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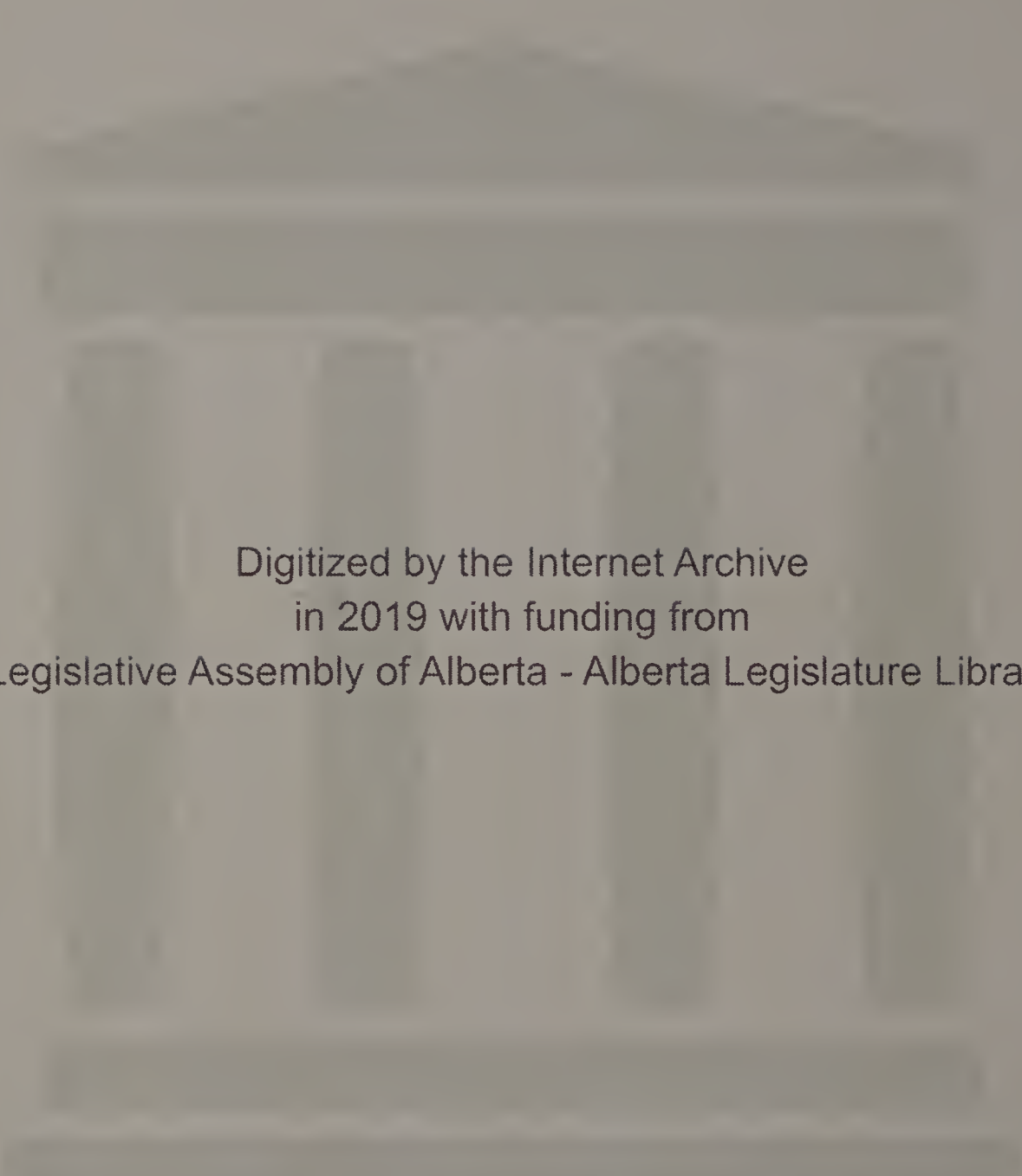
Alberta's FORESTS

By J.L. Irwin

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ALBERTA'S FORESTS

THE most important natural resources of a country are its forests, water and soil. Soil is dependent on water for quantity and quality. If water becomes deficient, agriculture, the basic industry of a nation's economy, becomes impaired. Water is dependent on forests for its regulated supply. Forests, therefore, come first in importance — not only first of these three resources but also first of all others which may follow to contribute to a country's welfare.

Amongst the natural structures of Canada, one of the most vital is the eastern slope of the Rocky Mountains, for it is the watershed upon which the vast territory of Western Canada is dependent.

