

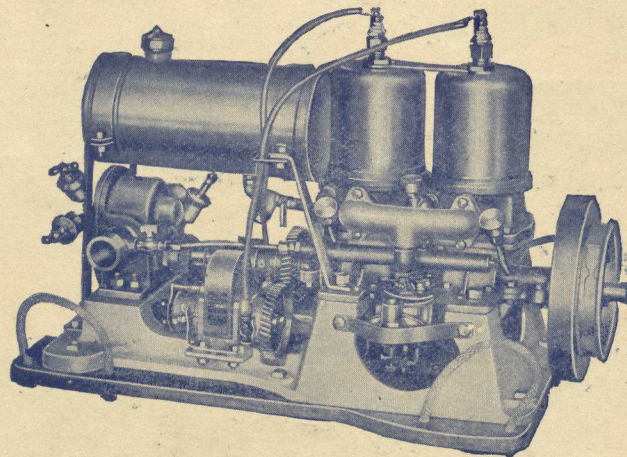
Vol. XIX
No. 5.

OTTAWA, CANADA, MAY, 1923

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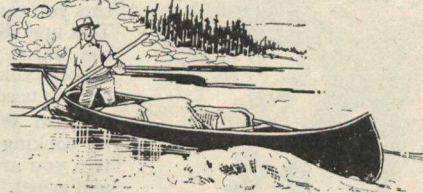
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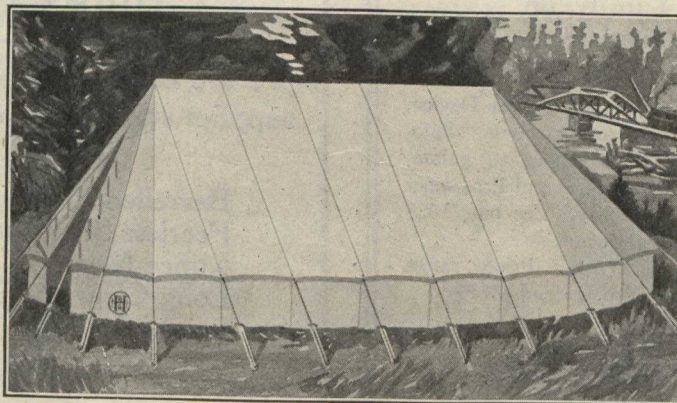
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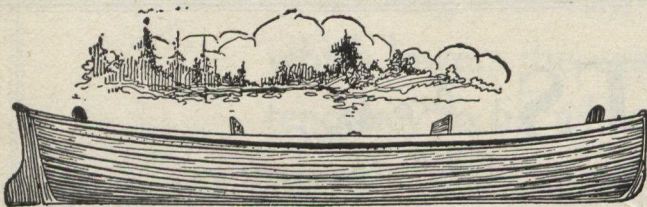
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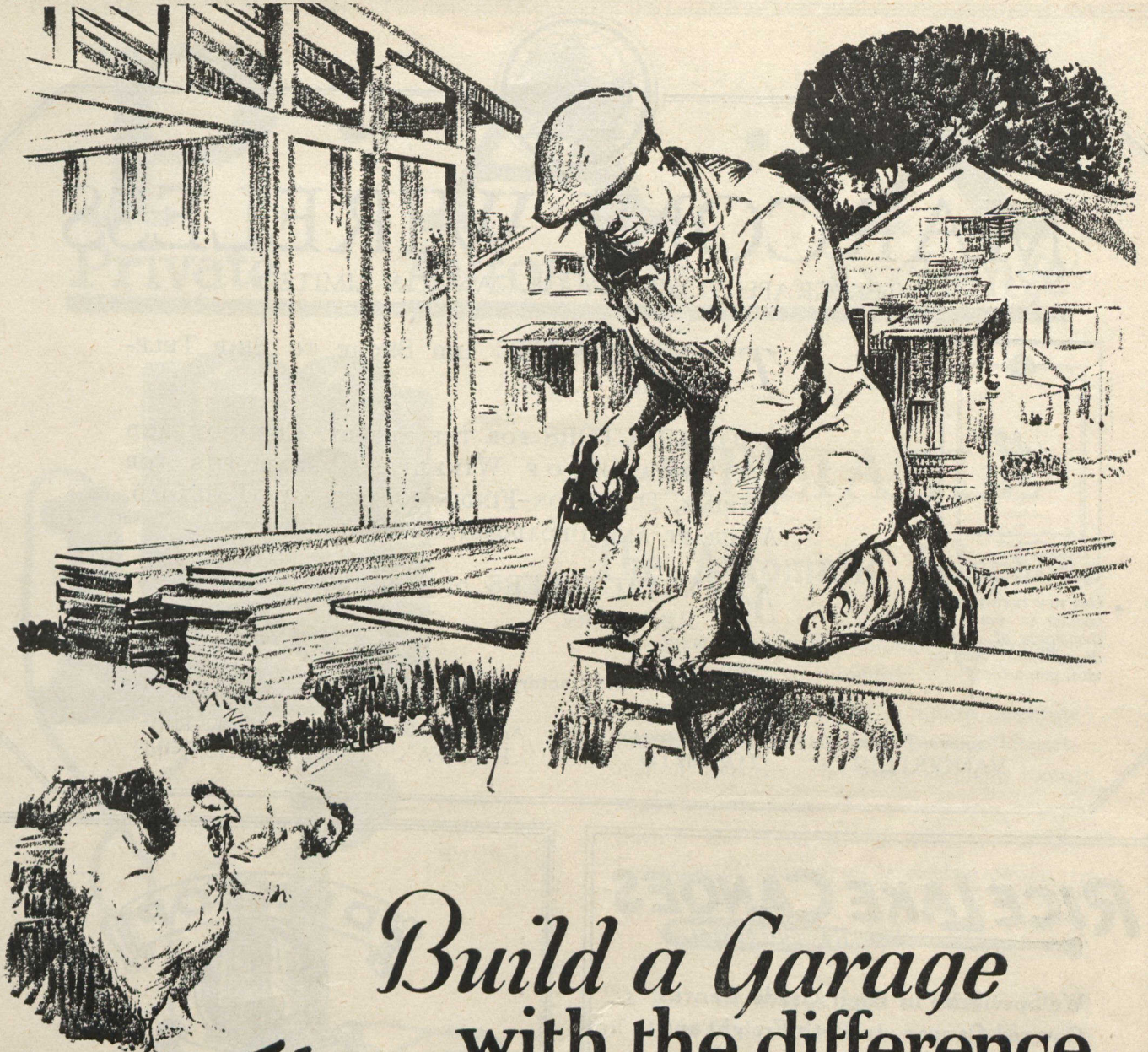
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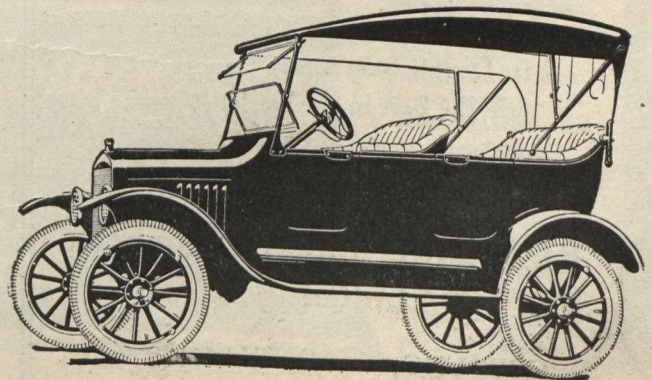
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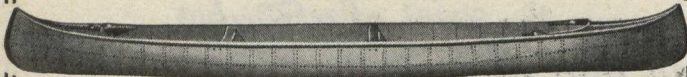
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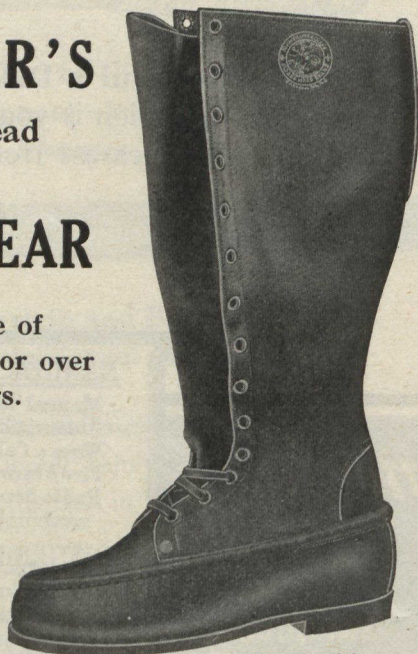
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THE ILLUSTRATED CANADIAN FORESTRY MAGAZINE



A Monthly Publication, National in Scope and Circulation, Devoted to the Conservation and Development of Canada's Forest Resources

VOL. XIX

OTTAWA, CANADA, MAY, 1923

No. 5

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IS \$500,000,000 A YEAR WORTH SAVING?

This is the Question to be Answered by the People of Canada

By Dr. Clifton D. Howe,
Dean, Faculty of Forestry, University of Toronto

IN the last analysis, adequate fire protection resolves itself down to the question of whether or not the people of this country wish to save their wood-using industries. Let us look into the service of these to the country. The value of the manufactured pulp and paper products is \$250,000,000 per annum. The various companies have invested in the business some \$375,000,000. They employ 33,000 men in the mills and in the forest, and they pay them each year \$40,000,000 in wages.

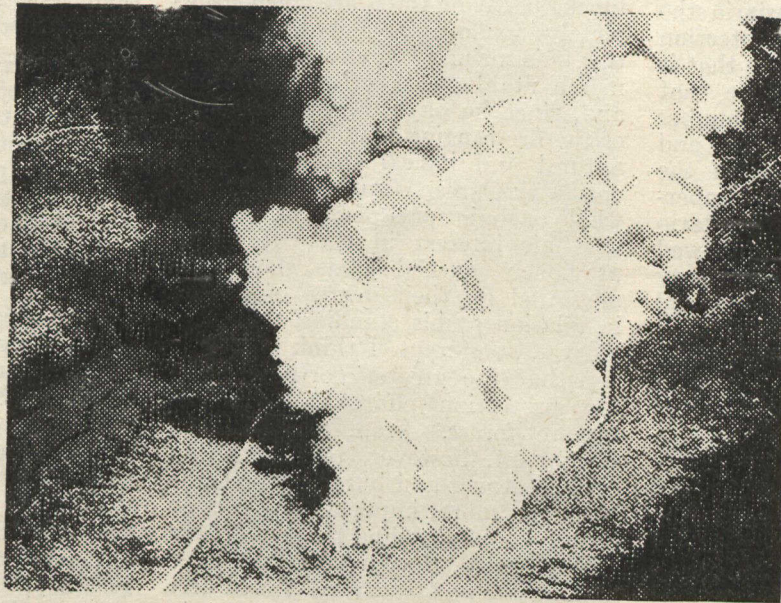
Isn't that business worth saving?

The value of lumber, lath and shingles produced in one year is \$150,000,000. Lumber means boards and deals, dimension stock—not the finished product, as in the case of paper. I can't find just how much is added to this value by the various minor wood-using industries. With reservations, I will say that the minor industries, which depend entirely upon wood, produce products to the value of \$60,000,000 annually. They have an invested capital of over \$50,000,000. They employ 13,000 people and pay annually in wages around \$14,000,000. Is it not worth some effort to keep these industries going?

To these should be added the industries that depend in essential part, but not entirely, upon forest products. These, such as the horse-drawn and motor-drawn vehicles, produce each year products valued at \$86,553,314. The capital invested totals over \$65,000,000. The employees number over 9,000, to whom are paid wages amounting to nearly \$12,000,000.

Going back to the lumber industry proper, we find that its invested capital reaches \$250,000,000. It employs 55,000 men, and gives them \$60,000,000 in wages annually. That business is worth saving, too, is it not?

There are more than 100,000 people in Canada at work converting the forest products into wealth in some form or other. They are chiefly heads of families or the bread winners of families, thus



they represent probably a half million people dependent upon the forest for a livelihood. Are they worth while in their work? Are they worth while to the country?

Must Invest in Protection

Let me emphasize that our great pulp and paper companies, the great lumber concerns will not exist many years longer unless there is more effective fire protection. In order to get more effective protection, the public must invest more money in it.

When we consider the area actually under license or pulpwood concession, the amount expended on it as a whole, averages less than one cent per acre per year. In other words, we spend less than a cent an acre a year as an insurance rate on forest lands whose supplies at the present day yields us products to the value of \$500,000,000 annually.

When we consider the total forest area of Canada capable of producing marketable materials and divide such area into the amount paid for fire protection, then we find we are investing less than one-fifth of one per cent per acre each year to insure the continuance in the future of the second largest wealth producing industry in the country. The amount invested in protecting the supply of our wood-using industries is entirely inadequate. If the people of Canada think it advisable to keep these industries going, they must pay more for forest protection than they are paying at present.

An Erroneous Attitude

A few years ago a government official in charge of the forest fire ranging in his province, in reply to a criticism of the efficiency of his force, made a statement to the newspapers, acknowledging that a certain fire had burned over several townships, but stating that no real damage had been done because no standing timber had been killed, since the townships had already been logged, and much of the area had been burned

THE FALLING FORESTS

1st 10 The logger's axe accounts for just one-tenth of the logs that fall in our Canadian forests each year.

9th 10 Nine-tenths of the slaughter of forests is due to the Fire Fiend.

10 And eight out of every ten forest fires are set by human hands.

The common causes are unextinguished camp fires, lighted tobacco and matches, prospector's fires and those due to land clearing.

before. Only non-usable trees, brush, and young growth had been killed, and, therefore, the fire did no harm!

Opinion Dies Hard

This statement reflected a quite general opinion of less than a decade since, and it is quite probable that such opinion may still linger in certain quarters. Its existence, however, has a very logical basis in the development of forest fire protection in Eastern Canada. I believe that it is historically correct to state that fire ranging began with the lumber companies, sometimes voluntarily and sometimes at the instigation of the government. In all cases the lumberman bore the expense—in Ontario for at least ten years. Then followed a period, extending about twenty years, in which the government and the lumbermen shared the cost of forest fire protection on a fifty-fifty basis. The modern method is to levy a direct tax upon the lumberman on the basis of a cent to two cents per acre annually. In some provinces, as in Ontario, the lumbermen make recommendations as to the men they wish to serve as fire rangers on their limits, but the actual appointive power lies with the government; in other provinces, as in New Brunswick, the fire rangers are appointed on the basis of a competitive examination. In case of the lumbermen's associations, the lumbermen pay the major cost, but receive certain contributions from the government.

Operator's Point of View

Thus, it will be seen that the operator apparently has always paid at least one half and for the greater part of the time the larger portion of the cost of fire ranging upon his limits. He owns only the timber. The land in most cases belongs to the

Crown, and the operator pays a small rent for the use of it. When he has taken away all the merchantable timber, he has no more use for the land and it reverts to the Crown. As a matter of fact, however, there are certain considerations not concerned directly with growing timber that impel the operator to hold on to his cutover lands until the block, berth or limit has been completely exploited. Notwithstanding this, his primary interest is in the merchantable timber of his limit, and, since he pays the greater share of the fire ranging cost, it is perfectly natural and logical that he should desire the green timber to get the whole or major part of the protection; that his interest in the cutover or previously burned areas should be measured by their degree of hazard in relation to his standing timber.

Even at present, I think it safe to say that the greater portion of the fire protection effort goes to the mature forest. From the foresters standpoint, however, the protection of the cutover and burned-over lands is much more important than the protection of standing timber. There are at least two good reasons for making such a statement. In the first place, if we may judge by the Ontario statistics on a five year average, less than one fifth of the area burned is timberland and one half the area burned has been previously burned. The figures, of course, may be interpreted in two ways, but either substantiates the point I am trying to make. They indicate either that more effective protection is placed upon the standing timber and, therefore, less is burned, or that the standing timber is not as great a hazard and, therefore, does not need as much protection as the areas that have already been burned at least once before.

Must Protect Old Burns

In the second place, although we have no accurate field data on the subject, the areas burned in Eastern Canada undoubtedly greatly surpass in extent the areas containing untouched saw timber and the areas cut and not burned combined. Indeed, it is probable that much more than half of the forested area has been burned within the past 75 years.

Reference to a study of 80,000 acres of burned-over pine lands in central Ontario illustrates this point. On areas burned but once there were 110 young pine trees per acre, burned twice, 14 trees, burned three times, 7 trees and on areas burned many times only three young trees remained on the average acre.

If we supposed that all the 110 trees on the area burned once lived to maturity and all the 80,000 acres to have been burned but once, the value of the final crop in dues and stumpage at the present rate of these would be \$3,900,000. However, the area stocked as it is after the repeated fires will be worth at maturity in terms of commercial timber about \$900,000. Thus the repeated fires reduced the potential value of these 80,000 acres by a round sum of \$3,000,000. That is on 80,000 acres. What is the area of similar conditions in Eastern Canada? We don't know, but we do know that it is enormous. Areas are being repeatedly burned in Ontario at the rate of 100,000 acres a year on a five year average. Young growth is doubtless being killed in a similar proportion in other provinces. We simply cannot endure this, if we are to have a future supply of timber in Canada. Therefore, more adequate protection of areas not at present containing saw-logs is as imperative as it is a patriotic duty.

SIX RULES FOR PREVENTION OF FIRES

1. **Matches.**—Be sure your match is out. Break it in two before you throw it away.
2. **Tobacco.**—Throw pipe ashes and cigar or cigarette stumps in the dust of the road and stamp or pinch out the fire before leaving them. Don't throw them into brush, leaves, or needles.
3. **Making Camp.**—Build a small camp fire. Build it in the open, not against a tree or log, or near brush. Scrape away the trash from all around it.
4. **Leaving Camp.**—Never leave a camp fire, even for a short time, without quenching it with water or earth.
5. **Bonfires.**—Never build bonfires in windy weather or where there is the slightest danger of their escaping from control. Don't make them larger than you need.
6. **Fighting Fires.**—If you find a fire, try to put it out. If you can't, get word of it to the nearest fire ranger at once. Keep in touch with the rangers.

Stefansson, Apostle of the North

Canada's "Native Son" Explorer Preaches Gospel of the Arctic

By George A. Mackie

MR. Vilhjalmur Stefansson, Arctic explorer, author, and public speaker, has recently revisited Canada on a brief lecture tour which concentrated, for the most part, in Toronto, although he made a side trip to Ottawa for a conference with the Federal Government authorities in connection with the continued occupation of Wrangel Island as a Canadian possession. Mr. Stefansson devoted a few twenty-hour working days to the city of Toronto where, in the course of hourly lectures before various educational, fraternal, and popular audiences, he delivered himself of a series of lectures, illustrated and otherwise, along the line of his chosen life's work. In addition to the mental nourishment which he disbursed among his Toronto auditors, Canada's native son explorer, through the medium of Toronto hotels and restaurants, familiarized many Ontarians with the possibilities of reindeer meat as a possible substitute for Canada's British-bound beef exports. Mr. Stefansson later filled a lecture date in Ottawa where he had a receptive audience but encountered some press hostility. His Toronto visit, however, can scarcely be described otherwise than as a triumphal tour from one crowded and enthusiastic audience to another. He explained his visit to Toronto as being undertaken with the object of focusing Canadian attention on the immediate problems and possibilities of Canada's Far North. He expressed himself to the writer, during the course of an interview, as being hopeful of a new statesmanship and a progressive public policy in connection with Canadian Arctic development. Mr. Stefansson makes no claims to preeminence as a writer or speaker although, for one of such modest claims in this regard, he surely obtains very gratifying press notices and popular recognition.

"I am a missionary by temperament, a Polar explorer by profession, not a speaker or a writer," he explains, "but I have written and spoken a great deal and corrected erroneous notions concerning the North and these lectures and articles serve



VILHJALMUR STEFANSSON
Canada's Arctic Explorer Dressed in
Conventional Attire.

AND AS HE APPEARED WHILE



"Bringing home the (Seal) 'bacon'" on His Arctic
Exploration Trip.

to provide me with funds for the extension of my work."

One of the most important tasks which Mr. Stefansson has set himself is that of correcting the false impressions general in Canada and elsewhere, concerning living conditions in the North. He particularly takes to task those people or organizations who are in a position to know better but still persist in disseminating misleading information. A case in point is his criticism of the Ontario School Geography now in use in the

public schools of that province. In this connection he relates that on his first trip North, with Mr. Elihu Stewart, at a point 300 miles north of Great Bear Lake they reported having found magnificent forests containing trees as high as 90 feet and of proportionate circumference. This information was published in a government report of 1907.

"And yet," said Mr. Stefansson, "we find the statement in the Ontario Geography in present use describing Great Bear Lake, 300 miles further south than the point we had reported on, in these inaccurate and misleading words:

"In this desolate region trees no more than six feet high and no bigger around than your wrist require four hundred years to grow."

"At that rate," commented Mr. Stefansson, "B. C. Red Pine would make the tombs of the Pharaohs seem like an affair of yesterday."

This instance was merely one of many of the mis-representations concerning Arctic conditions which Mr. Stefansson laid low in the course of

his numerous addresses. Lacking time to favor the interviewer with the data for an article on Canada's resources in the Arctic, Mr. Stefansson authorized the publication of some extensive extracts from his copyright work, "The Northward Course of Empire." With acknowledgments to Mr. Stefansson and his publishers some of the extracts thus authorized are herewith appended:

**Mr. Stefansson A
Canadian**

Under the title, "The North that Never Was," Mr. Stefansson refutes many of the popularly held conceptions concerning Northern conditions and possibilities. In his opening remarks, under this heading, Mr. Stefansson removes all doubt as to the land of his birth. Many people were under the impression that he was of Scandinavian nationality and others that he was of United States origin. As a matter of fact Mr. Stefansson was born in the province of Manitoba, and although his parents, who came originally from Iceland, only

resided there for about a year after his birth, he is, nevertheless, a British subject by birth. Mr. Stefansson's education was received in the common school, high school, leading to a university B. A. degree at the State University of Iowa. Following this he took three years of post graduate study at Harvard University, held a scholarship and two fellowships there, following which he became an instructor, as he puts it, "in a minor capacity." Proceeding with his story he says in part:—

It is, therefore, reasonable to suppose that during the period of my formal and informal education I absorbed the same general type of misinformation as does the average American. When I went North and became an explorer I found that nine out of ten of my ideas about the polar regions were wrong.

For many years it has been a large part of my activities to say in lectures and writings and conversation that the Far North, both in the western and eastern hemispheres, is destined to be colonized in the same general way as were the Western prairies of this continent, by the same type of people, and with a resulting civilization not fundamentally dissimilar. This assertion is met in the minds of readers or listeners by small armies of objections. The things you think you know about the North arise in a body to declare that the contention is absurd. With the initial advantage of knowing what the reader or listener thinks he knows about the North (for I knew those things myself once and believed them until I went North and found they were not true), I proceed as follows to demolish his misknowledge.

Temperature at North Pole

Nearly if not quite the most fundamental wrong idea about the North is that the North Pole is the coldest place in the northern hemisphere, and that the polar regions are far colder in the coldest part of Winter than any countries that are now inhabited by the average civilized European or American. When we stop to think about it, we see we have really always known that this could not be true—as will appear below.

Besides minor considerations, there are three main factors that determine what the possible minimum temperature of any place may be. These are, latitude, altitude, and distance from the ocean. We see at once that the North Pole has in a high degree only one of these three qualifications for being extremely

cold. Certainly it is at a high latitude. But the North Pole does not lie high above sea level, for it is located in an ocean which Admiral Peary, at the time he visited the Pole, found to be more than twelve thousand feet deep. And if it is not above sea level neither is it far away from the ocean, for it lies in the ocean. Possessing only one of the three main qualifications for being extremely cold, it naturally is never extremely cold. Those who theorize about it generally agree that the minimum temperature there seldom if ever, drops below sixty below zero, Fahrenheit. However, that is a matter of theory. No one has as yet spent an entire year at the North Pole. It need not be more than a year or two, and in my opinion it will not be more than a decade or two, until somebody goes to the North Pole, stays there a year, and brings back to us a coherent account of how cold or warm it is there from day to day for the twelve months.

If the actual minimum temperature in the North Pole is a matter of theory, we are in no doubt about the temperatures of the north coast of Canada or Alaska. For more than twenty years in the case of Canada and about forty in the case of the United States there have been weather bureau observation stations on the north coast of North America. I have spent in the polar regions ten winters and thirteen summers myself and during most of that time I have carried reliable thermometers, so that I could say from my own experience how cold it is up there in winter and how warm in summer, but I prefer to quote the records of the Canadian and American weather bureaus. I have written both of them and asked them to give me the lowest temperature ever recorded in the Canadian station at Herschel Island on the north coast of Canada near the mouth of the Mackenzie River, and the American station near Point Barrow, at the north tip of Alaska, about 250 miles north of the arctic circle. The replies in both cases were identical: "We have never recorded anything lower than 54°F. below zero."

Recently I was reading over a report of the meteorological observations of my arctic expedition of 1913-18, made by the second-in-command, Dr. A. M. Anderson. He says, "The lowest temperature of the winter (1915-16) was 46° below zero," or about like Saranac Lake, New York State, which is a winter resort. Temperatures as low as 50° below zero are rare on the north coast of North

America and there are many winters when 45° or 46° below is the lowest record.

