

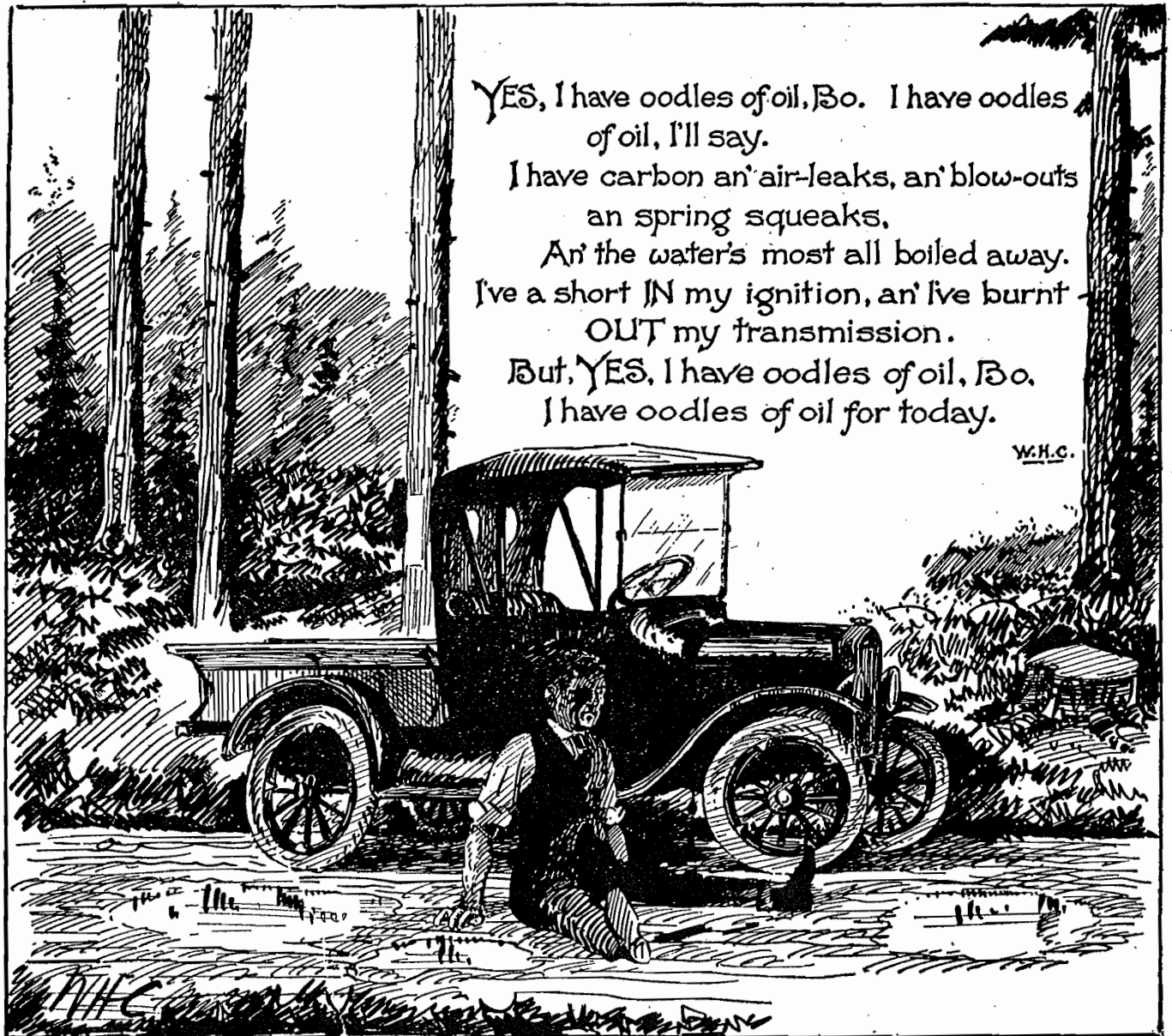
DEFECT COPY ROOT AND BRANCH



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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.

"SCHOOL ROOM PROPAGANDA" - THE TEACHER'S VIEWPOINT

(John L. Burt, Principal, High School,
Smithers, B. C.)

If an outsider may be allowed to 'butt-in' on your magazine, I should very much like to give you a teacher's point of view concerning 'SCHOOL ROOM RPOPAGANDA.'

From my own observation, I have long since concluded that School Room Propaganda is effective, but less so than it should be. A talk by a Ranger during the fire season each year is undoubtedly good, but children forget even more quickly than adults, and the impression made is only temporary.

Now, if Rangers could find time to drop in for occasional chats at various times during the year, the impression would be more permanent, as the ideas presented would be more or less continuously before the children and they would develop the habit of thinking in terms of Forest Protection.

The talks would also become more effective since the Rangers themselves would become accustomed to talking to children. More than one man has told me that he 'doesn't know what to say to them'. One man put it that - 'I don't want to talk over their heads, and I don't want to insult their intelligence by talking too simply.

Don't hesitate, Rangers!! Any teacher will tell you that you just CAN'T talk too simply for them, not even for the bigger ones.

Another point. A child remembers a talk from a visitor far more than he does the same thing said by his teacher. The sense of the unusual impresses him.

Circular letters to be read by the teachers are, in my opinion, of less value than a straight talk from a Ranger. As a rule, they do not make a great impression unless they are unusually bright children. (The only one that impressed me as being likely to do any good at all was the one sent out two years ago, telling the story of "The Red Dragon.")

Your correspondent, who suggests the sending of samples of woods to the schools, appears to be a man of sound ideas. Give the child something he can see and handle, and you have his interest at once. These samples would, I fancy, be particularly useful in High Schools where Botany is taught. There is a vast amount of ignorance (or, worse, of inaccurate 'knowledge') on the subject of Trees, even among our High School pupils, and such samples as your correspondent suggests would not only keep the thought of the forests before the children but would be of vast help in teaching them facts which would help them to appreciate the Forests.

Childhood (it is a hackneyed phrase) is the age of impressions, and if appreciation of our forests is inculcated in the youngsters' minds by careful and regular teaching, we shall have in the next decade, a generation of men and women who, because they appreciate the forests, will take care to guard them against carelessness and wanton destruction.

... ..

("Butting-in", when it is so much to the point as the foregoing, is not only allowed but welcomed, and it affords us very great pleasure to receive and publish Mr. Burt's article. Evidently we need not fear any lack of co-operation at Smithers!

As a matter of fact, the rural districts have always been more disposed to co-operate with us than have the schools in the larger centres. This, we believe, is not so much that the latter are out of sympathy with our objects as that their schedule is possibly more rigid and does not readily permit of the introduction of anything in the nature of an additional subject. It is possible, too, that the scholars in the rural districts are more receptive to our Forest Propaganda, as the Forest is to them a real and living thing. The city dweller is more apt to regard the Forest in pretty much the same light as he regards the Sea - simply as a pleasant place in which to recreate. It is there, it has always been there, it will always be there - it is Nature's business purely and none of his.

That is the attitude which we are seeking to correct, and we believe we are succeeding. Arrangements are now in progress for the issue of a Free Text-book on Forest Trees, the Timber Industry, and the vital importance of Forest Protection, which book will be used by the teachers as a guide to that part of the Nature Study course.

We do not intend to limit our educational campaign to the Schools. We intend to carry it into the Church. There is nothing incongruous in this. A man cannot be a good Christian who fails in his duty as a Citizen, and the main fails in his duty as a Citizen of this Province of British Columbia who is willing to remain in ignorance of what our forests mean to us - and him.

In the meantime, we express our thanks again to MR BURT. for his friendly and timely article, and in view of the keenly practical interest which it displays we are adding his name to our mailing list for "ROOT AND BRANCH". Since it is very evident, too, that a set of wood samples would be appreciated and put to their proper use, the Chief Forester has given instructions for a set to be prepared and forwarded to Mr. BURT.

Editor.)

AN INNOVATION IN RANGER EXAMINATIONS

(C. S. Cowan.)

In December last, an examination for Forest Rangers was held in Vancouver. At this examination a mental test was given to all applicants, which was designed to test the mental alertness of the applicants. It was in the nature of a trial, but the results obtained from these papers corresponded so very closely with the markings obtained by the various applicants in their written and experience papers, that the Department felt that here was a solution to the trouble which has hitherto attended the oral examination.

An intelligence test is intended to measure, more or less roughly only, the degree of mentality or intelligence of the candidate. Psychologists have not yet agreed on any theoretical definition of intelligence, but they mean just what we ordinarily mean by intelligence, - brightness, smartness, brains, keenness, and alertness, as contrasted with the opposites in dullness, stupidity, inability to catch on and understand, inability to learn rapidly, inability to face novel situations with resourcefulness.

