIONS AS A FACTOR IN FIRE CONTROL.

(H. Smith)

As it is well known that a large percentage of the fires which break through the fire line are caused by embers which are thrown off from burning snags or dead trees, the falling of snags in conjunction with current logging operations as a factor in fire control, is a subject which is entitled to far more consideration than it has hitherto received.

Naturally, snags are to be found in the greatest numbers on logged off and burned over areas; and the fire hazard there would necessarily be much greater than among dead trees standing in green timber. Areas which have been logged over are more exposed to the wind; there is no foliage to obstruct the drift, and both the snags and material in which the embers alight, are drier and more inflammable.

Without detracting at all from the vital effect of strong winds on the rate of spread, it must be remembered that a large number of our conflagrations have occurred under moderate wind conditions, the chief contributing factors to such a situation being snags and low humidity.

During periods of low humidity, even when there is very little wind, small pieces of burning material thrown from a snag will float for a considerable distance before alighting on the dry litter, which is ready to burst into flame.

The fundamental principle of fire fighting is to produce a gap between burning material and new fuel, in order to break the heat wave. Under normal weather conditions this is not difficult, providing the fire can be kept on the ground and has not reached the size of a conflagration. But in an area of snags, even though the weather conditions are the same, it is an entirely different proposition, and, should high wind conditions prevail, together with a low or moderately low humidity, a fire will rapidly attain uncontrollable proportions.

From a Forest Protection view point then, snag falling is good business, but it may be argued that the cost of falling all snags on an operation would be prohibitive. The following information, obtained from an operation in the North Vancouver District where snag falling has been in practice for the past three years, will prove this to be the contrary:

"Snag falling was first commenced on this operation in 1921 as an experiment, but the results were so satisfactory that it has now become a general practice, and they have definitely proved, that on their own operation, salvaged timber at least pays for the cost of falling.

All snags ten feet and over in height are cut down, and the average cost is slightly over \$1.00 per snag.

It is from the Fir that the salvage is principally obtained; between 50% and 60% of the butt logs, very often of the best grade, being saved from this species. In addition to this, logs of inferior grade are bucked up into cordwood lengths and used for camp and donkey fuel.

On rough, rocky ground cedar snags almost invariably shatter, but many slabs of the best shingle grade are salvaged. Except for fuel, there is very little saved from other species.

If an operator only breaks even on the salvage and cost there is still a lot of velvet in snag falling.

During the past season fire patrol on this operation was reduced very considerably. The services of three Patrolmen were dispensed with, at a saving of \$1,500 for the season - the cost of falling nearly 1500 snags. While this is not recommended it was found that the patrol was reduced with comparative safety."

Then there is the question of insurance. Many operators have found it impossible to get insurance on their camp, equipment, and timber holdings, owing to the extremely high risk, due principally to snags, while the operation to which I have made reference is considered a good risk, and the rates have been reduced 25% since snag falling has been adopted.

Snags are undoubtedly the greatest obstacle to the control of forest fires, and the fire control problem would be much simplified if snags were felled in conjunction with current logging operations.

ORGANIZING AN EMERGENCY FIRE-FIGHTING FORCE

(J. B. Conway)

I do not like the term emergency as applied to a Volunteer Fire Fighting Force, and I presume that is what is meant by this title.

To a great many men it presupposes an extreme condition, something indefinite which may, or may not happen. They feel that an emergency force would be a very nice thing to have but the chances are it will not be needed.

Many men have the impression that they have done their best if they drive themselves for twenty-four hours a day after an emergency occurs. To my mind the field man's emergency occurs in May and early June, when he should be building up his Volunteer Force, and anything that occurs later will be proof of how well he met it.

Briefly my idea is this, if any part of the fire season organization is permanent it should be this volunteer force. Build it up and after you have done so use it. Train it to be self reliant I'll gamble you will find it worth while.