Summer in the Arctic

A complement of the idea that the North is dreadfully cold in winter is the notion that it is also cold through the entire summer. It is possible to maintain that the winters are dreadfully cold, but only by agreeing that the winters of northern Vermont and Saranac Lake and Minnesota and Montana are also dreadfully cold. But no one can even glance at the Weather Bureau records for summer temperatures in polar regions and maintain that in any sense of the English language the summers there are "always cold." Climate may be classified in various ways. One of them is to make a division between continental and insular climates. The ocean is a great stabilizing influence. In the tropics it acts generally as a refrigerator and in the polar regions as a radiator. Even the warm waters of the Gulf of Mexico are colder than the surface of the land in Texas in summer, and accordingly the sea breezes keep Galveston and Corpus Christi reasonably cool. I was told at Fort Bragg, on the west coast of California, last summer, that since the town was built the temperature there has never risen above 85° in the shade, for the ocean breezes are continually blowing across it. But fifty miles inland, beyond a range of mountains they frequently have a temperature of 110° in the shade. Remembering that this is true of Texas and California, we are prepared to hear that the coastlines of the polar regions are never warm in summer.

Length of the Seasons

After considering the minimum temperatures of winter and the maximum temperatures of summer, we come next to a consideration of the length of the seasons. It is true, generally speaking, that the farther north you go in the northern hemisphere the longer the winter and the shorter the summer. However, this has far less of a "practical" meaning than is commonly supposed. A Sicilian may think that a winter of three months' length is intolerable and if he insists that it is intolerable you can't very well argue with him, but you can at least prove to him that numerous prosperous people live in a climate where there are three months of winter. There are those who are used to three months of winter who

insist that six months of winter would be intolerable, but you can similarly show them that there are prosperous cities (such as Winnipeg, for instance) where you have winter nearly half the year. But in Winnipeg you will in turn meet people who say that while five or six months of winter is no serious handicap to economic development, nine months of winter would be insuperable and intolerable. The argument is of the same nature and in its essence no more tenable than that of the Sicilian who thinks that even the shortest winter is unbearable.

It will be said that you cannot raise wheat or corn where the winter is nine months long. That is true, but this does not necessarily form a serious argument against the value of the North. You cannot raise cotton in Iowa, but you can raise corn; you cannot raise corn profitably in most parts of Manitoba, but it is one of the greatest wheat countries in the world; and you cannot raise wheat profitably on the arctic circle, but you can find something to take the place of wheat.

But see what sort of summer we have up there. On the Coppermine River, north of Great Bear Lake, about fifty miles north of the arctic circle, I remember one period of three weeks when there was not a cloud in the sky, the sun beat down upon us the twenty-four hours through, and the heat rose to the vicinity of 90° in the shade every afternoon without dropping lower than 70° or at the lowest 60° at night.



Photo by courtesy of Mr. Stefansson.

Eskimo Summer Camp in the Arctic. Note the Large Supply of Fish, Drying in the Sun.

Snow is not Permanent

That the ground in the polar region is always covered with snow, whether winter or summer, is another of the widely-spread wrong notions. Before going further we must realize that there are two ways of looking at this question. If I meet a Mexican and ask him, "Is there always snow in Mexico?" he can answer me either yes or no and defend either answer. If he says yes, he is thinking about the mountain tops; if he says no, he is thinking about the vast average of his country.

Even in the tropics there is permanent snow on the mountain tops if the mountains are high, and even in the remotest arctic regions the snow all disappears from the land in summer, unless it is fairly high land. Take, for instance, the north coast of Alaska. There is a range of mountains commonly considered a branch of the system of the Rockies which runs about straight east from Cape Lisburne, toward the mouth of the Mackenzie River, leaving to the north a triangular coastal plain with a total area two or three times that of New York State or a little more than that of England and Scotland put together. This is a real prairie. In winter it is thinly snow-covered and the grass in most places can be seen sticking up through the snow. In summer it is green with grass and golden with flowers and there is never a speck of snow.

We learn from the school books a great deal about the iciness of Greenland, and if we did not learn it from the school books we should learn it from the hymn book's "From Greenland's icy mountains to India's coral strand." But the hymn book is more correct and more careful in its statement than the ordinary geography, for the geography says that Greenland is icy and lets it go at that, but the hymn book specifies, "From Greenland's icy MOUNTAINS," and that is exactly correct.

The mountains of Greenland are icy and Greenland is mostly icy because it is mountainous. It is a mass of high mountains in a region of



Photo by courtesy of Mr. Stefansson

Stefansson and Party Building a Snow-House for their Own Occupancy in the Arctic.

(Continued on page 323)



SOME TYPICAL MOUNTAIN SCENERY

THE little mew of a cat-bird drops into the quiet, on a note that I can only describe as suggestive of a bird's ecstasy, yet of a quality that is suggestive to a human ear. Before me, dancing flakes of silver are the sun's reflections from the lake. Across the lake: forests; round me: forests. If I could be landed here out of London, without any slow approach, I know the emotion of that arrival would come chiefly from the odours of these forests, almost palpable. Living here among them I am only intimately aware of their rich scent when I split a log with an axe and so send up a jet of it into the air, or when I lay hold of a tree-branch in passing and, by the pressure of my hand, crush out the odour. The warmth of the sun is pleasant, on my neck, my hands. This is not a terrible heat as of Mesopotamia; it is kindly; it takes the rheumatism out of joints and does not give sun-stroke.

All the time there are trills and arpeggios of song going on in the woods, from birds the size of thrushes and with breasts red as the breasts of robins. These trills too, like the voice of the cat-bird, have a hint of sadness in their beauty to human ears. And then a little bird, grey, with black markings on its wings,

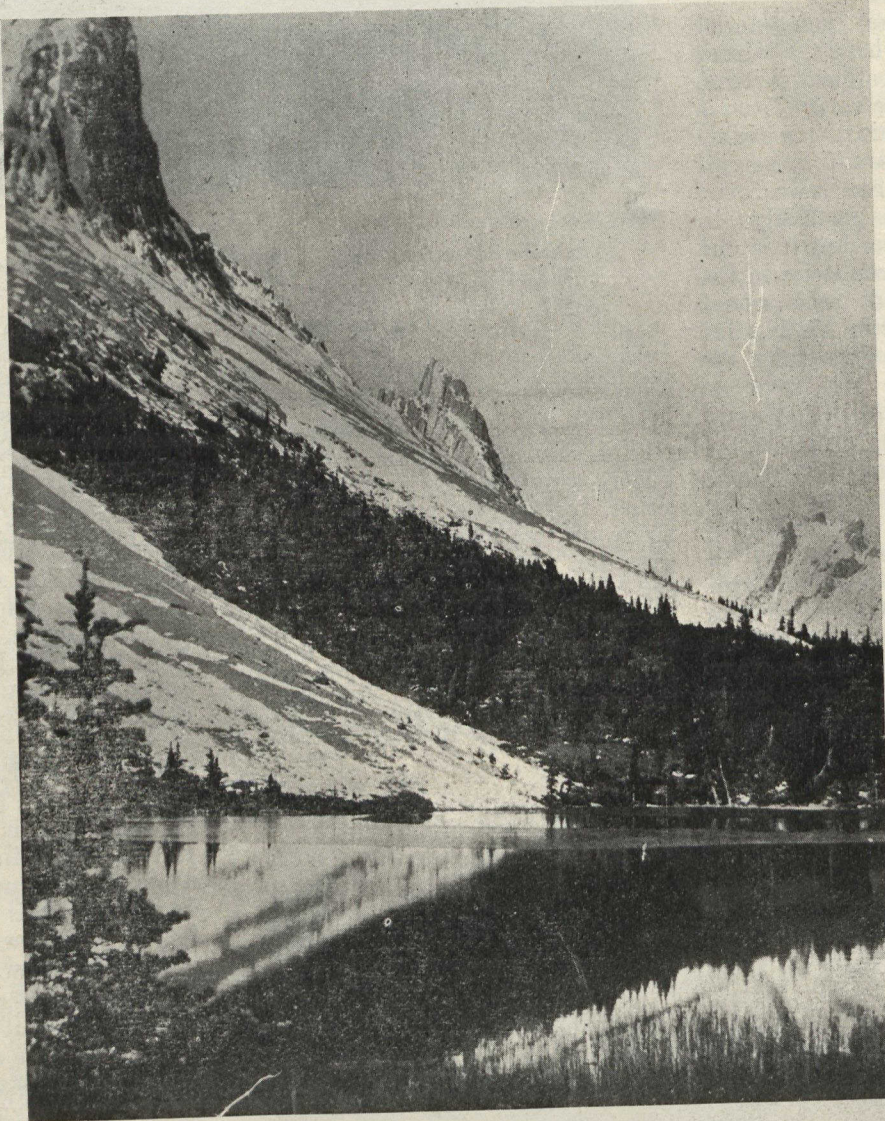
emits a series of tiny piping notes; and these again are half-jocund, half-sad. In and out among the fallen trees and their tangled branches, looking like mice at first glimpse, go little wren-like birds that stand astrut now and then, wren fashion, and stare, then bob about and about, swopping ends with comical abruptness.

Wild bees hum past; the wasp

called "yellow-jacket" darts his yellow through the green shade. Then there is a hurried flurry and a hum of what seems the largest bee so far, but a scarlet bee. It is a humming-bird. It balances in air and is off again, too quick to follow its flight. Among the reeds, where a stream that prattles downhill makes a fan of its earthy colour on the ruffled blue lake water, a blue dragon-fly shuttles to and fro; and when he hits the tall rushes there is a brief metallic clack. A big white lake gull flaps slowly past over its reflection, that is like ivory in the occasional still patches of jade-green water, as if venerated among the blue.

This is no far-sought inventory of the day. I just note as I see and hear. There is an outbreak as of laughter, and three loons come down out of the heights that make me pucker my eyes as I look up, and rest on the

water, tucking down their wings. A kingfisher veers along the shore, rising and falling as if on an invisible aerial switchback, alights on a dead tree-top by the water side and chatters there. Replying to him comes a series of harsh calls that I know are the voices of blue jays. They are back in the forests somewhere, popping up and down in the trees as canaries pop up and down on



Lake on the Elbow Pass at the Head of the Elbow River
in the Canadian Rockies

In the Canadian Rockies



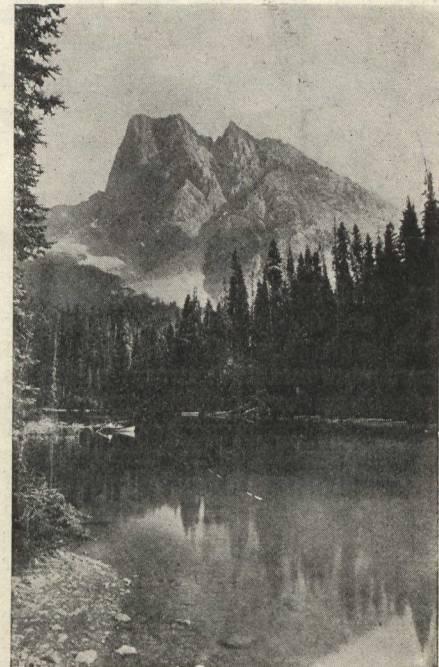
Lake Louise and Mount Lefroy

the perches of their cages, waiting for the pickings from my camp. They must be watching me all the time. I rose just now to tend the cooking-fire, and they at once talked of my movements with a series of harsh squawks.

Spiders, that must have been in the niches of the log on the fire, over-heated, scurry off into the sand, up the inch-high hills, and down the inch-low valleys, in great haste and trepidation. And now a jay, impatient, flies close, perches in a bush, raises its crest and screams deliberately at me, demanding a dole. It looks like a blazing blue parakeet.

Where is all this? So my readers may ask. It is in the land of Our Lady of the Snows! The summer has come to Kootenay Lake. It is only April. There is still a snap in the air at dawn and after dark; but all through the hours of sunshine, whatever troubles political, religious, financial, maybe in the world; whatever troubles there may be of national debts or personal debts to the grocer and the butcher, there are the sun and the birds and the silver ripples and the creeks with their coloured stones foaming down in the big quiet.

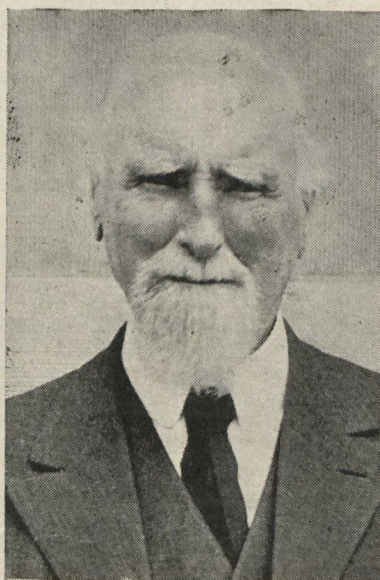
In the Canadian Rockies



Burgess Mountain, Emerald Lake

Robert Dollar's Formula For Success

WOODS LIFE is a hard life, but it is wonderful how many of the lumbermen who roved the length and breadth of Ontario and Quebec, fighting their battles against business problems, slumping at times into bankruptcy and rising again by sheer determination, have survived to enjoy in good health their seventieth and eightieth and ninetieth year. Robert Dollar, now a great power as a trans-Pacific steamship owner, an international trader with offices all through the Orient, is such a type. Recently he celebrated his 79th birthday at Vancouver. He regularly reaches his of-



MR. ROBERT DOLLAR

fice at nine o'clock, interviews half a dozen people in rapid order and is said by his business associates to have made his personal plans for another ten years of active business life.

Mr. Dollar, when in Vancouver, gave to the Western Lumberman a formula which he called "The Success Family." It is well worth perusal, particularly in view of the fact that the author of it once worked as cook boy for the late Hiram Robinson, in his Gatineau lumbering operations and received his first education by scrawling "suans" on wrapping paper laid across a barrel top.

THE SUCCESS FAMILY

KNOW the Success Family!
 The Father of Success is **WORK**.
 The Mother of Success is **Ambition**.
 The Oldest Son is **Common Sense**.
 Some of the Other Boys are **Perseverance, Honesty, Thoroughness, Foresight, Enthusiasm and Co-operation**

The Oldest Daughter is **Character**.
 Some of her Sisters are **Cheerfulness, Loyalty, Courtesy, Care, Economy, Sincerity and Harmony**.
 The Baby is **Opportunity**.
 Get well acquainted with the "Old Man" and you will get along pretty well with the rest of the family.

TORRESST FIRES and SINKS

By Percy E. Nobbs, M.A.

READERS of this Magazine are no doubt only too familiar with the destruction, both permanent and temporary, which is wrought on land by a forest fire, but in assessing the havoc we often forget what happens below the surface of the rivers and lakes. The smiling blue of waters ruffled by a Summer wind, and the sad black mirrors of the lakes as we know them in an early November frost, both tend to hide their secrets of what goes on beneath the surface as securely as Winter's armour-plate. Not the least of the co-ordinated benefits which properly regulated sport contributes to the cause of conservation is the knowledge and experience gained from probing the secrets of the lakes and rivers with rod and line. Let us consider how the angling interest, (and therefore the ascertained, or potential, food supply) is affected by a forest fire.

The number of fish in any given system of waters is determined chiefly by the nature of the spawning beds, and the size of the fish is determined, within the limits of growth of the species, entirely by the food supply. Now, all fish are migratory, more or less; the spawning ground is not the feeding ground (except for predatory fish of other kinds) and there are very few species in Canada which do not require running water for purposes of spawning. All game fishes do. The migrations vary from the extreme cases of the eel, which spawns in the depth of the ocean and feeds inland, and the salmon, which feeds in the sea and spawns inland, to fish such as chub and grey trout which may spawn at an outlet to a lake and feed all round the banks, and spend the Summer (as the speckled trout do, too) in the spring holes.

Now, the effects of a fire on the spawning grounds are manifold. Certain reliable limits of depth and of temperature, and a clean, gravelly bottom, together with accessibility, are the essentials of a spawning ground. A forest fire, by denudation, affects depths in this way. Rain, over burnt ground, causes rapid spates, while in drought the disappearance,

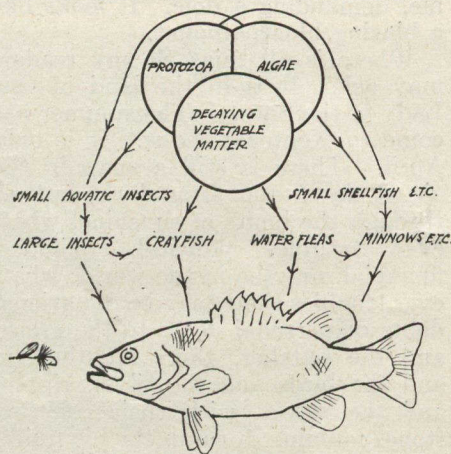


DIAGRAM SHOWING THE ORIGINS OF THE FOOD SUPPLY OF THE BLACK BASS.

or diminution, of the watercourse becomes more pronounced when the natural sponge of the forest and its floor are suddenly removed. Take the case of trout hatching out, like salmon, in April or May in Eastern Canada. An over spated stream is scoured by the Autumn rains and the Spring thaws. The ova may be moved, or smothered with silt, or destroyed by pressure due to depth, and such fry as are produced are liable to

suffer from these and the additional disadvantage of low, warm water, early in the season. Except in the case of small, confined waters a fire does not heat the water sufficiently to kill the fish—they seek deep water and escape, *pro tem* but the warm, lowered water from which there may be no escape the following Summer will surely do enormous damage. The ruined spawning bed and nursery is one result of fire, and another is the poisoning of the water. Ova and fry are very susceptible to impurity of water though grown fish are comparatively adaptable as the alcoholic waste from many a distillery has proved, time and again. If it is borne in mind that many a stream has been put out of commission for spawning, from end to end, by the presence of an oiled road following its bank, the contraceptive tendency of the very dilute poisons is manifest. When the burnt forest reeks sourly in the rain that has come too late to save it, alkaline salts and toxic matter, the result of distillation of tars and resins, are finding their way into the lakes and rivers, and damaging, if not destroying, the very delicate organisms of young life, vegetable and animal.

The Feeding of Fish

Now, as to feeding. Let us consider the case of the brook or red speckled trout as typical, this being a fish enjoying a varied appetite. The aquatic plants are of course affected by any change in the quality of the water, and still more by the behaviour of a lake or stream in the matter of rising and falling water levels. It is ultimately on the weed that the smaller creatures which constitute the food of fishes depend. Some weeds are highly beneficial to fish life, other are not; and it is generally agreed that too much "Canada weed" is destructive, but the point is, that fire in the forest affects the floor of the lakes and streams almost as much, if less suddenly, as it does the floor of the forest.

Apart from the aquatic lesser life of the streams—shell fish, water fleas, shrimps, crawfish, minnows,

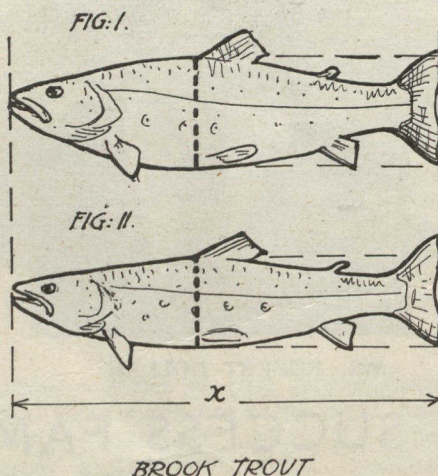


FIG. I. WELL CONDITIONED FISH
DEPTH ABOUT $\frac{1}{4}$ OF LENGTH.
FIG. II STARVED FISH
DEPTH $\frac{1}{5}$ OF LENGTH OR LESS.

etc., which rather directly depend on weed for food, and in turn provide the food of sizeable fishes, insect life constitutes a very large proportion of the fishes' dietary. This insect life is of two main kinds—of land origin, and of water origin. Thus moths, beetles and caterpillars find their way into, and on to, the water, especially on the windward side of lakes and rivers, and form no inconsiderable part of the diet of trout and other surface feeding fish. These perish with the fire and are only replaced gradually by years of immigration from outside the burned zone. As to the water flies,—those that pass their caterpillar and cocoon stages below water as caddises rise to the surface as nymphs, and mate above water, these of all kinds, and in all stages, form the staple food of fish, great and small. There is little doubt but that once the routine of nature is upset in the matters of pollution, water levels, sedimentation and so on, these delicate creatures suffer much in the same way as do the ova and fry of fish.

The writer has been familiar with a tract of 50 square miles of forest country, over a period of many years. It was burnt over some twenty years ago. Before that, good sized trout were generally distributed throughout the many lakes and streams dotting and threading the area. For some years after the fire there seems to have been no breeding, or what little there was, only served to fill the maw of cannibal fish; small and moderate sized trout disappeared and fly fishing was useless. One could catch long, lean, lantern jawed trout here and there with a troll or bait. Gradually small trout reappeared at a few spots, with an occasional monster in good condition. Twelve years after the fire, things began to improve, here and there, and where trout have reappeared they have become larger each year, of late. There are now pools, or rather outlets, here and there, where one-pounders are the rule, and two and a half pounders not a surprise. Most of the waters, however, are still barren, but two small lakes where the fire only

reached one corner, and the green-wood survived, and which have had the advantage of wholesome neglect, are now well stocked with natural bred three pounders in good condition. Other readers of this Magazine may be able to give more definite information on some of the points suggested above.

One hears a good deal these days about sportsmen as poor, stupid firebugs, and some of them, like a few of the very green college boys enlisted as fire rangers, do go about throwing matches into dry grass, and leaving smouldering fires. In the Province of Quebec, on Club territories at least, irresponsible sportsmen are very rare, and good guides the rule. The angling possibilities of a forest range can, if sanely exploited, provide by far the cheapest way of keeping the trails open. Trails are a by-product of sport. When a fire has to be fought, a good and known system of trails is more than half the battle.

Fire is the angler's worst enemy as well as the woodsman's.

CLASSIFIED ADVERTISING SECTION

(Rates under this heading may be secured upon application)

SUMMER RESORTS

Are
You
Planning
Your
Summer
Vacation
?



Why
Not Fix
on
This
Beautiful
Spot
?

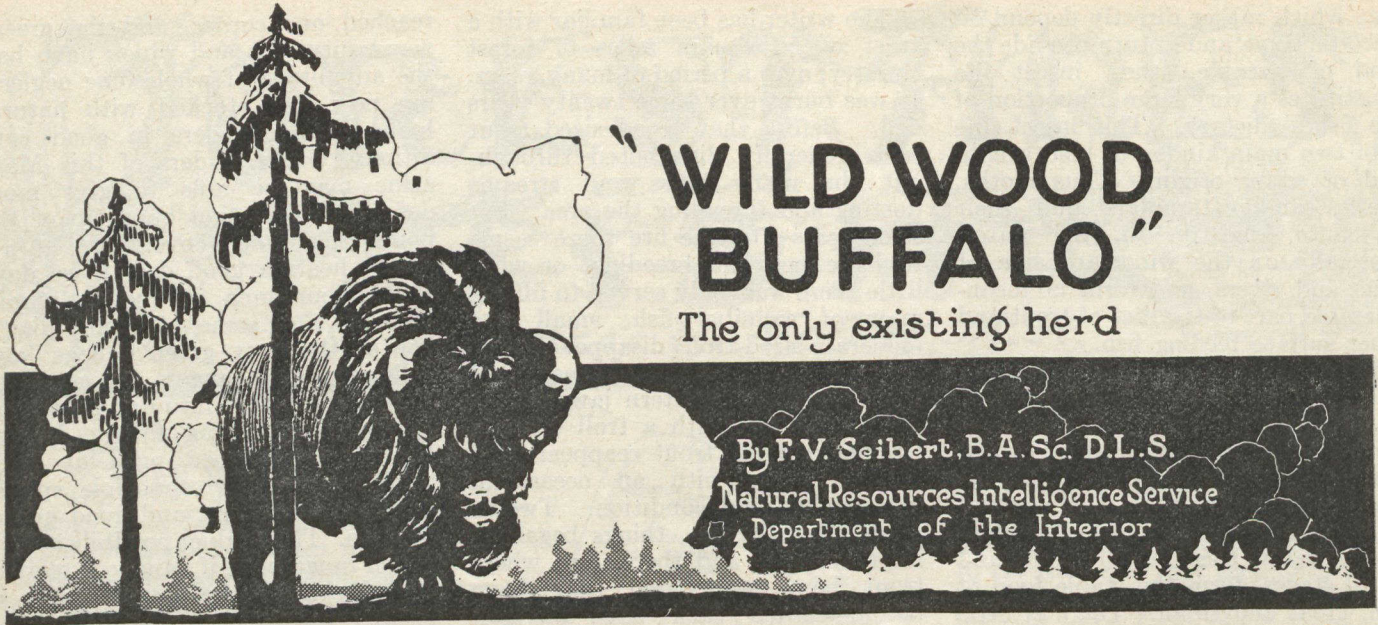
IT MUST BE A GOOD PLACE BECAUSE CAMPERS WERE HERE LAST YEAR.

They chose it because of the splendid stands of trees, so dense and gloriously green that every view was a tireless delight.

The campers, as we said, had a real good time. Of course nobody else for four generations will have a good time in the same township but then, there are other townships and personal liberty must be preserved at all costs.

Only a camp fire left burning, helped by a few lighted cigarettes and—
But we are forgetting our advertising mission.

Write for full particulars as to how to reach the sylvan paradise described by the photograph. Boating, bathing, fishing hunting (75 miles off.) Golf (by correspondence.) Sun baths a specialty. Special rates to geologists.



Wood Buffalo Park, set aside as a Wild Life Sanctuary by order-in-council of the Canadian Government under date of December 17th, 1922, is the largest national park in Canada. It contains within its boundaries the only existing herd of wild wood buffalo—the only remnants in a wild state, of the millions of buffalo which at one time roamed throughout the great central plains of

North America and which included in their habitat over one-third of this continent. This park will, in time no doubt, become one of the playgrounds of Canada where man may see, in his natural state, this monarch of the great North American plains, which has been so intimately woven into the romance of our early pioneer life. These animals, superior in size, weight and stamina to any other buffalo in existence, may yet have an immediate practical value in improving the blood of other herds now in captivity. As a sanctuary not only for the wood buffalo but for moose, deer, woodland caribou and all fur-bearers within its boundaries this park promises to play an important part in the economic affairs of northern Alberta and the Northwest Territories.