We must recall one fundamental difference between an intelligence test and a school examination. The school examination is intended to measure how much a person knows, how much he has learned from a course of instruction or from experience. The intelligence test is intended to measure, not how much a person has already learned, but how intelligent he is irrespective of his education. In practice it is impossible to separate these two factors entirely, but the intelligence test emphasizes native mental endowment, the ability to do mental work right now in the examination, quickly and accurately. The intelligence test assumes some education such as the ability to read and write and the knowledge of simple numbers, but this is assumed to be general for all who take the test. Intelligence is supposedly measured by the quickness and accuracy with which a person can use the facts that almost everybody knows.

The difference can be illustrated by an example. Suppose that a few simple problems in arithmetic are given to a child that is studying arithmetic in school. The problems would be partly an educational test because the arithmetical knowledge is part of the present school work of that child. It would be only partly a test of intelligence. If the same problems in arithmetic are given to a class of fifty high school seniors who have all supposedly mastered the rudiments of arithmetic we would be justified in saying that the differences are partly due to difference in the intelligence of the students.

Of course the fact must not be lost sight of that, other things being equal, the intelligent person learns more readily than the mentally less gifted person. Consequently education serves as a rough guide to intelligence. As a general rule those who have an education are brighter than those who have dropped out of school, but the distinction must be recognized between the

uneducated intelligent mind and the educated intelligent mind. The intelligence test is an effort to do justice to the bright mind, to let the alert mind show its qualities even though it has not enjoyed the opportunities of formal schooling.

It is really not necessary to define intelligence in order to use intelligence tests with profit. It is only necessary to show that the intelligence tests actually work. If they work and if they are not otherwise administratively offensive, they can be used to advantage even though it is not known with any final certainty what intelligence really is. People use electricity but they really do not know what electricity is. It is enough to know that electricity can be used to an advantage. That is why people use it. Examiners should reason the same way about intelligence. If the intelligence tests can be used to an advantage, their use is justified, even though no one can say with final scientific accuracy just what intelligence is.

Short-Answer Tests and Intelligence Tests

The ordinary examination question to which we are accustomed is technically known as the free-answer or the essay-answer type. When the competitor writes his answer he is given a blank sheet of paper and proceeds to write whatever he chooses. He writes a long or a short answer, and the form of the answer is entirely within his choice. The examiner then has the task of reading the free answer of the competitor and giving a grade to it. If the competitor is bluffing, the examiner must depend upon his own ingenuity to discover whether several pages of handwriting are a bluff on the part of the competitor, or a concise statement showing mastery of the subject matter.

The short answer type of examination is so conducted that the competitor is not given the opportunity to bluff. He is given very specific items which he must check or underline or mark in some way, and his knowledge or ignorance of the subject matter of the question is revealed by pinning him down to very specific answers to very specific questions. The short-answer examination is distinguished more by the form of the answer than by the form of the question. In the development of intelligence tests and psychological tests in general, the short-answer form of question and objective methods have been used. These two methods in examination technique are of course not limited to psychological tests, but their development has been largely due to their wide use in such tests. Short-answer tests are now being used in many school examinations and in other kinds of examinations outside the field of intelligence tests. Intelligence tests are not necessarily arranged in the form of short-answer tests, although most intelligence tests are so arranged, and the development and success of intelligence tests are probably in part due to their arrangement in the short-answer form.

If those competitors who make high scores in a test are also the people who are later judged to be the most able employees, and if those who make low scores in a test are judged to be the

least able, the test is a good one. On the other hand, if those who make low scores in the test are successful in their jobs as frequently as not, then the test is a poor one. The relative degree of agreement between the test ratings on the one hand and the known abilities of the people in the experimental group can be ascertained by statistical methods which are entirely free from personal bias and opinion. That test which agrees best with the known abilities of the competitors should be used.

The judgments of the abilities of people who take a test are known as the criterion or the standard by which the test is evaluated. It is one of the fundamental principles of examination technique that an examination must be shown to agree with a criterion or standard before it can be said to have demonstrated its practical value. This principle is very generally violated. Examinations are pronounced to be good for all sorts of reasons, but no reason for pronouncing a test good or bad can begin to compare in importance with this fundamental question, "Just how well does this test agree with the criterion?" The criterion is the best available statement of the known abilities of the competitors who take the test. If the test does not agree well with the abilities which the test is supposed to measure, then that test is a poor test, no matter what other characteristics it may have.

Recommendations regarding tests can best be made on the basis of experimental studies of their degree of relationship with some criterion or standard which is, as far as possible, independent of the test itself. Efficiency rating systems of various kinds are in use, but they are not often reliable as criteria for evaluating mental tests. The ratings of ability must be given by judges who know the people they are rating and who are genuinely interested in the success of the experiment. For this reason it is often necessary to ask for special ratings or estimates of the people who are asked to take an experimental test.

The method of checking the value of a test consists in comparing these two variables: (1) the scores in the test, and (2) the criterion, which is the estimates or judgments of ability. The degree of relationship between these two variables is a statement of the practical value of the test. If that relationship is found by statistical analysis to be low, the test is useless. If the relationship is found to be high, the test does measure that which it is intended to measure. It is, of course, the object of a civil service test to select applicants in such a way that those who are appointed will be declared to be competent by their superior after appointment.

It may be that the judgment of the examiner is the best available criterion of the value of a test. If no ratings of employees' ability are available, the examiner must depend upon his judgment in deciding whether or not any particular test is a good one. In such a case, however, the examiner is really comparing test scores and ability on the job although he is not able to do, it by any sort of mathematical calculation. Some examiners are

much more successful than others in preparing tests which prove to be useful, but in any case it is worth while to check up the test results if estimates of ability on the job are obtainable.

The above was mostly taken from a bulletin entitled "Intelligence tests in the Civil Service", but it occurred to me that possibly a reason for the existence of the tests should be made. Our experience, which we admit is limited, shows that so far, the tests are worth while, and very closely follow the results given by the men who have taken the examination and who are employed by the Department.

OF FORESTRY (From "The Brunswickan.") All the equipment one needs for a career in Forestry is a pair of spiked boots, a Mackinaw shirt and an axe. Even at that, the axe is not a necessity. An axe is primarily designed to cut wood, and a forester never cuts wood. That is work. He occasionally takes a bite out of a pine log to taste if it is yellow birch - which gladdens his heart with visions of M.R.B's, beams and flexure formulae. If after all it proves to be only white pine, he thinks of nothing more interesting than window frames and soap boxes - although it is rare that a forester comes even this near to thinking about soap.

A Forester identifying a piece of wood reminds one strongly of a small dog experimenting with an object suspected of being edible. He paws it over cautiously, walks around and looks at it from different angles, smells it, takes a tentative bite or two, and finally carries it home to test it on his professor. The professor is also frequently stumped, but never shows it, as this would be a fatal error. He extracts a large horn-handled toad-stabber from his flask pocket, carved several flakes off the wood - which reminds him of the plug of Corporal in his other pocket. This he also brings to light and carves a sample from it. He tastes the wood, then tastes the "aged-in-the-wood," finally pronouncing the former (a much-bitten specimen of rock maple) to be "elm, probably."

The Forester's life is a free and hardy one. Axe on shoulder and grub-stake on back he hikes through the forest, calipering trees, scaring rabbits and chasing squirrels. He frequently pauses in his occupation to count a few hundred growth-rings, but most of his time is spent in smoking and raising harmony, for which he is famous. Foresters also spend much of their time in relating stories and anecdotes. These innocent tales always contain matter of educational interest, and foresters will often be heard expounding to one another the everlasting mysteries of the forests. For instance, I recall being told by a Forester of Hibernian extraction the story of his first encounter with the wild life of the Canadian forests. Said he - "The first four-footed feathered fowl I ever saw when I came to Canada was a pitchpine

PRINCIPLE SOURCES OF ERROR IN CRUISING.

(Supervisor G. H. Smith.)

Until comparatively recent years the practise of cruising and estimating timber by ocular methods was almost universally employed; the available timber in the earlier years of the lumber industry being so plentiful, cheap and easily accessible, that an accurate estimate of the amount of timber on any particular tract was not demanded by the timber investor; the cruiser's guess, based on a superficial examination of the tract being sufficient to warrant the consummation of any timber transaction.

