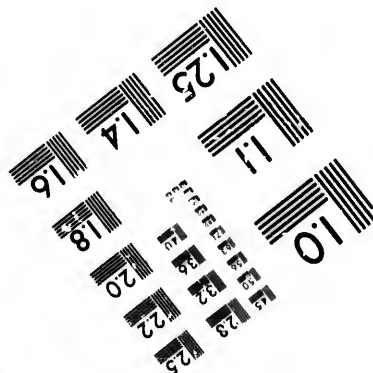
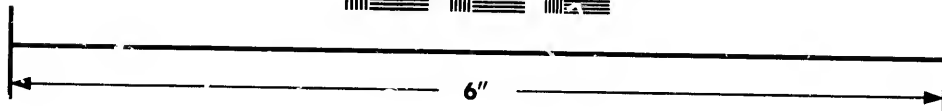
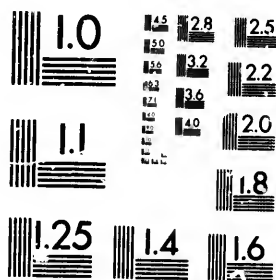


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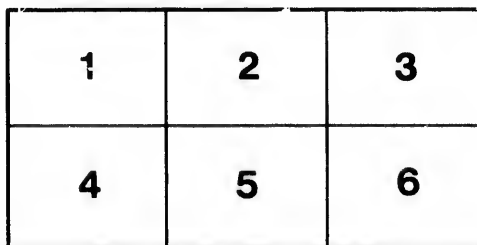
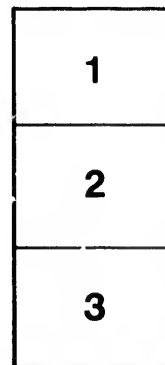
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The
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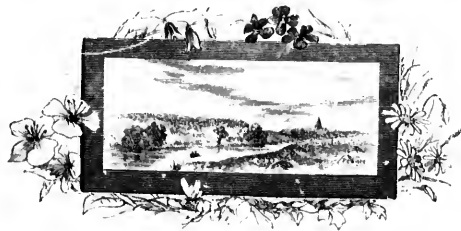
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The Wood Industries of Sweden.

THE Publishers have still a few copies of this book, which is a companion to "THE WOOD INDUSTRIES OF CANADA;" on sale at **2/6** each, or **3/-** post free.

THE WOOD INDUSTRIES OF CANADA

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The Wood Industries of Canada.

(By our Special Correspondents).



THE Dominion of Canada is the largest British colony, and it is also the nearest. It covers an area of 3,456,383 square miles, of which 3,315,647 are land and 140,736 water surface. It is washed by the Atlantic Ocean on the east and by the Pacific on the west, and is 3,500 miles across. On the north it stretches to the "Frozen Sea," and on the south to the chain of lakes and the United States.

It is difficult to convey an adequate conception of the extent of such a vast territory. It is forty times the area of Great Britain, which is only 88,000 square miles, and it is 30 per cent. of the total area of the British Empire.

There is a considerable misconception in England as to the climate of Canada. Many persons associate the name in their minds with perpetual frost and snow. In reality the climate of Canada is dry, healthy, and invigorating, and, owing to the great area of the country, extending over 20 degrees of latitude, or from the latitude of Constantinople to the North Pole, it has a wide range of temperature. The extreme dryness of the atmosphere, however, makes both cold and heat less acutely felt than the readings of the thermometer would lead one to expect. In the Maritime Provinces the climate resembles that of the British Isles; in Ontario, Quebec, and Manitoba the summers are warm and the winters cold, but the cold is pleasant and bracing, and the snow is of the greatest benefit alike to the farmer, the lumberman, and the merchant. In the North-West Territories cattle graze at large through the winter months, and on the Pacific slope, west of the Rocky Mountains, the climate is milder than in any other part.

The Dominion is so vast that one part may be charged with perpetual snow while the other is bathed in almost perennial heat and sunshine. One part receives the cold atmosphere of the "Frozen Sea"; another the humid air of the Atlantic; another the mild, genial breezes of the Pacific, and still a fourth has the surface of its soil baked by the heat of tropical waters. In the extreme northern parts vegetation is so stunted that the highest tree is not as tall as a two-year old child; in the southern parts vegetation is so luxuriant that fruits and flowers grow with as much vigour as in Italy or the South of France.