This watershed lies within the boundaries of the Province of Alberta. With the exception of the national parks, the protection of the forests it contains has, since 1930, been the sole responsibility of the Alberta Government. Because of the immense area it covers, the huge expenditures required for its maintenance and the scarcity of forestry personnel in the limited population of earlier days, there have been fires in hazardous years of the past which again and again have threatened the very existence of the forests in this great zone, so important to the healthy continuance of all types of life and industrial endeavour.

PROPERLY REGULATED QUANTITIES

The reason for the importance of this structure is that forests apportion moisture through surface and sub-surface channels in quantities properly regulated by nature. The moisture is fed to rivers, streams and lakes, the orderly replenishment of which stands as a guarantee against floods at certain seasons of the year, and against drought at others. The principal value of Alberta's forests, therefore, is the protection they bestow on so much of Canada's area by this distribution of water supply, a value which transcends all others such as the provision of timber for industrial development or the beauty of forest scenic effects for the attraction of tourists.

Despite the fact that Alberta is an inland province, she provides the sources of great river systems from her mountain watershed which flow into different seas and oceans.

The North and South Saskatchewan rivers, fed by many tributary rivers and streams, join in the Province of Saskatchewan east of Prince Albert and empty into Lake Winnipeg. From there, via the Nelson River, the course is directed into Hudson Bay. The Athabaska, with its source in Alberta, flows into Lake Athabaska, then into the MacKenzie and finally into the Arctic Ocean. The Peace, though

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its source is in British Columbia, is fed by many Alberta rivers of considerable size such as the Big and Little Smoky and the Wapiti. It empties into the Slave River and then follows the same course as the Athabaska to the Arctic Ocean. With the exception of the Peace, all of these waterways emanate from the forested regions of Alberta's eastern slope of the Rockies. In contrast to this general source is Battle Creek, rising from the Cypress Hills in south-eastern Alberta, which runs into the Milk River, thence across the International Border into the Missouri, which in turn feeds the Mississippi, with the Gulf of Mexico as its final destination.

RIVER TRANSPORT A NECESSITY

The continued healthy existence of these great river systems depends on the forest areas from which they spring. Not only is the regulated water supply which they provide necessary to all life and industry, but water for river transportation into the Northwest Territories, now under intensive development, becomes more than ever a necessity. A definite place of importance must also be assigned to the little Battle Creek which starts on its immense journey from the Cypress Hills Forest close to the Saskatchewan and International borders to become eventually one of the world's greatest rivers.

Recent surveys have shown how terribly Canada's timber lands have been ravaged in the last half century. It has been stated that the giant trees of the Pacific Coast, amongst them Douglas firs

a thousand years in age, will be gone by the time another half century has elapsed.

During the pioneer days of the Dominion, and up to recent times, the immense natural wealth represented by Canada's forests had received little or no protection in the practice of conservation regarding its development. That is coming at last, but it has come too late to save the mighty firs and cedars of the Pacific Coast. As one writer has already pointed out, we cannot wait for another thousand years to go by in order that we may increase our timber supply of this category. Everywhere we must employ the strictest conservation of what is left, take only what is safe to take, and accept without criticism whatever quantity or quality may be officially allowed us. Re-forestation — the planting of seedlings from forest nurseries — must be carried out on an ever-increasing scale, and only merchantable timber in properly regulated quantities must be taken. If we fail in this, history, in the near future, will indeed have a sad story to tell of the fate meted out to our vast forested regions.

In the Scandinavian countries and in Germany the timber industry is as prosperous today as it was a century and more ago, and by the practice of sane conservation principles the forests of those countries are as extensive today as in the past.

From the beginning, laws with teeth in them were put into effect and carried out. Only trees of a certain size were permitted to be felled, and only a specified quantity of these in each area. No tree could be cut down until it was first marked for this purpose by a responsible government



official. With the felling of each tree a transplant had to take its place. Every possible precaution against fire was rigidly carried out. The result was that forest fires were practically unknown, for over ninety per cent of such conflagrations are man made, and penalties for such offences were too severe to warrant the perpetration of such criminal carelessness. Full co-operation was given by everyone. It is only by the introduction and carrying out of such measures that complete success can be obtained. Resulting from all this, the European forest industry has prospered and its forests have remained intact.

One area in Sweden has done so well in this respect that today it pays all income taxes of the community and all public commitments out of forest revenues.

All this could have been experienced on the North American continent had the example of the old world been followed by the new when development first started. It wasn't, and now we are shutting the stable door after the horse has gone. Had we followed it, the tremendous war and post-war demands on our timber products would not be so hard to face at the present time.

