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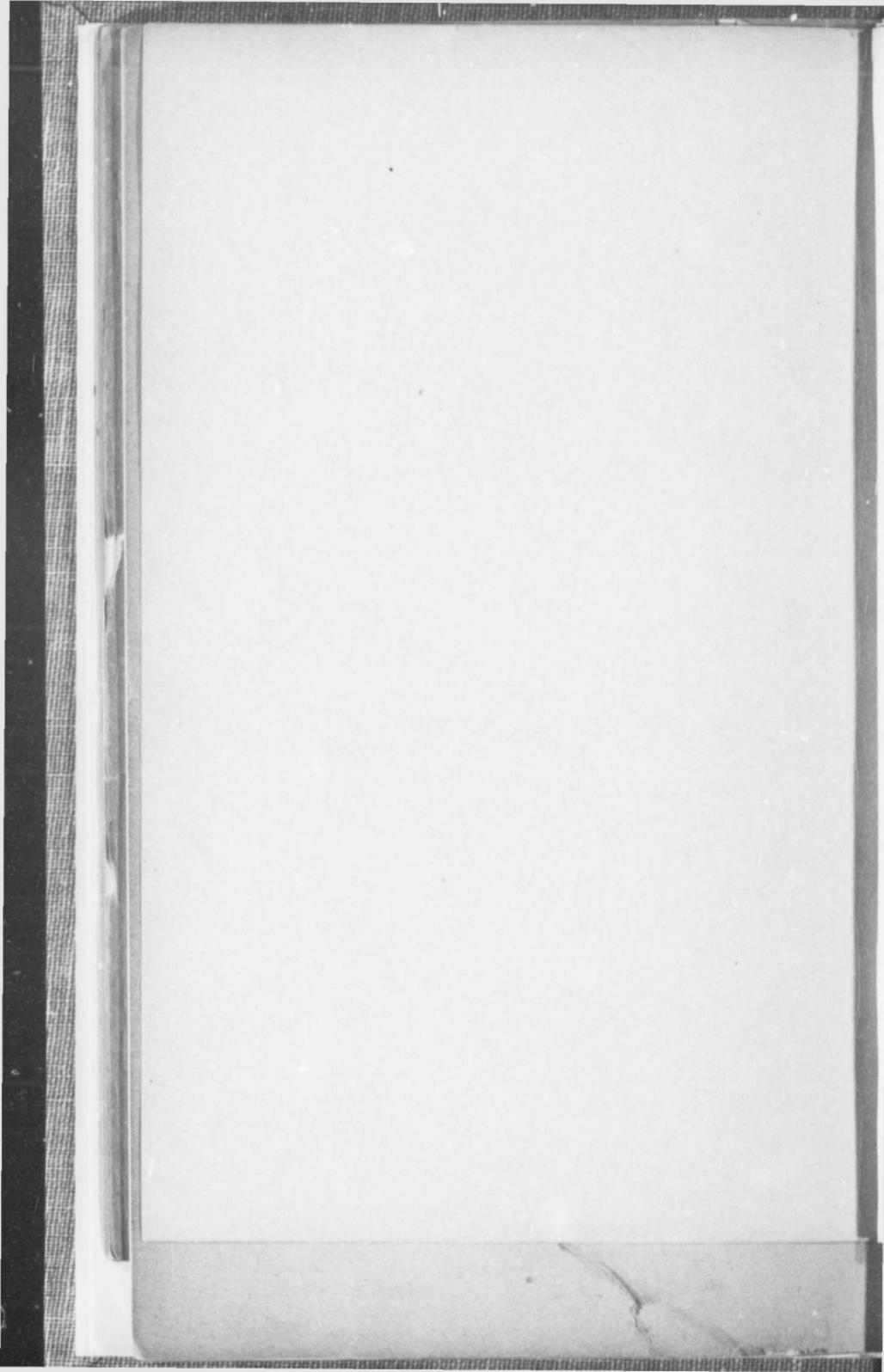
Our Timber Wealth and Its
Conservation

- BY -

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Our Timber Wealth and its Conservation

By WILLIAM J. SUTTON, F.G.S.

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The purpose of this paper, as the title indicates, is to present a general survey of the forest trees of the Province of British Columbia and call attention to the vital questions of conservation and reforestation.