During the summer of 1922 the writer, in his capacity as an official of the Natural Resources Intelligence Service, Department of the Interior, made an exploration tour of the Wood Buffalo Park district, the confines and extent of which are indicated on the map herewith reproduced. Associated with him in the work at different times were Mr. Fred. J. Stewart, of the University of Alberta, Edmonton, and son of the Hon. Chas. Stewart, Minister of the Interior, and

Mr. Maxwell Graham, of the Northwest Territories Branch. The main objects of this exploration were to determine the boundaries of the habitat of the so-called wood buffalo and to secure a general idea of the resources of the district, which lies immediately west of Slave river extending as far west as the Caribou mountains, Buffalo lake and Big Buffalo river.



In the shaded section of the map above are contained about 10,500 square miles of territory which has been set aside by Order-in-Council of the Canadian Government as a sanctuary for the only remaining herd of Wild Wood Buffalo, on this, or any other continent. The land included in this area while unfit for agricultural purposes is well adapted to provide year-round grazing for the Wood Buffalo herds of the present and the future.

From careful observations, thus made, an estimate places the present number of wood buffalo at from 1,000 to 2,000 head. Since they have been protected they have been increasing, and much evidence was secured to show that they are still increasing. Young stock, yearlings and calves, were observed at various times, and many tracks of such stock were noted throughout the range. Just previous, however, to the first action of the Dominion Government in affording them protection they were on the verge of extermination.

The gentle, unsuspecting nature of these magnificent specimens of our wild life has made it all the more necessary that they should be protected. That they were not exterminated long before their location was known to officials of the Dominion Government is due almost entirely to the inaccessibility of their range and the inherent indifference of the native Indians, who refuse to go far or exert themselves to any degree to secure food. With transportation into this north country improved, conditions have changed. Many white and half-breed trappers are pouring into these northern areas, and without ample protection our last "wild" buffalo would soon disappear.

Some Facts Concerning Wild Wood Buffalo, as Related by Mr. Seibert

THE habits and range of the Wood Buffalo up to the present have never been fully dealt with by any one. In fact, until last summer the extent of their habitat was not even known. The general impression has been that they inhabited a region almost inaccessible. A few years ago they could only be reached after a long, tedious journey, but transportation has so improved within the last few years that now they may be said to be almost at our door.

Today, twenty hours by train to Waterways, on the Clearwater river, two days by modern river steamboat to Fitzgerald and an automobile ride of sixteen miles over the portage to Fort Smith take the traveller to the very threshold of this area. One day by saddle-horse from Fort Smith will bring him to where he is almost sure to see buffalo during July and August any day he cares to look for them.

The habitat of the wood buffalo is divided into two ranges, which have as a common boundary the upper waters of the Little Buffalo river. The southern range, extending south from near Fort Smith to the Peace river and from Slave river west to the Jackfish and Little Buffalo rivers, has been patrolled for a number of years by rangers of the Dominion Government. In our work last summer we were fortunate in having the assistance of William McNeill, chief



Fred V. Seibert in his exploring "togs" up North.

ranger over this part of the country. His knowledge of the range was of great assistance. The northern range up to this time was not as well known as the southern range, in fact, it was a common impression, even with residents of Fort Smith, that the existence of buffalo on this range was merely a myth.

The northern range was entered by canoe early in the season by way of Slave river, the portage at Le Grand Detour, Little Buffalo river and the Nyarling river. Later in the season the whole northern range was traversed and retraversed by means of pack-horses, and with the assistance of Sousa Marie and Chief Squirrel. Many buffalo were seen over a widely scattered area, and motion pictures of them were taken at widely separated points.

Two Types of Indian

Sousa (Joseph) Marie is the young "bucko" of Fort Smith, the hero of all the native girls and half the married women. He talks English fluently, cannot refrain from boasting, and is a record breaker on the homeward journey. He cannot get too many meals and too many hours

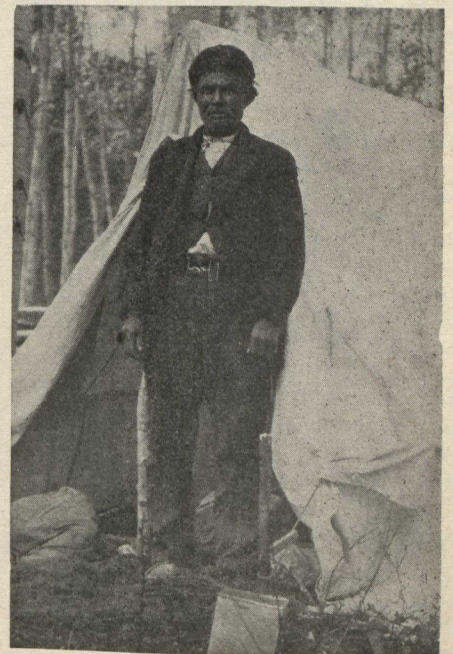
of sleep on the outward journey, but once the horses are headed for home, sleep and food immediately lose their importance and are reduced to mere incidents or unavoidable delays on the way home. His money goes chiefly to purchasing presents for his many sweethearts. He has a strong constitution, better than the average, and if some jealous husband does not prematurely end his career he should live to a ripe old age. But a better companion could hardly have been found for such a trip.

Chief Squirrel is one of the finest specimens of the fast disappearing type of old-time Indian. He is a man whom I am proud to have as a friend. He speaks only a few words of English, and, Indianlike, can understand better at certain times than at others, according to whether he wants to or not. He possesses all of the good traits of the Indian and has never acquired the bad ones of the white. Incidentally, he has no use for a half-breed.

We travelled Indian style, choosing the line of least resistance, across a country which contained large muskeg areas and no pack-trails. Numerous buffalo trails at times assisted our progress. The time at our disposal for the trip was limited. We had to catch the last boat out from Fort Smith or wait until "freeze-up" and mush it over the 285 miles to the end of steel at Waterways. So, while we adopted the Indian's style of



Print from a motion picture film of a Wild Wood Buffalo Snap-shot on the run.



Chief "Squirrel" a type of a "Good Indian" whom Mr. Seibert is proud to claim as a friend.

travelling in the lightest manner possible, reducing our grub supply, wearing apparel, sleeping equipment, and camp outfit to a minimum, we stuck rigidly to the white man's methods of persistent effort. Fortunately we belonged to no labour union. The twice eight-hour day was barely long enough. Réveillé at 4 a.m. was the order of the day, and from that time until 9 and sometimes 10.30 p.m. not a moment was wasted. Seldom was there time even to roll a cigarette except in the last few moments before rolling up in our blankets for the night, and even that indulgence was taken at the expense of the much-needed sleep.

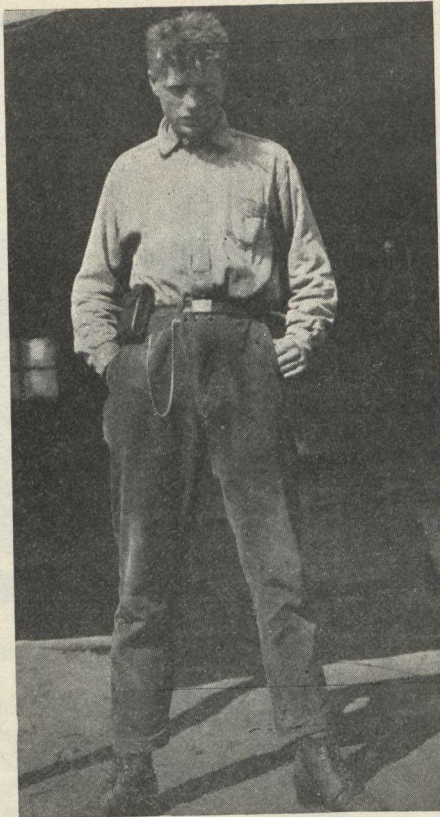
A daily routine such as ours can be guaranteed to dismiss insomnia and cure all ailments affecting the appetite.

The Indian Appetite

The bannock had to be baked after supper. My Indians had confided to me before we started that they never ate much bannock, but when I had to bake it before an open fire, all the while longing for my snug and comfortable blanket, I realized that either they had deliberately misled me or else had an extremely modest estimate of their capacity. Yet the amount of bannock those men could eat, incredibly large as it was, was small when compared to the quantity of bacon and duck or chicken, or all three, they could devour. I shall not state how much they ate at one meal for fear the reader might doubt my veracity. One is disposed to think, however, that two large mallard ducks might be considered a fairly ample meal when taken along with three or four thick slices of bacon and a plentiful supply of bannock washed down by miniature torrents of boiled tea, which reminds me that I can taste that tea even yet.

The Indian's method of making tea is to add the tea to the cold water and then bring it to a boil and continue the boiling process until it has all been used. You cannot hurt an Indian's feelings by warming up tea, no matter how long it has been steeped. The stronger the better for him. Occasionally I made some real tea, but almost as often one or other of my Indian companions would put it on the fire again. We had the same course for all three meals, bannock, bacon, boiled duck or partridge, and the usual boiled tea.

That I took kindly to this bill of fare and did it justice regularly as occasion permitted was brought home to me on one occasion when my



Mr. Fred J. Stewart, University of Alberta, son of Hon. Charles Stewart. He was one of Mr. Seibert's chief aides.

companions, after agreeing on the matter in Chipewyan, stated that they never before had seen a white man who could do everything an Indian could do. After a little thought Sousa says, "Just one other man like dat, Mr. Brabant; you know Mr. Brabant?" He's what you call 'em Hudson's Bay Company Fur Commissionair, Winnipeg. Fi-en man, Mr. Brabant." On another occasion when Sousa and the chief had been jabbering away as they usually were wont to do in their guttural Chipewyan I threw a little German at them by way of diversion. The Chief, through Sousa, wanted to know what that was. After some explanation and further questions I was forced to admit that about two hundred years ago my forefathers were German. With a look of relief, as though he had solved a difficult problem, Sousa said, "That's just what the Chief and I say the other day at dinner; we reckon you not pure whiteman."

The Buffalo Ranges

Both of these distant buffalo ranges are characterized by a type of country, not found elsewhere in northern Canada, a country of subsurface drainage. This underground drainage is so marked in places that it can

be truly said that it is a country of underground rivers. The beautiful Nyarling river, as its name in the native tongue implies, flows for eight to ten miles underground. The Clewi river also disappears into the ground and then emerges again about a mile farther on. In addition to these streams there are numerous sink-holes, evidences of sub-surface drainage. Where these sink-holes occur there is little or no surface drainage. The formation is remarkably dry and usually carries a good growth of grass. It is on this formation that the wood buffalo seeks his summer feed. At the edge of this formation, the sink-holes usually carry water and numerous springs are to be found. These latter usually carry salt in solution. The wood buffalo is therefore always assured of a plentiful supply of water and salt.

Salt Supply Available

The timber is larger than one would expect in the interior at this latitude. This is no doubt due to the superior drainage. Much jackpine occurs of sufficient size for railway ties. Spruce of merchantable size can be found in a number of places. Fire has, however, taken its toll and windfall and brule abound.

The salt springs which occur near the Salt river, about twenty-five miles west of Fort Smith, were for years the only source of supply of salt for the north and even south to Chipewyan. Even now from three to four tons are shipped annually by the Roman Catholic church to their more northerly missions. The water in these springs is practically a saturated solution of pure salt. Numerous salt springs along the Salt river, which is about one hundred and fifty feet wide and from two to three feet deep with a current of two miles per hour, have made the waters of this river unfit for drinking although its source and upper waters are absolutely fresh. There is very little agricultural land in the wood buffalo ranges. Certainly there are no areas sufficiently large for settlement for many years to come if ever.

The buffalo's main article of food is grass. He does, however, at times browse on the leaves of willow and small poplar and a motion picture was taken this summer of one while feeding on a clump of small willow. Occasionally during the winter he will eat caribou moss and the moss hanging from spruce trees. In the northern range the summer and winter feeding grounds are often found quite close together. In the

southern range the main summer range is in the north and the main winter range in the south. In this latter range the migration southward from summer to winter range is during September while the northern migration is in June.

Buffalo as Trail-Maker

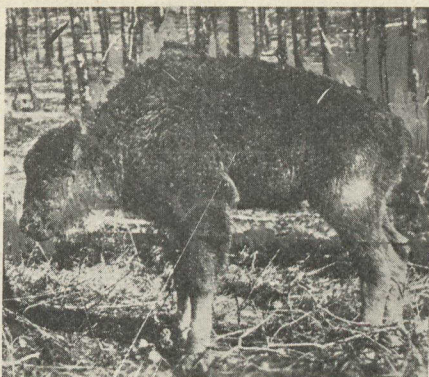
Unquestionably the wood buffalo is without a peer as a trail-maker. I have yet to see a trail locator who can equal him in this regard. As this is a quality he holds in common with his brother on the prairies there is little wonder that many of our national highways follow the paths first laid down by the buffalo. These trails are one of the characteristic features of the range. They start at something definite, a drinking place, a feeding ground or a salt lick, and end at something definite. Unlike the trails of our domestic cattle or horses they always take the most direct route consistent with obtaining the best trail and have few local bends. They maintain one direction for miles, unless diverted because of some serious obstacle. One trail runs almost across the summer range for a distance of thirty miles and some of the migratory trails extend north and south uninterrupted for a distance of over sixty miles.

The wood buffalo prefers dry country but his ability to cross bad muskeg and swamp when necessary is truly remarkable. He ploughs through the most difficult morasses which even a man might find difficult to cross and, in so doing, emits loud pig-like grunts that can frequently be heard over a quarter of a mile. There is very little country in Northern Alberta and the Northwest Territories which the buffalo cannot cross if necessary.

Buffalo Wallows Remarkable

Next to the trails the numerous wallows are the most striking indication of the presence of wood buffalo. These are places which the buffalo has cleared of all sticks, roots and sod or leaves and on which he delights to roll. He loves a good roll at all times and particularly during July and August when this gives him relief from the flies. Later, when the flies have gone, he uses these wallows quite extensively for his daily sun bath and momentary snoozes.

Most of these wallows are just large enough for a buffalo to roll in and yet not a few are large enough to accommodate a whole herd. One of these was over six acres in extent and all resembled cattle pens on a large ranch.



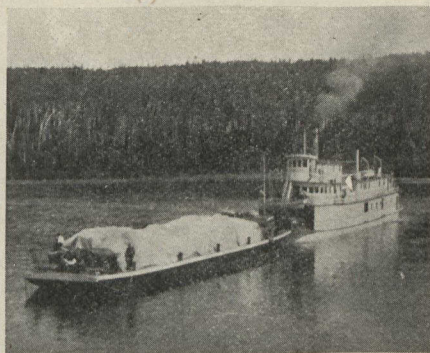
A Baby Wood Buffalo who seems inclined to be "hostile."

Buffalo Habits Regular

The rutting season commences about the first of September and the calves come in June and July, late enough to avoid the cold spring weather. Their habits are remarkably regular. They generally frequent the same places at similar periods of the year and usually travel the same trails to go from one place to the other.

During the summer they are found in herds, usually from twelve to fifty animals, and in pairs or, more often, singly. The individual animals, always bulls, are seldom difficult to approach. They are often found lying down during the warm part of the day when it is quite possible to get within twenty yards and in some cases much closer. One animal last summer was approached to within seven yards while another was met on an abrupt bend in the trail at five yards and still another at three yards.

The general attitude of the individual animals and pairs appears to be that they have little to fear, which goes to show that they are seldom disturbed. Once they are aware, however, of the presence of a man their actions are decisive and



The Str. "Slave River" which plies between Waterways at the end of A. & G. W. Ry. Steel and Fitzgerald at the head of Slave River Rapids. This steamer takes two days to make the voyage "down north" and four days for the return trip "up south."

prompt. Their one idea is to get away and this they do with remarkable speed. In some cases they do not stop until they are at least out of sound and sight. Others will merely run for 50 to 100 yards and then stop at the edge of the range of visibility. In these cases their curiosity overcomes their fear. They face in the direction from which they came and sniff the air for a scent. If they do not scent anything they will often circle until they do, when away they will go as fast as ever.

An Ancient Report

It is interesting to note what Samuel Hearne, of the Hudson's Bay Company, said of the wood buffalo which he encountered south of Great Slave Lake and east of Slave river as long ago as in 1772.

"They are of such an amazing strength," he wrote, "that they frequently brush down trees as thick as a man's arm; and be the snow ever so deep, such is their strength and agility that they are enabled to plunge through it faster than the swiftest Indian can run on snowshoes. To this I have been an eye-witness many times. I once had the vanity to think that I could have kept pace with them; but, though I was at that time celebrated for being particularly fleet of foot on snowshoes, I soon found I was no match for the buffaloes, notwithstanding they were then plunging through such deep snow that their bellies made a trench in it as large as if many heavy sacks had been hauled through it."

Even when walking with that deliberate and apparently slow tread which is their peculiarity, the speed of these ponderous animals is most deceiving. A man must run to overtake them.

Met a Curious Bull

Over one hundred and fifty buffalo were seen before one was encountered that would not run at first sight. This animal's curiosity got the better of him at the very start, and the fact that there was a strong wind blowing from him to me made it impossible for him to realize how great was his danger. Two shots from a 22-calibre revolver fired in the air made no impression. He took less notice of that than he would have taken of the buzz of a bull-dog fly. He never faltered, but kept up his deliberate advance. When he had approached to within thirty-five yards I began to look for a tree to climb. The nearest one at this particular place was over half a mile distant and to me at that moment it appeared to be

at least a hundred miles away. Those snorts of his I felt were not entirely snorts of welcome and those horns were too sharp and his hoofs altogether too active for me to desire a more intimate acquaintance. It was a case of do something and do it quick. A couple of loud shouts and a charge of a few yards in his direction, however, served to turn him in the opposite direction, when he galloped off as fast as his legs could carry him.

The herds, containing as they do, animals of both sexes and all ages, cows, calves, yearlings and bulls, are more restless and suspicious than the individual animals. This no doubt is due to the presence of the cows and their calves and the natural instinct of the former to protect their young. The largest herd seen within recent years numbered one hundred and fifty head. Of all the herds seen, each contained one large bull whose size was a conspicuous feature of the herd.

Larger Than Ordinary Buffalo

The name "wood buffalo" leads the observer to expect a type of animal somewhat different from the plains buffalo. Nevertheless they have the same conformation, the wood buffalo, however, being larger and darker. The wood buffalo of northwestern Canada are without doubt superior in size, weight and

stamina to any other herds now existing. These differences may be accounted for by the fact that they have always been wild, and also because of the shelter and good feeding conditions within their range. A specimen of wood buffalo at Calgary weighed, when killed, 2,402 pounds. A number of animals were seen last summer that were at least as large as, and perhaps larger than, this specimen.

The wood buffalo's sense of hearing does not appear to be acute, neither is his eyesight good. He depends for his protection on his keen scent and on his superior size and corresponding ability to defend himself when forced to do so. His sense of smell is particularly keen. At different times buffalo were observed taking notice of tracks of man and horse a number of hours old. On more than one occasion they were seen to come to a human track and sniff and change their course.

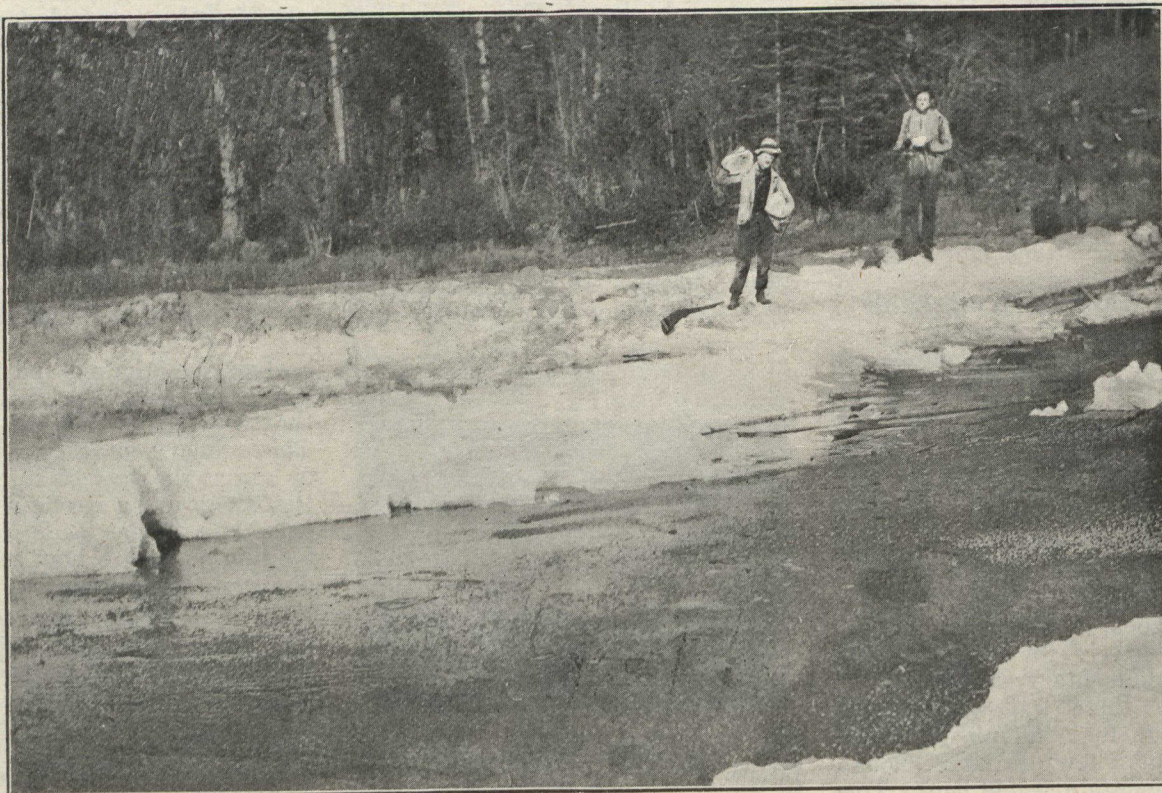
On a couple of trips through a portion of the southern range, where the buffalo were particularly numerous, it was later observed that a number of the herds in that locality left for a new area. Some of these animals never saw us on either of the trips, but had picked up our tracks soon after we passed and as a result had moved to other parts.

Except during the rutting season

these animals display a gentle, friendly and curious but not timorous nature. When roused, however, to a fighting pitch, they become exceedingly dangerous, rushing at the enemy with irresistible force.

The wood buffalo have existed in these northern latitudes from early times. Samuel Hearne's experiences already have been quoted. Sir Alexander Mackenzie, speaking of the country north of Great Slave lake and the Mackenzie river in 1789, said that "the country is so crowded with animals (i.e., elk and buffalo) as to have the appearance, in some places, of a stall-yard from the state of the ground and the quantity of dung which is scattered over it." In 1808, Harmon found them plentiful on either side of the Peace river, near the Rocky mountains. The most northerly recorded occurrence was reported by Franklin in 1825, at Slave point, on the north shore of Great Slave lake. "Sousa King" (Joseph Beaulieu), of Fort Resolution, states that his father, the notorious King Beaulieu, used to put up buffalo meat north of old Fort Providence, which was then situated on Great Slave lake, near the north channel of the Mackenzie river.

To-day the only existing herds in their native wild state are those now ranging west and south of Fort Smith, N. W. T.



Remarkable Salt Springs which are located about 25 miles west of Fort Smith. From three to four tons of salt are shipped each year, from here to the more northerly missions of the Roman Catholic Church.

Plantation
of
Black
Walnut
on
Heavy
Soil



The
Trees in
this
Grove are
about
30 years
of Age

Planting Some of Our Common Hardwoods

By Arthur Herbert Richardson, M.A., M.F.

THE PLANTING of hardwoods has not received so much attention, or has not been popularized to the same extent as the planting of evergreens. This should not be! The reasons perhaps, are that hardwoods do not form as close a shelter wall during Winter months, they require, as a rule, better soil than the sand preferring pines, and also are a little more difficult to handle in planting.

Farm Wood Lots

When a farm consists of all good agricultural soil, it is doubtful whether it would be wise for the owner to plant even a small area with forest trees. The only justification for this, would be for sentimental reasons and in order to have wood ready at hand to be cut as wanted. If a man's property is all good soil he could more than pay for the trees he might grow on such a field from the returns received from agricultural crops. Usually, however, there are small parts of the farm, such as a side hill, and land cut off by a stream or railroad where certain hardwoods might profitably be grown.

The foregoing may explain in part why these trees are not being planted

more extensively throughout our country, and yet over against this there are a number of things which can be said in favour of hardwoods and which should encourage land-owners in this pleasant and satisfying work.

When it comes to the securing of seed, evergreens require hard and expensive work in gathering and an elaborate process of extracting before the seed is ready to plant. On the other hand, these common hardwoods may be gathered from roadside trees with little difficulty and require no additional handling before planting.

When grown in the nursery, evergreens require careful handling, shading and watering, and are transplanted at least once during the two or three years they grow there. Hardwoods require neither shading nor watering and seldom remain in the nursery longer than one year. Because of the ease with which these trees are raised, they also are adapted well to home growing, and the man who wants to be independent of nurseries, and have material on hand when wanted and in the desired quantities, will have much better success with hardwoods than with conifers.