The complaint is made that we cannot build a permanent organization, because the Assistant Rangers are not on the permanent staff, and are constantly changing. This undoubtedly is a serious obstacle, but the fact remains that we are getting good men every year, and the standard of efficiency is increasing. This applies also to the volunteer force, there is always enough of the old force left to build on.

Again, why wait for an emergency to make use of this volunteer force. If it has been built up it should be just as effective in reducing fire cost and damage in a light year as a bad one.

Every man has his own ideas as to methods of organization, and every district requires something different, but one thing is essential to successful fire suppression in every district, and that is a Forest Protection Spirit. Get it yourself, instill it in the Assistant Ranger, and between you pass it on to the Honorary Warden and your volunteer organization is more than half accomplished.

These two men are the hub of your organization and the result will depend on the impression you make on them. Remember that the Assistant Ranger is a human being the same as yourself, and capable of carrying as much grey matter. Treat him as such, let him know what you hope to accomplish. Give him his share of the commendation that comes to your district, as well as the criticism.

The same thing applies to the Honorary Warden, get him interested in your work and he will organize his locality as effectively as you can do it. Sell his Forest Protection for him, help him to get away with a small cost fire or so, and you will find that you have increased the number of Assistant Rangers in your district by one.

It may take time to see results from your work, but it is worth it. I can probably better illustrate this as follows. Although it took us two years to sell enough of this forest protection throughout the district, to enable us to build up a working organization. last season, instead of having two Assistant Rangers and 19 Honorary Wardens, as shown on our Organization Chart we had 14 Assistant Rangers. We had the satisfaction of knowing that in every locality where one of these men held an appointment prompt and efficient action would be taken on a fire whether a Forest Official was present or not.

In closing I would say that the time is opportune for volunteer organization work. Successive bad fire seasons, and persistent Forest Branch propaganda has awakened the public to the need for forest protection. In these interior districts where lightning is the chief hazard, and transportation is nearly a minus quantity, Volunteer Organizations will be found more effective than all the expensive equipment and fire chasing crews, that we are likely to have for a good many years.

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SPEEDING UP PAYMENT OF FIREFIGHTERS

(Ranger F.H. Pym.)

In writing on this subject, let it be understood that whatever is said in the way of remedy appears to me to suit this district, and may not suit others, where conditions probably differ.

Before going into the matter of remedy, it might be as well to say a few words about the abuse to be remedied. Abuse is a strong term perhaps, but the length of time which sometimes elapses before a fire-fighter gets paid, is nothing less. In this district I have known three weeks and even a month pass by before a man has been paid. This has been nobody's fault in particular. The voucher has not remained in the Forest office for more than 24 hours, and the man in the Government office who writes the cheques, being clerk of the court, could not do the work, because of the number of bootlegging cases coming up at the time and the others had their own work. This is bad business and makes it hard for the men in the field, when it comes to getting fire-fighters. There are always agitators amongst them who start the story that it takes three months to get any pay and glib talkers always find listeners. Unfortunately there is a slight foundation of truth in it; although it is not as bad as painted. The men are taken from more lucrative and pleasanter pursuits, and after doing a job they dislike, are laid off and have to wait usually four or five days for their pay unless they care to pay their fare to head office, often arriving after closing time. This means a bed and meals to pay for until the following day. Any man being laid off in other places can as a rule get his pay right away. There are also those who are broke and possibly do not wish to go to head office as they may be travelling the other way. Often a large portion of their pay is used up paying board and lodging while awaiting their cheques. It is no use saying that it is not the fault of the Forest Branch, they merely think you are passing the buck.