The following are the principal forest trees of commercial value, indigenous to the Province, in approximately the order of their relative importance:

Douglas Fir
Western Red Cedar
Western Hemlock
Menzies Spruce
Engelmann Spruce
Western Yellow Pine
Lodgepole or Black Pine
Western Larch or Tamarack
Balsam or Amabilis Fir
Black Cottonwood
Aspen Poplar
Grand or White Fir
Western White Pine
Yellow Cedar
White Spruce
Broadleaf Maple
Red Alder
Garry Oak.

THE DOUGLAS FIR (*Pseudotsuga taxifolia*)

This is the most important forest tree in British Columbia, and which, strange as it may appear, is the native home of this remarkable tree. It is only indigenous to the northwestern

portion of North America, and peculiarly a Pacific coast production.

At first, it was classified as a fir, but later investigators have given it the special generic name of false hemlock; as its scientific name now designates.

The wood in its properties, is a sort of cross between pine and hemlock. It is well adapted for construction purposes, and owing to its large size and dense growth over a considerable portion of the Province, is regarded as of the greatest commercial importance.

Its maximum growth under the most favorable circumstances is about 15 feet in diameter and 300 feet in height.

The largest saw-log ever converted into lumber, to my knowledge, was one cut at the Chemainus saw-mill—it was slightly over 12 feet in diameter. The humid Pacific coast region is the most favorable for its best growth, where it ordinarily reaches from four to five feet in diameter and about 180 feet in height, with massive trunks, straight and clear of branches for upwards of 100 feet. It thus forms an ideal forest for the woodsman, who revels amongst these magnificent specimens of tree growth. It is important to note that it only reaches its best growth over a comparatively limited area, where the conditions are most favorable. It has a strong tendency to grow scrubby in exposed places, becoming greatly stunted on high mountainous regions; sometimes being a mere shrub less than 10 feet in height.

Douglas fir is a rapid grower, especially for the first 100 years. It is long-lived, reaching maturity at about 600 years. Trees three feet in diameter are about 150 years old, and those five feet in diameter from 250 to 300 years old. The rapidity of growth greatly depends upon soil conditions.

It thrives under a great variety of conditions, both as to soil, moisture and temperature. We have it growing on the humid coast, and also in the drier interior of the Province. It reaches its best growth upon loamy well drained soil with abundance of moisture, but not excessive. Where the soil is too wet it is subject to ground rot, and where exposed to the

wind is subject to gum-shake defects. The west coast of Vancouver Island and the northwest coast of the mainland are too wet for it.

It is the prevailing tree over about one-half the area of Vancouver Island. It is especially notable in the east coast districts of Cowichan, Chemainus, Nanaimo, Comox, Sayward, and in Alberni district. Its habitat extends from Sooke on the south end of the island to about Nimpkish river in the north and extending into the interior over most of the easterly drainage area. It is not found on the west coast of the island close to the Pacific border, but on the upper reaches of some of the Sounds it has a foothold.

The first appearance of Douglas fir on Barkley Sound is upon the upper end of Copper Island. As you pass up the Sound, it becomes more and more abundant, and when you reach Alberni, it is the dominant tree; exemplifying, very strikingly, the influence of the ocean upon tree growth.

On the upper portions of Nootka and Kyuquot Sounds, there is considerable Douglas fir, again denoting the effect of the sea upon the climate, and thus upon plant life.

On Clayoquot Sound one may occasionally see a lonely fir tree perched upon a dry bare rock, evidently trying to find a dry spot. Under such conditions, the wood is unusually soft.

The Douglas fir grows upon the coast islands and the mainland from the 49th parallel to a point about opposite the north end of Vancouver Island.

Around the shores of Burrard's Inlet, in days that have gone by, it formed, along with Red cedar, a wealth of forest growth that was wonderful to behold. But those giants of the forest have gone for ever, to make way for the city of Vancouver. There are still a few old veterans in Stanley Park, and around the suburbs of Vancouver there are many large stumps to remind us of those great monarchs of the past.

The Douglas tree is also an important tree over a considerable portion of the interior of British Columbia, being locally abundant upon elevated slopes where there is a fair amount of moisture; but only reaches moderate dimensions.

It is not sensitive to cold; but shrinks away from the very dry valleys of the interior plateau, where the western yellow pine generally abounds.

It is a prolific seeder, but with rather low vitality, and in many sections of the Province is being replaced by hemlock and black pine—to which I purpose referring in connection with reforestation.