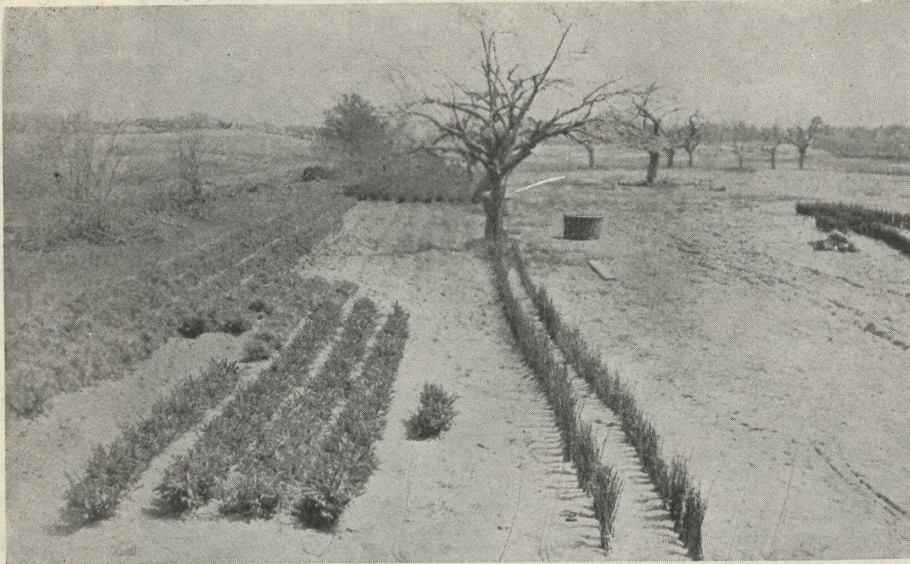
With evergreens it is not advisable

to attempt extensive reforestation by direct sowing of seed on the planting side, owing to the many misfortunes which may come to the young trees before they are able to compete with surrounding growth. Hardwoods, moreover, lend themselves admirably to this kind of planting, especially the nut trees, and may be sown in the Autumn as soon as the seed is gathered.

Choice of Species

The Black Walnut grew originally and finds its best development in the most southerly part of Ontario, along the Lake Erie shore. Fifty years ago trees of 2-3 feet in diameter of this species were not uncommon and occasionally today one finds rails in old fences or logs in old houses, of this valuable tree. The walnut has its best development in deep loamy soil of good agricultural value. It is also grown successfully on lighter soils and will make good growth on heavy land. By planting, its range has been greatly extended and trees are reported as far from its original home as Ottawa. This means that it may be grown in Ontario, at least south of Georgian Bay.

As the foliage of this tree is quite



Thousands of Hardwood and Conifers heeled in ready for planting.

thin and open it is preferable to plant it in mixture with some other species such as white ash, red oak or spruce.

The nuts ripen during September and may be planted as soon as gathered — if squirrels are not too plentiful — or they may be stored in a pit over Winter. Not infrequently the nuts are dried for Winter use, their flavour being similar to, but a little stronger than butternuts.

Butternut is very similar to walnut in appearance and habit. It is not so exacting as regards soil requirements and is frequently found on poor land and in rocky lime-stone country. It is often found growing in river bottoms and along the edge of streams. Its range is more extensive than walnut and may be grown generally throughout southern, eastern Canada. The nuts ripen in September and are a very fine flavour.

The Red Oak is a common tree with us in Eastern Canada and one which might be used more for planting work. It will grow on poorer soils than any of the trees mentioned in this article and because of this is adapted to planting on light land providing there is fairly good drainage. The acorns are not edible, are ripe in September and should be planted on the permanent site soon after gathering.

Hard Maple and White Ash are two trees which need little introduction. Both are prized for the valuable lumber they produce and the Maple especially for its sugar producing qualities. Hard Maple has its best development on sandy loam with good drainage, but is often found on heavy soils and lighter sand. White Ash

prefers fertile or moist land where hillsides flatten off into benches and will not do well on light soil. Both trees are prolific seeders and have their time of gathering in September. Maple seed drops to the ground when ripe where it may easily be swept up from the road-side. Ash seed clings to the tree after the leaves have fallen and may be gathered by climbing the tree. The seed of both may be planted as soon as gathered, or stored in layers of sand until Spring.

Soft Maple and Elm are common on heavy and wet land, or where drainage is uncertain. Not infrequently one sees a soft maple swamp which has been cut over, with several vigorous shoots growing from each stump. Elm is a favorite everywhere and is seldom found in pure stands. It is best known by an isolated specimen, beautifully formed

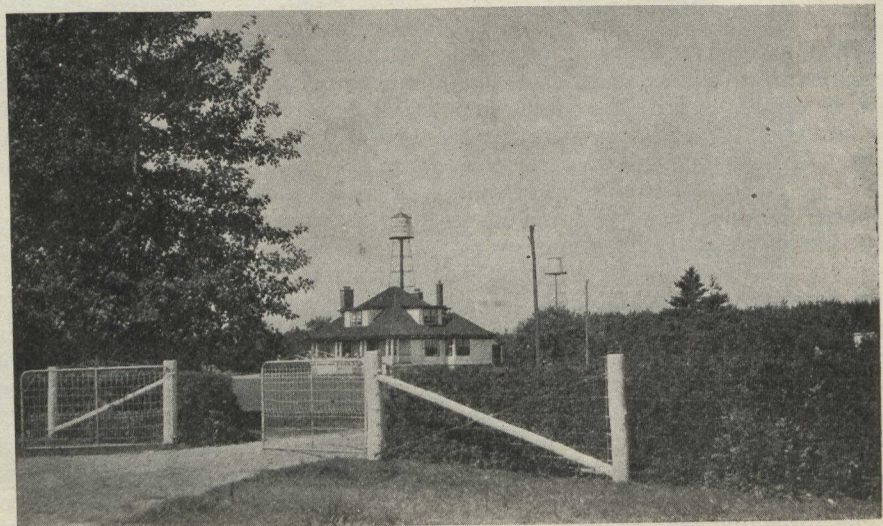
and standing as if on guard on some windy hill. Both trees will grow on lighter soils providing there is some moisture.

The seed of Soft Maple and Elm may be gathered in early June. Both fall to the ground when ripe and may be swept up from bare places or along roadsides. The Soft Maple seeds are similar in shape to the Hard Maple and a little larger. The Elm is quite small, being $\frac{1}{4}$ - $\frac{1}{3}$ inches across the wing. This seed may often be gathered conveniently from the surface of a stream or pond over which the trees hang. Both species should be planted as soon as gathered.

Planting Young Trees

It may be that a land owner prefers to plant a part of a good field with hardwoods, or wishes to establish a wide protective belt of some broad-leaved species on the borders of a tillable land. If the area has been cultivated the work is quite simple. The trees are carried along the planting line in a pail partly filled with water, a hole is made with spade or shovel after which the trees are carefully planted and the earth formed about the roots.

If the field has not been cultivated and is of good soil, the surface will be covered with grass and other vegetation. This should be removed for a short space, say a foot and a half square, before the tree is planted. The easiest way to do this is to run a shallow furrow, six feet apart, after which the trees may easily be planted. When it comes to hillside planting and it is not convenient to use a plow, the spade or shovel must be resorted to, or if the site is rocky, a grub or mattock should be used.



Ontario's Fine Forest Tree Nursery at St. Williams.

Planting Seed

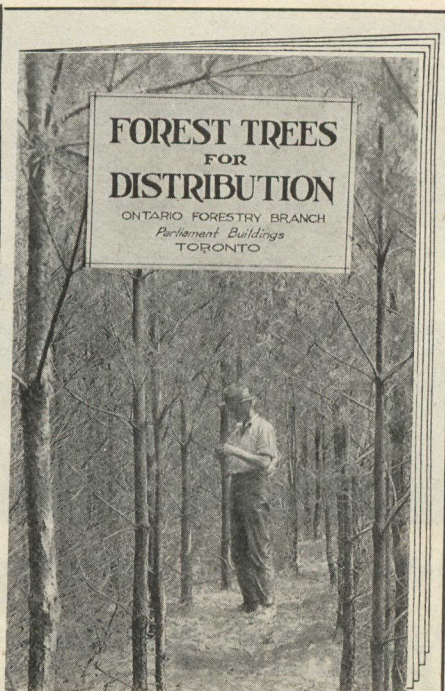
Sometimes hardwood trees for reforestation purposes are not easily obtained, or the desired species may not be available from the nearest nursery. For either of these reasons, or simply because of a man's inclination, it may be desirable to plant seed direct. Now the seven species of hardwoods mentioned are all suitable for this kind of work, and, as far as the organizing in the field is concerned, the planting moves along much in the same way as if one were using trees.

In the case of Walnut, Butternut and Oak, it is customary to plant these by dibbling. A hole is made with a sharpened stick after which the nut is dropped in and covered with about twice its own thickness of soil. If the field is cultivated, or if ploughed furrows are used, the nuts may be either dibbled or planted with a hoe.

With Hard Maple, Ash, Soft Maple and Elm, the method used is termed seed spotting. If there is vegetation on the site a small area of this should be scraped away forming a cleaned area or spot. Into this several seeds should be scattered and then covered with earth. If the field has been cultivated, the planting is very easy and if a furrow is used, the spots are marked out at six foot intervals and built up slightly to prevent excessive moisture in the trough of the furrow.

Cultivation.

As hardwoods are grown on the better classes of soil, there is bound to be more competition from grass and other vegetation. This means



The above circular is being distributed by the Ontario Forestry Branch and gives the conditions under which trees are sent out for waste land planting in Ontario.

This work has been growing steadily since its inception in 1907 and preparations are being made to carry on reforestation even more extensively. Last year the Forestry Branch distributed 1,059,232 trees of all species for this kind of work. There is a larger supply on hand this year for distribution, but judging from the number of applications already received some will not be able to secure their material this year. It is suggested that persons contemplating tree planting make application for trees just as soon as possible.

that the young plantation must be cultivated. In fact, it is almost hopeless to attempt to grow hardwoods without giving them some care during the first Summer at least. It will not be necessary to cultivate the whole area laboriously, the cutting back of competing growth wherever this is seriously interfering with the young trees should suffice. This will mean that a few hours with a hoe at odd intervals during the Summer should produce the desired effect.

In connection with the cultivation of hardwoods, there arises the question as to the choice of planting material. If the stock obtained is large — say two or three year transplants — these could be cut back severely at the time of planting, making as little bulk as possible, and when growth commences they would likely shoot up far enough to clear surrounding growth. If one year old stock is used, as is more common in forest planting, the trees will adapt themselves more easily to their surroundings and will be handled easier in planting than the older material; on the other hand they will not grow so tall the first year and, consequently, will require some cultivation.

Where to Secure Material.

Trees for forest planting may be secured from the Department of Lands and Forests, Province of Quebec, The Ontario Forestry Branch, Toronto, and the Dominion Forestry Branch, Indian Head, Saskatchewan. Usually hardwoods are available for distribution, if not, correspondence will be invited with any of these Departments and the names of local nurserymen, if any, who handle such material, will gladly be forwarded.

PLEASE MAIL THIS COPY TO A SCHOOL TEACHER

Scores of readers of the "Canadian Forestry Magazine" make each copy do double work by mailing it to school teachers, clergymen, and other influential citizens of their acquaintance. One man mails his copies to Wales, another to India, but what we are asking now is that you give your copy to a school teacher, if possible. Two cents will accomplish this service. You might mark any special articles that you consider more than commonly worth while.

The Forestry Magazine is a publication with a positive patriotic purpose.

Help to double its influence!



Mallards and White Gull Ducks at their Lunch in J. L. Morden's Sanctuary.

Wild Life Responds to Human Kindness

J. Lake Morden, Bowmanville, is Successful as Tamer of Birds and Beasts

By George A. Mackie.

KINGSVILLE is not the only Ontario town which can "point with pride" to its Wild Bird Sanctuary, nor is Jack Miner the only firm believer in, and practical demonstrator of, the doctrine whereby wild geese and ducks can be tamed by human kindness so that they are more domesticated than the ordinary barnyard variety of water fowl. At Bowmanville, Ontario, about 40 miles east of Toronto, Mr. J. Lake Morden maintains Winter quarters for a flock of wild geese and wild ducks which is limited only in size by the accommodations he has to offer.

During the past Winter, Mr. Morden's flock of "tame wild fowl" consisted of eleven geese, a saw-bill, a keel, twenty-six mallards and ten white gull-ducks—these latter, Mr. Morden believing to be a cross between a sea gull and a wild duck. Mr. Morden feeds these ducks himself and the fact that he is the president and general manager of John Mackay Company Limited, manufacturers of Cream of Barley and other cereals reacts very favorably on the physical well-being of his feathered protegeses.

"You feed wild geese and they will not migrate as long as they have open water" says Mr. Morden, and he can verify this statement by his experience. His eleven geese have never been under cover and stay in the running water all night. On many occasions their wings have



Mr. Morden and his favorite duck "Babe" which comes between him and his work.

been coated with ice when they have permitted Mr. Morden to pick them up and remove their excess wing surface. Cold weather does not affect them in any way, but they must have open or running water. The wild ducks are much the same. They stay in the water during the coldest days in Winter and never seek cover at any time.

These fowl are all pets and will respond to their protector's call from any distance within earshot. This, by the way, is the only kind of shot

which Mr. Morden permits on his land. One of these ducks is however, a particular favorite, as will be seen in one of the illustrations herewith. "Babe" is her name and she is really more like a child than a wild duck. Her owner has refused twenty-five dollars, which you may rest assured was not the offer of a restaurateur or purveyor of wild fowl in a dressed state, for this wise young bird. Mr. Morden enthuses over "Babe."

"Talk about a wise bird! There are few human beings who can beat her. My office is about one hundred feet from the mill and "Babe" when she is hungry will call 'Quack' 'Quack' until I open the door to let her in. She will follow me back to the mill where I mix her up a little porridge and believe me "Babe" and her younger babes thrive on the treatment."

Mr. Morden talks most entertainingly concerning his predilection for Wild Life Conservation. Wild fowl are only one of his hobbies. He has also been successful in taming other species of both birds and animals. "You can tame anything in the wild state with kindness and feed," he says. "I am, and always have been most interested in everything alive; even when a small boy, I loved animals of all kinds and the most vicious dog would follow me. I believe we are not all built just the same, for there are people, who

are born naturally cruel and want to kill anything that is alive and who are really not interested in anything, but like to see blood shed."

A few years ago, Mr. Morden possessed a colony of about two hundred muskrats which might have been a very profitable business, but he did not raise them for that purpose; it was purely for the pleasure of seeing them grow and multiply. He now has only one pair left but, in time, he expects to have as many as before. He has had a muskrat come and eat out of his hand, which is very rare, but he says "you can tame

anything in the wild state with kindness and feed."

He has had mink too and, raised them successfully, having sold them as high as two hundred dollars per pair. He did this for the sole purpose of experimenting to see what could be done. He has held five young mink with one old one in his arms at one time notwithstanding that they are the most vicious animal known in Canada. He has two mink now, which are not in captivity but live under his barn and, says Mr. Morden "they are an asset to my business. Woe be unto the house-rat, he cleans them up every-

where. A few years ago, we lost dollars and dollars in bags being chewed up by rats but to-day it is entirely different. I have about two hundred chickens in my chicken-house and the door is open all the time and I know a mink has never killed a chicken here but I have seen them grab a little chick."

Mr. Morden claims that if he had protection, he would have hundreds and hundreds of wild ducks, mink and muskrats, that would come to him and never leave but—and there was a world of feeling in Mr. Morden's words "it is the hardest thing in the world to keep people from shooting them."

Natural Regeneration of White Pine

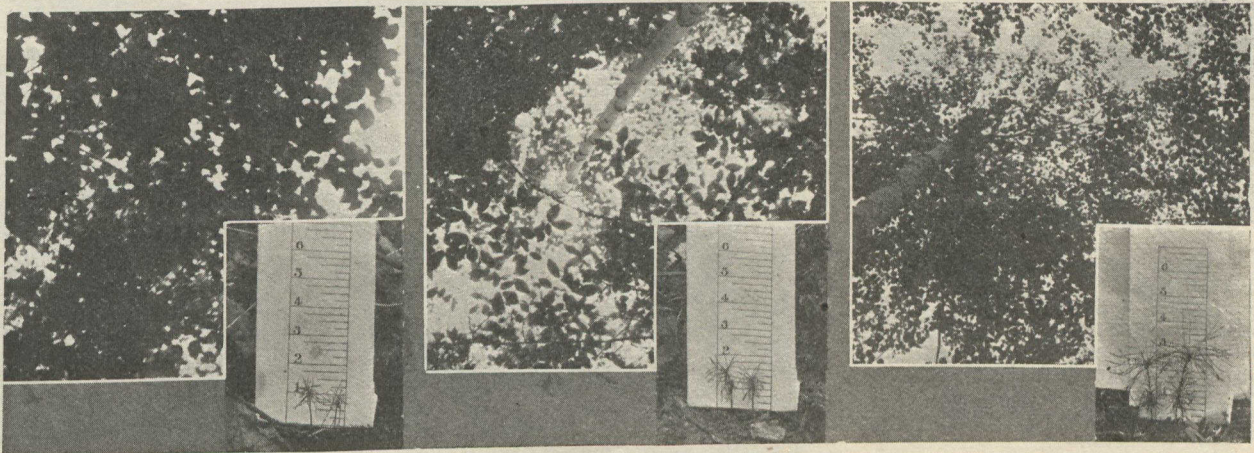
Some of the Results Obtained at Petawawa Forest Experiment Station

By J. C. Veness, Dominion Forestry Branch

Area A

Area B

Area C



Very heavy shade by poplar and white birch with understory of small maple and beech.

Heavy Shade by white birch and poplar with light understory of maple and beech.

Moderate Shade by white birch

IN a short article, by W. G. Wright, under a heading similar to the above, in the July 1922 issue of the Illustrated Canadian Forestry Magazine, it was pointed out that, while poplar and white birch may sometimes be an advantage as a nurse for young white pine, the poplar and birch type of forest may be so dense as to prevent the establishment of pine or other softwoods, at any rate until the forest has opened up with age.

Investigations are being undertaken at the Petawawa Forest Experiment Station to determine the conditions of shade under which the best growth of white pine or other softwoods can be expected; the ultimate object being to use the information obtained as a basis for treatment of the poplar birch type of forest.

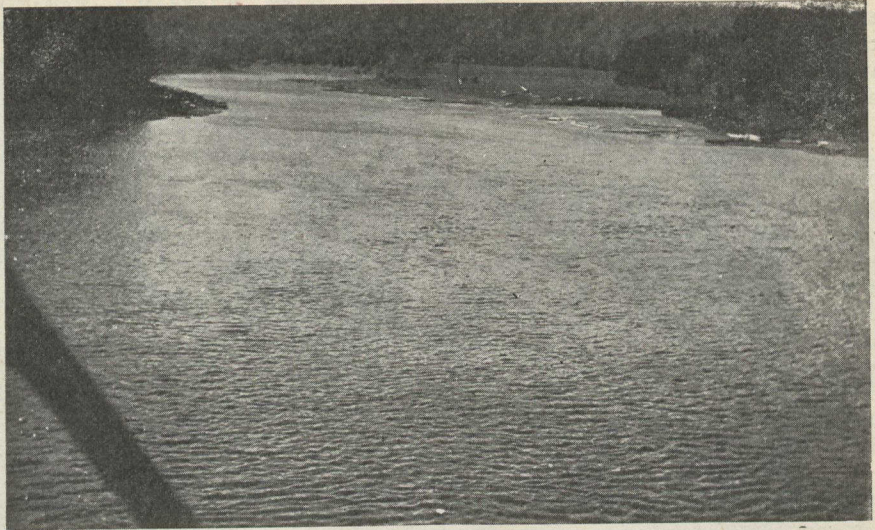
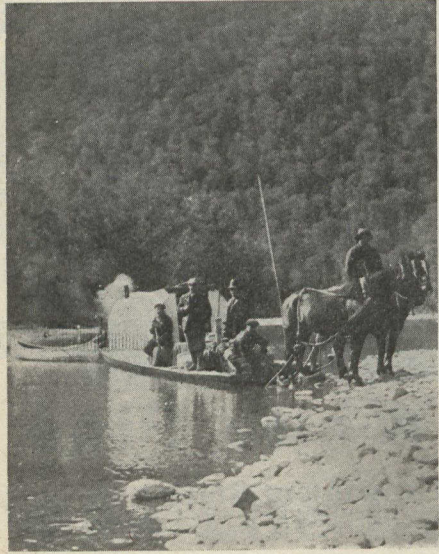
The following table illustrates the effect of dense and medium shading from a 40-year old forest of the above type, on the death rate of white pine seedlings sown two years ago. The density of shading on Areas A, B and C is illustrated in the accompanying vertical photographs. The picture of Area A shows a low understory of maple and beech, responsible mainly for the heavy shade on that area. On Area C this low understory of

maple and beech has been removed. Area B is seen to be intermediate in density.

	Area A	Area B	Area C
Poplar, birch and other trees, per acre	1715	1278	600
Average diameter, inches.....	4	4	5
White pine seed sown Oct., 1920, per acre.....	40,000 to 45,000		
Seedlings living July, 1921, per acre.	3200	3200	9500
Of these, there died:			
Between July, 1921, and Oct., 1921	75%	25%	5%
Between July, 1921, and Oct., 1922	90	50%	15%

The mortality rates in the table are reflected in the present rate of growth of the seedlings, illustrated by the photographs of representative seedlings inset in the vertical photographs. These photographs were taken in September, 1922, and show two years' growth in each case, the scale being in inches. The results obtained from this experiment seem to show that under certain conditions, it may be necessary to make thinnings in the poplar birch type of forest, if a satisfactory growth of white pine is to be expected.

Salmon Fishing on the Restigouche



This is the life! Dr. Lunam of Campbellton, New Brunswick, annually makes a fishing trip on some of the head waters of the Restigouche. The flat bottomed boat, fully equipped as a fisherman's home, is towed upstream through the shallow waters.

Lower Picture shows

Gipsy life on the waters of the Restigouche. On the way down stream and ready for any adventure.



At top—The expedition passes through the 'Million Dollar Pool' the famous Patapedia Salmon Pool held in fee simple by the Restigouche Salmon Club, where the most remarkable salmon "on earth" are secured.

Above—Dr. Lunam does not fish without an ample reward. His party secured these splendid salmon in one day's outing.

At left—A forty pound salmon taxing the muscle of the doctor and his guide.

Our Canadian Song-Birds

Appreciation of Bird Songs Largely a Matter of Sentiment and Tradition

By P. A. Taverner

Ornithologist of the Canadian
National Museum, Ottawa.



The Vesper Sparrow cheerfully welcomes the Spring.



The Mountain Blue Bird "Good Grass-Hopper Poison".

WITH the belated arrival of Spring, Canadian bird-lovers are once more on the lookout for the return of their feathered favorites. Canada's song-birds, beloved as they are by her native sons and daughters, have at times, been objects of disparaging reference by new-comers to our country. In this connection it may be pointed out that appreciation of bird songs is largely a matter of sentiment, familiarity, association and tradition. Coming here where all is new, the bird songs carry no memories and association to the visitor from foreign shores, even if that shore is no more foreign than the British Isles.

It is not at all surprising that the newcomer fails to hear the music that we read into them. William Brewster failed to appreciate the white-throated sparrow when he first heard it in the north, and such sincere American bird lovers as Frank Chapman, John Burrows and our own Will Saunders expressed themselves disappointed at the first hearing of British birds. One friend visiting England described the sky-lark's song as "that squeaking up there." I am not insinuating that the skylark squeaks but merely attempting to demonstrate that appreciation of bird songs depends as much on what we bring to them as what they bring to us. An Englishman can no more justly appreciate our birds than we can his.

Our Singers are Shy.

Unfortunately most of our finest singers have to be unobtrusively wooed. To a native Canadian no song can be sweeter than the cheerful chirrup of the robin (American) the plaintive, graceful warble of the bluebird or the golden flute notes of the meadow lark. They are not mere songs to us, they are the voice of Spring, the beauty of the blossoming orchard and the memories of the old home. It is impossible to judge them dispassionately and in cold blood. These associations are, to us, as much a part of the songs as the notes themselves.

Have you ever heard a brown thrasher in Spring-time, singing hour after hour from the topmost spray of a thorn bush; or a really good catbird when he forgets interpolations? The house wren bubbling and boiling over or that wondrous sound from the tiny ruby-crowned kinglet? Have you heard the witching song of the winter wren in the black tangle of the deep spruce woods, the absolute purity of tone of the hermit thrush or the golden jangling chain of the veery? The American goldfinch has a charming little warble as well as his merry "per-chick-o-pee" that he utters as he strings his graceful loops of flight. Is there anything more perfectly in keeping with the night, its woodsy hollows and soft shadows, than the plaintive whip-poor-will? Have you ever heard the long loud wail of the loon over the black water to an accompaniment of whispering pines?

No Intruders Wanted.

This is our music and it is truly Canadian and part of our fiber and soul. We do not want intruding, stranger birds. We can only have them at the expense of old friends. There are only so many bird niches in the economic scheme of things. To introduce one means the dis-

possession of another, and the price is too steep to pay.

Ill-advised introductions have been attempted again and again. There are probably few land birds on the British list that at one time or another somewhere in the country mistaken enthusiasts have not attempted to naturalize. With few exceptions they have, thank Providence, all failed. Yes, there must be Guardian Angels to protect us from ourselves. Goldfinches and skylarks held on precariously about New York and elsewhere but never made secure establishment. The only success we have had succeeded but too well. The Guardian Angel must have dozed. The house sparrow and the European starling are with us for keeps and we wish they weren't. Lately comes the report of the Japanese starling about Vancouver. Where it will end, goodness only knows, but we have little confidence in it. We hope it will be harmless but it has become a pest in Hawaii where it was also introduced.