Instead of 'six months' winter and six months' cold

weather" being the normal condition, the fact is that the average winter is about four and a half months, and though the spring may begin two or three weeks later than in England, the conditions for rapid growth—warm sunshine and rain—are so favourable that the crops of the two countries are about equally advanced by the middle of July. The marine currents are singularly favourable to Canada; along the Atlantic Coast the Gulf stream exerts an influence so beneficial that on Sable Island are troops of wild ponies, whose progenitors, two centuries ago, were shipwrecked and cast upon the island, where three successive generations without shelter of any kind, have lived and multiplied. Along the Canadian shores of the Pacific Ocean the Japanese current produces the same effect on the climate as the Gulf stream does in England. Vancouver Island is like the south of England, except that it has a greater summer heat, with less humidity.

The system of government established in Canada under the Union Act of 1867 is a Federal Union (the first of the kind in the British Empire), having a general or central Government controlling all matters essential to the general development, the permanency and the unity of the whole Dominion, and a number of local or provincial Governments having the control and management of certain matters naturally and conveniently falling within their defined jurisdiction, while each Government is administered in accordance with the British system of Parliamentary institutions. By this Act the Imperial Parliament practically gave to the Dominion Parliament the largest possible rights which can be exercised by a dependency of legislating on at matters of importance to the Union generally. The position that Canada consequently occupies is that of a semi-independent power.

Canada, as a matter of fact, has been much neglected by Englishmen, but the vast mineral wealth of the country is just beginning to be appreciated. Forty years ago our adventurous young men made their way to the Australian and Californian goldfields, and later they have rushed to the diamond and gold mines of South Africa, but now they are beginning to realise that Canada is a country worth prospecting.

The mineral wealth of Canada, as might be expected from her vast extent of territory, and very various geological formations, is very diverse in character. The greater part of it is still totally undeveloped, the entire mining population at the present time being only about 14,000—or 0.4 of

those engaged in gainful occupations. The greatest enterprise in this direction is to be found in British Columbia and Nova Scotia, which together contain 76 per cent. of the total mining population. In the province of Quebec there are in all some 1,500 miners, and something over 1,000 in Ontario.

It is, in fact, only quite recently that the Canadians have woken up to the realisation of the enormous mineral wealth which has so long been neglected, and in many cases unsuspected, beneath the surface of their country. Coal mining, in especial, has made rapid strides during the last few years. Nova Scotia and British Columbia have exceedingly rich coalfields. In Nova Scotia the number of men employed in connection with coal mining in 1895 was 5,793, and the output of coal averaged 404 tons per man for the year. In British Columbia the number of men and boys employed for the same year was 2,024, against 2,012 in 1888, and the output of coal 548,017 tons, averaging 360 tons per man.

This, though not quite equal to the average output per man in the United States (448), is greatly in excess of that in the United Kingdom, where the output only averages 256 tons per man per annum. The coal areas of Canada altogether are estimated at 27,200 square miles. This estimate, however, does not include those known, but as yet undeveloped, in the Far North.

In addition to coal, Canada produces iron, gold, copper, silver, nickel, petroleum, salt, phosphate, asbestos, and gypsum in considerable quantities.

The annual gold yield of Canada amounts to 53,000 oz. Practically the whole of this comes from the provinces of British Columbia and Nova Scotia. The area of the gold measures of Nova Scotia has been estimated variously from 5,000 to 7,000 square miles, or about a quarter of the whole province; but the area from which gold has up to the present time actually been obtained is barely 40 square miles.

Copper occurs in Canada in the forms of native or metallic copper, and the sulphuretted ores. The former is confined principally to the rocks of the upper copper-bearing series on Lake Superior. The latter are widely diffused.

In Ontario, on the North Eastern shores of Lake Huron, extensive veins of rich copper ores have been mined for years. It is, however, in Sudbury, Ontario, that the greatest development of the copper mining industry has taken place, the output here having doubled during the last three or four years. Copper mining is, however, still in its infancy, and the expenditure of considerable capital is required, as well as the general adoption of cheaper and more effective methods of separating the copper and the nickel, to assist its development.

Petroleum has been found in Quebec, Nova Scotia, and New Brunswick, and it is affirmed that there is also an immense oil region still unexplored in the North West Territories. The largest oil-producing district is at present the county of Lambton, Ontario. The oil is obtained to a depth of from 370 to 500 ft. The first flowing well was struck on February 19th, 1882, and before October in the same year there were no less than 35 flowing wells. The annual output is reckoned at 600,000 barrels.