Douglas fir occurs occasionally in such dense stands, that an acre may yield in the neighborhood of 300,000 feet of merchantable timber.

I may mention two of these remarkable localities where the forest is still standing; namely, on Robertson river which flows into Cowichan lake, and around Roberts lake, Sayward District.

These extraordinarily choice spots give no criterion upon which to make an estimate of the average yield.

The fairly well timbered areas of Douglas fir yield an average of about 50,000 feet per acre.

WESTERN RED CEDAR (*Thuja plicata*)

This is the large cedar of the coast region, reaching a maximum of about 20 feet in diameter. I have measured several around 50 feet in circumference four feet from the ground, although, of course, these are exceptionally large, and are invariably heart-rotten and hoary with age.

The best timber runs about four to six feet in diameter, and about 120 feet in height.

This cedar, like the Douglas fir, is specially indigenous to the north-west portion of North America, and reaches its maximum size and best development in the extra humid regions of the Pacific slope.

It will stand an immense amount of atmospheric moisture, but does not favor very soggy ground for its roots. It thrives best where limestone is the underlying country rock. I have seen immense trees growing on bare limestone with the roots ramifying the fissures.

The wood is of great commercial value, on account of its lightness and durability under all sorts of exposure.

It is not uncommon to find a tree five feet in diameter growing over a fallen cedar which is still only sap-rotten, although lying on the ground for two or three centuries.

The Red cedar is an extremely long-lived tree. Trees three feet in diameter are about 200 years old, and the largest trees take about 1,000 years to reach maturity, and may remain standing in a state of decadence for several hundred years more. Woodman, spare that tree!

The Red cedar grows all over the Pacific coast region of British Columbia. It is to be found scattered amongst the Douglas fir forest, seeking out the wetter spots. It also covers those areas of the country too wet for the Douglas fir. It is the dominant tree on the west and northern coast of Vancouver Island—I may specially mention, Barkley, Clayoquot and Quatsino Sounds.

It extends over the islands and northwest coast of the mainland to the northern boundary of British Columbia.

It is the prevailing tree on the Queen Charlotte Islands.

A large quantity of fine cedar at one time grew on the shores of Burrard's Inlet and Howe Sound, but is now almost depleted.

Narrow belts of Red cedar occur along river valleys in the interior of British Columbia, such as on the Columbia, Kootenay and North Thompson rivers, but it only reaches a moderate size and is inclined to be hollow-butted and knotty.

Red cedar has a strong tendency to become scrubby where the conditions are not favorable. The old trees make the best merchantable lumber. It is a prolific seeder, and takes root readily on moist ground; but not so well over ground covered by forest fires.

WESTERN HEMLOCK (*Tsuga heterophylla*)

Hemlock is the most universal of any forest tree in British Columbia. Almost everywhere it occurs as a subordinate in association with Douglas fir and Red cedar, and forms im-

portant groves with Amabilis fir and Menzies spruce over the humid area of the Pacific slope.

The Western hemlock is an important forest tree both for lumber and tanbark. Its commercial value has only of late years been appreciated. Owing to a prejudice, founded upon the inferior quality of its eastern namesake, it has been greatly underrated.

Vertical grained flooring of hemlock is even superior to the Douglas fir. The tanbark is also superior to the eastern article.

Hemlock is a slow grower, but reaches occasionally as large as eight feet in diameter; usually from three to four feet in diameter, with height of about 150 feet. Trees two feet in diameter are about 200 years old, and the largest trees are seven or eight hundred years old.

It is not very particular as regards the quality of soil, thriving on poor soils so long as there is sufficient humidity. It grows best where there is abundant rainfall upon a fairly well-drained moist soil; moisture being one of its most essential requirements. Where it grows on exposed ground, the butt log will often sink in salt water, and will be very tough and gnarly.

Hemlock grows generally as a subordinate tree all over Vancouver Island and the Queen Charlotte Islands, and on the mainland coast to Alaska.

Along the east coast of Vancouver Island hemlock is a common tree in the Douglas fir forest; and on account of its smaller size, is commonly used for making skid roads and landings by the loggers; formerly all hemlock was left in the woods to be later destroyed by fire; but the larger trees are now being taken out by the logger.

On the west coast of Vancouver Island hemlock occurs in abundance associated with Red cedar, Amabilis fir, and Menzies spruce.