So dangerous is this naturalization of foreign birds and animals deemed that their introduction is now forbidden and today no importations can be made in either Canada or the United States without special permission and if necessary guarantees against liberation or escape.

Making Homes For the Birds

It is a fact that, although we have so many species of birds around us, few people are familiar with them, and it is the more surprising, when we consider that not a few of our Canadian Songsters will nest close to human habitations in shelters or boxes provided for them. Among the most attractive are little Jenny Wren, the living insect destroyer, the darting tree swallow which keeps the air free of mosquitoes and the pensive, shy, Bluebird,

..... shifting his light load of song
From post to post along the cheerless fence" (Emerson)

Trees in the Prairie Schoolyard

They Would Prove Important Factor in Producing Contentment.

By Archibald Mitchell.

NOT many years ago, it will be remembered, a fiery cross of education went blazing through Canada from end to end.

Somebody has recently said, "In these times the acid test of anything is: Does it serve? If it does not fulfil the purpose for which it was

tural advantages of Western Canada than many Immigration Agents." Then came the idea of comfort and content of the prairie womenkind



Indian School at Crooked Lake, Sask.

"Let us revise our educational system." "Let's have it less pedagogical and more practical." "The old fogies who have been running us educationally have got us into a groove." "Let's get out." "Let us have some business sense among whoever makes out our curricula and let us get out of the rut." And as everybody will remember, everybody said "Hear, Hear."

Train the Children.

By and by a big convention was held in Winnipeg, a committee was appointed to reconstruct our educational system, which, in its turn promptly turned over the whole business to a number of professors chosen from among the same kind of people who had been responsible for the educational system everybody was so anxious to revise. And there you are.

The present writer does not know what steps these learned gentlemen took to amend matters or if they did amend them. No doubt they did the very best that was in their power and no doubt brilliant results are being accomplished among our young generation though to the common man, this may not be very apparent. So much for that.

intended, it soon passes into the discard." And everybody, it is presumed, will agree.

The Winnipeg Convention.

Not many weeks ago the writer was addressing the students of a certain Normal School and as he looked at the two hundred and fifty bright young faces before him, the choicest of the choice of our young people, this question, "Does it serve?" came to him. Is the information and training these young people are getting here serving all the purposes they might and should? After all, what are they here for? What is the meaning of their being here at all? Is it not that they may be prepared to take charge of our schools, our citizen factories, the places where our children are trained to become useful citizens, where they learn the principles of the business of life and especially, in this agricultural country, the business of life on the prairie farm?

Then another recollection came up, the sentiment expressed at the convention of the United Farmers of Manitoba at Brandon the other day, "A greater degree of content and comfort among farm women would do more to advertise the agricul-

without a tree to shelter them or a shrub to beautify their homes. Ye gods!

We thought of the hundreds of school grounds we had seen, every one of which had at one time or other been either planted or the ground at least prepared for planting, and of the fact that nearly every one was either a complete failure or such a doubtful success that very few indeed could be classed as first-class.

Recalled School Days.

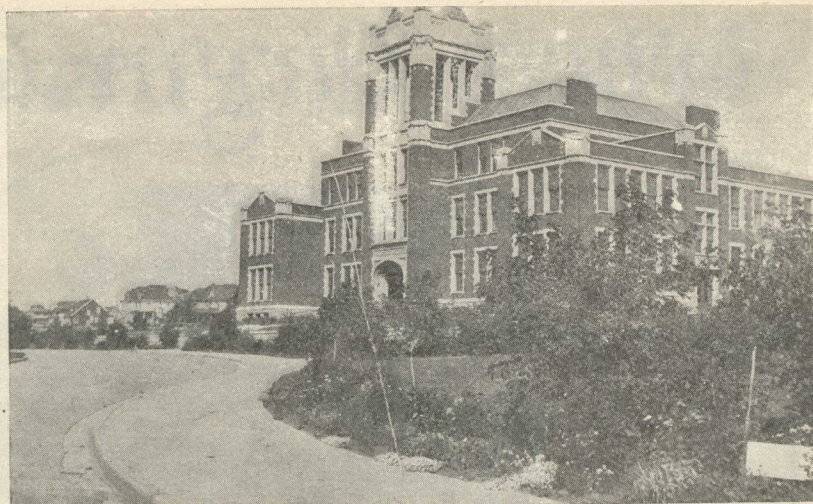
And then some recollection of our own school days came back and we told those young students, potential teachers, how we also had been condemned to spend certain years trying to persuade somebody else that we knew far more Latin, for instance, than we did. And how, among other things, we had learned the most interesting fact that "All Gaul was divided into tree parts", and that Caesar had had some trouble with a certain speculator, a Mr. Dumnorix, an Aeduan, (whatever that might mean), who had failed to come through in some grain deal, and how the said Caesar had brought him to time. About all we could remember of our Latin days. We presumed they, the students, were well primed

with similar frills and would soon be finished and out manning the citizen factories and spreading their newly acquired information and culture among the up-growing citizens of the country. And we congratulated them on their accomplishments and their opportunities. But we had to tell them that, though we had had the supreme satisfaction of knowing, all the twenty years we had been meeting farmers on the prairies, that all Gaul was divided into those three parts and that, "The day after that day it behooved Caesar to measure out the corn", not once in all those years had a single farmer ever asked us if we could tell him how many parts Gaul was divided into, or what happened to Dumnorix when he found he had sold short in the Caesarean grain exchange. They seemed to have no interest at all in such important and erudite matters. But, and we used the word with a capital B, we had met thousands of farmers and their wives who had asked us and asked us anxiously how to grow trees or flowers or shrubs, and how to make the surroundings of the home worth while.

Have Never Seen a Tree.

Then we thought of the few opportunities we had had of taking the upper classes at some of the schools out into the plantations and showing them things, and how we had showed them little facts and principles about the trees that they had no business to get from us at all; the teachers should have been able to tell them, and we wondered if the acid test "Does it serve?" were applied to our educational system, what would the verdict be? Hundreds and hundreds of schools and thousands of homes without a tree, and hundreds and hundreds more that look the worse for what they do have, the poor little kiddies we had seen and heard of who had never even seen a tree, and particularly we had in mind the little chap in the Car a week or two before who, when he saw, on our picture screen, a man climbing a tree, shouted out, "Oh, look, at him climbing the telephone pole".

A telephone pole! Poor little chap, —and he was only one,—there must be thousands just like him. And we wondered whose was the blame that these children, potential citizens of forested Canada, were so robbed and defrauded of their birthright. We admit we don't know anything about education, but when we look over the treeless prairie and see how little "comfort and content" there can



High School at Moose Jaw, Sask.

ever be without trees, and when we think of the stress the Manitoba farmers placed upon them we wonder if in all these years we have not been misplacing emphasis in some directions in matters educational and that we have not yet found the knack of putting first things first, and if there is not some other way of "encouraging" tree growing in the prairie than by the almost invariable failure we see in so many of our school playgrounds.

And this not only in the rural districts, but in the smaller towns and villages as well. Some of the largest towns haven't had the grace at many of their schools to even attempt to grow a tree. Want of interest on the part of the trustees is no excuse, for behind the trustees are the parents. It is astonishing the excuses one hears from those in authority, for tree failures. "No money to cultivate", "Couldn't hire the help necessary, labor so scarce", "The grass got in and the trees died", "Too dry the last few years". These are samples and they are all equally lame. If the desire to have the trees is strong enough, the want of money or help to cultivate will be no excuse. A little "Bee" of half-a-dozen people an hour or two now and then will overcome that. The thing is the will to do. When the trustees get careless there is always the remedy of the Annual Meeting and public opinion. Grass among the trees is only too often a very evident reason for the failure. This is possibly the result of faulty preparation of the ground or carelessness at any rate in allowing the grass to get a foothold. Probably nine tenths of the school planting failures are attributable to this cause, and the cure is so simple. Grass among trees, even the dreaded blue joint, is easily rotted out by

smothering it deeply under straw or strawy manure in the month of June.

Importance of Varieties Chosen.

Then there is great room for improvement in the varieties of trees chosen. Equipment of every Normal School grounds should include at least one short section of a model farmer's plantation and several of model school plantations to suit the different sizes of school grounds. These two classes of plantations are different, for there is less room for number of rows in the playground than in the farmer's field, yet they all have to fulfil the same purpose. They have to afford shelter as rapidly, as efficiently, and as cheaply and permanently as possible. Every tree in these plantings should be there because that is the place for it and no other, and every student should know and know thoroughly the reason why. Then people would learn to have confidence in what they planted, the teachers would know and so would the pupils, and it is only a step from that to the people. A restoration of confidence in tree growing is what people are needing about as much as anything else. There have been so many failures it is no wonder there is so little enthusiasm in the planting of the school grounds. Education is the only cure, education and demonstration with hearty cooperation on the part of everybody concerned, and until we have these more generally adopted we are not going to see any very great materializing of the very excellent sentiment expressed at the Manitoba convention, "A greater degree of content and comfort" on the prairie. The school playground is an excellent place at which to begin; what we need is the will to do.

Where Virgin Wilderness

This is the kind of salmon trout to be caught in the lakes of the park. Imagine the battle!



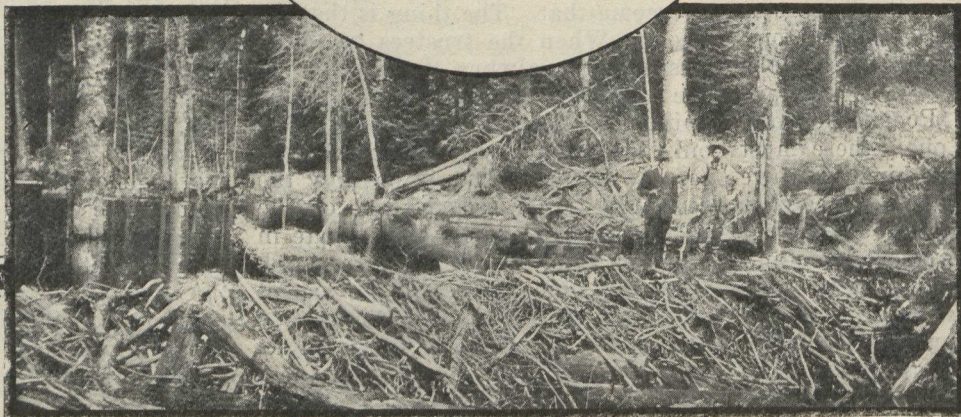
Two of these caught before breakfast prove that the lakes teem with fish



ALGNQUIN PARK in the heart of the highlands of Ontario is a forest preserve and wild game sanctuary set aside by the provincial government in perpetuity as a playground for the continent. It contains 2721 square miles of virgin wilderness with more than a thousand lakes interlocked by flashing streams. The main gateways of the park are 160 miles west of Ottawa, the interesting capital of Canada and 200 miles north of the City of Toronto. For the convenience of tourists a large and comfortable hostelry supplies the visitor with all the advantages of a big city in the heart of the forest. There are a number of cottage villages dotted through the park, and camping out is one of the customary practices of tourists. Protected for years by law, wild animals and birds have multiplied until they are plentiful on every hand. Guns of all kinds are barred from the park. The animals have become accustomed to man and show little fear. In consequence the man or woman with a camera has an interesting time taking pictures of deer, moose, beaver, foxes, coyotes, lynx, bobcats, porcupines, racoons, and many other denizens of the primeval coverts and fastnesses. The accompanying snapshots show the possibility of wild animal photography in Algonquin Park with a glimpse of what can be done in an angling way. They are reproduced by courtesy of the Grand Trunk Railway. The lakes and streams are full of trout, black bass, salmon trout, pike, pickerel, perch and other game fish.



Below is a picture of a beaver dam which serves as a retaining wall for the lake created by the busy and very intelligent little fellows.



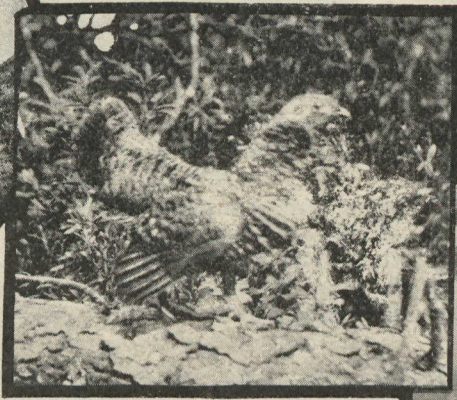
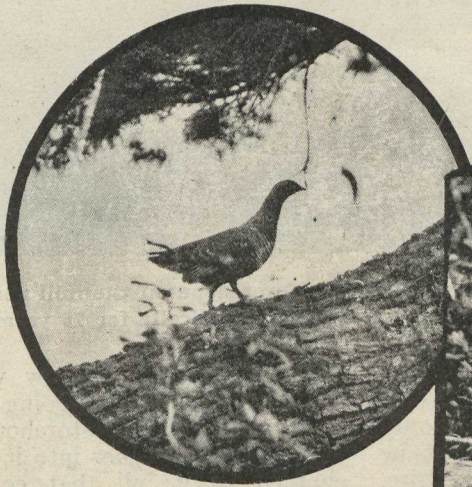
Lures Camera Enthusiasts



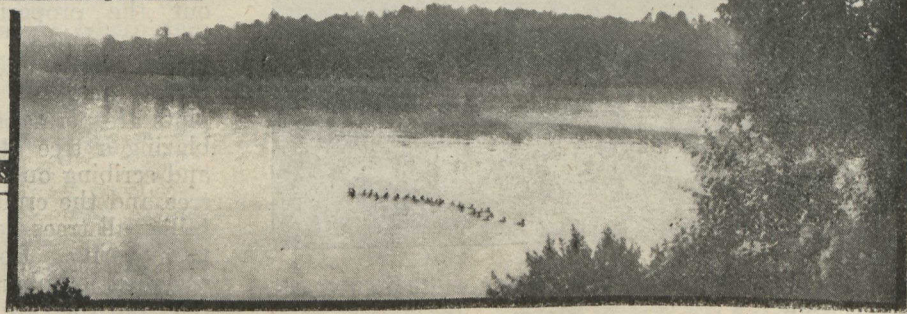
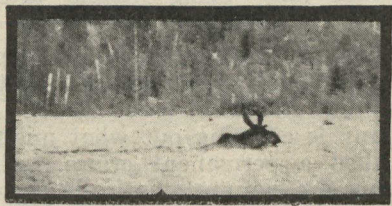
The lynx on the left will dine on the snowshoe rabbit he has captured. Below is a picture of a deer manifesting only a casual interest in the photographer



Here are three remarkable pictures, particularly the one of the drumming partridge



The animals in the park are all comparatively tame, but the moose on the left still has some of his natural caution in his system. He is hustling for the tall timber. The picture below shows a flock of young ducks, not greatly alarmed. The lakes are the summer breeding grounds of thousands of ducks, geese and other waterfowl



Perpetuating a Pulpwood Supply

Methods Which Will Place Forestry Properties on a Sustained Yield Basis

By D. E. Lauderburn,

Forest Engineer, Department of Woodlands, Pejepscot Paper Co.

THE job of a woodlands department of a paper company is to see that the supply of the principal raw material is continuous for as long as the business lasts. Either the company has in view a time when it plans to liquidate or it plans to continue producing indefinitely. The Forest Engineer, therefore, as technical adviser to the management, has before him the problem of having the forest properties in as salable condition as possible at the time of liquidation or the equally interesting task of seeing that the supply of pulpwood is perpetual at a fixed amount per annum.

In the case of the Pejepscot Paper Company, the latter policy, that of continuous production with an annual fixed perpetual consumption, is the one being followed. That, therefore, is the essential task of the Forest Engineer, to study the resources available with a view to supplying perpetually a fixed amount of wood each year.

The first step in the management of a timber property is the taking of the forest inventory, in other words, the timber estimate. A complicating factor here, however, is the fact that a forest is not a stable thing. The



24 cords of pulpwood per acre on the cut over slopes at the mill pond. These slopes have been culled for saw logs periodically for 75 years.

trees are constantly growing or dying. And yet, for practical use, the forest inventory must not only be kept up to date but must be projected tentatively into the future.

We must not only know what we have, but what we are going to have. The forest is like a storehouse. All that is in it and goes into it must be charged to it; all that comes out should be credited. The forester is the clerk who keeps the records. But the clerk at the storehouse can stand at the door and count all that goes in. Not so with the forest. What comes in, is a layer of wood laid on each living tree under the bark, something unseen, the cumulative effect only being visible after a period of years.

To ascertain all the facts appertaining to the perpetual forest inventory, the Pejepscot Paper Company is carrying out what might be called a permanent cruise. Cruise lines are run systematically throughout the properties. Quarter-acre plots are laid off at regular intervals on the cruise lines and tallies of the timber made on these plots. These plots are permanently established by blazing a tree at or near the center and scribing on it the number of the tree and the cruise line. The cruiser tallies all trees he thinks will survive to maturity. Borings are made in a specified number of trees on each plot and the rate of diameter growth



Natural reproduction in old fields which will produce a heavy cut, largely Spruce, a few decades hence.



Large Spruce and White Birch in Softwood Type cut to the diameter limit of about 12 inches a decade or two previously. An advance growth of softwoods has been established. This is now ready for a clean cut for pulpwood, thus liberating the young trees.

is recorded. Thus the forest storehouse clerk tallies the goods coming in. From these measurements of diameter growth and from measurements of the heights of trees of each diameter the volume of these trees at future periods is estimated and the result shown in yield, cords per acre per year, usually a fraction of a cord on each acre annually. It is planned to check these growth predictions in the future by measuring and tallying these permanently established plots over again, perhaps every five or ten years.

The following hypothetical tabulation shows how a perpetual forest inventory might appear:—

	Cords.
Original Capital Stock	135,099
Cut, Winter of 1917-1918	11,963
Left, Spring of 1918	123,136
Growth, Summer of 1918	5,722
Capital Stock, Fall of 1918	128,858
Cut, 1918-1919	9,533
Left, Spring of 1919	119,325
Additions by Purchase 1919	10,840
Original Stock & Purchase	130,165
Loss from Fire & Budworm	12,976
Capital Stock after Deducting Losses	117,189
Growth, Summer of 1919	5,931
Capital Stock, Fall of 1919	123,120

The above tabulation shows that cutting at the rate of 10,000 cords per year will eventually deplete a property with an annual growth of 5,000 cords. Another property may show the reverse, annual cutting less than the annual growth. Thus the operations may be adjusted to what the various properties will produce. If the studies show more is being cut than is growing, more forest land should be acquired or the yield in the future increased by planting, thinning, girdling of wolf trees or any other means applicable.

The precision with which all this can be done is questionable, of course, but it is not difficult to arrive at an approximately accurate estimate of yield which may be used tentatively until we learn more about the rate of growth and also the rate of death, in our forests.

The company requiring a sustained



A valuable Yellow Birch over-shading valuable Red Spruce reproduction.

yield, however, cannot be satisfied with merely ascertaining that yield. The lands must be made to produce their maximum of the most desirable species. With this in view, the Pejepscot Paper Company has planted many hundreds of acres of old fields where natural seeding in was slow. Well-stocked cut-over lands and abandoned farms have been purchased. Properties essentially hardwood will be stripped of their pulpwood and held for their hardwood yield or sold.

That, essentially, I feel, should be the forest policy of a company requiring a continuous and perpetual supply of any wood material. Forestry is not for show or advertising purposes. Forestry is absolutely essential for the efficient management of any forest property.

Briefs About Forestry and Allied Topics

The Government of British Columbia won its case before the Privy Council recently thereby preserving the right to exclude from the operation of any Crown forest Japanese competitors who have been invading the logging and shingle camps.

The continued production of timber is exceedingly important in Louisiana where the lumber business represents an investment of \$290,000,000 employing approximately 57% of the State industrial labor. Within a few years this investment and source of employment will be entirely wiped out unless constructive forestry is applied at once.

According to the Western Lumberman the forest revenue of the province of New Brunswick during the four years, 1918-21, averaged \$1,061,000. Expenditures averaged \$188,000, or only 18% of the revenue. Damage from fire in New Brunswick averaged \$342,280.00 per annum.

Mr. Ralph Hopping, Forest Entomologist, who has been investigating damages done by forest insects in Nicola Country of British Columbia, states that the damage done in that section between 1914 and 1919 equals more than 150,000,000 feet B. M. of timber and 50,000,000 feet additional in the Merritt-Nicola section. Control measures will have the effect of saving 80% of the timber. The cost of eradication, says Mr. Hopping, was not to be compared with the value of the timber to be saved. An expenditure of \$50,000 might save 300,000,000 feet.

C. H. Morse, District Inspector of Forest Reserves, Calgary, Alberta, declares that 90% of the fires causing damage in Alberta last year were started through human agency. Rank carelessness was responsible for at least half of all the fires; 412 conflagrations were reported on the forest reserve, 26 of them especially serious. The damage amounted to \$74,696.00 against \$206,450.00 in 1921. Settlers caused 628 fires outside the reserve.

E D I T O R I A L

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Water for Our Water Powers

NO ACADEMIC wizard is needed to persuade the users of hydraulic power in the northern industrial districts of Canada that the uniformity and reliability of power-giving streams in many districts is decidedly on the wane. Scores of lumbermen can point to rivers on which abundance of water was always to be had for driving logs and today are dried up not only in the Fall, but in the late Spring as well. Rivers that assured great paper industries of an adequate flow the year round are now, in some instances, increasingly unreliable, making it necessary to buy up other power sites at great distances as a safeguard against future emergencies.

As pointed out in another brief article in this issue, employment has been appreciably cut down in Ottawa and Hull during the past twelve months because the water powers for the big industries at the Chaudiere proved unequal to keep the turbines turning. One large plant in Ottawa was forced to purchase pulp in Eastern Quebec at double the price at which it could have been manufactured by its own machines.

Conditions Due to Forest Destruction

Why have these conditions arisen? No answer is forthcoming other than the plain evidence of forest destruction on the watersheds. Contrasted conditions of densely shaded watersheds with steady flow of streams as against cut-over and burned-over watersheds with streams run wild are too abundant to be passed over lightly. It is not argued that the forest is capable of maintaining perfect storage conditions without artificial aid of dams but almost any lumberman can point to streams where he drove logs some years ago and which today show practically no flow at all as evaporation in

annual precipitation of snow and rain. Storage dams under such circumstances certainly will not create a water supply.

The stripping of the slopes along the main rivers and streams and, what is more important, the burning off of the porous litter, moss, etc., and the exposing of the accumulations of snow to wind and sun have played havoc with the economic value of streams in supply of hydraulic power. Evaporation rids the areas of moisture and the absence of sufficient natural storage causes flood in Springtime and drought in the later months.

Forest fire destruction strikes at the national welfare from a multitude of angles. It ousts the fur trade, it is a menace to our growing tourist traffic, it directly raises the cost of house building and of many branches of manufacture, it adds to the cost of farming, of coal mining, of railway building and maintenance. Indeed, every commercial activity, every source of employment, is first cousin to forest conservation.

Paying for Forest Losses by Costly Storage Dams

By Dr. C. D. Howe

It is generally believed that the surface waters get to the streams more rapidly from de-forested than from forested slopes. The result is higher water stages in the Spring or in wet periods and lower water levels in the Summer or dry periods. This has a tendency to dislocate the regularity of the industries depending upon water power or water transportation. Quebec has contributed very large sums of money to build a huge storage reservoir to regulate the waterflow of a great river that twenty or thirty years ago would not have needed such treatment. In the meantime, the forest has been burned, I understand, on about one third the drainage area of that river basin. That is only one river. How many rivers are there in Eastern Canada to which similar conditions apply?

The over-plus of surface drainage comes from the burned and reburned slopes, hence the necessity for adequate fire protection on such areas.

The Pulp and Paper Industry

The Pulp and Paper Industry of Canada has 100 mills in operation, forty being pulp mills, thirty-three paper mills, and twenty-seven produce both pulp and paper. Seventeen of the latter are news print plants. The present progress of the industry indicates an output of 1,500,000 tons of news print in 1924. This will mean the utilization of over 2,250,000 cords of pulpwood for a single year's newsprint paper output in this Dominion.

Necessity for Tree Planting

"There is nothing needed more in this country than an intensive campaign of tree-planting," said Supt. S. G. Porter of the C.P.R. irrigation branch in an interview at Lethbridge, Alberta. Mr. Porter had just made a survey of the Coaldale-East Lethbridge section of the C.P.R. southern project, the results of which caused him to make his assertion.

The following facts tell their own story:

Only 72 irrigated farms of 160 acres, out of the 673 in the territory reviewed, have trees on them.

Out of the 72, only 39 farms have good showings of trees. The percentage, therefore, is only 11 per cent., only six per cent. of which were considered good, healthy showings.

Trees in Place of Barbed Wire

AN UNPRETENTIOUS little newspaper despatch in the *Lethbridge Herald* recently from Picture Butte, Alberta, shows how the interest of settlers in tree planting is growing rapidly. Says the item in question:

Yes, dear people, Picture Butte is going to get on the map once more. We have it that the Irrigation Council has secured an option on the Picture Butte farm wherewith to build the headquarters of the L. N. I. D.

As for trees the citizens of this road have decided that a barbed wire fence does not look very handsome for a road adornment, so starting at Jack Graham's and running clear through to Hobbs' farm every farmer has decided to either plant a grove of trees this season around his home or prepare for same this season.

H. B. Kane and Tommy Nolan are going to plant the whole of their road allowance to trees this following season as is also the owner of Groveholme. This season he will plant 7,700 trees so that his home will truly be in a grove. No more shacks in weed fields for Picture Butte, but homes in picturesque surroundings.

A Question Answered

Q.—Please give me details as to the big planting programme which, I understand, the Ontario Government has launched.