The salt produced in the Dominion is almost all manufactured in the province of Ontario, the Census returns showing 19 establishments in Ontario out of 20 for the Dominion. The salt beds of Western Ontario cover an area of about 2,000 square miles, embracing the counties of Lambton, Mason, and portions of Bruce, Middlesex, Kent and Essex. The beds are usually three in number, with an aggregate thickness of about 100 ft., and the salt is of excellent quality.

There is probably no mining industry in Canada that is in a healthier condition at the present time than that of asbestos. The mineral produced is in reality not asbestos proper, but a form of serpentine called "chrysotile." It occurs in veins in certain parts of the great belts of serpentine rocks of the eastern townships of Quebec. This mineral is shipped in large quantities to England, Germany, Belgium, Holland, and the United States.

Gypsum is at present worked only in Ontario, New Brunswick, and Nova Scotia, though deposits have also been found in Manitoba and the Territories. It is perhaps the oldest worked of any of the deposits of the country, having been mined by the French in St. John (New Brunswick) as early as the year 1701.

The principal articles of mineral production go almost

exclusively to the United States or the United Kingdom—the vastly larger proportion of these going to the States.

In addition to her minerals, Canada has rich natural resources in her forests, her farms, and her fisheries.

The forests have been ruthlessly destroyed by the axe and by fire. The most valuable woods in the early days of the colony were literally regarded as so much "lumber," and how it was destroyed, so long as it disappeared, no one cared. The growing scarcity of the most valuable forest product, viz., first quality white pine, is causing the condition of the forests to be seriously considered by the Government, and it is to be hoped that some steps will be taken to prevent the total extinction of this wood.

The white pine forests on the North American Continent are now pretty well narrowed down to Canada, the immense forests which at one time existed in the northern parts of the United States having been cut out at a rapid rate. It is only about twenty-five years ago that Michigan was an unbroken forest of pine, and it has all disappeared before the lumberman's axe.

In the Ottawa valley the quantity of standing pine may be greater than some imagine, but lumbermen who have surveyed wide areas for investment in timber limits say that good tracts of pine are rapidly getting scarcer.

In the districts around the new railway to Parry Sound a good timber country, little worked, has been made accessible, and Gilmour & Co. and the St. Anthony Lumber Company have started working some valuable limits, producing good saw logs, square timber, and board pine, as well as hardwoods.

Canada stands fourth on the list of timber-exporting countries, and next to agriculture the timber trade is the most important industry from a commercial and economic point of view in the colony. The following figures will convey some idea of its extent. There are about 6,000 saw-mills in the Dominion, both large and small, with, say, an average capacity of 400,000 ft. board measure per season. These mills find employment during the working season for about 150,000 men, in and around the mills, sawing, piling, shipping, &c. In the woods, during the winter, getting out the logs and timber and river driving, about the same number are engaged.

The Department of Agriculture gives the following statistics of all the wood industries of the Dominion from the census of 1891:—

Name of Industries.	Invested Capital.	Wages.	Value of Product.
Ashery, pot and pearl ...	\$15,019	\$45,139	\$153,441
Basket making ...	80,540	66,987	151,003
Boat building ...	421,395	170,092	477,522
Cabinet and furniture ...	6,094,435	2,437,714	7,768,093
Carpenters and joiners ...	5,012,690	2,940,803	9,111,299
Carriage factories ...	8,023,621	2,999,572	9,744,416
Carving and gilding ...	72,174	42,845	136,430
Charcoal burning ...	56,831	22,696	91,874
Cheese-box factories ...	106,380	44,876	137,616
Clear box factories ...	19,500	6,000	15,000
Coffin and casket making ...	502,146	166,039	498,440
Cooperages ...	1,896,931	744,534	2,382,072
Hub and spoke factories ...	106,895	30,010	105,400
Iron and baby carriages ...	51,300	43,400	145,500
Last and peg factories ...	67,000	26,630	72,500
Lath mills ...	25,365	11,180	37,860
Mast and spar making ...	58,065	15,620	59,800
Match factories ...	336,950	143,064	434,953
Pecking cases ...	137,305	68,900	293,869
Pail and tub factories ...	191,130	36,480	99,908
Patterns and moulds ...	3,700	4,450	16,500
Piano-action factory ...	11,000	10,800	20,500
Picture frame making ...	289,962	122,014	564,579
Planing mills ...	2,955,680	970,112	5,211,592
Pulp-mills ...	2,900,907	292,099	1,057,810
Pump and wind-mills ...	519,897	163,345	601,513
Refrigerator factories ...	22,715	22,840	56,350
Sash, door, and blind factories ...	7,118,676	2,300,267	9,891,510
Saw-mills ...	50,203,111	12,625,895	51,262,435
Shingle mills ...	1,529,358	616,356	2,093,924
Shipbuilding ...	2,045,456	998,615	3,101,275
Show-case making ...	233,425	84,850	441,750
Shoek factories ...	73,677	28,127	99,710
Spinning wheel making ...	12,915	5,050	8,788
Spoon factories ...	63,407	25,000	50,000
Slave mills ...	724,242	297,008	814,333
Street car works ...	13,898	2,400	12,600
Tanneries ...	6,322,131	1,522,097	*11,422,860
Trunk and box factories ...	659,805	253,863	1,042,733
Washing machines and wringers ...	93,260	46,300	164,998
Wood turning ...	469,510	204,265	621,096
Total ...	99,637,522	30,680,281	120,415,516