It is still possible to arrange for a forest legacy for Canada's future. Not for the next generation, nor for the one to follow, but for a period more remote but yet to come. If we decide to do this, it must be done now, and it must be done under the same rigid and inflexible conditions as practised for so long by the old world.

STUMPAGE LOSSES

TOTAL MILLIONS

Forest fires have been a terrible cause of our timber losses. As stated, more than ninety per cent of Alberta's forest fires have been, and continue to be, the result of human carelessness. Over a decade, stumpage losses have totalled millions of dollars, from which the timber so burned might have been manufactured and sold at a valuation many times this figure.

Fire prevention is all important. The fires must stop, for the people of Alberta can no longer afford these terrible conflagrations. Protection of the forests must be the individual responsibility of every citizen. More publicity is now being issued to picture this terrible scourge, and more modern equipment to deal with the situation is now available. Radios, portable and stationary, are also playing a vitally important part in the work by effecting speedy and direct communication, and it is hoped that the devastating losses of the past may not be repeated.

One of the most important things to remember, stressed continually in this publicity, is that immediate report by telephone or otherwise to the nearest authority—forest ranger, police or some responsible person — must be made if any kind of fire, large or small, or any appearance of smoke is noted. Quick action at the start may save life, and property valued in the millions. A cigarette stub or campfire not properly extinguished may result in a forest fire lasting a week or more and destroying



thousands of acres of valuable timber lands. Upon the continued existence of forests, all types of life depend, human and animal, and all industrial effort.

Alberta's forested areas comprise the following divisions: — The Northern Alberta Forest District, generally referred to as the N.A.F.D.; The Crowsnest — Bow River Forest Reserve; the Clearwater Forest Reserve; the Brazeau — Athabaska Forest Reserve, and the Cypress Hills Forest Reserve.

Since the Alberta Forest area came under provincial control, fires in the forest reserves of the east slope have by no means been extreme, with the exception of the year 1936. The principal fire losses have occurred in the vast region of the Northern Alberta Forest District. Forestry personnel in this great area has not been and could not have been large enough to give the protection needed. The continual encroachment of settlement on these forest districts has been a perpetual hazard. The clearing and burning of brush by settlers results often in forest fires which soon are out of control if the regulations laid down for this procedure are not strictly adhered to.

The Forestry Division has issued a great deal of publicity through this area regarding forest protection. In response to this, co-operation has been satisfactorily secured in a great many instances. There are many more, however, especially in the areas occupied by central Europeans, where such co-operation seems to be quite unobtainable.

RESPONSIBILITY NOT ALBERTA'S

With reference to the great fire year of 1936, responsibility for this could in no way be attached to Alberta. Two fires started in this year in British Columbia and had assumed uncontrollable size by the time they swept into this province. It was hoped that the British Columbia authorities, knowing they had started, would have dealt with them immediately when they were in their own province. Unfortunately they were heavily engaged in another area at the time.

Before being put out they had burned over 102,422 acres of Alberta with an estimated loss of \$1,274,367, based on timber dues, and \$68,995 in fire-fighting operations. Value of timber destroyed totalled approximately ten times the total of these two figures. So long did these fires last and so intensive were they that visibility was obscured for watchers in look-out cabins on mountain tops and look-out towers. This in turn prevented early action in fighting small Alberta fires caused by lightning. It was a bad year for the province.

Statistical information covering Alberta's fire losses from October 1st, 1930, to the close of the calendar year 1944 is given as follows:—Number of fires within forest reserves, 416; outside forest reserves, 4,472; total, 4,888. Number of acres burned over: within forest reserves, 331,046; outside forest reserves, 7,200,577; total, 7,531,623. Loss of saw timber, unsalvageable; within forest reserves, 959,780,000 F.B.M.; outside forest re-



serves, 2,240,828,000 F.B.M.; total, 3,200,-608,000 F.B.M. Suppression costs: within forest reserves, \$251,350; outside forest reserves, \$875,487; total, \$1,126,837. Total losses: within forest reserves, \$2,629,511; outside forest reserves, \$9,-391,195; total, \$12,020,706.

The transfer of Alberta's natural resources to the control of the province became effective on October 1st, 1930. As the fiscal year periods close on March 31st, Alberta's first fiscal year of the new control, 1930-31, is represented in the matter of forestry expenditures by payments made in the latter half of that year. They amounted to \$44,754.40 in salaries and \$24,131.39 in expenses, comprising a total of \$68,885.79. The last full year under Dominion Government control, 1929-30, expenditures were \$185,642.66, salaries, \$85,465.84, expenses, with total of \$271,108.50.