It seems to me that we ought to handle our own business, if not entirely, at least in greater part than we do, in the matter of paying off men. Allow a sum to the District Forester of from \$2,000. to \$5,000. or whatever is considered necessary. Let the cheques be written out in the Forest office and signed by him. The vouchers will be made out in the ordinary way and go to the Government office with a notation to the effect that the total amount is to be paid to the District Forester. It will mean less vouchers, as it will often be possible to wait until the fire is over and all names in. Only one cheque need be written by the Government Agent for each voucher. The \$2,000 can be used over and over again, let us hope however, not too often. The field officer can, knowing when he will lay a man off write out his time statement two days before he intends to lay him off and so have his cheque sent from head office and immediately ready for him. The draw back to this method is that the District Forester's

cheque not being a Government cheque might be questioned when submitted for payment at any place but the bank in which the money is deposited and the last state would be worse than the first. In any case, the trouble over the elapse of time between the cessation of work and the payment of wages lies in the fact that we do not make out and sign our own cheques for fire fighting. Why could not the District Forester make out and sign a Government cheque drawing on an allotment as outlined above?

RANGE BURNING AS A FACTOR IN FOREST FIRE LOSS.

(C. J. Haddon)

Range burning is a practice commonly indulged in with a view to burning off forest growth in an effort to provide new range, also to increase and stimulate better grass growth.

Results of extensive investigations carried on by the California Committee, covering a period of three years, also investigations in the South Eastern United States pine forests, and general investigations made throughout the Interior of British Columbia, re burning over grass range, together with the very drastic resolutions passed by various British Columbia and United States Stockmen's Associations giving entire support to all proposed Forest Protective measures, point out very clearly that range burning is more injurious than beneficial and as a result constitutes a larger factor in Forest Fire Loss than is generally known.

The ranges in British Columbia are divided into two classes (1) Open Bunch Grass, (2) Timbered Range. Fires on open grass range are a great mistake as not only is the amount of range very limited but the forage, in addition to being the best range feed for growing beef, makes and is needed for fall and winter rustling. Burning would destroy the natural cured grass and necessitate the use of hay crops in its place, thereby greatly increasing the carrying charges of stock through the winter and reducing the revenue producing capacity of the range.

Although burning makes the range appear green and in better condition in the spring owing to the absence of all old grass, yet in reality it has a weakening effect on the new grass. The old grass, if left, forms a "mulch" around the roots and gives the young grass the protection it needs to make the best growth. Repeated fires would finally result in Bunch Grass being completely eradicated and in its place would be found growing weedy species with a far less commercial value.

In the timbered or jackpine ranges light fires, instead of thinning out the timber and brush, cause a heavy seeding resulting in a new and thicker growth of pine. Jackpine, owing to its thin bark, being non-resistant to fire, seldom survives even a light fire and after a time falls down and makes an impenetrable barrier to stock. This additional hazard greatly increases the intensity of further fires which in turn considerably reduces the fertility of the soil. While pine, or timber grass, will grow and seed after light fires, yet it is a shallow rooted plant and needs the matted roots in the humus to hold it in place. With the humus destroyed light grazing will pull fully 50% of the grass out by the roots. New timber grass coming in on burned areas while looking fresh and green, is apparently unpalatable, as cattle show a decided preference for forage growing on unburned areas, and will leave new grass on burned areas entirely untouched.

Fire also restrains the growth of weeds and herbaceous plants, which with pine grass constitutes what is known as "timber feed." These weeds and plants to the casual observer may be classed as unimportant but being as a rule very succulent, are necessary for the range cow with a growing calf, as too much dry feed is not conducive to a good milk flow. In addition to the value of forage destroyed by Range Burning, the value of timber destroyed must also be taken into consideration.

A large percentage of the Cariboo plateaus range lands are covered with jackpine suitable for the manufacture of Railway ties. This timber has a big commercial value and will furnish a heavy ties supply in the future. As an example, the range lands between Kelly Lake and Quesnel were the source of supply for over half a million dollars worth of ties and bridge timbers during the construction of the P.C.E. Railway and the remaining stands of timber will be of immense future value if the practice of range burning ceases to exist. As it is range fires are slowly but surely depleting the supply.