Those methods of cruising require long years of experience and constant practise to attain a fair degree of accuracy, but as the methods relied exclusively on the unchecked judgment of the cruiser, the estimates were more or less a general guess.

These methods survived for many years, fully meeting the economic requirements of the period, until (apparently keeping pace with the gradual increasing efficiency in logging methods) more accurate and uniform methods were devised to meet the changing economic condition.

With the increasing demand for lumber products, the more accessible tracts of timber were soon depleted, which had the effect of considerably increasing land and stumpage values to a point hereto unknown: and indirectly influenced the evolution of logging methods to such an extent, that today millions of dollars are invested in costly and complex machinery and equipment; so it is obvious that the old inaccurate methods of cruising could not survive the present day.

Formerly, an investor was satisfied with an approximate estimate; whereas today, with the enormously increased values and risk, it is imperative that the investor be furnished with an accurate estimate, as serious loss may be sustained by the vendor or purchaser, according to whether the tract involved has been under or over estimated.

There are a great number of methods of cruising employed today, each designed for some particular kind of problem; and each possessing its own merit when applied to a given problem; and experience has taught us that with each method there are many sources of error to be encountered and guarded against in order to obtain accurate estimates.

As it is the purpose of this paper to promote discussion of some of the principle sources of error, I have chosen the Strip Method as being applicable to the purpose; this being the generally adopted method in coastal cruising practise.

The sources of error in chaining and pacing are fairly well understood, and comparatively easy to check, if the ends of

cruise lines are tied to accurately measured chainage points on the base lines, or, in the case of small cruises the boundaries of which have been surveyed; to the nearest survey corner.

In chaining, if lengths are measured along the surface regardless of slope, it is apparent that an acre of steep slope is less than an acre when projected on the map, and the error from this source will affect both the estimate and the projection of topographical features to a varying extent, if the distance is not checked at the end of the cruise line and the amount of error distributed over the strips.

Measuring distance by pacing requires considerable training and practise in order to attain a consistently high degree of accuracy, but as the error in pacing cruise lines is more or less compensating owing to the varying ground surface, this should not cause a great amount of trouble, as the amount of error, as it effects the estimate, can be distributed over the strip when discovered at the end of the cruise line.

In measuring distances with the chain or tape, over steep or broken ground, the error can be largely avoided by the method of breaking chain or using the hand level or clinometer.

Judging the width of strip is perhaps the most prolific and damaging source of error in estimating timber; it generally happens that the cruisers judgment of width is consistently over or under estimate, although I am inclined to the belief that the latter is more often the case than the former.

To give an idea of the accumulative effect of such errors the following example is given:- A cruiser estimated a half chain on each side of the compass line three feet short, thus making the strip sixty feet wide instead of sixty-six feet wide. The stand is computed at eighteen thousand feet per acre. For every ten chains of strip, instead of an acre he has thirty-nine thousand six hundred square feet, or about nine tenths of an acre. The actual stand would be twenty thousand feet per acre, and the error arising from this source would be about ten per cent, and the estimate on each forty, 840 feet below the actual contents of the stand.

It will be seen from this example that great care should be exercised in judging the width of strip, and that frequent checks should be made by actual measurement, either by pacing or with the tape; or the law of averages, on which cruising methods are based, will be defeated.

All trees whose centres fall exactly on the edge of the strip should not be tallied, but if the centres fall within the strip it is obvious that they should be included in the estimate.

Errors in the determination of the breast height diameter of trees are chiefly caused by the estimator omitting to

check his judgment by taking measurements with a diameter tape or other diameter measuring instrument.

This should be done frequently in each acre of strip in order to insure a fair degree of accuracy.

Care should be taken to measure swell butted trees just above the pronounced swelling; to take mean diameters of obviously eccentric or irregular shaped trees; and to make allowance when measuring trees whose butts have been damaged by fire or other causes.

Another great error arises in the application of volume tables.

The Forest Branch Coast Volume Tables were constructed to apply in a general way to coast timber. Being based on the average volume of a number of trees of various diameters and heights, and growing under varying conditions in several regions of the coast, it is obvious that these tables are not always applicable; even to stands in the same regions from which the data was obtained; therefore before a cruise is commenced it is always advisable to ascertain, either by measuring windfalls, or making a number of measurements in an adjacent operation, the percentage of correction that will have to be applied to the tables.

It might be suggested here that any correction data obtained in this way should be recorded with all particulars, as such information will prove of value in localising our present tables.

As in the days of guess cruising, judgment still plays an important if not a dominant part.

This is particularly true in determining the merchantability of trees, from which arises a source of error that can only be overcome by studying market requirements; making studies during the process of cutting; and experience in the field, in order that a knowledge may be gained that will assist in estimating to what extent the utilization of the timber on a given tract may be carried.

Careful consideration should be given to the volume of trees when determining the minimum D.B.H. as a reference to the volume tables will reveal. For example:- A cruiser estimates to a minimum D.B.H. of 20". The volume tables show that a 20" short Fir contains 290 feet, whereas an 18" medium Fir contains 320'. A 16" tall Fir, 380'. An 18" tall Cedar, 300 feet. An 18" medium Hemlock, 410'. An 18" tall Hemlock, 530'. A 16" medium Hemlock, 300', and a 16" tall Hemlock, 410'.

It is obvious that if a 20" short Fir was the smallest tree estimated by the cruiser, and that there was a large quantity

of the trees of lesser diameter and greater volume, the estimate would be affected to that extent.

Merchantable length should be estimated to as low a diameter at the top as will produce merchantable timber; in otherwise sound trees, this is usually to a point where knots are so numerous that the lowest grade of lumber cannot be produced.

The estimator should frequently check his judgment of height, as errors from this source affect the final estimate to a much greater extent than errors arising from judging diameters, as the following example will show:- On an acre of strip a cruiser estimates and computes the following:-

10 trees,	30" Medium	10750 feet.
5 "	38" "	10250 "
5 "	42" "	<u>13375</u> "
TOTAL		34375 feet

The actual sizes and computation were as follows:-

10 trees,	30" Tall	13750 feet.
5 "	38" "	13200 "
5 "	42" "	<u>17000</u> "
TOTAL		43950 feet.

The error in the acre of strip is 9575 feet, or an under estimate of about 22%. As a check, windfalls should be measured, or the hypsometer used fairly frequently.

Some cruisers work out their estimates by the merchantable area, type, or logging unit; in which case the boundaries of such areas should be tied in to the cruise lines as frequently as possible, and errors due to poor chaining or pacing carefully distributed over the strip at the end of each cruise.

If this is neglected the amount of error will be in proportion to the number of acres by which the total area is under or over estimated, which would be quite extensive in dense stands of timber.

Of the sources of error in clerical work and computation the following is a summary:- The interpolation of dots where they do not belong; tallying trees twice or omitting to tally trees altogether; reading the wrong diameters in the volume table; misapplying the short, medium and tall height classification; using the wrong volume table; omitting to apply the percent for cull and breakage; and errors in addition, multiplication etc. These errors of course can be eliminated by care and attention to detail.

It is evident, that to overcome the chief errors involved in cruising, the cruiser must familiarize himself with

local lumbering conditions; he must be able to recognize the external signs of defect; be able to judge the amount of loss involved in defective timber, and the amount of loss that will be caused through breakage; constantly check his judgment of distance, diameters, and heights, and take advantage of every opportunity to make studies of timber in the process of cutting.

In studying timber in process of cutting the Forest Branch field man has a decided advantage over the commercial cruiser, as many opportunities are afforded of studying cut timber which he has cruised, enabling him to apply information which would otherwise take a long experience to acquire.

There are many minor sources of error encountered by the cruiser, which are usually overcome by experience and practise, but which should not be ignored; but if the chief sources are carefully studied, and the judgment of the cruiser constantly checked, the reliability of the estimates, and the standard of cruising will be elevated to a higher plane.

(Continued from page 6.)

forkentine. He had two fore hind-feet and two hind fore-feet and two back teeth stickin' straight out in front. I chased him up a haystack, a stamarack and a stedarpree an' fin'ly shot him wit a club. I stuck my pitchfork into him threw my shoulder over him an' carried him nine miles straight away from home" As an illustration of my Hibernian friend's thrift, I may say that after the successful conclusion of the encounter, he devoured the spoils, skin, bone and hair, saving only the quills, which he used to sew up his shirt which had been ripped in the encounter. He thus saved two days' grub and the price of a new shirt.