The first full year under Alberta control, 1931-32, expenditures were salaries \$118,343.58, expenses \$42,657.52, total \$161,001.10, of which \$77,102.06 was charged to the east slope. In 1943-44, Alberta passed the Dominion's expenditure in its last full year of 1929-30 by spending a total of \$291,327.50, of which \$118,333.89 was spent on the east slope administration. The total rose to \$387,770.00, which included \$162,863.00 charged to the east slope, in 1946-47, an increase of more than \$100,000 over that of the last full Dominion year. The figure for 1946-47 is taken from the Provincial Estimates.

Information of great interest to everyone comes in the announcement that the

Dominion and Provincial Governments have negotiated an agreement which will result in an adequate conservation programme being carried out on the east slope of the Rockies. Legislation, in fact, is now before the Provincial Legislature authorizing the Minister of Lands and Mines to enter into an agreement placing the administration of the east slope under a Board, which will have at its disposal approximately six million dollars for capital expenditure, as well as about a quarter of a million dollars each year for administration.

Mention has been made of the healthy development and utilization of forests over a long period of years in Scandinavia and Germany. There are other countries, however, where the situation has been the reverse, where watersheds have been denuded to be followed in time by floods, drought and desert.

CHINA CITED AS EXAMPLE

China is perhaps the most outstanding example of what can happen to a country when this type of neglect has been allowed to take place. Marco Polo in his travels many centuries ago described this vast land of China as one covered by great forests. Pasture lands springing from rich soil were also abundant. In the course of time, however, the forests were cut down for fuel and other usage and the lands were overgrazed. The scene which followed was one of devastation.

The mountain slopes surrounding the upper reaches of rivers, devoid of protecting forest cover, loosened their torrents of water into the streams and rivers, huge



gullies were created by this tremendous volume, and silt, gravel and even rocks were carried into and down the rivers. Erosion of the rich soil of these lands set in over huge areas. This is the tragic story of China and the story of any land where protection of forests is given no consideration. The Yellow River and other smaller rivers in Northern China in an area of only 15,000 square miles suffered the most. In this particular territory 17,646 villages were affected by the floods of 1917 and 5,611,759 sufferers were either homeless or starving.

Until recent years one of the major problems in the United States was that of flood waters continually rising from the great Mississippi river. The timber lands of the central northern States covering the head waters of the Mississippi drainage system had been denuded. This brought the inevitable result of cutting off the regulated water supply. Without forests to control the enormous quantities of water created by rainy seasons, the tributary streams to the great river and the Mississippi itself overflowed their banks bringing chaos and destruction wherever they went.

Levees were built everywhere. The silt carried down by the flood waters, however, continually forced the water upwards. Again and again the levees had to be raised and constant dredging of the lower Mississippi to remove the silt had to be carried out.

Eventually the Civilian Conservation Corps was formed and a timber belt was built right across the dust bowl and in the upper regions of the Mississippi. Hun-

dreds and hundreds of trees were planted on the banks of tributary streams of the Ohio River. Eventually the dust bowl came back into operation and the flood hazard of the Mississippi is now being reduced.

In the Peace River country of northern Alberta the lack of surplus moisture is another problem. An outstanding characteristic of this area is the depth of the top soil. Secondary layers such as clay or rock are far beneath. The result of this formation is that moisture seeps through and is lost due to the fact that the substrata is not shallow enough to hold it to the surface area.

SETTLERS FORCED TO STORE ICE

Due to this also, drilling for water has not met with the success experienced in many other farming districts of the province. If a well is achieved it is an event which has only been brought about by penetrating to a great depth. So acute is the problem that in many places settlers are forced to put up ice and store it for purposes of watering stock and for domestic use. Under these conditions it is of great importance that the removal of timber and shrubs, which hold moisture in the soil, should be reduced to a minimum, otherwise the area may develop into a dust bowl.

The matter has been taken in hand and conservation is introduced. With reference to the settlement of veterans in the large area selected for this purpose, contracts awarded to these settlers insist on timber in strips of certain measurements



being allowed to stand. Under these precautionary measures the problem should be solved.

One of the influences of forest water-flow is the obstruction which foliage will offer in reducing the amount of water that reaches the soil, and lengthening the time it takes to do so. Too much water is as harmful as too little. Foliage and litter keep soil from packing so that through it water can easily percolate. Litter, underbrush, bush and moss prevent rapid surface drainage which is what is needed. Added to this is the network of deeply penetrating roots, dead or alive, which offer additional drainage through sub-surface channels. One square mile of moss will hold one hundred million gallons of water. If this is burned off the holding capacity of the forest floor is gone.