Hemlock occurs sparingly over scattered areas on the mountain slopes and more humid parts of the southern interior of British Columbia.

It is a strong reproducer where conditions are at all favorable, especially over moist ground, not overrun by fire. It endures shade in the dense forest wonderfully well, and is holding its own in the struggle for existence amongst the tree life of the coast. It is rapidly growing in importance as a commercial wood.

MENZIES OR SITKA SPRUCE (*Picea sitchensis*)

Also called tideland spruce on account of its frequent occurrence on the tidal flats of most of our rivers. It is frequently a very large handsome tree, reaching, when fully grown in favorable localities, 15 feet in diameter and 250 feet high; but usually four to six feet in diameter.

It is a strikingly round tree, and in dense stands carries its size wonderfully well with trunk clear of branches, for upwards of 100 feet.

This spruce is a very light soft wood, and very useful for certain purposes, such as boxes, boat lumber and shelving, and especially valuable for pulp. On the northern coast of B. C. it is used almost entirely for building purposes. It grows to a great age, the largest trees being about 700 years old. It grows rapidly for the first 100 years, and reaches four feet in diameter in about 300 years.

It has a strong tendency to develop large low limbs in open stands, thus rendering it unsuitable for the lumberman. Very often along the water front, the exposed side will have immense limbs, while the other side may be clear.

Menzies spruce is confined to the Pacific slope region of great humidity. It is to be found all over Vancouver Island in limited areas, along the banks and deltas of rivers, but most plentifully on the west and northern coast of the Island. It flourishes best and is the most abundant on higher ground in northern latitudes of the coast region. It is plentiful on the Queen Charlotte Islands, especially around Masset Inlet.

It thrives best upon sandy river bottom land, slightly elevated, and a short distance from the water's edge, with the

heavy rainfall and fog prevalent on the west coast of Vancouver Island and northern coast of B. C. It is the principal tree on the Alaskan archipelago.

ENGELMANN SPRUCE (*Picea engelmanni*)

This is an important forest tree over parts of the interior of British Columbia, but is unknown in the coast region. It is a semi-Alpine tree, growing on elevated mountain slopes where there is sufficient moisture. Where it grows in dense stands, it forms a clean straight trunk, and reaches a maximum size of about four feet in diameter, and 120 feet in height. Usually about 30 inches in diameter is considered good timber.

It is a very useful timber in many of the mining sections of the Province. It covers many of the mountain slopes in the central plateau region, and extends from the 49th parallel as far north as Babine and McLeod lakes in northern B. C. It is long-lived and very tenacious of life. Trees two feet in diameter are likely to be about 300 years old. On exposed mountain tops, where the struggle for existence is intense, a tree six inches in diameter may be 200 years old.

WESTERN YELLOW PINE (*Pinus ponderosa*)

This pine is confined to the dry interior plateau region of British Columbia. In contrast with all the trees previously described, this tree does not grow on damp ground, but thrives best in the dry arid valleys where the rainfall is light. It grows to a large tree in favorable localities, reaching as large as six feet in diameter occasionally. Usually about three feet in diameter with abundance of limbs and forming park-like groves. The wood is inclined to be resinous and only of moderate commercial value, and useful mainly for local purposes. It occurs over all the dry lower valleys of the southern interior of B. C., i.e., around Princeton, Nicola, Stump Lake, Kamloops, Clinton, etc. It is a useful tree for forming wind-brakes in the dry prairie country, as it will grow on any soil and thrive under the most adverse conditions. It grows to a good old age, reaching about 500 years.

Western yellow pine is abundant in the dry belt of the United States east of the coast mountains.

LODGEPOLE OR BLACK PINE (*Pinus contorta*)

This tree is the most accommodating and persistent of any of our forest trees. It is not at all exacting as to moisture or temperature or altitude. Once it has established a foothold it will thrive under all manner of conditions. Unfortunately, it has only a small commercial value. It rarely grows above two feet in diameter and 60 feet in height, and is usually only about one foot in diameter. As a rule it is only fit for mine timber and firewood, and is very resinous.

Black pine occurs in scattered areas all over the Province, more particularly upon sandy ground, and is most abundant over the middle and northern sections of Central British Columbia. It is gaining a foothold in many places where it is not desirable, through its strong seeding qualities, especially upon burnt over ground.

In the open, it will bear fertile seed cones, when only five to six years of age.