Consideration must also be given the effect of range burning on the water supply. A stock range without water is absolutely valueless. Throughout certain sections of the Cariboo the water situation on the range is serious, numerous springs and large lakes have completely dried up and there is a general shortage of water. This condition of affairs is particularly noticeable in sections that have been repeatedly burned over and on which the forest cover has been destroyed and while it is questionable as to what extent range fires are responsible for the shortage of water, yet it is apparent there is a direct relation between the two and should be given consideration when appraising fire loss from Range Burning.

TIGHTENING UP ON FIRE LAW ENFORCEMENT.

(R.H. Leighton)

The sanction, (using the word in its juridical sense), of every law, is public opinion. Our criminal law is the codification of those offences that are abhorrent to the people, in that they threaten the security of person or property or, traverse those principles of social morality which experience has proved necessary to a well-ordered communal existence. The statute created offence stands on a different footing. The thief, the thug, the violator of women are naturally detestable to us, but, who of us has not condoned their offences and rather envied those venturesome spirits who are growing wealthy by the breach of the liquor laws, of our own land and of those of the republic to the south of us? Ethically, such men are no better than the thief or thug, yet, public opinion has shown no detestation of their crimes, but has viewed them rather with mild tolerance. From this spring the tremendous difficulties which the enforcement of these laws entails.

To a less degree we are in a similar position with regard to the enforcement of our fire laws. Until we develop a public opinion that will view the abandoned camp fire or carelessly thrown match, as crimes no less heinous than theft or rape, rigid enforcement of our laws is an impossibility.

Anyone who has tried to dig up evidence to ground a prosecution knows how difficult it is to get witnesses to testify to facts within their knowledge. Such witnesses would display no diffidence if called on a case of larceny, but, a fire law case is different. Sandy Thompson feels, that if he tells what he knows about Axel Larsen it means "bad neighbours", but, if Sandy Thompson believed, that Axel Larsen when he started the fire that burned out the country side, was a very bad neighbour to begin with, and had robbed the people of the Province of a considerable sum of money, he would alter his views on the question of giving evidence. As with Fire Prevention so with Fire Law Enforcement, public education is the prime essential.

When should we prosecute? No prosecution should be started unless there is a case so strong that a conviction is practically assured. A succession of dismissals in any district is bound to bring the Act into contempt. Country Justices, in many cases by no means men learned in the law, are eager to find precedents to govern their decisions. To be told that Mr. Jones fifty miles away dismissed a similar case last week, is often sufficient reason for dismissal, although the similarity may exist only in the mind of the person making the statement.

An officer who has to conduct prosecutions should try to acquaint himself with the elementary principles of the law of evidence. Should know what he can proffer and what will be accepted. He should be prepared to prove his case for, the

maxim of British Law, in any case of a criminal or quasi criminal nature is, that the burden of proof is on the complainant, Section 122, of the Forest Act to the contrary notwithstanding.

Offences under Part XI of the Act may be roughly classified thus:

- (a) Offences by breach of sections of the Act.
- (b) Offences by breach of regulations laid down by Order-in-Council under authority of the Act.

An officer prosecuting in one of the latter may find himself in a difficulty with regard to proving the regulations. A court would be quite justified in declining to accept his bare statement that regulations were so and so, and demand proof of them. What constitutes proof is doubtful, but I do not think a court would require anything further than the production of a certified copy of the Order-in-Council, or a copy of the Gazette in which it was published. One should always be prepared to offer this proof at least. Section 112 gives a wide field for prosecutions, but informations should only be laid under it with great caution. The latitude which it permits has a tendency to make a court look for very strict proof before enforcing it. Offences by breach of duty, especially where the breach is a sin of omission only, are a serious problem to the average magistrate. The section can best be utilized, where you are morally certain but cannot prove, that an individual started the fire. You can at least prove that he failed to report it and exerted no effort to stay its progress.

The man in the field sometimes is diffident about starting a prosecution for breach of the Act, where owing to the poverty of the delinquent, or for some other reason, he feels that the imposition of even the minimum penalty would inflict excessive hardship. It is better in such cases to bring the delinquent into court and make him realize his offence even if you should later ask the magistrate merely to admonish him and to permit you to withdraw the case. Failure to prosecute will not only encourage negligence in others, but may later be thrown up to you when you are prosecuting some other offender.