*The product in this instance is leather. In all the other cases the product remains wood.

In addition to which there are the 16,500 miles of railways, for which, allowing 3,000 sleepers to the mile, 55,770,000 were required in the construction of the lines, and about 8,000,000 per year required for repairing the permanent ways.

Agriculture is the chief industry, and it is estimated that 45 per cent. of the population are engaged in it. In the year of the last census, 1891, there were 174,000,000 bushels of grain produced. There is a very large area of land available for settlement, either for agricultural or for mining purposes, and it would be beneficial to Britain as well as to the colony if some of our surplus population could be transported on to these broad acres.

The fisheries are the most extensive in the world, embracing a sea-coast line of immense extent, in addition to inland seas, innumerable lakes, and many rivers. The western coast line is 7,181 miles in length, and the eastern 560 miles.

Canada is fairly off for railways, having 16,500 miles. The Canadian Pacific, which runs across the continent, is a most important institution for the colony, and if a really fast service of passenger boats could be established between Europe and Quebec the colony would derive much benefit in many ways. It would attract both passengers and freight by the St. Lawrence route, which is 600 miles shorter sea passage than by New York. Tourists would prefer the route for its picturesque attractions, and this would be likely to lead to the investment of capital in the country.

The total exports in 1895 were valued at 113,638,000 dols., of which 61,850,000 dols. were exported to Great Britain. Forest produce accounts for 5,400,000 dols. of this, 3,000,000 dols. of which went to Great Britain, and 2,400,000 dols. to the States.

The total imports in the same year were 110,780,000 dols., of which 37,138,414 dols. came from the old country.

The population of Canada is somewhere about 5,000,000, and it does not increase much. What the country requires is more population and more capital, and it is to be hoped that now greater attention is being paid to Colonial matters both men and money will be attracted to Canada, where there is ample field for the profitable employment of both.

Vigorous efforts are being made by Canadians to increase their trade, and new schemes for the development of the country are being pushed forward. To benefit Quebec it is proposed to build a bridge across the St. Lawrence, and to extend the Parry Sound Railway from Ottawa at that point. Cold storage depots are being established in various parts of the country to assist the farmers to ship their fruit, cheese, poultry, and other perishable commodities in good condition. The channel of the St. Lawrence, above Quebec, is to be deepened to 30 ft., and the canals to the Great Lakes are to be deepened and widened. These and other public schemes are

on foot, which tend to show that the Canadians do not intend to stand still.

It is to be hoped, too, that a growing Inter-Colonial trade may spring up, and that Canadian forest produce may find its way to the Cape and our Australian Colonies, both of which countries import large quantities for buildings and for use in mining and various industries.

The following articles deal more particularly with the export timber trade of the Dominion, but other subjects closely connected with that industry are alluded to.

In writing about the Canadian wood trade for English readers, it is difficult to avoid using words in the sense in which they are understood in Canada, which, in some cases, differs from ours.

Thus, the wood of the *pinus strobus* is called by us "yellow pine," whereas it is called in Canada "white pine." "Timber" in England is used in a general sense to include wood of every kind, whereas in Canada "timber" is understood to be only hewn, squared, or waney logs, and all sawn wood is called "lumber."

Some other local timber terms are used in these articles, of which the following are the definitions:—

A "Timber Slide" is a narrow artificial channel for floating sawlogs, single trees, cribs, or drams, to avoid the danger of shooting the rapids.

A "Chute" is a sloping artificial channel made to avoid the rapids or falls.

A "Flume" is an artificial channel for floating the logs to the mills.

A "Rollway" is a cleared space on the side of a hill down which logs are rolled to a stream.

A "Portage" is an overland route over which carriers and baggage have to be conveyed past rapids or falls, or from one lake to another.