Foresters are great sportsmen and will hunt anything from a cootie to an elephant. One of the strangest hunting anecdotes ever heard by mortal ears was related to me by a veteran forester, who has since been awarded the degree of M.B.S. It had reference to his quest for an Oafum-woofem in the wilds of the Andes. In one way only can this creature be captured. You must procure a boat, a water auger, a large spike and a piece of cheese. Then row out to the exact middle of the lake (the Oafum-woofem is an amphibian), and there anchor. With the water auger bore a hole in the bottom of the boat, then place the cheese in a ring around the hole and stand by with the spike. Rising from the depths, the Oafum-woofem (which is passionately fond of cheese) thrusts his snout far up through the hole made by the water auger. You must then quickly thrust the spike through his snout, so as to hold him securely while you row quickly to the shore. My friend the forester however, was unable to obtain a water auger, and so was forced to abandon his quest for a specimen of that strange, primitive, almost prehistoric creature, the Oafum-woofem of the Andes.

FIELD FORCE AND FORESTRY

(T. P. MacKenzie)

Few activities of the world to-day call for the depth of liberal thought regarding the future needs of countries than that of forest conservation. The future of forestry demands of the forester a singleness and steadfastness of purpose to combat jealous and selfish interests and that apathetic public attitude born of the fact that future results of forestry practice are so remotely intangible in the mind of the ordinary layman.

Remoteness, present inaccessibility, economic necessity and the absence of present markets must not be permitted to influence the administrative officer in developing crystallized habits of thought and action suited to forest conditions which may not at this time appear to warrant the immediate consideration of well-defined forestry practices for each and every forest unit of the Province.

The development of all wooded countries demands to a certain extent the destruction of forest resources to open the way to more intensive, perhaps, developments along the various lines of endeavour peculiar to the life of all social communities. In such lands the average citizen is prone to consider the timber supply as a never-ending resource. Our experience has been such, however, that we should realize the fallaciousness of this and prudent and thoughtful men are, consequently, moved to restrain the impulse to unnecessarily destroy and to plan the conservation of all forest resources.

British Columbia is a wooded land with its general problems of necessary destruction of timber in the interests of agricultural development and of unnecessary destruction due to the failure of so many to realize the limitations of even apparently unlimited supplies. Each community of the Province has also its individual problems, related, it is true, as they contribute to the present and potential wealth of Provincial forest resources, but still distinct and self contained in unit importance.

An example of this is seen in the forestry problems of the Cariboo-Lillooet plateau. There we have a serious condition directly the result of indiscriminate burning following the influx of miners in the early 60's leading to the present problems of developing a future forest either of Douglas Fir or Lodgepole Pine and the constant possibility of interference with silvicultural and grazing working plans due to the desire of many of those grazing livestock in the forest to burn what they deem unmerchantable timber for the purpose of bettering grazing conditions on areas which they assert are not potential forest lands.

The financial handicap is always a problem with the forester. The restraints of forced economy are always to be greatly deplored since the application of effective forestry

plans along technical lines is too long and too greatly retarded. The public mind is not yet so open to conviction that the forests of British Columbia cannot be expected to go on furnishing an endless supply of timber, that financial aid for technical assistance to render them so will be readily considered. It is necessary, therefore, to continue to strike at the problem from the other angle with increasing determination and, that is, in the reduction of suppression costs due to fire in particular.

Present protection costs per acre of average forest land must of necessity be deemed high or excessive in all instances where much of the expenditure incurred lies in suppression costs. Suppression costs should always be classed as unnecessary expense for the reason that the element of carelessness so often enters into the matter and, particularly so, in causes of fire outbreak. Fire suppression expense will be controlled and gradually reduced as the influence of determined educative work attunes the public mind to the disastrous effects of carelessness with fire in forested regions. It is therefore, well to always keep in mind the fact that fire suppression costs at least are an expense to be eliminated, not because favourable climatic conditions permits it but because of a keen public appreciation of the serious damage the forest fire may cause.

As this is accomplished true protection or prevention costs will become the outstanding expense of forest protection and a diminishing interference with progressive practises will be enjoyed. Furthermore, the existing financial barrier to the development of working plans for the present and particularly for the future in accordance with technical forestry practices will, to a great extent, be removed, as funds may then be diverted to protection and development costs. It is never too early to begin this work anywhere and the exigencies of present day affairs in forest administration, governed as they are by economic necessity, must not be permitted to divert our minds from future needs. Future requirements can only be adequately met by present day activity. With the development of right thinking among our field men in this respect leading to effective action and results, it is fair to assume that true protection costs may be greatly increased before they will exceed what might be termed reasonable insurance premium expense. And that in addition a more liberal annual outlay will be warranted to develop and stabilize working plans to adequately protect the future forestal interests of the Province.

THE FOREST PROTECTION CAR - The Canadian Forestry Association Car paid a brief visit to Victoria on February 25th and 26th, and was enthusiastically welcomed by the youngsters, some of whom, to our certain knowledge, have talked a good deal about it since.

MORE ABOUT "UNIFORMS".

(W. H. Browne)

"Certain definite advantages would result from plain business-like uniforms being worn by all Forest Officers" - This quotation, from the able pen of District Forester A. E. Parlow of Vernon, calls I think for further discussion on this interesting subject, and if I may be permitted space in your valuable paper to further substantiate my first letter which appeared in the November issue of Root and Branch - the following points against the wearing of a uniform are submitted for further controversy.

However small and insignificant the "definite advantages" may be, they should certainly not be overlooked; but these same points are over-ruled and lost sight of in the broader vision of Economy, which is of the utmost importance not only to the individual, the Forest Service, and society in general, but above all, to those members of society who are guardians of the Public Funds. If a sign of authority is needed, one's profession does not necessarily have to be 'broadcasted' by the use of expensive clothes - and that is the attitude the general public would take. A badge (imposing beyond the dreams of King Tutankhamen's sign of power) worn on one's breast should be (and is, I am sure) sufficient to fill the bill - and much cheaper. Certain regulations could be made and enforced regarding the personal appearance of Forest Officers - such as uniformity in dress, khaki slacks and shirt for preference, and a shaven countenance, which brings to my mind the sensibly workmanlike and tidy appearance of the same Mr. Parlow, when I met him in the Field.

The slogan "Economy till it hurts" cannot be upheld if uncalled-for and unnecessary expenditures are indulged in. Never in the history of the world has it been proven that - "The uniform -----stands for absolute honesty" - we know that fine feathers make fine birds - but that does not necessarily mean that honesty is its companion.

Regarding the point of 'optional wear' of a uniform by a Forest Officer, this again is not in keeping with any organization of merit, and as regards the Forest Service, they would suffer still more from extreme contrast in dress than exists at present, for even were the rule optional - I am of the opinion that the 'option' would very probably not be exercised in all cases.

I quote "Immortal Burns" to uphold this last statement:-

"To gain Dame Fortunes golden smile -
Assiduous wait upon her -
And capture gear by every wile, that's
justified by honour -
Not for to hide it in a hedge, nor for
a train attendant -
But for the glorious privilege of being
INDEPENDENT.

One's personality and individualism is lost when cloth-
ed in a uniform, and economy is sacrificed on the altar of Red
Tape; the two other main points to consider, Honesty and Efficiency
remain the same so that the scales show an adverse balance when
a uniform is worn.

PERSONAL PARS

From Kamloops comes news of the birth of a daughter to
District Forester and Mrs F.B. Prowd on February 11th. Hearty
good wishes, and may her heaviest burden be the weight of years.

... ..

The "KIOPA", by all accounts, can't have rubbed much
paint off the home boom-stick during February. Ed Burchett turned
in fifty-five logging inspection reports during the month, in
addition to four cruises. Thirty-eight of these were full reports
of operations in progress.

... ..

Jackson Thompson's "Lizzie" wasn't idle either, apparent-
ly. He made forty-eight reports in addition to two cruises.
Twenty-eight of his loggers were caught in action.

... ..

With R.C. St Clair, C.S. Cowan and G.P. Melrose all absent
in the field, the place has a hollow sound these days.

... ..

Speaking of Cowan and Melrose brings to mind a little
sporting event which was pulled off last week, when the Water
Rights Branch emerged from their coy seclusion to hurl a challenge
at the Foresters to meet them on the links. This they did on
Sunday last when Hodsdon, Templeton, Denniston and Lane of the
Water Rights took the field against Cowan, Melrose, Ciceri and
Loveland.

The first round ended with all square; Cowan and Melrose
were victors over Templeton and Hodsdon, while Denniston and Lane
triumphed over Loveland and Ciceri, With Cowan and Denniston
absent, the second round went to the Water Rights, when Loveland
and Ciceri went down before Templeton and Lane, and Hodsdon was
able to hold Melrose down to an even break.