A.—According to a tentative announcement of the Premier of Ontario and his Chief Forester, several square miles a year would be planted with white and red pine. The Government estimates that if ten thousand acres a year were planted the province would have sufficient pine timber at the end of sixty years to supply four hundred million board feet of lumber per year or about fifty million feet more than the present annual cut. The annual expenditure would be about \$200,000.

Danger Ahead

To the Editor,
Canadian Forestry Magazine,—

In a short time the Forest fire season will be upon us again with all its horrors; its destruction of real and potential wealth, its cost of property, and also perhaps its toll of human lives. All authorities on Forestry and most people engaged in the conversion of raw forest products into the finished product, such as Lumber, Lath, Shingles, Pulp, Paper, Ties, Posts and Poles, are agreed that our supply of available timber is getting dangerously low. During the year of 1922, about 4,000 fires claimed 1,300,000 acres of Forests; such colossal claim of the Fire demon should not only be food for profound thought, but it should arouse in every Canadian citizen a desire to prevent a recurrence. The daily press, as well as lumber journals, pulp and paper magazines, forestry publications and others have given their space and time unstinted to the teachings of the Gospel of Conservation. The people of Canada, who own and are trustees of about 80% of Canada's rapidly decreasing forest wealth, can obtain still better results in their fight against the careless use of fires, matches and tobacco in the woods if they enlist the powerful help of the pulpit all over the Dominion; the Church being recognized as a most powerful and important element in moral education, also the schools and school teachers must be approached to lend a helping hand in educating the coming generations as to the stupidity and the criminality of forest fires caused by human carelessness in virgin forests and especially in second growth, from which our future supply must eventually come.

Stop Forest fires of all description and Canada will become one of the most favored and prosperous nations on earth. Keep on burning and in less than a century Canada may share the fate of China. Which is it to be?

FRED BROWN.

Fort Frances, March 30th, 1923.

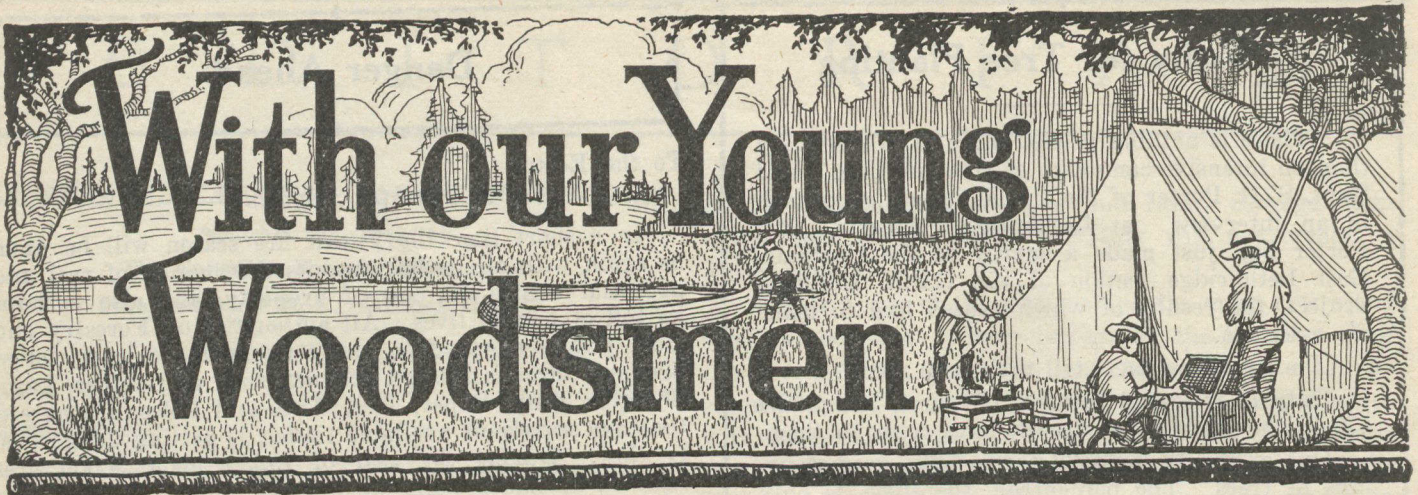
Ask Questions—We'll Answer Them!

MR. Arthur Herbert Richardson, who has charge of the Ontario Government reforestation project under Mr. E. J. Zavitz, the Provincial Forester, has undertaken to prepare a series of monthly articles for the "Illustrated Canadian Forestry Magazine". These will be well worth following and should prove a most popular feature.

Mr. Richardson will be glad to answer in these columns, or by mail, any questions that may be asked by tree planters in any part of the Dominion. The Canadian Forestry Association will gladly undertake to secure for our readers accurate replies from competent authorities.

The Laurentide Nursery

The Laurentide Company Limited of Grand'Mère, P.Q., have about 20,000,000 white spruce seedlings and transplants in their nursery.



Radio Sets Presented to Our Young Leaguers

THE Young Canadians Forest League is rapidly making headway and before the year is much older will have established contact with scores of thousands of boys and girls in many parts of the Dominion.

Sixty thousand attractively printed novelties in two colors are being distributed this month to the juvenile visitors to our Forest Exhibits Car now travelling in Quebec, and it is hoped to reach other thousands as the tour proceeds.

The boys and girls of Canada have the future of the forests in their own control. In the truest sense, the forests of Canada belong in very large degree to the younger generation. It is a pitiful fact that we grown-ups take our responsibility so lightly that we consent to 4,000 forest fires a year, knowing that each fire steals away property belonging to our children and grandchildren. Much of this deplorable neglect of a public owned resource is due to misconceptions handed down from generations back. We still hold to the notion that the forests are so large that no form of ruin can exhaust them. We still foolishly believe that as fast as the forests are burned down and cut down Nature replaces them with new crops of timber. These errors seem to have wonderful vitality for they have been out-dated fifty

years or more and yet are to be heard in everyday conversation.

The boys and girls of Canada will either follow in the erratic footsteps of the present generation of forest killers or they will see their duty and their self interest with truer vision. If the damaging ideas of 'exhaustless forests' are to be smothered out, some agency must assume an educational task of no mean proportions. The Young Canadians

new member, which is applied to a splendid radio equipment, with valve, aerials, phones, batteries and everything complete.

Note some of these excellent results:

The 14th St. John N. B. Troop of Scouts went on the war path for the Canadian Forestry Association and quickly landed 60 members. Their radio set was shipped within 24 hours and on being set up caught quite clearly eighteen broadcasting stations

The Sackville Boy Scouts did a great month's work and turned in 61 members.

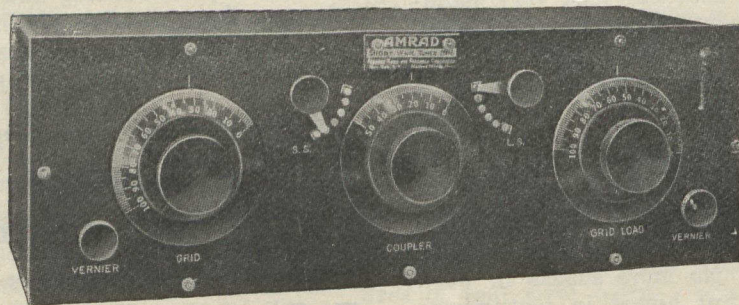
At Elk Lake, 80 members were developed in record time.

At Loverna, Saskatchewan, sixty members.

These are just examples of what has been done in communities, some of which at first sight, would appear to be very difficult propositions considering the limitations of population and other factors.

Any reader of the Canadian Forestry Magazine may enlist his son or a group of boys to win one of the radio sets. One great feature is that every boy wins, either in cash or in radio equipment. Every worker is well rewarded.

Address, the Young Canadians Forest League, 51 Sparks St., Ottawa.



The Detector of one of Radio Sets Presented by the Y. C. F. L.

Forest League has undertaken to enlist as many boys and girls as it can handle under the banner of Forest Conservation.

To stimulate interest in the first stages, we are offering free radio sets of the most expensive standard makes to Boy Scout troops or any other groups of boys who will carry our literature to their grown-up friends and secure their allegiance to the parent body, the Canadian Forestry Association, as paid members. For this effort we reward the boys at the rate of approximately one dollar a

Prize-Winning Essays and Their Writers

In this and subsequent issues of "The Illustrated Canadian Forestry Magazine" there will be published prize-winning essays in the recent School Essay Competition, conducted by the Canadian Forestry Association. The prizes awarded for each Province were as follows:—1st prize \$25; 2nd prize \$15; 3rd prize \$10.

I AM a little girl of eight years of age, rather young to write an essay on trees, but I think I am qualified for the reason that although I was born on the prairie, I have always been able to have my play-house under trees, due to the fact that my Daddy is always planting them.

So I am going to ask him all about them and write it down for the benefit of anyone who will take the trouble to read.

There is a good deal of mistaken ideas about trees on the prairie, such as "winter killing," "too slow of growth to be of any immediate benefit," "cannot afford the time to plant," "not time to cultivate" and lastly that bugbear of all "too dry."

For those who contemplate and for those who perhaps, for some of the above reasons have abstained, I will reply to them in the order named: "winter killing"; at first there were some varieties of willow which would kill back every year, but for many years now the varieties sent out by the Experimental Farm proved absolutely hardy, and if cultivation is stopped about the end of July, enabling that season's growth to mature, there is no danger from this source. "Rate of growth" — I cannot answer this any better than by giving growth in actual height obtained on the farm on which I live. In 1921, my Daddy planted 2,200 trees, at this date October, 1922, the Maples are seven feet in many places, and none less than five feet, willows are eight feet, and Russian Poplar, from four to six feet, and only twenty required re-planting, this should satisfy anyone as to quickness of results: "time taken in planting" this poor excuse is worse than none, for from 800 to 1,000 seedlings and cuttings can be planted in a day, thus if every farmer took two days, about the first week in May planting trees, he would still be able to get his usual crop in and never miss these two days, and in a few years he would have all the trees necessary for a good shelter belt, and as for cultivation a few hours can easily be spared about three times during the summer time, until the trees fill the rows, so

1st Prize—Saskatchewan

By Marjorie Gem. Sagon,
Gagenville School,
Biggar, Sask.

AN ESSAY ON TREES



Miss Marjorie Gem. Sagon

as to prevent a horse getting between them, after which they will be firmly established and able to take care of themselves.

And now for the most common objection "too dry". In actual experience of twenty-five years it has never been too dry, so Daddy says, in any season for trees planted in good time and cultivated even only moderately to make a good growth on the prairie. The height of the trees mentioned above were obtained in spite of the fact that in this district (Biggar) the present season has been too dry for even oats to grow. No rain falling from May 26th until the 6th of August. This should be answer enough to satisfy all those who imagine it is too dry for trees on the prairie; as a matter of fact it is not drought, but grass, as a general rule, which prevents trees from growing.

Now I will touch briefly on the advantages to be had from the planting a shelter belt, but it will only briefly because one could not begin in an essay of this length to cover them all.

First on the practical side it is a

well known fact, that all the small fruits can be grown successfully on the prairies if properly protected from the high winds, which destroy to a great extent the blossoms, this is avoided and the ground shaded by a growth of trees, resulting in large crops of berries which I am sure is appreciated in a land of no fruit trees.

Again so much is expended in nearly every small town on the prairie for canned goods, which would be entirely unnecessary if a grove of trees surrounded the garden for this protects the young plants, holds the snow in the garden plot, retaining moisture, encourages the birds who devour large quantities of insects, and again, the result is large crops of vegetables fresh all summer, and plenty to store for winter use. In our own household 12 cans would cover the total brought into our house for five years, and myself and little sisters do not know what it is to be without all kinds of fresh garden stuff, and we are able to supply many of our neighbors, all due to the growth of trees surrounding our garden.

Again the beautiful result is extended into the winter for the snow collects in the trees, and, where properly planted, in the snow trap, thus preventing after every storm the accumulation of snow in drifts around the buildings. I would like to close this essay first with a suggestion, as to how to increase the number of prairie tree plantings and I will base it on the old saying "Imitation is the sincerest flattery." If it could be arranged for the Forestry Department to plant a shelter belt on a farm say in every township, school district, or whatever was deemed the best, the growth of these trees would be an ocular demonstration that would dispel all doubts for it has acted that way in our own district when my Daddy planted all those 7,200 little seedlings and cuttings. Many farmers passing on the road thought he was only wasting time, but when they saw the marvellous growth and paid him good money for garden produce which was the result of tree planting even the biggest scoffers made application, and prepared to plant trees. Thus the best missionary for tree planting is a good grove of trees, in a district hitherto destitute.

Some Camping Hints for Young Woodmen

1. Do not sit or lie on bare ground; it is harmful and likely to cause sickness. It is better if caught out in the rain to sit on your hat and go bare-headed than to sit on the ground.

2. Always carry two waterproof match boxes of the hard rubber kind that will float — one full of salt and one full of matches and do not use them all the time, but keep in reserve in case of accident. This is cheap life insurance.

3. Drink sparingly of water in a strange country; it may cause dysentery or be very constipating until you get used to it.

4. If a horse won't drink water don't do it yourself; trust a horse, but don't trust a dog, for he will drink any filthy water.

5. Don't fail to take a good compass with a lock needle, and become familiar with it before you start. Don't wait until you are lost to do this.

6. If lost in the woods your watch is your compass as long as the sun shines. Point the hour hand at the sun and the south is half way between the hour hand and the figure XII on the dial.

7. If lost keep your head and trust your compass. Don't think your compass is wrong. And remember it can only help you if you keep your head and travel by its direction. Also travel away from camp by your compass as it will not help you to return unless you know which way you walked.

8. If lost in an unknown territory find a stream and follow it down; it will generally bring you out near habitation.

9. Don't follow old wood roads; they generally wander around aimlessly and lead nowhere.

10. Your jack knife should be not too large, of good steel, with two strong blades, a can opener, leather punch and file.

11. Don't forget that sewing kit in your ditty bag, which should contain safety pins, needles, thread, darning cotton, buttons, wax, etc.

12. If you're hard up, the tail of your sweater will do fine for darning if you unravel a bit of it.

13. Two heavy woolen lumbermen's shirts are more comfortable and warmer than a sweater or a coat.

14. If thirsty and without water put a small round stone or button



Reproduced by courtesy of Canadian National Parks.

Young Antelope in Buffalo Park, Wainwright, Alta.

under your tongue; it will keep your mouth moist.

15. Plan your work. Let each member of the party have a certain amount of work allotted to him and everyone do his share.

16. Do not leave a dirty camp. It should be cleaner than your home. Crumbs dropped on the ground don't show like they do on the floor, but flies and insects find them. Destroy all refuse from the table in the fire. Don't pollute the woods.

"THE WOODMAN AND THE SERPENT"

(From Aesop's Fables.)

One Wintry day a Woodman was tramping home from his work when he saw something black lying on the snow. When he came closer, he saw it was a Serpent, to all appearance dead, but he took it up and put it in his bosom to warm while he hurried home. As soon as he got indoors, he put the Serpent down on the hearth before the fire. The children watched it and saw it slowly come to life again. Then one of them stooped down to stroke it, but the Serpent raised his head, put out its fangs and was about to sting the child to death. So the Woodman seized his axe, and with one stroke cut the Serpent in two. "Ah," he said, "No gratitude from the wicked."

HOW WE USE THE FOREST

TO EVERY living Canadian wood is a necessity and in one way or another figures in the daily life of almost every inhabitant of the Dominion. As the late Dr. Fernow once put it: "Our civilization is built on wood. From the cradle to the coffin in some shape or other it surrounds us as a conveyance or a necessity... We are rocked in wooden cradles, play with wooden toys, sit on wooden chairs... are entertained by music from wooden instruments, enlightened by information printed on wooden paper with black ink made from wood."

More than one half the people in Canada live in wooden houses; more than two thirds use wood as fuel. Thousands of miles of railway rest on wooden ties, or sleepers. The waters of the Canadian lakes are churned by wooden paddles or wooden steamboats; fleets of wooden vessels ply up and down the coasts. Mining operations in Canada on a large scale are only made possible by the liberal use of wooden pit props. Thousands of families derive their livelihood, either directly or indirectly, by employment connected with the woods. The woods bring health and happiness to thousands who use them both in Summer and Winter for recreational purposes.

A Memorable Moose Hunt

Experiences and Impressions of a Hunter's First Kill.

By W. M. Romans, Bear River, N. S.

The accompanying article and illustration is of particular interest in view of the fact that the trophy picture herewith which was secured by Mr. W. M. Romans, under the circumstances here described was considered such a perfect specimen that it was elected as a model head to be used in illustrating the very attractive literature issued by the Department of Forests and Game for the Province of Nova Scotia,



The Head, pictured above, has a spread of 51 in. with 33 points of exceptional beauty in symmetry and color. The Head was mounted by John McEwan, Indian Guide, Bear River, N.S.

Mr. J. A. Knight, Commissioner of Forests and Game for Nova Scotia in a recent letter refers to the trophy as follows: "The antlers of this head, while not the largest taken in Nova Scotia, are almost the most symmetrical and best proportioned that I have seen. In order that this may be recognized as a head of a real moose and not merely a picture, I would suggest that you put a descriptive line under the cut."

LEAVING the picturesque village of Bear River, Nova Scotia, about noon it took slightly under two hours, with a horse, to make the lumbering camp at Tom Wallace Lake where Mr. S. B. Davis, the proprietor of the lands on which I was destined to procure my first Moose, with a record Head, was in waiting for me. Shortly after my arrival we, with Mr. Wall Rice, a master shipbuilder who acted as guide, set out for the Langford Bog, a walk of about 45 minutes. The afternoon was spent in observation, a rather sleepy occupation, and it was during this time I was shown a pine tree on the western slope which had a bushy top and informed that "Wall" had chained a Moose to it and that I would have a chance at him in the morning. It sounded good but hardly probable.

After supper it was arranged that in the morning I should go out on the Bog alone. Mr. Davis was to watch the place where we left the Cow and "Wall" to call from a point of higher land between us. My! I can even now recall the lonesome feeling that came over me. However, I took heart and swallowed my symptoms of "Buck Fever." I was instructed in many things, foolish and otherwise, and finally told, just before retiring, that in order to have the "Meat" out by 10 a.m. or before banking hours I must have him shot not later than

7 o'clock. Next morning, "Wall" developed a severe cough, one that would not succumb to any treatment; so it was decided that he should accompany me to the Bog and leave Mr. Davis to take care of the "Prospect." How I thanked my stars for that cough!

It turned out a dull, drizzly morning and in due time we were at our stations the Guide and I, in close proximity to each other, on the Langford Bog, Mr. Davis being well within sound of the horn. The first call was made at ten minutes to six, the second at ten minutes past which was immediately answered by a "Waugh" from, at or near the Pine Tree to which I had been told in jest the Moose was chained. We heard him quite distinctly when he crossed the brook at the head of the Bog about half a mile away, then silence for three quarters of an hour when we heard directly opposite and behind the island a sound like the breaking of the top rail of a doubtful fence when one endeavours to get over; this was our Moose coming. I had just time to raise on one knee and see that the sights were clear before he appeared round the western end of the island, walking leisurely towards us; but before leaving all cover he came to a standstill behind a very small tree that would have effectually hidden him had we not seen him previously. After remaining there

some minutes he moved into full view walking with a positive step, the nose down like a horse which showed his antlers to perfection. They resembled large yellow packing cases on either side of his head supported and fastened in the middle to him by a bar. He walked with a "Go-as-you-please" air rolling his head with a slight swing which rose at each step making a sort of semi-circle movement which seemed to me in excellent waltz time. After clearing the island he turned east in true military style and when right opposite, with full broadside at 110 yards by tape line, he stopped, raised his head and turning it slightly looked straight at us.

"Let him have it" were my instructions and I did, aiming just behind and below where I judged the shoulder should be. He sure jumped and started straight away from us for cover; but "Wall", ever-on-the-job, gave two short calls that brought him around, like a flash, to the same position, but 10 yards further away. I put up, took deliberate aim and pulled, only to find that I had neglected to work a fresh cartridge into the chamber. This was rather disconcerting; but as the Monarch gave me ample time, I did not lose the shot. After this he moved back about twenty yards, and stood back to with his head up and looking at us over his shoulder. He had the appearance of standing on

something with his fore feet. It afterwards proved to be the rake from his withers to his antlers that gave this impression as the place on which he was standing was as level as a billiard table. He remained in this position for what seemed hours then settled in his tracks. I looked at my watch, "Just seven" I chuckled, shook hands with "Wall" and we both hustled up to our prize with intent to finish him off; but this was unnecessary as his eye was sunk and only a slight kick left in him. So different to what I expected; I had visions of seeing him floundering and me watching to catch a chance shot.

We now started for camp, meeting Mr. Davis coming on the Bog. He first upbraided us for not firing an extra shot to let him know we had gotten our game and in the second place would not believe us when we told him we had bagged a fifty spread.

Nothing would do, he must see for himself. We took him round so as to come on the Moose head-on. His surprise was as great as though the beast had jumped at him and he remarked: "Oh!—what a fine color"; nothing else seemed to appeal to him.

It was now decided to paunch him before returning. The Moose looked so slick and light that had I been asked to turn him over I would have tried without the slightest thought that I could not easily do it.

As a matter of fact, it gave the three of us all we could do assisted with a rope twitched to trees to turn the head over, much less the body. He dressed upwards of 800 lbs. Mr. Davis looked after the final dressing of the meat so I was able to be back on-the-job before 10 a.m.

Thus ended a Memorable Moose Hunt.

Hints for Junior Readers

BOYS' REFORESTATION CLUB

A BOYS' Reforestation Club has been successfully operated in the State of Louisiana under the auspices of the State conservation department. Necessarily the boys interested in this scheme are residents of timber growing districts for one of the conditions is that each lad shall take charge of a plot of woodland between one and three acres in size. The effort in Louisiana was made through the instrumentality of the forest rangers. The Clubs being organized the Forest Rangers assisted them in securing plots of ground and the lesson that was taught chiefly was fire prevention and fire control. The lads were taught to construct fire lines around their plots as the first lesson in their work and they were then instructed in the proper thinning out and cleaning of their plots. The judges who examined each of the plots, preliminary to the distribution of prizes, declared that some of them resembled United States Forest Reserve plots, so excellently had the work been done. Most of the boys had charge of from one to three acres of second growth pine or second growth hardwood. In any plots that were partially seeded or barren they either transplanted seedlings or planted the seed, thus providing a real service.

BUILDING A CAMP FIRE

The average novice, when he builds his first camp fire, does so with absolute disregard of the wind's direction and velocity, the nature of the fuel he must use, and the amount of fuel he may have at his disposal. The fire should be located at a point far enough and in a direction from the camp to prevent embers or smoke from blowing into the tents or bedding. If the fire is to be cooked over, however, it should not be so far away from the dining tent that valuable time may be lost in going to and from it.

Building the Fire:—Small, dry fuel should be placed directly on the ground and covered with the coarser fuel, the latter being prevented from smothering the blaze by the support of stones or logs placed beside the spot selected for the fire. Green logs are preferable for this use and should be laid parallel with each other, one on either side of the fire; placed in this position, they not only serve as a means of support for the fuel, but they also act as walls for the confinement of the live coals.

Camp fires should never, in any instance, be built against the trunks of large trees or against large logs that will not be completely consumed by the time camp is to be moved. Neither should they be built in the midst of inflammable material until a wide area has been swept off quite clean.—Jay L. Taylor.

COOEY CANUCK RIFLES

Carry a
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CANUCK"**
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On your Fishing Trip, at your Summer Camp, along the trap line or in the bush, the Cooley "Canuck" is the ideal rifle for small game or target shooting.

Accurate, hard hitting and safe to carry. Built to stand rough use. The special "White Spot" sight gives you a quick sure bead on your target in any light. Half-cock feature on bolt makes accidental discharge impossible. Easily taken down for carrying. Single shot, turn bolt action, 22 or 25 calibre. 22 calibre shoots all sizes up to 22 long rifle. 25 calibre shoots short and long rim fire shells. Genuine oiled Walnut stock. Every part made in Canada and fully guaranteed.

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COOEY CANUCK RIFLES



The Silkworm's Rival

Reprinted from the *Scientific Monthly*

MAN has entered into active competition with the silkworm and, although the worm has the advantage of several million generations of previous practice in the art of silk making, man is rapidly catching up. The output of artificial silk has increased fivefold during the last twenty years, while the output of natural silk has only gained fifty per cent. More than a third of what seems silk to the eye comes from the factory instead of the cocoon. Some forty million foreign feet are now encased in synthetic silk stockings made in America.

Artificial silk is not silk and should never be sold as such. But if it is, it is not so much because the salesman desires to deceive, as it is because the public is unwilling to credit the chemist with the creation of something new or to believe that he can make anything so good as is made by a worm. Of late this un-natural prejudice in favor of nature is being overcome and the new synthetic fibers are being marketed by their manufacturers as they should be under synthetic names. Some of the trade names are viscose, lustron, fibersilk, lustre-fibre, Givet silk, Soie de Paris, Glanzstoff, artiseta, lustra-cellose. There are a lot of others, but I omit to mention them because I can't remember them.

There are four different modes of manufacture but the raw material is essentially the same, cellulose. This is the substance of wood, paper and cotton, so it is cheap and abundant enough, but the difficulty is to dissolve it so it can be squirted out of the tiny holes in the spinnerette to form the fibers. Water will not dissolve paper pulp, of course, nor will any ordinary solvent except strong acids and alkalies.

The first person to solve the problem was a Frenchman, Count de Chardonnet, who in 1884 deposited with the French Academy of Sciences a sealed document. Three years later this was opened and found to contain a method of making artificial fiber by treating cellulose with nitric acid. The resulting compound, which is a mild form of gun-cotton, can be dissolved in alcohol and ether, like the common collodion that we use to cover our skinned knuckles. But the nitric had to be thoroughly eliminated from the yarn, otherwise it was too inflammable.