Many springs are found in forests. Snow is conserved and will take from four to eight times as long to melt as it would in the open. Water deposited by dews and mists in a forest area will sometimes exceed that coming from rainfall. All these contribute to the upkeep of stream-flow and the contribution is made on an orderly basis so that replenishment of rivers and streams is carried out in regulated quantities. As long as the forests remain to do this vitally important and necessary work the danger of soil erosion is removed.

Flood waters bring with them solid matter on the basis of approximately one-third water and two-thirds silt, gravel and rocks. In North China, the most infested spot on earth for floods and drought, millions of dollars have been

spent in efforts to save the situation. Dams, reservoirs and levees were built, but solid matter filled the first two and in the case of levees raised the height of the river bottom so much that in certain places it was twenty feet above the level of the surrounding country. The building of reservoirs does not provide a solution for the reason that in addition to being costly they fill up with silt and have to be renewed.

RETENTION OF FOREST COVER

Alberta's answer to the problem will be the retention of forest cover. By so doing the province will never reach the position China was compelled to face. Only by the obstruction of foliage, litter and deeply penetrating roots, existing in forest growth, can stream flow be safely regulated.

What happened in China can happen in any forest area in the world. It has happened in the United States and it can happen in Canada. If a watershed is denuded, disaster must follow. The people of Canada have been warned again and again against eventual shortage of timber, and the great danger that is being caused by continuing devastation of fire. So far public interest has not been aroused. It is hoped, however, that in connection with this vitally important subject a new chapter is about to be opened in Canada—a chapter that will show just what is really meant by forest protection and forest development. Discussion along the lines of irrigation and water tables is useless if protection of



Western Canada's watershed is not continued and increased.

The challenge to bring this about is made directly to the citizens of Canada. Man-made laws are helpless without the complete co-operation of all classes of the Dominion's population.

With regard to merchantable timber, Alberta cannot hope to compete with British Columbia in quality of lumber. The humid conditions of sea-level forests on the Pacific Coast result in speedier growth and taller trees with greater distances between branches, which means of course fewer knots and therefore improved quality. Alberta's lumber industry is nevertheless extensive. There are approximately 500 sawmills throughout the province and local timber plays an important part in the provision of props and other material for the mining industry. Fuel supply of timber in Alberta also represents a most important activity. A variety of uses may be named but the most important function of Alberta's forests is their maintenance of water supply for the immense territory of Western Canada.

TREE PLANTING IMPORTANT

Much publicity is given by the Forestry Division of the Alberta Government each year to the importance of planting trees in rural areas. Apart from their beauty, such planting is of great value to farmers and market gardeners as a protection for their soil against adverse winds. An idea of how important this endeavour can be is supplied by the fact that every foot in

height of trees protects at least fifty feet of soil.

In the spring of each year, the Forestry Division sends out transplants by the hundred thousand to applicants throughout the province. This service is carried out free of all cost save the express charge for shipment. A large variety of trees is offered and the applicant has but to mention the type desired for his own particular place. For many years the forest nurseries of both Alberta and the Dominion have given this much needed service with results that become increasingly beneficial as time goes on.

The benefits conferred on man by forest growth are manifold. With the exception of food products, no material is so universally used or so indispensable to human economy as wood. Wood provides fuel and building material of every kind for domestic and industrial purposes on both land and sea. By-products include paper, turpentine, rayon and plastics. New usages are continually being discovered by industrial science which offer a wide and varying range in products required by man.

The greatest value of trees, however, lies in their orderly provision of water upon which all types of life are completely dependent. This is their most important function.

So important is it that every effort should at all times be put forward to ensure their safety. There are only two main questions — conservation, or waste for selfish interests. Which is it to be?

Protection and orderly development will make reforestation unnecessary. A stitch in time saves nine. Alberta's forests can be saved only by the public conscience. A conscience which completely realizes and understands the importance of this great resource of nature to all citizens, individually and collectively. It is a national responsibility, a responsibility which belongs to everyone irrespective of age, sex or occupation.

Forests, water and soil are the most important natural resources of any land. Because soil is dependent on water for its existence, and because water must have

the protection of forest growth for its regular supplies, forests must therefore come first. They must be protected not only for present day benefits, but also to provide a legacy for those who are to follow. By so doing they will stand in perpetuity, undiminished in quantity and quality, through succeeding generations.

Protection must start now — without delay. Educational programmes, films and other forms of general publicity can assist in the all important job which must be done. The protection of our forests is everybody's responsibility. It must never, at any time, be forgotten.





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