... ..

THE "B.C. FORESTER"

(The Editor)

Today (Tuesday March 4th) we had an Opportunity of inspecting the good ship "B.C. Forester," the latest and largest vessel of our fleet, and we place ourselves on record as being of the opinion that she is a good job, and a credit alike to the brain which conceived her and the hands that built her.

The "Forester," it will be remembered, was launched from Thurston Bay as a finale to the Ranger Conference which was held there a month ago. Her engine was installed and the superstructure completed at Vancouver, after which she proceeded to Victoria on her trial trip.

She is a sturdily-built craft and her accommodation is excellent. Without being luxurious, she is thoroughly habitable, and her living quarters will present a very pleasing appearance when the painting and interior trim has been completed. A noticeable feature is the generous headroom in the Charthouse, Engine-room and Main Cabin. In the Fore Cabin and Galley the headroom is necessarily a trifle more restricted, but is still ample.

Access to the Fore Cabin is from the Charthouse, and it might be possible to make this a little easier in future vessels of this class. From the Charthouse, one proceeds aft to the Engine-room which houses the massive 50 B.H.P. Washington-Ester Diesel Engine, and such other accessories as the dynamo, switchboard, storage battery for the radio set, and the compressor motor. The engine room is well lighted both from the sides and overhead, and leaves Engineer Charles Plant ample room to walk around his machine.

Aft of the engine-room is the Main Cabin, with sleeping accommodation for six, arranged on the Pullman principle. The toilet projects into the cabin on the starboard side, and two corners will be taken up with a small buffet and a clothes cupboard when the interior arrangements have been completed.

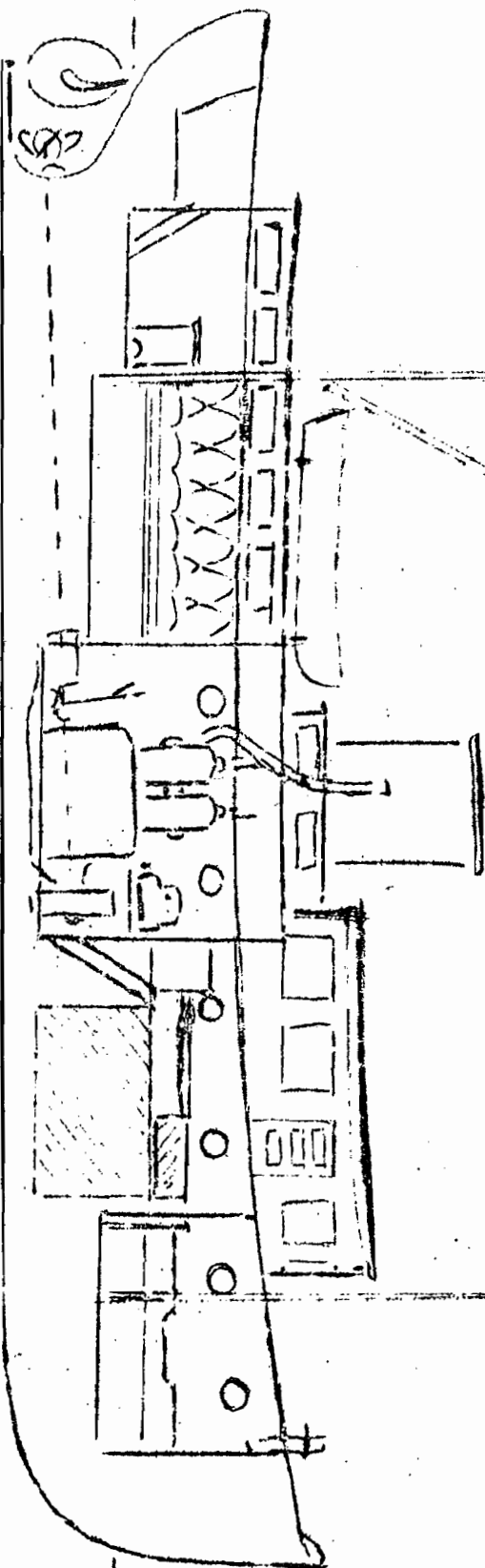
Still further aft is the Galley, presided over by Chef Al. Claydon. The headroom is a trifle restricted here, but Al doesn't need a hell of a lot of headroom anyway. The galley is well equipped, with a "Georgian" Range to burn distillate or coal-oil, using a "Nuway" burner for the purpose, and a Gurney-Oxford water heater for the heating system, with a "Therm" distillate burner operating from the same fuel system as the cooking range. A heating system of Gurney-Oxford radiators is installed throughout the boat.

The compromise stern leaves room for only a tiny after-deck but the added seaworthiness of that type of stern much more than offsets the larger afterdeck which a square transom would have allowed.

(Continued on Page 27)

"B.C. FORESTER."

L.O.A.	57 ft
L.W.L.	52 ft
Beam	13 ft
Draught	5 ft
Power ...	50 BHP Washington-Estep Marine Diesel.



Galley. Main Cabin.

Engine-room. Chart-house, Main Fuel Tanks. (2 - 500 Gals.ea.)

The boat provides accommodation for eleven persons, i.e., six in Main Cabin, three in Chart-house, and two in Fore-peak.

STUMPAGE APPRAISALS.

(Being a criticism by Ranger W. Lowry (McBride) on Stumpage Appraisal by Ranger J. B. Conway and a reply by the latter)

Discussion was invited on Mr. Conway's Appraisal received with this month's Root and Branch. It may be of interest to compare prices received for cedar poles in other localities as the figures shown under the head of "selling price of poles" appear to be different in different localities.

The appraisal figures show poles classified solely as to length class and no consideration has been given to top diameter sizes on which the Purchasers' prices are based. Of course the market conditions and prices vary in time and place and different specifications are made in different localities but top diameter sizes are as a rule considered. A top diameter classification of poles in a stumpage appraisal would have a noticeable effect in the computation and would yield a different margin on short length poles. This may be seen from the following table:-

CLASS OF POLES:	30'6";	30'7";	35'7";	35'8";	40'7";	40'8" to 60'8"	
LOCAL PRICE FOB	\$2.00	\$3.00	\$4.75	\$5.25	\$5.25	\$6.00	\$9.00
PRICE PER FT.	6½¢	10¢	13½¢	15¢	13¢	15¢	15¢

Should not export charges be considered as a cost item in addition to royalty? Ninety per cent. of pole timber cut in the province now is for export purposes. If these charges were included it would be necessary to reckon an additional ½¢ to cost of production of poles over 40 ft. Although export charges are usually paid by the broker must not they still be considered for the purpose of an appraisal as a charge against the timber?

... ..

In reply I would say that top diameter, is a factor in determining value, in two lengths, that is 30 and 35 feet. The 7" - 40 is not recognised in my locality as yet. All poles over 35 feet in length, must be of sufficient size to measure 8" top diameter, after shrinking.

I believe that I am right in saying, that the practice of using the mean value of any length, for its two top diameters, as the selling price of that length, is general in the district. Though I will admit of argument as to the fairness of the method, I would point out that the final result would not be altered, and the government is not the loser.

It has been my experience that an average stand will yield approximately 60% of the small diameters as against 40% of the large for any length. An example of averaging the value for the

two top diameters, on a short pole, would be as follows,

6" - 30, Value	\$2.50	Value per lineal foot	8.33 cts.
7" - 30 "	\$3.00	" " " "	10.0 "
Mean value	\$2.75	Mean value	9.0 "

The loss and gain is represented by, 60% of .67cts. per foot in favor of the government, as against 40% of 1ct. in favor of the operator. The margin on 35s. is slightly in favor of the government.

The selling price will vary in a ranger district according to the point of delivery. Where delivery is taken on cars, the price will naturally be higher than where delivery is taken on a river bank or lake shore, when towing and yarding must be done. In this district the latter operation is done by the broker, but since we accept his price to the operator at point of delivery, as the selling price, this part of the operation does not enter our appraisals.

With reference to export tax, all operators in my district dispose of their poles through a broker, who pays the tax, when, and if the material is exported. Since his price to the operator is exclusive of this tax, it does not concern us.

If the operator were exporting direct, and paying the tax, the selling price would be increased and the export tax would then enter the cost of production.

I hope that the publishing of this appraisal has not created a very wide impression that we are in the habit of making appraisals without having regard for such an obvious factor, as top diameter, in determining value on short poles.