Another process, invented by the French and worked by the German, got the cellulose into fluid form by dissolving it in a solution of copper and ammonium salts.

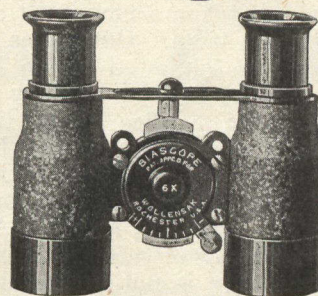
In the making of viscose a third method is employed. Wood pulp, such as is used in paper making, is treated with strong soda lye and then with carbon disulfide. This brings the cellulose into solution as an orange liquid. This is forced through minute holes in a platinum nozzle into dilute acid, which hardens each fine stream into solid fiber and the sulfide is then removed.

During the war another form of soluble cellulose found extensive employment as "scac" or dope for airplane wings. This is the acetate, made by dissolving cotton or wood pulp in the concentrated acid of vinegar, acetic. Lustron is made by this process.

These various kinds of artificial fibers differ from one another and all of them differ from natural silk. And in this difference lies their value. For fabrics can be woven out of natural and artificial silk and with cotton or wool in any desired combination. The fabric at first may look white and uniform, but if it is dipped in baths of various dyes each thread will attach a particular tint and a complicated design brought out in color.

The artificial fibers and the coal-tar dyes make a brilliant combination and through the aid of this alliance

Something NEW!



"BIASCOPE"
SIX-POWER

FIELD AND THEATRE GLASS

FOR \$6.50 WITH LEATHER CASE POSTAGE PAID

QUANTITY production enables the manufacturers of this excellent glass to allow it to be retailed at \$6.50. It is not exaggerating to say that it compares favorably with glasses selling at 3 to 5 times this price.

The power is six times. The definition and illumination is fine and the scope of view is ample for practically any requirement. A dioptric scale of reading enables one to make instant adjustment without focusing every time the glasses are used.

The Biascope is constructed of brass and has a black lacquer finish resembling leather but more durable.

It weighs only seven ounces and fits into a vest pocket.

PHOTOGRAPHIC STORES, LTD.

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NORTHERN ONTARIO

The Great Clay Belt of Northern Ontario lies one degree south of Winnipeg, and contains millions of acres of virgin soil fit for mixed farming which may be had by returned soldiers and sailors free; to others—18 years and over—50c. per acre.

Information required by intending settlers is found in a booklet on 'Northern Ontario' prepared by direction of the Minister of Agriculture—Honorable Manning Doherty, and may be had free on application.

Write

H. A. MACDONELL

Director of Colonization,

Parliament Buildings, Toronto, Ontario.

our world has become more colorful and cheerful. Sweaters and hose, neckties and underwear, have blossomed out in varied hue like the flowers that bloom in the spring. The knitting machine has taken a new spurt and is now running a race with the loom. Our ladies may now wear synthetic lace that is shadowed by no thought of toilsome fingers and bent shoulders. They may wear synthetic furs without the sacrifice of wild life.

Man is no longer dependent upon what he can pick up in the plant or animal kingdoms, for the new fiber can be made in any form desired, flat or round, smooth or rough, thick or thin, and of any length. A single filament may be run out thousands of yards without knot or break.

The man-made fiber is not so strong as the worm-made silk, especially when wet, but this has not interfered with its popularity so much as the fact that it is lacking in seroop. The seroop, as the sound of the word suggests, is the audible evidence of the presence of silk. What is the use of owning a silk petticoat if nobody can hear it as you pass by? But science is overcoming even this obstacle.

An Interesting Exhibit

THE Royal Ontario Museum of Zoology, Toronto, has recently issued an illustrated pamphlet outlining what it has to offer to the public and indicating how the public may assist in the work it is trying to do.

The museum's present collection illustrates in the main the following features:

(1) An exhibition collection illustrating the various species of Canadian animals, with special reference to those of Ontario.

(2) A series of habitat groups illustrating native animals in carefully elaborated replicas of their natural environments.

(3) A selected series illustrating the chief peculiarities of form, coloration, and life history of insects, and the natural history of Canadian insects; including a subsidiary collection of the commonest, together with a complete demonstration of the methods of collecting and mounting.

(4) A special collection illustrating the injurious insects of farm, orchard, park, and forest with examples of their work.

(5) A series of coloured casts of Canadian fishes, especially those significant in game and commercial fisheries. This series is being prepared at great expense of time and effort and is already one of the outstanding features of the collection.

(6) A study collection of animals, not used for exhibition, but available at all times to students of natural history, artists, and others.

It is pointed out that while museums do acquire specimens by direct purchase, large and valuable additions are due to the generosity of private individuals. A museum, it is urged, should be regarded as a public repository. Not even the large museums of the world have attained their present eminence on any other basis. Though there are many instances in which specimens and whole collections, through one circumstance or another, have to be handled in a commercial way, the chief consideration for the prospective donor or collector is whether he wishes to keep his specimens for his individual enjoyment, to count them a commercial asset, or to enjoy the satisfaction of having them cared for in perpetuity, shared with the public, and publicly acknowledged.

Copy of the pamphlet may be had on application to the museum.

World-Wide Facilities



FOR the handling of Foreign Exchange transactions, collections and the remitting of money at home and abroad, this bank can offer you exceptional facilities and a direct personal service through over 700 of its own branches in Canada and Newfoundland, the British West Indies, Cuba, Central and South America, as well as in London, New York, Paris and Barcelona.

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ENCOURAGEMENT

From E. B. Worthington, Barrister, Sherbrooke, Quebec:
 "Best wishes to the Canadian Forestry Association in the patriot work you are carrying on so splendidly."

From Dr. Howard Murray of Dalhousie University, Halifax, N. S.:

"I wish to congratulate you on the splendid work that you have been doing and to wish you an even greater measure of success in 1923."

From H. W. Johnson, Esq., Hope, B. C.

"Am enclosing check for membership. I consider it as good an investment as any I can make. You have my best wishes in everything you do."

From a well known Calgary Barrister, Mr. Alexander B. MacKay,

"I have pleasure in enclosing check for \$2.15 in payment of 1923 subscription. I cannot speak too highly of the magazine which you people are producing or the work you are doing."

From a regular reader of the Magazine,

"I am sure that if we did not have the Forestry Magazine we never would have wakened up. I hope you will be able to keep your able staff of men around you to go on with the good work which you splendidly started."

From: G. W. Parmelee, Department of Public Instruction, Quebec, P.Q.,

"I wish to congratulate you on the measure of success that has crowned your efforts during the past year, and to assure you of my hearty sympathy in your work which is one of such great economic and social importance to this country."

From: Mr. A. E. Cross, Pres. Calgary Brewing & Malting Co. Ltd.,

"Receiving yours of February 13th explaining the work done by your Association and compliment you on such a successful year and hope it will be possible for your Association to help to prevent all forest fires which cause untold loss to the people of Canada. You are doing a great work in educating them to realize the loss caused by fire."

From: Auguste Dupuis, Village des Aulnaies, P.Q.,

"The Illustrated Canadian Forestry Magazine is doing immense good. It is a beautiful and most instructive magazine. It's progress is wonderful. Hon. Mr. Turgeon, your new President, when Minister of Agriculture was the first to help County L'Islet Horticultural Society in rewarding the farmers who managed economically their wood-lots in view of keeping their richness forever and this in Counties of L'Islet, Montmagny, Bellechasse. Honor to him for supplying experts for the visits and reports. Your 84 year old servant, Auguste Dupuis."

Bovril Makes Good Cooks

You cannot help serving tasty dishes if you use Bovril. If you want to flavour the soup or the hash or the stew—Bovril does it for you. There is no natural food substance so tasty as Bovril.

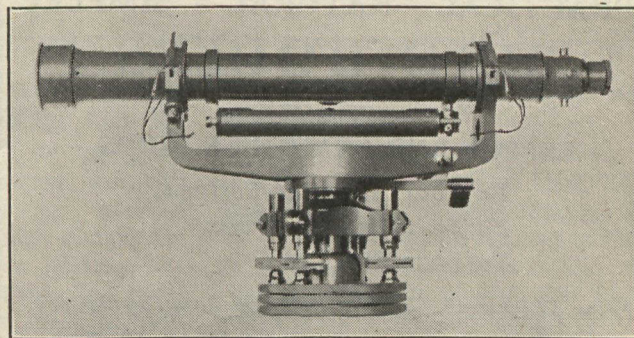
All you need do to make meals a success is to "put a little Bovril in." Use

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Forest Exhibits Car Draws Great Crowds

THE Forest Exhibits Car of the Canadian Forestry Association once more has started its long pilgrimage which last season covered over 12,000 miles and brought this forest protection enterprise into contact with nearly 250,000 people.

The Car commenced work for the 1923 season at Chicoutimi, April 13th, with Mr. Napoleon Lemay, kindly loaned by the Quebec Department of Lands and Forests, as lecturer, and Mr. Angus G. Cooch and Mr. V. Charlebois of the Canadian Forestry Association in charge. Through the courtesy of Price Brothers & Company every facility was given the Association. Indeed co-operation could not have been more complete. The parish priests over the whole Lake St. John country helped the enterprise by making public announcements and urging parishioners to visit the car and attend the daily lectures on forest fire prevention. The tour has been most notable on account of the work done back from the railway lines requiring special trips by sleigh taking the staff, electrical equipment, motion picture machine, etc. into the communities where dwell woodsmen and others who literally have in their own hands the protection of the forest areas from fire. On Saturday, the 14th of April, 450 people visited the Exhibits Car. In the evening a lecture was held in the Town Hall presided over by Mayor Guay of Chicoutimi, with 800 present. Thus proceeded the record from day to day, with hundreds of people reached not only in the railway towns but in the more remote communities to which the Canadian Forestry Association staff proceeded by sleighs.

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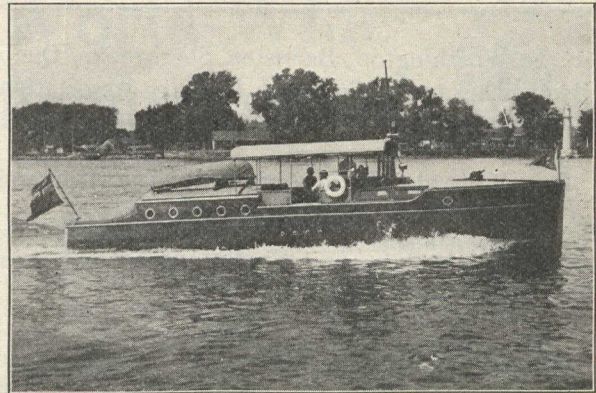
Where we can furnish fire-fighting equipment on short notice.

We have supplied several Forest Protective Associations, and can give excellent service.

Among our products are:—

Fire Hose Fire Department Supplies
Fire Extinguishers General Rubber Goods

The Canadian Fire Hose Co., Ltd.



Pictured above is an example of the skilled workmanship executed in our plant.

WE are qualified and equipped to undertake original or standardized designs and carry them out in detail. On our staff we include a Naval Architect who will act in an advisory capacity in the preparation of plans and specifications.

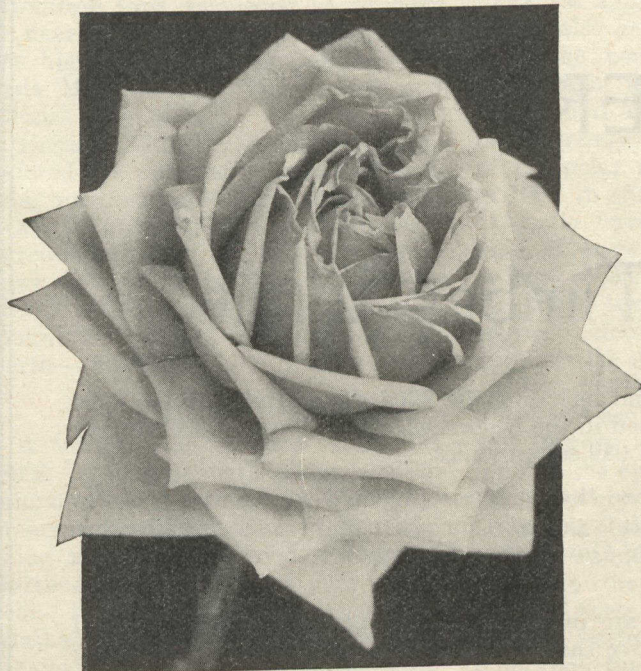
No work is too large and none too small to receive our most careful attention.

We solicit enquiries regarding the construction of all types of motor driven and sailing craft.

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Roses of Exceptional Merit



Roses from "Maplewood" are grown in the open, not forced in greenhouses. They are hardy, vigorous plants, and will supply abundant bloom. Every rose guaranteed true to name.

Collection "A"—One strong plant each, of the following 12 superb roses, selected from the National Rose Society's List of 32 Best Roses for General Garden Cultivation, \$10.00 carriage paid: General McArthur, Golden Ophelia, Daily Mail, Ophelia, Red Letter Day, Los Angeles, Hugh Dickson, Queen Alexandra, Caroline Testout, Lieut. Chaure, Mrs. Henry Morse, Frau Karl Druschki.

Collection "B"—Six of the Best of the Newer Roses. All recommended by the National Rose Society, \$10.00 carriage paid: Jean G. N. Forestier, Padre, Souv. de Claudius Pernet, Sunstar, Una Wallace, Souv. de George Beckwith.

Collection "C"—10 Superb Garden Roses in 10 distinct varieties, our selection, \$6.00 carriage paid.

Collection "D"—25 Superb Garden Roses in 25 distinct varieties, our selection \$12.50 carriage paid.

Collection "E"—50 Superb Garden Roses in 50 distinct varieties, our selection \$20.00 carriage paid.

ILLUSTRATED
CATALOGUE
FREE ON
REQUEST

**Kenneth M'Donald
& Sons Limited
Seeds Ottawa, Can.
Market Sq.**

Forests a Supreme Asset in New Brunswick

THE ANNUAL agricultural and forest crops of New Brunswick comprise about 85% of the total value of all products produced. The forests cover about 70% of the total area of the province, and the total value of the forest products produced averages about \$35,000,000. Agricultural products in 1922 were valued at \$42,965,000. These two great industries, lumbering and farming, combine to keep New Brunswick stable and the financial credit of the province in a comparatively high position. They have earned for the province the title "The Land of Comfortable Homes." There are 34 acres of forest land for every man, woman and child in the province, while cultivated farming land under field crops aggregates 21½ acres per capita.

The Farmer and the Forests.

The rural population is much greater than the total in towns and cities. Farming communities in fertile valleys and on rich uplands are surrounded by forests. During the

long Winter months when the prairie farmer, the potato planter and the fruit grower are more or less idle, the New Brunswick farmer is busily engaged cutting logs either in the timber limits of the lumber companies or on his own wood-lot getting out logs, lathwood, pulpwood, or cordwood. Did you ever meet a man from rural New Brunswick who did not know how to use an axe? It is estimated that 10,000 men are employed in the lumber woods this winter. Over \$2,000,000 will be paid out in wages and board before the annual cut of 15 million logs will be safely skidded on the banks of the streams. The forest payroll of the long winter months keeps the farm on a stable footing in that period between harvesting and sowing. If the reader doubts this statement, let him ask any of the merchants in the rural districts about conditions during the 1921-22 season when the depression in the lumber industry was at the lowest level, and there was little or no work in the woods. The same condition would arise and exist for a

century if these same forest areas were burned.

The Menace of Forest Fires.

It is very important that forest fires be kept out of such land, so that the present economic balance will not be broken. It is needless to state that burned forest land lies idle for at least eighty years and lessens the output of forest and farm. By keeping out forest fires further development of both industries will be possible. As forest products are more closely utilized, as the rough product is finished up within the province requiring more mills and factories, a greater population will be required. Areas of farming land not yet taken up will be settled and farmed and the economic balance will thus be maintained. The whole secret of further development lies in the treatment of forest and farm. At present the vital question is adequate forest fire protection. Be as careful of fire in New Brunswick forests as you would be in a powder factory, for the prosperity of the province hinges on the forest resources.



TENDERS

for

Pulpwood and Timber Limit

Tenders will be received by the undersigned up to and including the 22nd day of June, 1923, for the right to cut pulpwood and timber on a certain area situated in the watershed of the Trout and Chapleau Rivers in the District of Sudbury, comprising an area of 1,049 square miles.

Tenderers shall state the amount per cord on pulpwood that they are prepared to pay as a bonus in addition to dues of 80 cents per cord for Spruce and 40 cents per cord for other pulpwoods, or such other rates as may from time to time be fixed by the Lieutenant-Governor in Council, for the right to operate a Kraft pulp mill and a paper mill.

Tenderers shall also be required to say what they are prepared to pay, per thousand feet board measure, for the following classes of timber, over and above the upset prices in addition to Crown dues:

Red and White Pine, upset price.....	\$6.00 per M. ft. B.M.
Spruce (too large for pulpwood) upset price.....	5.00 per M. ft. B.M.
Jackpine (banksian) upset price.....	2.50 per M. ft. B.M.

The Crown dues on Pine including Jackpine being \$2.50 and on Spruce \$2.00 per M. ft. B.M., or such other rates as may from time to time be fixed by the Lieutenant-Governor in Council.

The successful tenderer shall be required to erect a mill or mills within the limit or at some point in Ontario approved by the Minister, and to manufacture the wood into Kraft pulp, and also such portion thereof into Kraft paper when required so to do.

Parties making tender will be required to deposit with their tender a marked cheque, payable to the Honourable the Treasurer of the Province of Ontario, for fifty thousand dollars (\$50,000.) which amount will be forfeited in the event of the successful tenderer not entering into agreement to carry out conditions, etc.

The said \$50,000. shall remain on deposit until the Kraft pulp mill, as provided by terms and conditions of sale, is erected and in operation. Any timber cut in the meantime shall be subject to payment of dues and bonus as accounts for same are rendered. After the said pulp mill is erected and in operation the deposit of \$50,000. may be applied on account of bonus dues as they accrue, but the regulation dues as mentioned above shall be paid in the usual manner as returns for cutting of wood and timber are received and accounts rendered.

The highest or any tender not necessarily accepted.

For particulars as to description of territory, capital to be invested, etc., apply to the undersigned.

All tenders should be enclosed in sealed envelopes and marked plainly on outside "Tender for Trout-Chapleau Pulp and Timber Limit."

BENIAH BOWMAN,
Minister of Lands and Forests.

Toronto, April 16, 1923.

N.B.—No unauthorised publication of this notice will be paid for.

(Continued from page 287)

heavy precipitation. Just to the east is the Gulf Stream and from the warm waters of the Gulf Stream there continually rise clouds of vapor that are carried to the west and condensed into snow against the mountain tops, somewhat as we have a nearly perpetual snowfall upon the high slopes and tops of the Cascade Mountains in Washington and British Columbia.

British Columbia is commonly considered the warmest province of Canada, but because of high altitude and heavy precipitation it contains over three-fourths of all the permanent snow and ice in continental Canada. Nearly all the rest is in the high mountains of the territory to the north—the Yukon.

Snowfall not Heavy

A corollary of the idea that the north is covered with snow even in summer is the one that it is a region of heavy snowfall. This is far from being true. If you take a map of North America and place your pencil near the southwestern corner of Alaska on the coast of Behring Straits, you may draw a line east, along the south coast some fifty miles inland. When you come east to British Columbia your line turns south, still keeping fifty or a hun-

dred miles inland. When you come near the international boundary your line will run east following the boundary between the United States and Canada, roughly. This is the line of heaviest snowfall. South of that line, generally speaking, you have less and less snow and north of it you also have less and less snow.

In the north polar regions there is, to begin with, very little snow on the ground at the end of winter. We have already said that in some parts of the polar regions the temperature is 100° in the shade in the summer. It would have to be a very peculiar kind of snow if a little of it, more or less covering the ground in winter, would last far into the spring. Of course it does not last long but disappears like magic. For two or four or five months, according to just where you are, you have green prairies and flowery meadows that are a delight to the eye and would be delightful to every sense but for the unbelievable plague of insects—mosquitoes, sandflies, horseflies, and the like. In the development of the country these will prove a drawback next in seriousness to the wall of ignorance that surrounds the northern lands. China's wall of masonry was never a very efficient barrier. A wall of misinformation is more effective, more difficult to tear down.

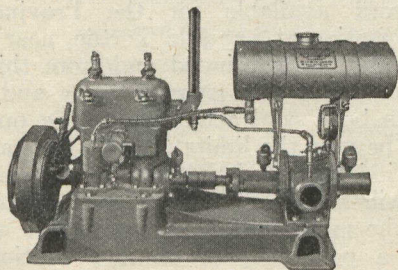
PLANTING BY WATER COMPANIES

Harrisburg, Pa. — Water companies, owners of mining properties, and clubs of sportsmen in Pennsylvania planted more than 1,200,000 young forest trees on their holdings during the spring of 1922, according to an announcement made by Major R. Y. Stuart, the State's chief forester. During the last eight years the same groups have set out about 5,217,000 seedlings.

Last spring, the mining companies' plantings exceeded those of water companies and outing clubs by a wide margin. The former planted 840,000 young trees to provide a future timber supply for the operation of their mines. The water companies set out 320,600, and the clubs, 86,470.

The largest individual planting in the spring of 1922 by a water company was made by the Pennsylvania Water and Power Company, of Holtwood, which set out 70,000 trees. Ten thousand less were planted by the Williamsport Water Company. Four other companies set out more than 25,000 each.

Of the mining corporations, the Clearfield Bituminous Corporation led with 130,000. Nine other companies planted over 50,000 trees each.



Guaranteed to develop 140 lbs. pressure and has reached 185 lbs. on tests

The Development of the

Evinrude High Pressure Pump

is of VITAL INTEREST to those interested in protecting CANADA'S FORESTS

Recently—at a test conducted while **Actually Fighting Forest Fires** the pump delivered 70 U. S. Gallons per Minute.

The Higher Pressures & Greater Volume developed by the **Evinrude** means **More Territory Protected**.

It deserves the use of a better hose—our No. 1 Quality **Linen** (Not Flax Tow) Hose—a hose built for forestry work—which will hold all the water pumped at 200 lbs. pressure (Guaranteed), which sweats enough to keep the hose wet, and which is **Flexible and Easy to Roll**.

The **EVINRUDE** Pump and No. 1 Quality Hose are the result of the honest endeavors of **WATSON JACK & CO.** to give the Fire Rangers of Canada a more efficient Equipment with which to combat forest destruction.

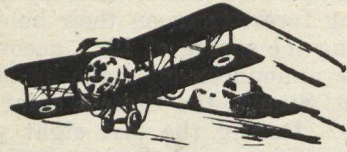
We are now able to announce that—after much Experimental work we are in a position to supply nozzles, Strainers, Siamese with Valves, etc., in a Special Metal as light as Aluminum to increase portability.

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AERONAUTICAL SECTION



A department devoted particularly to the application of aerial methods in forest conservation and generally to the promotion of sane civil aviation in Canada.

Canadian Aviation in 1923

Commercial aircraft operations on a much larger scale than ever before will be undertaken

(Specially contributed to the Canadian Forestry Magazine)

THE Flying Season of 1923 should be a banner one for Commercial Aviation in Canada. After four years of the hardest kind of missionary and experience-gaining work, the commercial situation has greatly crystallized through the elimination of joy-riding and other non-commercial flying and the development of woods operations, such as fire patrol, aerial sketching, photography and transportation in the North country. There is, of course, a certain volume of work in the more settled areas but this is comparatively small as yet.

During the four years of the development period of commercial aviation, the operating personnel have gained a great deal of valuable experience and data on problems peculiar to the commercial side of the business and the result is that 1923 work is being carried out on a thoroughly sound basis and with every prospect of continuing its past success from an operating point of view and increasing the financial returns to be secured through this new industry.

Operations in Quebec.

So far as is known, there will only be two distinct commercial companies in Eastern Canada. Messrs. Price Bros. are continuing the operating of their aircraft department which has proven such an efficient and profitable one in their work during the past three years. No details are available at this writing as to their personnel or the operations to be carried out but it is understood that the work of forest survey, fire patrol and photography will be continued. Price Bros. were pioneers in aircraft development and are continuing their research work.

The Laurentide Air Service, Limited, announce a programme which involves a very large degree of expansion over their 1922 programme, which comprised over 700 hours, or more than one-third of the total commercial flying in Canada during that year. Development work has been carried out throughout the Winter with machines fitted with skis and a considerable amount of valuable data accumulated on Winter flying and wireless telephony.

Big Plans for Ontario.

Ontario should continue to be the most important sphere of operations. Remi Lake will be continued as a main Ontario base for the purpose of completing forest survey of that area and the handling of transportation work into James Bay and the adjoining areas. A new station is to be established on Lake Nipigon. The Ontario Government intend to carry on an aerial inventory of forest areas in this vicinity and the work will be done from Orient Bay. It is also expected that a considerable volume of work will be available in the transportation of

fishing, hunting and camping parties, who require quick transport through this sportsman's Paradise. This part of Ontario has always been a Mecca for lovers of out-door life but one of the big difficulties has been transportation into the inaccessible points and with aircraft service available it is expected that a great increase in number of tourists, campers and sportsmen will occur.