If judgment is used in starting prosecutions and if justice is tempered with clemency regardless of person, I am satisfied that sane public opinion will be behind any effort to reduce our man-created fires by penalizing those whose negligence and indifference are annually levying so heavy a toll on the public purse.

MOTOR CARS -- OPERATION AND MAINTENANCE.

(W. Black)

The Vancouver Forest District employs twenty-one departmental cars and also hires four private cars for departmental use. Most of our men have been in our employ for some time and my personal knowledge of these men leads me to state that our drivers are at least as efficient as those employed by ordinary commercial firms. This allows a very fair contrast to be made between all classes of drivers.

Having had to superintend the making up of Monthly and Yearly Operating and Maintenance Reports I know what our cars have cost to operate and maintain and have made enquiries from Car Manufacturers' Agents, wholesale houses and others who run fleets of Ford Cars, and I find our costs are lower by at least two cents per mile.

At the end of November 1923 the cars in this District, with a total mileage of 183,476 miles, showed an average cost of 4.84 cents per mile for gas, oil and repairs. At the same date 1924, with a mileage of 185,836, the cost was down to 3.9 cents, making a total reduction of \$1260.41. The old argument that the mileage is only guessed at, as we do not have speedometers, still comes in. To offset this it is found on enquiry from the Commercial concerns mentioned above that they have run cars with and without speedometers and find that the average driver is nearly always inclined to under-estimate his mileage.

One saving that has been effected generally during the last year is in the buying of oil in 15 gallon drums. The drum is stored in the garage and a suitable can is filled from the drum (which is fitted with a convenient tap) and carried in the car. By this method of purchasing in bulk two things are accomplished: one is always sure of having the grade of oil wanted, (it is a known fact that many of the filling stations, when given an order for a pint or quart of oil, accept the order as to brand, charge accordingly, and deliver all brands from the same tank) and there is a saving of at least 50 cents per gallon. Correct lubrication means a lot in efficient car service. All makers of cars pay a great deal of attention to it in their manuals, and my advice is to get a suitable grade of oil and stick to it. Don't forget that you save springs and a lot of weird squeaks if you keep the oil which is drained from the base every 600 to 1000 miles and apply it with a brush to the springs and working parts of the chassis.

Very few Forest Officers have the time or training to make repairs. Get to know a garage that will give you good reliable service and when "Lizzie" is in trouble take her in. Time will be saved and, I think, money too, Find out what is to be

done and get an estimate of the cost before you leave. When the job is finished a counter slip with details of work and charges will save an argument when the bill comes in at the end of the month. The Ford Price List of parts is accurate and you should check up prices with it.

How many of our drivers carry a tire gauge? They are standard equipment. Tires fully inflated give less trouble and keep the costs down. The equipping of rear wheels with cord tires has been a good move and I hope it won't be long before we are allowed to use them on all four and the spare.

One of the chief troubles in car maintenance is battery. The most important thing is to always keep the plates well covered with Electrolyte. This can be kept up by adding pure distilled water, or better, rain water, once a week. Test the battery by the gravity test. This is done by using a syringe hydrometer and noting the density of the Electrolyte. A fully charged battery will show a reading of 1.250 to 1.280. Never allow the reading to go below 1.175. Always make it a point to test the battery once each week, and if the battery shows to be discharged, have it recharged, either by running the car at a steady speed or have it charged at a reliable Service Station. The outside of the battery should always be kept clean by wiping with a cloth at each inspection. The terminals, especially, should be clean to insure maximum service. If they become green with corrosion take off and scrape, and after replacing cover with vaseline.

It is rumored that the Ford Company is installing the Ruckstell Axel as standard on all cars this year. If this rumor is correct the "R" boosters say our troubles will be over.