FORESTRY'S PLACE IN THE ROYAL HOUSEHOLD - ".....Mention of the Prince Consort recalls that that royal gentleman had a great deal to do with reorganizing the Queen's household. When he came to England there was seemingly more confusion than comfort at the Palace. Baron Stockmars has told of the situation -

"The Lord Steward finds the fuel, and lays the fire; the Lord Chamberlain lights it. The Lord Chamberlain provides the lamps; the Lord Steward must clean and trim and light them. The inside cleaning of windows belongs to the Lord Chamberlain's department, but the outer parts must be attended to by the office of Woods and Forests, so that the windows remain dirty unless the two Departments can come to an understanding."

FOREST INVESTIGATIONS 1923 - RESULTS AND CONCLUSIONS

(J. L. Alexander.)

The problem of continuous production from our forest lands, in Vancouver District, is of particular importance due to our Coast Region being rugged yet capable of producing a quality and quantity of material per acre not possible in any other portion of Canada. The virgin stands on the deeper soils of the plains, benches, and lower slopes on account of grade and quantity, and accessibility of the timber are rapidly being depleted. Some of the areas may eventually be used for agricultural purposes but the proportion where a man can make a living by farming, is considered by many to be very small. A larger percentage of these level areas and all the steeper slopes will probably be used perpetually for growing trees and should be considered at present as absolute forest soil. Unless our system of controlling these areas keeps them producing our whole scheme of management fails. This necessitates the establishment of a second stand after cutting and protection from fire and other agencies until ready for harvesting.

Satisfactory stocking of young growth is of little practical value unless it can be protected until ready to be cut. On the other hand absolute fire protection of areas which are barren is of little benefit so far as those areas are concerned. It is essential to establish a balance between the various factors which are included in the production of timber.

There is the impression in the minds of the public that our forest lands are left in such a condition after logging that another crop by natural regeneration is impossible. The purpose of the investigation project on the coast this year was mainly to determine the minimum requirements necessary for keeping our potential forested lands perpetually producing and from the data gathered, I would consider that with proper management of our forested areas, we can get a future crop from natural regeneration even where the modern methods of logging are used. In some cases on exceptional sites some slight changes may be necessary but generally speaking if fire is kept out of the Fir mixtures of the south coast and Vancouver Island there will be very few areas which will not be rapidly stocked naturally, after the present stand has been removed.

Up to a short time ago there were very conflicting opinions in the minds of our own organization as to the effect of high lead logging on the possibilities of areas restocking. It was also generally considered that the broadcast burning of slash was a silvicultural necessity and in order to facilitate the restocking, burning was necessary. One of the main problems undertaken this year was to determine the effect of burning on succeeding reproduction. An effort was also made to determine as far as possible the effect of the various factors of site and methods of cutting on the future young growth.

A great diversity of opinion results from personal observation not backed by reliable data. In the work this year in the field and office the personal element was eliminated as far as possible and the conclusions formed from summaries of the conditions which actually existed on the ground. In some cases there was contradictory evidence but in most cases the summaries showed a definite trend on which conclusions were based. Owing to the comparative small amount of time spent on the work, the project this year must be considered in the same light as an extensive reconnaissance and as a basis for future studies.

Strips one tenth chain in width were run through the areas under study using a chain and abney for slope allowance so that areas given would represent true horizontal surface. A rod 3.3 feet in length was used to measure out from the chain, so that the margin of the strip could be accurately determined. Tallies were kept every 2 chains so that the distribution could be visualized from the field book. Summaries were made on a special form for each change of site or other condition and these field sheets were later grouped for similar conditions and summaries made so that the effect of the various factors could be determined. In gathering data of this kind it is essential that every condition which would effect the establishment of reproduction be noted in the field, so that the multitude of classifications which may develop in the work can be made.

EFFECT OF SEASONAL BURNING

In order to determine the effect of seasonal burning on reproduction it was necessary to choose areas where conditions were similar. An area at Covichan Lake was studied. Portions burnt over at various times in 1918 showed the following amounts of reproduction established per acre:

Spring Burning	200F	30C	201H
Fall "	156F	3C	6H
Summer "	79F	43C	170H

An average of all the burns for all conditions of site, etc., between 1913 and 1920 inclusive give the following results:-

Spring Burning	340F	13C	259H
Fall "	124F	12C	52H
Summer "	72F	105C	1103H

Since the first summary is based on similar conditions, I consider it the more reliable. This indicates that Spring burning is followed by better Fir reproduction than where Summer or Fall fires occur. In the Spring the slash dries from the top down resulting in the surface layers becoming highly inflammable while the soil is still moist. For this reason the debris may be consumed with least disturbance to the forest floor in which the seed is stored. Under no condition would it be practical to burn slash in the Summer on account of the risk. In the Fall the slash becomes

moistened from the top down and when the conditions are safe to burn the top layers may be less inflammable than the lower and under these conditions a fire will consume considerable of the forest floor.

In order for any considerable percentage of the seeds to sprout and reach the surface Fir can not be buried to a greater depth than 2"; Hemlock $\frac{1}{2}$ "; Cedar $\frac{1}{4}$ ". If a large percentage of our reproduction after logging comes from seed in the forest floor as has been proven by investigators in the South then it is advisable if burning is done to carry this out at a time when least amount of seed will be consumed. After very hot summer fires satisfactory natural restocking from seed stored in the forest floor can not be expected.

RATE OF ESTABLISHMENT

The rate of establishment on cut-over land is very important in management. Seedlings continue to establish on unburned areas where the influence of seed trees is considered to be small for at least five years. An average of the number of seedlings establishing where the slash is left is shown by the following table, which is based on percentages of the total for the first five years after logging.

<u>SPECIES</u>	<u>1st year</u>	<u>2nd year</u>	<u>3rd year</u>	<u>4th year</u>	<u>5th year</u>
Fir	38	33	21	6	2
Hemlock	26	12	25	29	8
Cedar	5	19	45	21	10
Others	69	16	5	5	5

This shows that our most important commercial species, Fir, establishes most rapidly. Hemlock establishes slower and Cedar slowest. The other species which include Pine and Balsam show rapid regeneration after cutting.

The rapid establishment of Fir, may be due to more food being stored in the larger seed which enables it to force its rootlets more deeply into the soil in search of moisture than the smaller seeds of other species. This enables Fir to resist draught where Hemlock and Cedar could not exist. The mortality among the more shallow rooted species on exposed sites is enormous the first year, and these species may require to some degree the formation of a nurse crop of weeds etc., which affords the required protection before any large amount can survive; or the slower rate may be due to an inherent quality in the seed. On areas logged after June practically no reproduction was found which had germinated that year, however, on some areas logged in early Spring three hundred seedlings had germinated by the latter part of June. It is the opinion of those who have carried out experiments over long periods that large quantities of seed are stored in the forest floor and that the longer it is stored the slower it is to germinate. This would account to some degree for the

establishment over considerable period. The seed which was buried at first too deeply for germination may have the covering removed by erosion until conditions are favorable for sprouting.

The data gathered this year shows that the burning of slash delays the establishment of Fir for about three years. On areas burned over very few seedlings were found until the third or fourth year after the fire, and they continued to come in for a period of nine years although long distances from green timber. Most of the fresh surface seed will have been destroyed by burning and only the older seed which will be slower to germinate than the fresher will be left. This delayed establishment may also be partly due to the uncovering of the seed by erosion. The seedlings may not survive but require for establishment the protection afforded by herbaceous plants which follow several years after broadcast burning. On the other hand seed may come long distances from green timber. An important point to be noted is that burning delays the establishment of Fir seedlings for about three years. A cover of young trees is considered a good risk, but since burning delays its establishment the reduction of hazard should be on a comparison of an area where the slash is left as compared with an area burnt over three years.

The studies on the rate of establishment show that we cannot determine the possibility of an area restocking until at least five years after burning and on areas not burned over for at least two years. Since 71% of the Fir establishes the first two growing seasons burning if attempted should be carried out as soon after logging as possible otherwise it will be done at the great expense of young growth.

In considering the effect of broadcast burning on reproduction the areas studied were divided into two main types.

(1) Pure Fir Type.

In this type Fir comprised 80% of the virgin stand. The Pure Fir Type is confined to the pains and lower slopes where the soil is a sandy loam, deep, of a characteristic reddish appearance and chemically in many cases unsuitable for the production of agricultural products. Under these conditions large amount of seed will become mixed with the soil through the various activities of logging and some of this will not be destroyed by the slash fires.