Black pine is a useful tree in the barren sections of the country, as it will thrive where hardly anything else will grow. In contrast with Red cedar, it has an aversion to limestone. Its age limit is about 200 years—a tree one foot in diameter is about 80 years of age.

WESTERN LARCH OR TAMARACK (*Larix occidentalis*)

This tree does not occur on the coast. It is fairly abundant at a moderate elevation over the interior of British Columbia.

It is a slim tall tree with small branches, and rarely grows any larger than two feet in diameter. It is an ideal tree for poles and railway ties, for which it is principally used—also for mine timbering.

It is to be found in the far north, being not averse to a cold climate. It requires a fair amount of moisture and favors damp, cool, northern slopes. It thrives on almost any soil

under these conditions. It occurs in the Okanagan, Slocan and Kootenay districts, and as far north as the Yukon.

Western larch grows rapidly in height, but slow in diameter, and takes about 250 years to mature. Trees 12 inches in diameter are about 100 years old. Seeds well over burnt areas, and often disputes the ground with Black pine.

BALSAM OR AMABILIS FIR (*Abies amabilis*)

Also called "Silver" and "White" Fir

This tree is not very well known, although there is a considerable quantity of it on the coast. It grows to a maximum size of about five feet in diameter, but is usually about three feet in diameter.

In dense stands, it forms a clean straight tree, free of branches for 100 feet or more. The wood is somewhat similar to spruce in general character and is suitable for boxes, pulp, etc. As yet it has not come into commercial use.

Amabilis fir requires about the same conditions as to climate and soil as Western hemlock, with which it is invariably associated. It is abundant on the west coast and northern portions of Vancouver Island.

The following special localities may be noted: Barkley Sound, Clayoquot Sound and north of Salmon river. It also occurs along the coast range of the mainland, and on the Queen Charlotte Islands. It is moderately long-lived.

Trees three feet in diameter are about 150 years old, and probable age limit about 300 years. Its seed is sought after by the squirrel, and is their principal food where it abounds.

BLACK COTTONWOOD (*Populus trichocarpa*)

Cottonwood is the largest of the poplars, growing to a maximum of about six feet in diameter. Usually from two to four feet in diameter and about 80 feet in height. It is not in great demand at the present time, but is destined to become an important soft wood for special purposes. It is now being used for the manufacture of staves for sugar barrels, excelsior, etc. It is one of the best woods we have for mechanically

made pulp. It is a very thirsty tree, and grows with its roots almost in water. It is confined to the river bottom lands, especially along the banks of all the large rivers, such as the Fraser, Skeena, Naas and Stickeen. It is especially abundant in the valley of the Skeena river. Cottonwood is not averse to a cold climate, but must have sufficient moisture. It occurs sparingly in the interior of British Columbia along river bottoms and margins of some of the lakes. A few scattered trees occur on the banks of almost every stream in the Province. Cottonwood is not a long-lived tree. It grows very rapidly. Trees three feet in diameter are about 100 years old, and it reaches maturity in about 200 years. It seeds very readily, where there is any moist sand to grow upon.

ASPEN (*Populus tremuloides*)

This tree is very abundant in the northern interior of British Columbia. It rarely grows over a foot in diameter, and is usually six to ten inches in diameter. It is a good wood for making the better classes of paper pulp. A short-lived tree, reaching only about 50 years of age—trees eight inches in diameter are about 30 years old.

GRAND OR WHITE FIR (*Abies grandis*)

This fir reaches sometimes a diameter of six feet and 250 feet in height. Usually about four feet in diameter. It occurs along the coast, on the banks of most of the streams, especially on tidal flats. The wood is inclined to be rather soggy and knotty. It is generally a subordinate tree and does not cover any extensive area; and may be considered only of moderate commercial value.

WESTERN WHITE PINE (*Pinus monticola*)

This is the finest pine tree that grows in British Columbia, but unfortunately does not cover any large area. It occurs very sparingly over most of Vancouver Island, and a few scattered groves have been noted on the mainland. It forms a beautiful straight, tall, round tree, free of limbs in the dense

forest. It closely approaches the eastern white pine (*Pinus strobus*) in character, and is a tree of high commercial value. Its maximum growth is about five feet in diameter, but its usual size is about three feet in diameter. It is not exacting in regard to soil or climatic requirements. It will grow well on sandy or gravelly soil, with a fair amount of humidity. It reaches a fair old age—trees three feet in diameter are about 200 years old. It reproduces itself rather poorly, and should receive the forester's care and attention.