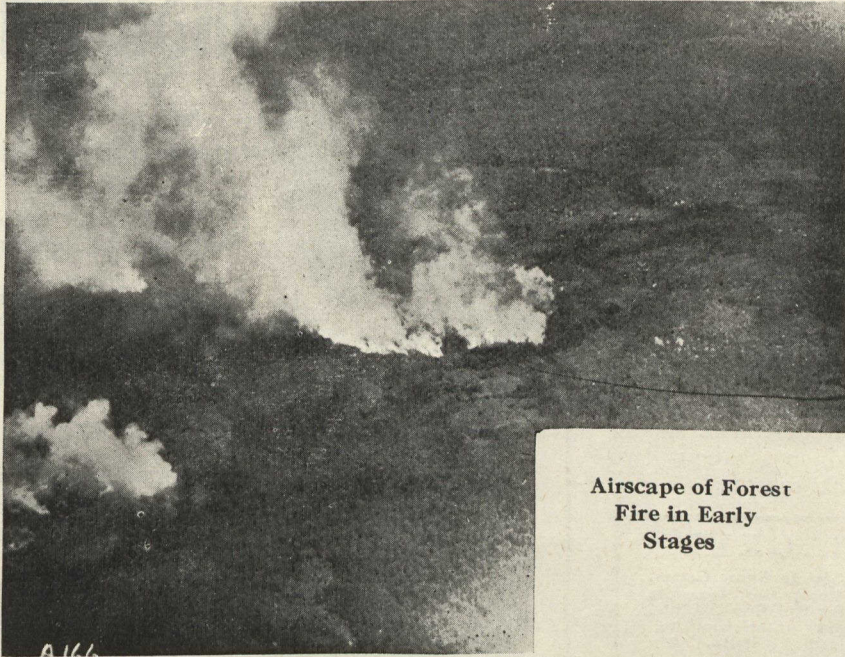
At least one, and possibly two additional sub-bases will be established at other points throughout the Province for the carrying on of further operations. The details of these are not available but they will consist largely of transportation and survey work.

In Quebec the work has not yet been settled. Until the plans of the Air Board are complete it is almost impossible for commercial companies to make definite plans because of the fact that the Quebec Government has worked with the Air Board in the past and naturally the Government work involves a considerable proportion of the total work available for the Province. The Company's main station at Lac à la Tortue, near Grand'Mere, will, of course, be continued and from this point a considerable amount of fire patrol, survey and photographic work has been contracted for. The operations will be extended beyond the limits of the work carried on during 1922 and it is expected that one or more machines of a land type will be operated for special photographic work which can be more efficiently carried out with this type. There is a possibility of another station being opened in Quebec but no plans have definitely been formed.

Operations of U. S. Companies.

Two other operations have been announced by American interests, but neither of these affect forestry work. The Aeromarine Airways, Ltd. of New York have announced their intention of flying into Hudson Bay, using a fleet of two F5Ls carrying eleven passengers and equipment each, and one H.S.2L. five seater. The trip is being planned and carried out by American business men, primarily as a novel holiday, but it is felt that this scheme holds promise of their becoming interested in Canadian enterprises in the areas to be visited and it would not be surprising if the trip resulted in a stimulus to Canadian mining and forestry work in some undeveloped regions.

The daily press contained reports some little time ago of the organization of International Airways, Ltd., a Canadian subsidiary of International Airways, Inc., which is presently being organized in the United States for the purpose of developing a net work of air lines radiating from Chicago, and which it is intended will eventually include Toronto and Ottawa, as a Canadian extension. An American machine was in Toronto for some days this Spring carrying on propaganda work for



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Fire in Early
Stages

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There is no phase of forestry operations in which aircraft can play a larger or more valuable part than in fire protection.

The aeroplane is the equivalent of a fire tower which can be moved to any position required at the rate of 60-120 miles per hour and can be raised to an elevation of five thousand feet or more if desired. It can report by wireless or by flying to a base the position and full details of fires spotted.

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But even here the utility of the aeroplanes does not cease. An aerial sketch or photo survey will establish beyond question—and within a few days—the actual damage done, for purposes of insurance settlement or adjustment of limit values.

The efficiency of aircraft operations depends very largely upon the completeness of ground organization. This requires time, and matters of fire protection should, therefore, be given very early attention.

All inquiries will be promptly acted upon and will involve no obligation whatever.

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(of Canada) Limited,**
GRAND'MÈRE, P. Q.

Quebec Base:
Lac a la Tortue, Que.
(near Grand'mère,)

Ontario Base:
Remi Lake, Ont.
(Moonbeam, Ont.)

this Company but they have not yet announced definite plans for their Canadian operations, and it is, therefore, doubtful whether any serious work can be carried on during the coming season.

In talking with executives of aircraft companies it has generally been found that the greatest single difficulty met with in their work is the lack of appreciation on the part of the public generally of the amount of time required to thoroughly organize an efficient aircraft operation. It is true that most operations can be carried out with very little organization but by planning months in advance it is possible to arrange for supplies of fuel and stores and also for the use of machines at times which will permit of a very great reduction in cost of such operations. Forestry interests have on the whole shown keen appreciation of the possibilities of aircraft and are not slow in taking advantage of the many advantages which it offers.

The very severe Winter and late Spring of this year have naturally operated to delay the opening of the flying season but it is expected that flying boats should be in operation by the 10th May, which is about two weeks later than the opening of the 1922 season.

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A Firm Friend of Forest Conservation

Honorable Honoré Mercier, K.C., L.L.B. Minister of Crown Lands and Forests of Quebec, who has rendered sterling service to his native province by a vigorous and progressive administration of the forest resources.

Hon. Mr. Mercier was born at St. Hyacinthe, 1875, the son of Hon. Honoré Mercier, formerly Prime Minister of Quebec, and Virginie (St. Denis) Mercier. He was educated at St. Mary's College, Laval University; Montreal (L.L.B.) He was called to the Quebec Bar in 1900 and was a partner of Judge Camille Piché for some time; later forming the partnership of Mercier & Bélique. He was elected to the Quebec Legislature for Chateauguay, 1907 and re-elected in 1908, 1912, 1914, 1916, 1919 and 1923. He became an alderman of the



Honorable Honoré Mercier, K.C., L.L.B.

city of Montreal in 1906 and was re-elected in 1908.

Hon. Mr. Mercier was called to the Gouin Cabinet on April 29, 1914, as Minister of Colonization, Mines and Fisheries and became Minister of Crown Lands and Forests in August, 1919. He was president of the Quebec Streams Commission in 1921; President International Association of Game, Fish and Conservation Commissioners in 1922. He is an Ex-Director of l'Ecole des Hautes-Etudes Commerciales de Montréal.

Hon. Mr. Mercier married Jeanne Frechette, 1903, and their family consists of five sons and four daughters. He is a member of the Quebec Garrison and Montreal Reform Clubs. His chief recreations are hunting and fishing. He is a Liberal in politics and a Roman Catholic in religion. His residence is at Bellevue, Que.

A New Film to Preach Against Fire

THE Canadian Forestry Association has completed the first of a series of popular motion picture films dealing with forest fire prevention.

That the initial picture was favored with a very remarkable cast of players may be gathered from the fact that Rt. Hon. W. L. Mackenzie King, Premier Taschereau, Hon. Honoré Mercier, Sir Henry Thornton and Gustave C. Piché, posed especially for the Canadian Forestry Association cameraman, while a picture of E. W.

What was your Greatest Woods Adventure?

Two Cash Prizes of \$10 and \$5 will be paid by the Illustrated Canadian Forestry each month for the most striking articles of 500 words each for the best narrative of actual woods adventure, whether in the course of hunting, fishing, fire ranging or in any other way.

Get out your stub pen and go at it tonight. The prize will go not to a 'literary artist,' but to the man with a real story.

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And, please, keep it down to 500 words at most.

Beatty was supplied by courtesy of the Associated Screen News of Canada. Other provincial Premiers, Ministers, etc., are being added to the film as rapidly as possible.

Each figure in the film appears in a speaking posture and delivers a short and pointed sermonette on prevention of forest fires. French and English titles, of course, are used for Quebec Province. The effect is further heightened by alternating the personal flashes with strips of forests in flame, the general result being most striking and by no means easy to forget.

Distribution through all the regular motion picture theatres has been commenced so that millions of Canadians should witness the film before the summer is far along. The title is "Forest Flashes."

Tribute to the Late Dr. B. E. Fernow

Address given by Sir Robert Falconer, President, University of Toronto, at the funeral of Dr. Fernow, which was held in the chapel of Knox College, Toronto, Thursday, February 8th, 1923.

DEATH came gently to Dr. Fernow. He had no long wrestle with his last foe, but fell into unconsciousness several hours before the end and never came out of it. But he would have faced death, we may be sure, had he been in full possession of his natural powers, with the same courage that he displayed in his other experiences. His last appearance among his friends was on January 19th in Hart House, when he came in to hear Dean Graves of Yale address the Foresters' Club, and he must have been greatly pleased to receive the expressions of respect for his work and regard for his personal worth that were made by experts and former students. His feebleness on that occasion was a token to most of us that his remaining days would be few, and we cannot but be thankful that he has gone before his powers had so failed as to leave him little pleasure in life.

We wish to think of Dr. Fernow as he was in the fullness of his powers. He was then a man of great consistency of character. His walk and bearing were those of an upright man, and such he was. He was also one of the leading authorities on his subject in this continent, so much so that he has been called "the father of American Forestry." Dr. Fernow was born in Prussia 72 years ago, was educated in the Forest Academy of Münden and in the University of Königsberg and was six years in the Prussian Forest

Department. He came to the United States in 1876 and engaged in the metallurgical business. In 1886 he became Chief of the Division of Forestry in the Department of Agriculture at Washington, where he remained until 1898. From 1898 to 1903 he was Director and Dean of the State College of Forestry in Cornell, and for one year afterward was Professor of Forestry in State College, Pennsylvania. In 1907, he accepted the position of Dean of the new Faculty of Forestry in the University of Toronto, which he held until in 1919 he retired after having passed the age limit and on account of approaching infirmity. During all these years he was a prolific contributor on forestry subjects; he established a *Forestry Quarterly*, wrote a *History of Forestry, Economics of Forestry, and Care of Trees*.

Dr. Graves of Yale University on the occasion above referred to spoke of Dr. Fernow as the creator of Modern Forestry in the United States. Few in Toronto probably realized the position which he held in this department. Probably the years he spent in Cornell were those in which he had most unalloyed satisfaction, and the impression he made in those five years is shown by the fact that even till to-day he is most warmly remembered in that University, and not many months ago a memorial was erected there to perpetuate his name.

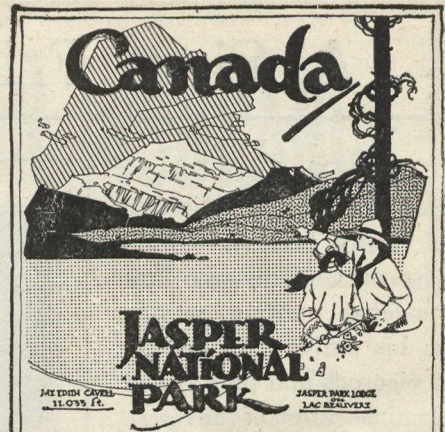
In Toronto, Dr. Fernow had to inaugurate a new faculty and that on a comparatively small scale. With all respect to his associates it may be said



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that for some years after its establishment when we thought of the Faculty we thought of Dean Fernow. Hampered though he often was, he quietly continued to do his best and at the same time to urge on the University and the public the needs of development. He saw the school grow from a score to over fifty and he gathered about him young men on whom he placed his own imprint. Staff and students looked up to him as their unquestioned Master. They were proud of him; they loved him; they could trust him to the uttermost. But he realized that much of his duty as Dean lay in informing the people of the province as to the necessity for conservation. So he travelled and lectured. He was a clear and convincing speaker. He knew his facts; he would speak in palatable truths, for he was in a real sense a prophet of the conservation of our natural resources.

But more than that, he was a highly educated gentleman who knew what education meant and who sought to make his students educated foresters. He drew up a broadly educative course for the ordinary degree in Forestry, and another combined course in Arts and Forestry, to both of which he insisted upon a high standard of entrance. He understood well that in the long run the best educated man is the most practical man because he grows with the years.

Dr. Fernow also exemplified finely the office of dean because he dealt with his students individually, and was interested in their personal development. For some he and Mrs. Fernow acted almost *in loco parentis*, and all were welcomed in their home. Here Dr. Fernow presided with dignity, finding his great pleasure in music. Mrs. Fernow for years taught without any remuneration in some of the cultural subjects of the course and many a student looks back gratefully to her for the inspiration she gave because she loved to teach.

Of course, the years from 1914 to 1918 brought supreme distress to Dr. Fernow, but all those who knew him admired his bearing throughout, his dignified silence, his endurance of sorrows, the deeper because of his fine character and because his own nature and ideals were so different from those of the men who were chiefly responsible for the world calamity. He was an American citizen and three of his sons were



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officers in the American army. Dr. Fernow never failed to act as a true man in circumstances which, thank God, few people have to pass through.

As has been remarked, he was a man whose refinement brought him respect and warm friends; whose aesthetic and intellectual pursuits made him an elevating companion. And when two years ago this University showed its high regard for him by giving him the honorary

degree of Doctor of Laws the honour was felt to be eminently deserved.

To Mrs. Fernow our hearts go out in deep sympathy. She entered into her husband's life with unusual penetration and understanding. She made him a home which those who had the privilege of entering will long remember as a centre of refinement and affection, and in all his trials she equalled him in high-minded patience. The memory of the just shall not perish.

Leaky Faucets on Public Treasuries

Every time a Canadian forest burns down, the public treasuries are stripped of a future cash return. Under our system of forest leases, the provincial treasuries of Ontario, Quebec, the Maritime Provinces and British Columbia collect so many dollars for every thousand feet cut by the lumber operator or for every cord of pulpwood cut by the paper maker. This arrangement makes the public a financial partner with the millman. When fire destroys the "limits" of the "X.Y.Z. Company," the latter is of course a heavy loser but the Public also sacrifices the yearly revenues that would have come to the Treasury from the dues on the wood cut.

The public impression that 'limits' represent 'alienated' resources is largely in error for the public treasury is a financial shareholder with the lessee of the limit and in case of fire damage, the penalty is fixed on both.

For example, one of the largest spruce limits in Ontario has been fifty per cent. destroyed by prospectors searching for minerals that were never found. The limit holder lost part of his heavy investment, his payroll was cut down by the fact of the timber being burned, and the province lost one dollar in dues for every one of the million cords that went up in smoke. Forest fires are paid for by the Public every time.

Woodpile 369,000 miles long.

The people of Canada and the United States use enough forest materials in a year to make a pile of logs four feet high and three hundred and sixty thousand miles long, or fifteen times around the earth.

This enormous drain on the forest wealth has so alarmed the public authorities that protective policies unheard of a few years ago are now being brought into force. In Canada,

the Quebec Government has closed all the forests against travellers except on written permit from a fire

ranger or other official. A few years ago this would have been considered drastic but with an annual record of five thousand conflagrations set in this Dominion by campers, fishermen, settlers, and other classes (who are the people who really lose most by what they destroy) the governments have no other option than to save what remains of the forests by stricter measures.

One camp fire in Ontario destroyed fifty-six years' supply of a mammoth Ottawa Valley lumber mill. A band of prospectors in another district burned twenty years' supply of one of Canada's largest paper mills. And none of the enormous areas thus destroyed can be reproduced under 150 years.



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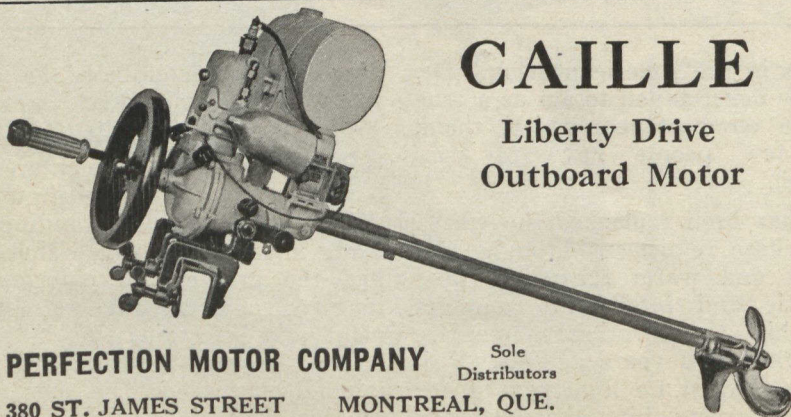
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The latest record covering twelve months shows over 11 million tons of lumber, pulpwood, logs, posts, ties, and paper.

This compares with 5 million tons carried by the Canadian Pacific.

The total traffic supplied by the forest to all railways for twelve months was in excess of 22 million tons.

No Canadian commercial interest is so intimately identified with the safety of the forests as a railway carrier. From the millions of wooden track ties, the scores of thousands of telegraph and telephone poles, the fifty to sixty million feet of lumber for buildings and repairs, a modern steam road is a forest creature and cannot run a mile until it first has called on a timberland for essential supplies.

The future of the public owned Canadian National roads is so intimately tied up with maintenance of the forests along its lines that experts look upon every forest fire in Canadian National territory as having the most serious possible bearing upon the earning capacity of the system.

With every timber tree taking on new value in a rising world market, the forest resources which the C.N.R. taps throughout such a large part of its territory promise to develop freight traffic far beyond anything as yet realized. The "fly in the ointment" however is the fearful record of forest fires, most of them set by campers, fishermen, prospectors, etc., which are ruining the timber resources nine to ten times as fast as they are being cut. Although millions of tons of pulpwood have been cut and shipped on Canadian railway lines, probably nine times as much has been destroyed by human-set fires.

The sportsman, the prospector, the settler and all other users of the woods have the power to maintain or destroy the future revenues of the Canadian National Railways from forest products. This does not take into consideration the menace of forest fires to tourist traffic for, after all, the tourist patronizes Canadian railways because of the lure of the woods and not to inspect our city streets or our factories.

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Forest Fires and Unemployment

THAT unemployed workmen are walking the streets of Ottawa and Hull today because forest fires set by thoughtless citizens have made the water powers of the Chaudiere mills no longer reliable, is the statement of Mr. Robson Black, manager of the Canadian Forestry Association, in an interview.

"A great part of the forest destruction on the numerous watersheds drained by the Ottawa has been unnecessary. The axe has not taken one tree to ten killed by fire. In very few cases of careful logging does the operation seriously affect the storage capacity of the region, but when fire comes and the soil is swept bare, the 'run off' amounts to a torrent in Springtime and but little water is available at the seasons when the turbines most require it.

"Because timber regions were burned down by campers, settlers, prospectors and others in the upper wa-

ters of the Ottawa, some of the chief local industries have been forced to buy part of their pulp from Eastern Quebec at double the price at which they could manufacture the same article, and Ottawa employees are thereby out of a job.

"A pulp and paper mill is just the agent of the Forest. To kill a forest by careless acts with fire is a body blow at the security of water powers and the raw material on which the mill exists and pays wages. Every forest fire must be paid for and we see who actually does pay the price when workmen are turned loose. Prospectors searching for non-existing minerals destroyed twenty years' supply of pulpwood for one Ottawa company. Such acts of legalized vandalism will do more to send skilled workmen to the United States than can be counteracted by any quantity of immigration propaganda."



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This advertisement inserted in the interests of forest protection by

The Spanish River Pulp and Paper Mills, Limited

Rules for Transplanting Evergreens

By Archibald Mitchell

IN THE first place the time to transplant evergreens is important. You can move them in Spring and about the middle of August. The best time in the West is the last week of May and the first week in June, while in the East, earlier transplanting is generally possible. You will find Spruces easier to transplant than Pines, and the smaller the trees are, the better. You can move trees up to four feet or over, but they are safer at two to three feet. Select open grown trees with plenty of branches close to the ground; close grown trees have usually poor foliage and it is difficult getting them with good root systems.

The important thing in transplanting evergreens is to keep the roots from being exposed to the light or air and the logical way to accomplish this is to lift the dirt along with the roots in a solid ball. Your spade should be sharp (a shovel is best) so that it will cut through all the roots easily without jarring and loosening the ball. Sharpen with a file if necessary.

Your plant selected, tie the lower branches up out of your way and then with your shovel dig a circle round the tree, driving the blade down full depth and slanted so that the point will be a few inches from the axis underneath the tree. When your circular cut is complete, drive your shovel well down here and there in the circle to cut the tap root and at the same time gently ease up the ball and lift it right out. Two men working opposite do this much easier and better than one man alone. The circles vary in diameter with the

size of the tree, about 14 to 16 inches for trees 2 to 3 feet and about two feet for trees four feet, a good deal depending on the tenacity of the soil, for it is far more important to have small root with the ball of soil intact, than a larger root with the dirt falling to pieces. Lay the ball and tree on its side on the ground and cut off the end of the tap root with a sharp knife taking care not to jar the soil. It is better to cut the tap root up into the ball than to have it sticking out at the bottom. The ball should be wrapped tightly in a piece of burlap to keep it together in transit. Placing it loosely in a sack as is so often done will not do, the package must be tight so that the earth has no chance to fall off.

upright, fill in the soil carefully until the hole is about half full then tramp it firm. This done, fill in the balance of the hole and tramp firmly again leaving a depression two or three inches deep on the surface. So far, we have said nothing about watering, but now is the time to water. Fill this depression or basin with water, leave it to soak away, fill it again, and after it has soaked away the second time, fill in the basin with loose soil and the job is done. Leave this soil loose.

A tree planted in this way needs no staking and no branches should be taken from it, and above all, do not cut off the top of the tree, the poor thing has enough trouble without your compelling it to make a new leader.

For Summer watering, a good soaking once a week will be plenty unless in very dry weather when it may

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be done twice. In these cases, water in the evening, raking back the surface soil two or three inches deep to form a basin. Fill this twice with water as before, allowing it to soak away, and leaving the loose mulch on the surface again by throwing the rim of the basin back on to the surface.

If you can drive a good force of water through the foliage several times during the Summer your trees will benefit greatly.

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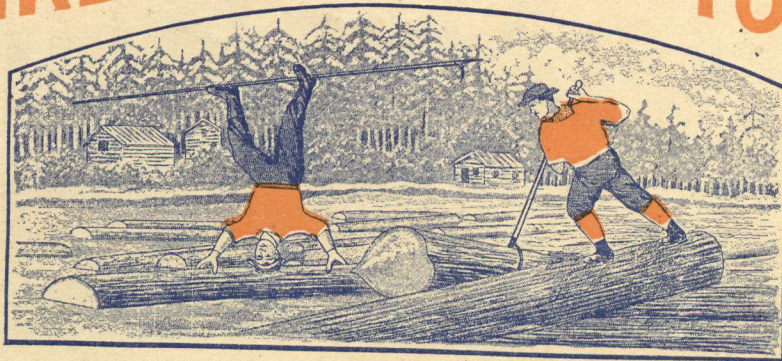
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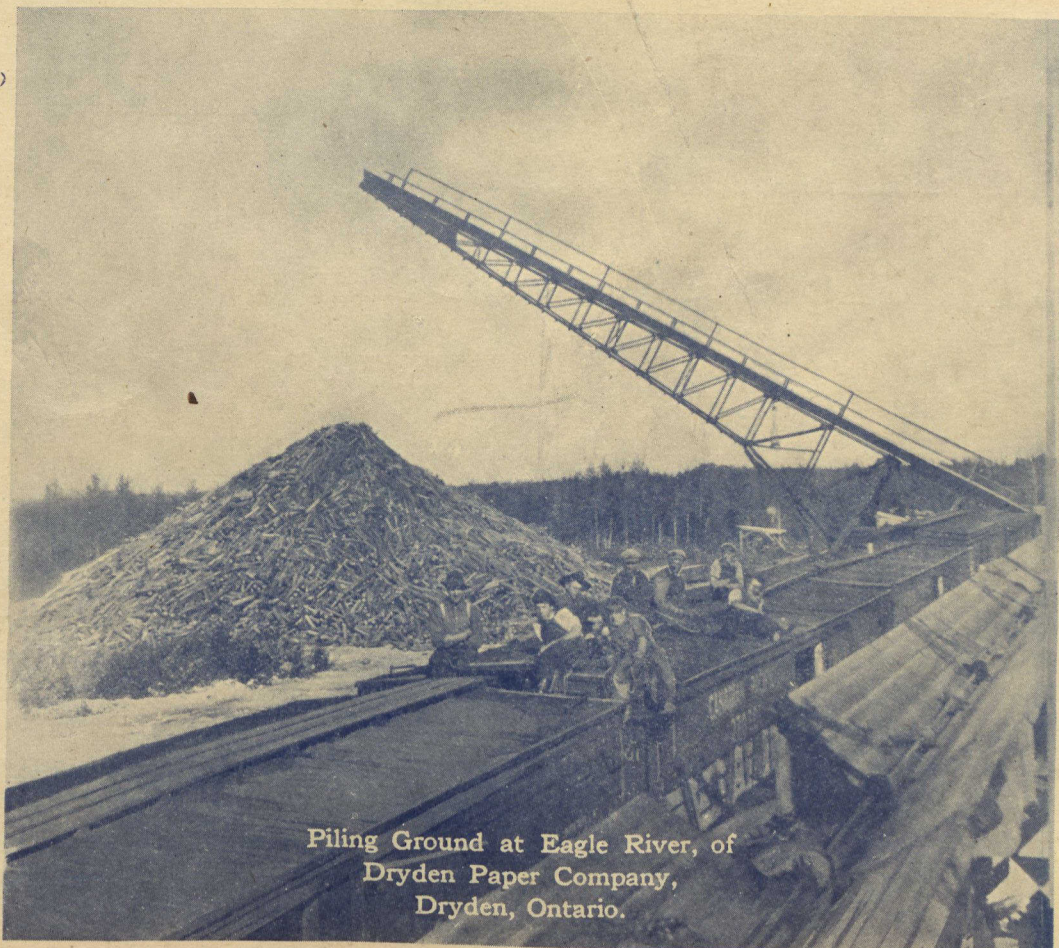
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