FIR		CEDAR		HEMLOCK		TOTAL
#/acre	%	#/acre	%	#/acre	%	
Burned						
524	75	26	3	153	22	703
Not Burned						
625	64	29	3	332	33	986

Burning decreased the amount of Fir 16% and Hemlock 54%. Although the reproduction showed a decrease through burning for

all species the percentage of Fir was slightly increased. It is difficult to determine from the percentage of the various species which come in soon after logging what the ultimate mixture at maturity will be. Any deductions we make must for some time be based on the principles underlying the growth and development of the various species. Although the amount of reproduction on unburned areas shows a decrease in the percentage of Fir as compared with the virgin stand the percentage of this species should increase as the stand becomes older, due to more rapid growth over its competitor and its resistance to stagnation where crowded. The Cedar and Hemlock cannot germinate when buried to as great a depth as Fir. On this account the fire may destroy practically all the Hemlock and Cedar seed which would be capable of sprouting and at the same time a large amount of Fir seed capable of germination may escape injury. This would account for the larger percentage of Fir coming in after burns than where the slash is left. These studies show that the broadcast burning of slash lessens the amount of reproduction of each species, but even though slash is burned the first season after logging at a time when the ground is somewhat moist there will be sufficient seed left capable of sprouting to satisfactorily stock the areas in the pure Fir Type.

Fir-Hemlock and Fir-Cedar Type. Those areas on which no species formed 80% of the stand but in which Fir formed the second largest percentage of the total and when combined with Cedar or Hemlock separately represented at least 80% of the virgin stand.

FIR		CEDAR		HEMLOCK		TOTAL
#/acre	%	#/acre	%	#/acre	%	
Burned						
257	37	169	24	267	39	693
Not Burned						
541	21	863	33	1220	46	2624

17% of the area not burned and 47% of the area burned had less than 500 seedlings per acre. Burning in this type decreased the amount of Fir 52%, Hemlock 78%, and Cedar 80%. The more marked difference in the reduction of Fir through burning in this type as compared with the pure Fir type is probably due to the shallow peaty soil characteristic of the sites where only a small proportion of Fir exists in the stands. Very little seed becomes mixed with the soil and is protected in this way as the fires very often burn to rock.

The studies indicate that burning in the Hem-Fir-Cedar mixture will increase the percentage of Fir but decrease the total amount of reproduction to a very great degree and in many cases make satisfactory natural regeneration very doubtful. In this type a considerable amount of advanced reproduction exists. This when relieved by the removal of the trees in logging shows remarkable recovery and aids materially in rapidly forming a crown cover.

The slash on the steep hillsides where the soil is shallow prevents erosion after logging and in this way prevents the young seedlings which may establish from being destroyed. The comparative studies indicate a great loss in the amount of reproduction through burning and the ultimate possibilities of the areas restocking, and this should be very carefully weighed against the effect on hazard in determining the method of slash disposal.

EFFECT OF MARGINAL TIMBER

In order to determine a method of cutting to insure reproduction in case of successive fires studies were made on the effect of the timber at the margins of the settings on the number of seedlings establishing.

Pure Fir Type.

Reproduction within six chains of Marginal Timber:

FIR		HEMLOCK		CEDAR		TOTAL
#/acre	%	#/acre	%	#/acre	%	
Burned						
838	74	113	20	183	16	1134
Unburned						
2566	75	696	21	153	4	2415

About three times as much reproduction established on the unburned areas within 6 chains of green timber as on the burned; yet in either case there is sufficient young growth to insure satisfactory stocking. The increase in the amount of Fir within 6 chains as compared with areas further away was 60% on the burned and 311% on the unburned, with a greater increase for Hemlock and Cedar. The difference in the amount of reproduction due to marginal timber is sufficient for satisfactory restocking up to at least 6 chains from the edge of cuttings. This is of increasing importance due to the growing tendency of operators to log their areas in strips for fire protection and even in case of successive fires these blocks will insure natural regeneration for at least 6 chains from their boundaries. In the Hemlock-Fir mixture it was found that Hemlock influences reproduction for 14 chains and areas at this distance from green timber even where successive fires occur will restock naturally.

THE EFFECT OF INDIVIDUAL SEED TREES

Individual Fir trees showed a marked effect in the amount of reproduction for two chains with a rapid dropping off at three chains beyond which the influence was very small. Even on areas burned over where the seed trees had been killed by the fires a marked increase in the amount of reproduction was noticed near these trees. The seed in the cones may have matured after the trees had died. On some areas we may leave seed trees as an

insurance of natural regeneration in event of successive fires; however, the leaving of seed trees is an expensive measure where defective trees are not available. If seed trees are left they must be of sufficient size to resist overthrow in yarding and trees over thirty inches D.B.H. should be chosen and this would be practical only on fairly level sites where the soil is deep. It would be advisable to mark about two per acre.

Although considerable seed may be stored in the forest floor the work this year indicates that a large amount of the reproduction is due to seed which is carried from living trees. In studying seed dissemination it is essential that factors of germination etc., be eliminated, since for successful establishment the seed must have favorable conditions for germination and growth. To illustrate this, studies were made on the shores of a small lake near Beaver Creek. In pure sphagnum moss an average of over a million and a half Hemlock and Cedar seedlings were found per acre. There were all one year old, but no older age classes were found. The sphagnum moss which was damp afforded favorable conditions for germination but on account of the seedlings not getting their roots in mineral soil they died the first year. These seedlings although only 1/2" above the moss had roots 5" in length. It has generally been supposed that seedlings require mineral soil to germinate, but the studies this year showed that the large percentage of seedlings of all species establishing comes in among the moss and duff. Where the mineral soil is exposed on yarding ways only a small amount of reproduction is usually found but on the margins of these ways where the mineral soil has become mixed with the duff reproduction may be plentiful.

Since satisfactory stocking of young growth is of little practical value unless it can be protected until merchantable, and absolute fire protection of areas which are barren is of little benefit as far as those areas concerned, the various factors which are included in the production of timber must be carefully balanced in determining the method of management.

In the application of last years silvicultural findings the main points to be noted are as follows:-

1. That satisfactory reproduction almost always follows logging where the slash is left, with a few exceptions on very dry southern slopes.
2. That burning for our conditions usually decreases the amount of reproduction of each species and is not silvicultural requirement in our Fir mixtures.
3. That fire increases the percentage of Fir, but that any Fir in the mixtures will soon form the dominant trees of the stand.

4. That seed trees will satisfactorily restock areas within a radius of about three chains, and if seed trees are left they would act as insurance of natural regeneration in case of successive fires.
 5. That blocks of green timber will stock areas within 6 chains of Fir and 14 chains for Hemlock even in case of successive fires, and that logging by alternate settings should be encouraged both from a silvicultural and protection viewpoint.
 6. That on no areas studied in the Hemlock-Fir type was broadcast burning found to be a silvicultural benefit except in the immediate vicinity of spar trees where a large amount of debris accumulates.
-

(The "B.C. Forester" - continued from Page 16.)

Work on deck with any kind of a sea running would have its element of risk, we should say, but a handrail is being fitted which will improve matters considerably. The camber is rather accentuated, which makes for strength, but unless we are prepared to withdraw the embargo on caulked boots, we may find it necessary to consider the issue of vacuum soles!

Broadly speaking, we liked the looks of the "B.C. Forester." From what can be seen of her structural timbers, such as the decks, deck carlins, knees, and so forth, she is stoutly built, and the vibration when the engine is running is only trifling. She answers her helm with a readiness which is almost disconcerting, and we noticed that she displayed no tendency to roll in the wash from the s.s. SOLDUC.

With regard to the engine, we have little to say. We are not familiar with the principle upon which the Diesel engine operates, but we know that it has been thoroughly established and abundantly successful. The Washington-Estep seems to be remarkably accessible for inspection and repairs, which is a great feature in itself. We noticed too the total absence of the objectionable fumes which are present in the average gasboat. Not even the faintest trace of vapour was seen from the exhaust.

From the standpoint of economy in operation there would seem to be no argument. A gasoline engine of the same B.H.P. would cost us for operation \$1.50 an hour, taking gasoline at .30¢ a gallon, whereas the Diesel, using crude oil at .6¢ a gallon, costs us only .12¢ an hour; so that, the Diesel engine, compared with the ordinary 4-cycle gasoline engine, uses only two-fifths of the fuel at a fifth of the cost per gallon.

OBJECT LESSONS

(T.A. Moilliet, Secretary, Upper N. Thompson Live
Stock Association.)