YELLOW CEDAR (*Chamæcyparis nootkatensis*)

The wood of the Yellow cedar possesses many good qualities, and is more valuable commercially than perhaps any other timber that grows in the Province. It has a beautiful sulphur-yellow color, is fine grained, is easily worked, takes a high polish, and is firm, strong and durable.

On account of its defective growth, and scattered occurrence, it is usually only taken out by the logger in conjunction with other timber.

I have seen trees as large as six feet in diameter, but it is commonly two to three feet in diameter, and about 80 feet in height.

Yellow cedar is often found as a mere shrub on rocky mountain tops.

It requires plenty of atmospheric humidity; but is not exacting as to soil requirements. It seeks elevation over the southern portion of Vancouver Island, where it does not occur under an altitude of 500 feet, but comes down to the sea level on the northern portion of the Island, where it reaches its best development.

It occurs sparingly over the northwest coast, and on the Queen Charlotte Islands, although there it is rather more abundant. It grows very slowly. A tree two feet in diameter will be about 300 years old, and its maximum age may possibly reach 1,000 years. On account of the supply of Yellow cedar being limited, its usefulness must be confined to special purposes.

WHITE SPRUCE (*Picea canadensis*)

The White spruce is an important commercial tree over the northern interior of British Columbia, where it makes the best lumber and timber available in those cold northern regions. It forms a fairly well-grown tree from two to three feet in diameter where the conditions are favorable. It grows on river banks and on low moist areas. It is abundant in the Yukon river valley. It does not occur on the coast.

MAPLE (*Acer macrophyllum*)

This is the only large maple tree on the coast. It is one of the most valuable hard-woods found in the Province. Under the most favorable conditions, it reaches five feet in diameter and 120 feet in height; but is usually about two feet in diameter.

It grows along the banks and bottom lands of most of the streams, on the island and west coast of the mainland, and is usually associated with Cedar, Spruce, Grand Fir, Alder and Hemlock.

Although a valuable wood, it must not be considered as of any special importance on account of its very limited extent. It thrives best on rich bottom lands, with considerable moisture. It is a fairly rapid grower—trees 12 inches in diameter are about 50 years old, and two feet in diameter about 100 years of age.

RED ALDER (*Alnus rubra*)

This alder grows to a fairly large tree, occasionally reaching three feet in diameter, but usually about a foot in diameter. It is the finest wood we possess for making charcoal, especially charcoal for gunpowder.

It has a certain value for cabinet work, and makes very good firewood. Like the maple, it grows on the rich bottom and wet bench lands. It is frequently found in small patches on springy side-hills. Alder is a rapid grower, reaching eight inches in diameter in 25 years.

At the head waters of the Kokisilah river, I found a six-inch alder growing in the centre of a log shanty that I had slept in 25 years previously.

GARRY OAK (*Quercus garryana*)

This is the only species of oak in the Province. It is almost entirely indigenous to Vancouver Island. A few odd trees have been noted on the mainland. It is abundant in the immediate neighborhood of Victoria. It forms a few park-like groves on Saanich peninsula and in Cowichan and Comox districts; also a few trees at Quatsino and on the Gulf islands. It grows on dry, well-drained table lands, frequently rocky. It is a very slow growing tree, reaching occasionally four feet in diameter, with short trunk and broad spreading crown. Age limit is probably about 500 years. It is not sufficiently abundant to be of much commercial importance, although on account of its valuable properties should receive the forester's attention.

I have thus briefly sketched the character and occurrence of all our forest trees of special commercial importance. There are quite a number, of limited occurrence, which may be regarded more in the light of scientific interest, although having a certain value for special purposes, namely: Arbutus, Birch, several Willows, Black Spruce, Dogwood, White Bark Pine, Mountain Hemlock, *Alpine Fir, Alpine Larch, Yew, Vine Maple, Cherry, Crab-apple, Balm of Giliad, Juniper, Ash, Elderberry and Bearberry, and possibly several others.

It will now be in order to take a summary view of the relative extent of the forest lands of the whole Province. Some writers have, in glowing terms, dwelt upon the vast and unlimited extent of our forest wealth, so that the general public have, I think, erroneous impressions regarding our timber resources.

It is high time that we should look the actual facts full in the face, and not be carried away by inflated notions.

I beg to state that the timber resources of British Columbia are comparatively limited. In comparison with the vast

extent of the Province, the relative percentage of wooded lands of commercial value is strikingly small.

As an approximate estimate of the total possible yield of merchantable timber for the whole of the Province, including Vancouver and the coast islands, I venture to state, that at the present time, it is under 400 billion feet, and probably does not exceed 300 billion feet.

When we take into consideration the annual destruction by fire, the large percentage of scrubby timber, and the quantity growing in inaccessible localities, we shall find that the actual yield, as a commercial asset, will be greatly below what is generally supposed.

Vancouver Island is very well clothed with forest trees, but the great interior of British Columbia contains millions of acres, which are practically treeless.

The great saw mills at Vancouver have to depend to a large extent upon Vancouver Island for most of their timber. The mainland coast-line from Burrard's Inlet to the Portland Canal, is geologically a great granitic batholith, presenting with its bare, precipitous mountain sides, very little surface suitable for tree growth. So that, notwithstanding the extensive shore-line, the possible yield of timber will be very small indeed.

I have seen some very mis-leading statements regarding the possible yield of timber on the Queen Charlotte Islands. The islands are well clothed with forest trees (comprising Red Cedar, Spruce, Hemlock and Yellow Cedar), but a considerable percentage is scrubby—which also applies to the whole coast line.

The great north land of British Columbia is very sparsely timbered, even in the valleys the timber is small and only fit for local purposes. So that the extent of our merchantable timber is confined to a very limited area in comparison to the total acreage of the Province.

In such a land of plenty, it is difficult for the average layman to realize that there is anything of a serious character, in the appeals for conservation which have lately received so much attention.

Earnest efforts are being made all over the world to try and check the present wilful waste of natural resources.

During the past fifty years, the consumption and destruction of the natural products of mother earth has been greater than during all the centuries preceding. An aspect of our development and civilization which is fast becoming not only serious, but alarming, when we consider the well-being of the generations to follow us. During the year 1909, the consumption of coal in North America amounted to about 450 million tons. The consumption of petroleum, nearly 200 million barrels. The consumption of timber, including destruction, over 100 billion feet.

It is now a well known fact that the world's supply of timber is becoming far too inadequate to meet the present day demands upon it, and that a timber famine is near at hand.

British Columbia has a very valuable inheritance in her forest wealth, and it behooves us to take more thought for the morrow, and exercise more care and foresight in the management of her timber domain than has been in evidence in the past.

In this connection, it is interesting to glance over the history of past legislation upon the timber question in this Province.

The "Land Act" has been altered from time to time, giving more and more freedom to the timber speculator, until the last stampede, when the situation became so objectionable, that the Government very wisely decided to withdraw all the remaining timber land from the market.

The wide-open license system, whereby anyone could with a small expenditure, secure the tenure to a large area of virgin forest, fanned the speculative fervor, and brought an abundance of cash into the Provincial treasury.

The method may simply be described in a word, "frenzied finance," or discounting our timber assets at the speculator's bank, by a small payment down with future delivery. In the end, the poor consumer must pay the piper.

There has been issued 15,164 timber licences covering an area of about ten million acres.

I think it is regrettable that such a large proportion of the timber wealth of the Province should have been thus alienated.

Under the present time-limited licence, the licence holder is a mere tenant, and by the very nature of his tenure has no special interest in conservation; he only desires to skim off the best timber when the opportunity is presented, and then return the despoiled remnant to the Government.

The question of extending the time limit of timber licences has been ably discussed before the "Board of Forestry Commissioners." It appears to be the consensus of opinion that the only rational solution of the situation, "as we find it today," is to make the timber licence perpetual with the necessary safeguards in the interest of the country.

A more stringent supervision over logging methods is desirable.

In the past, the logger has been allowed free latitude to go into the forest and act like a bull in a china shop. He has frequently picked out a few choice trees in a choice belt of timber, and made a sort of bonfire of the whole country around him. It is often appalling to see the desolate country the logger has left behind him.

I have not time to fully cover the fire question. I may briefly note that fire not only destroys the timber, but in many cases ruins and destroys the soil also. This is especially noticeable where fire has swept over the more elevated regions, with a slight covering of soil. On many hills the forest tree has gained a foothold by a slow process of preparation which has taken centuries to mature.