Scattered over the various districts of British Columbia, and especially in the Interior, are splendid object lessons showing the destructive effects of Forest Fires.

These object lessons could be emphasized if suitably placarded where roads enter the devastated areas, and in this way an original asset which has been converted into a fire hazard liability might be made the means of preventing a similar process of transmutation in surrounding timber. I have in mind two areas in particular in the North Thompson district, that of Raft River for one, and the area which was the scene of the McMurphy Fire.

I submit a type of notice which might be of educational value if suitably modified for particular areas.

... ..

IN MEMORY OF.....Feet of GREEN TIMBER, Destroyed
By Fire in the Summer of.....

READ, LOOK AROUND YOU, AND LEARN

The Fire which denuded this areas was started by.....

.....Settlers burnt to death.
.....Settlers' homes burnt.
.....Million Feet of Timber went up in smoke.
.....Million Cords of Wood destroyed.
.....Dollars worth of Young Growth killed.
.....Dollars worth of Fertility destroyed, or
Five Centuries' Accumulated Fertility
turned to ashes.

If this Timber had not been destroyed, the sum of \$.....
would have been distributed amongst the wage earners of
the Province of British Columbia.

This Fire robbed the Taxpayer of British Columbia of the
stupendous sum of \$.....and has turned the greatest
asset of this community into a costly Fire Hazard.

PUT OUT YOUR CAMP FIRE!!!

EDUCATION OF SCHOOL CHILDREN

(Extract from paper read by T. H. Wilkinson at Thurston Bay Ranger Meeting.)

This to me is the most important phase of Forest Protection propaganda. It is another subject upon which volumes might be written. However, as I have already overstepped my time limit, I can only deal, very briefly, with the matter. The chief object to be achieved in educating the children, is to have them develop into manhood and womanhood, with a full sense of their duties as citizens in the matter of Forest Protection, to appreciate that our Forest wealth is not inexhaustible, to realize that their timber supply is threatened by fire, and finally to know that this great destructive agent is chiefly the result of human carelessness. This education of the young can only be carried on by personal talks, which can be supplemented with an illustrated booklet on Forests and Forest Fires. Such a book is under preparation by the Chief of Operation at the present time, and should do much to educate the young. This form of education does not only cover the children, but embraces the Father, Mother, Sister and Brother, because they are all interested in what the youngsters have been doing at school. The most vulnerable point in a parents' armour is his or her child or children, and it is certain that if we cannot get our message over to the parent through the child, then there is something radically wrong with our system of spreading Forest Protection propaganda, or the system is alright but the parent is a mighty poor one who is not interested in his or her child's progress, and can only be reached by the prosecution route.

You are all familiar with the success attendant upon the school children Essay Competition this year, so that there is no need to dwell on that, except in passing, to remark, that we now have a years experience behind us and, will govern ourselves accordingly. This method of spreading Forest Protection propaganda last year, was a tremendous undertaking, considering the short amount of time to prepare the plan and put it across. However, it was carried to a successful consumation, thanks once again to the enthusiasm and unstinted efforts put forth by you all.

Last year the inside cover of school children's exercise books were utilized for publishing Forest Protection propaganda. This year it is proposed to use the outside cover, in order to convey to the young mind, the importance of the timber industry to the country, by showing the "Tree" in its course from the stand to the mill. Forest Aide buttons, and cards containing Forest Protection Literature were also distributed.

ON "UNIFORMS"

(H. C. Nichols)✓

With reference to the discussion on uniforms now going on in "Root and Branch", I beg to submit suggestions for a simple and effective uniform, should it be decided to adopt one for the B. C. Service. The uniform suggested is designed primarily for use in the Field, but could, I believe, with slight variations, be used to advantage also in the Office.

Specification of Uniform (Fire Season Period. Male Staff only.)

1. Coat

1 Coat anti-mosquito dope. Color Green.
(Lardeau and Upper Duncan 3 coats.)
(Note: For Prince Rupert district should be waterproof.)

2. Trousers?

1 Kilt, kilt apron, or sporran. Color: Green
(War Office statistics prove there was less sickness
among kilted regiments than others during the Great War.)

Fabric: Optional, but gunny sack muslin, cheesecloth, or mosquito netting, recommended for Interior; Oilskin for Coast.

3. Hat

1 Canvas bucket. (In case of Fire, you have it right on the "spot".)

Color: Green. With design, a pine tree or devil-club
"rampant"

(Field men only. For office wear, opera hat or panama.)

4. Footwear.

Moccassins, sandals, or clogs - caulked, and with climbing irons attached.

Color: Green.

(Prince Rupert district, thigh length rubber boots.)

5. Belt (Field men only)

1 Canvas or leather. Color: Green. With pockets for carrying the following:-

1 compass	1 Time book
3 doz. hose washers	2 Note books
6 hose clips	1 Aneroid Bar
Blue prints	1 pr Field glasses
1 Biltmore stick	1 Axe
1 Permit Book	1 Flashlight
1 Pre. Fire Report book	1 pr Pliers

1 tin Fray Bentos
Splicing pliers
Spare horse-shoes

Spare spark plugs
Quantity telephone wire
etc. etc.

6. Watch

1 Armour-clad wrist watch, luminous.
Color: Green

7. Gloves

1 pr anti-devil club hornet proof, gloves or gauntlets.
Color: Green.

8. Spats.

1 pr green spats (optional)

7. Monocle

1 Monocle (optional, but would be very impressive when
"commandeering" fire crew.)

Advantages

The advantages of above uniform will be so obvious that it seems superfluous to itemise them; a few, however, may be mentioned - for instance:

The Canvas Bucket could be worn in bed as a night-cap; and, in case of a Fire-call, the wearer would be already half-dressed, as the Coat could also be kept on while sleeping.

Again, the Kilt in case of hot weather hiking, would make a pack-sack in which other articles could be rolled and carried by means of the belt. The whole uniform would be simple, effective, and economical, and could be replaced at small expense, if wholly, or in part, worn out, lost, or mislaid.

It is believed that Forest Officers could be readily distinguished as such when wearing this uniform; in the event, however, of an officer being mistaken, in the open season for a deer, a small fine could be imposed for a first offence, a more severe punishment in the case of a repetition, and so on, until the fact became impressed that there exists no "open season" at any time for Forest Officers.

In conclusion it is suggested that the public could be familiarised with the proposed dress, by having members (male) of the staff, wearing the uniform, stationed at prominent points and distributing copies of the Fire Law, etc. during Fire Prevention Week, April 27th - May 3rd.

OUR BOOK SHELF

CHRISTMAS TREES. Defends the Judicious Cutting of Christmas Trees
Dr. Howe (Canadian Lumberman, Jan. 15th, 1924)

Use of Christmas Trees Approved.
(West Coast Lumberman, Dec. 15th, 1923)

Wanton Waste in Christmas Trees.
(Canadian Lumberman, Jan. 1st, 1924)

Forest Fire Prevention Conference Resolutions, Ottawa, Jan, 1924.

Building Population by Building Forests, Dr. Howe.
(Speakers Bureau of Can. Forestry Assoc.)

Lumber Definitions - Forest Product Lab., Madison.
(B.C. Lumberman, February 2nd, 1924)

Practical Forest Steps in Logging Douglas Fir, T.T. Munger.
What Forest Steps are Practical in Logging White Pine in Idaho.
Forest Steps Practical in Logging Western Pine.
(Lumber World Review, Dec. 25th., 1923.)

Yield, Even-aged Douglas Fir Stands.
(U. of Wash. Forest Club Quarterly, Jan. 1924)

Cut-over Lands Discussed at Western Forestry & Cons. Assoc. Meeting
(West Coast Lumberman, Dec. 15th, 1923)

What Canada has done in Forest Research. Clyde Leavitt.
(Ill. Can. Forest and Outdoors. Dec. 1923)

Moisture Content of Fuels as an index to Fire Danger.
(Lumber World Review, Dec. 15th., 1923)

The Blister Rust News.

The Importance of Duff Moisture Content in the Forest Fire Problem.

Tests of Rocky Mountain Woods for Telephone Poles.
(U.S. Dept. of Agric. Bulletin No. 67)

Lumber Standard Sizes which have now Definitely Established.
(Lumber World Review, Dec. 25th, 1923.)

B.C. Red Cedar Shingles under Fire. Tests made at University
Grounds. (Western Lumberman. Nov. 1923)

A Guide to the Identification of our Most Useful Timbers.
(Cambridge University Press, 1920)

Spruce Limb Serves as Humidity Indicator.
(West Coast Lumberman. Feb. 1st, 1924)