Fire cleans off everything to the bare rock again, and the process has to commence *de novo*.

This applies with special force to the conditions on many of our uplands, and we have already some of our evergreen hills converted into bare, parched, rocky elevations, desolate and forbidding. I have in mind several localities, namely: the

mountain range on the south side of the Nanaimo lakes has been completely destroyed by fire, leaving nothing but a few blackened stubs as sentinels of the destruction that has taken place—both timber and soil gone.

On the mainland coast opposite Texada island, the country has been logged over and fire has followed with its deadly work. Here it has burnt off everything down to the gravel subsoil, and left a dry, gravelly, dreary waste for several miles, where nothing will grow until nature has had time to recuperate.

British Columbia has been very dilatory in the matter of establishing forest reserves.

Extensive reserves should be placed over the gathering grounds or water sheds of our larger streams and the forest covering held inviolate for all time. These reserves to also serve as asylums for game.

The imperative necessity of creating forest reserves has been a burning question for governments all over the world, and in many cases large areas have been bought back again to be created into reserves.

France has had a notable experience in this respect; also the United States, as in the Adirondacks.

It is now well recognized that a forest covering not only greatly lessens evaporation, but also increases the rainfall and checks the rapid descent of water from the higher levels. It is especially important in a hilly country like Vancouver Island, that these upland forests should be preserved against the inroads of the axe and fire. Generally, the timber is not commercially valuable, as the best timber is usually below the 2,000 foot altitude.

I understand that the Dominion Government has established forest reserves in the railway belt on the mainland, but I am not aware of any forest reserves yet created by the Provincial Government.

A Provincial bureau of forestry is urgently needed, to supervise all matters relating to our forests.

There is a great field for investigation and work—not only for the scientific management of our forests, but to take active steps towards reforestation.

British Columbia has a very large area of country which is only fit for the growth of trees. We have thousands of acres in the central plateau region now lying in a state of barren waste, unproductive and desolate, which would if intelligently planted, produce a good harvest of timber.

Reforestation should not be left to haphazard seeding, as usually our best timber is replaced by inferior trees.

The Douglas fir when destroyed, is almost everywhere being replaced by small hemlock, cedar and black pine. In the dry belt, aspen and birch take the place of the spruce and the larch. Black or lodgepole pine (*pinus contorta*) is gaining a strong foothold over many parts of Vancouver Island, on burnt over ground, by virtue of its strong seeding properties, and if it is not checked we shall, ere long, have our magnificent Douglas fir replaced by a scrub pine of little commercial value.

The Western white pine is a very valuable indigenous tree and thrives well upon Vancouver Island, but it requires nursing and encouragement.

It is often crowded out in the fierce struggle for supremacy by the more fertile and persistent seeding trees. Once it has a foothold, it grows rapidly and holds its own, so that it is only a matter of getting rooted before the other scrubby fellows have pre-empted or got possession of the ground. This applies with equal force to the Douglas fir. In some sections of the upper country, on burnt over ground, it is interesting to note the struggle for supremacy between black pine and larch. Generally it is a matter of which gets the first start. If they become seeded together, the larch is able to hold its own by its more rapid upward growth.

It is time that nurseries were established for the culture of our best forest trees, and active steps taken to scientifically supervise all matters of this kind.

This can only be done by the establishment of a proper bureau of forestry.

There should be a government officer thoroughly trained in all matters relating to forestry, and his department should take up the study and investigation of such questions as the following:

- The soil-requiring qualities of the different tree species?
- What trees improve soil conditions?
- What trees require rich soil?
- Their relative moisture needs?
- Their temperature requirements?
- The effect of altitude on different trees?
- The shade enduring qualities of trees?
- The quality and properties of the different woods?
- The rapidity of growth?
- The height and size at maturity?
- What trees are exclusive?
- What trees may be grouped together?
- What trees require nursing?
- Topographical conditions affecting tree growth?
- The relative value for commercial purposes?
- The general care of forests?
- The collection and care of seeds?
- The establishment and care of nurseries?
- The pathology of trees?

In short, forest culture in all its branches, and the development of a thorough scientific system of forestry.

I think that forest culture will soon become almost as important to the well being of our Province as that of agriculture.

That a school of forestry should be established at an early date.

That the public mind be educated to realize that the forest is not a thing to be wantonly destroyed, but that it is one of nature's best gifts to mankind. What would this world be like if it were destitute of tree life?