"Sawlogs" are the logs cut from the trunks of trees—usually 12 ft. long. The standard log is 12 ft. in length and 21 in. in diameter.

"Dimension timber" is used for all kinds of timber sawn into sizes for building purposes, interior fittings, etc., etc.

A "Carload" of lumber is the quantity of any kind that can be loaded on a railway car or truck, but as the size of the trucks varies, every carload is not the same quantity, but an average carload is from 12,000 to 15,000 ft. board measure.

"Board Measure."—All lumber is bought and sold in Canada by the thousand superficial foot of 1 in. and 12 wide, and this is called "board measure."

In the compilation of the following pages thanks are due for the valuable assistance which was so willingly given by Mr. Tachez, of the Crown Lands Department, Quebec; Mr. Aubrey White, of the Crown Lands Department, Toronto; Mr. Southworth, Clerk of Forestry to the Government of Ontario; Mr. Johnson, the Government Statistician, Ottawa; Dr. Bell, M.D., LL.D., of the Geological Survey of Canada, Ottawa, and many others.

The Forests of Canada.



HERE was originally in Eastern Canada one unbroken forest from Nova Scotia to the Lake of the Woods, a distance of 2,000 miles, and covering an area of 315 million acres. Through this forest there ran the rivers Miramichi, the St. John, and the St. Lawrence, with its string of lakes, great and small, and with its great tributaries, the Saguenay, the St. Maurice, the Ottawa, and others.

The census of 1891 shows that there has been cut out from this forest area, say, 30 million acres of land for agricultural purposes. Possibly in 20 million other acres work has been done to reduce this particular area to a low percentage of forest trees.

The remainder is under forest. But a large portion of this remainder has been "deviled" by the lumberman seeking for merchantable timber. The careless torch has

lighted fires like the Miramichi fire, which swept with fierce energy over an area of more than 3 million acres, leaving blackened giant pines, to be a reminder for more than half a century of the immense destruction there and then caused. Thus, there has been a thinning out of the forest trees all through the 260 million acres not used for farm and pasture. Vast areas have suffered from fires so severely that in many places the soil has been burned off to the very rock, and a century's disintegrating forces will have to act upon the rock before there can be soil enough created for practical uses.

Lakes and pools and streams innumerable take away a good sized slice from the 260 million acres. But allowing that one-half of the area is comparatively useless as forest area because of water and rock, there are still 130 million acres of forest area. Under this assumption 45 per cent. of the Eastern provinces is still under forest.

Of the districts from which the timber is derived:—First in

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order is the Saguenay Territory, 140 miles above the Point des Monts, at the head of the Gulf of St. Lawrence. The Saguenay River discharges, from the northward, the drainage of 27,000 square miles. This river is navigable for ships of the largest burthen for a length of over 60 miles. Its surface is diversified by lake, river, and stream, but the character of its soil forbids profitable settlement to any considerable extent. It must always continue forest land, and, judiciously managed, can furnish an inexhaustible supply of lumber, chiefly spruce, as well as a large proportion of minerals.

Between the valley of the Saguenay and the next great lumber region, the St. Maurice, a territory of 8,000 square miles interposes. The City of Quebec stands about midway between the Saguenay and St. Maurice on the shores of this territory. Its surplus waters are discharged into the St. Lawrence by isolated but sufficiently copious streams.

The St. Maurice River discharges the drainage of an area of 21,000 square miles into the St. Lawrence at a point ninety miles above Quebec. Its valley may literally be called a "land of many waters." A map of its territory resembles a section of a "plum pudding" where the fruit is uncommonly large and plentiful, more than any other object, so thickly is it studded with lakes and lakelets.

Between the St. Maurice River and the Brute de l'Isle, at the Island of Montreal, where the north branch of the Ottawa joins the St. Lawrence, a small valley of 9,600 square miles intervenes. It is drained into the St. Lawrence by its own streams, some of which are seventy to eighty miles in length, and good floatable rivers.

The valley of the Ottawa covers an area of 60,000 square miles. It is traversed throughout its greatest length by the river from which its name is derived, and which may be said to encompass the whole area on the south, west, and north. Its sources overlap the St. Maurice, and itself is overlapped by the sources of the Saguenay, the head water of these rivers being within two days' journey or forty miles of each other. Its tributaries are of great magnitude, many of them being from 300 to 400 miles in length, while the main stream has a course of 780 miles and is navigable for canoes to its source.

The valley of the Ottawa is the principal site of the pine trade, and has been since June 11th, 1806, when the first raft left the mouth of its great tributary, the Gatineau.

Thus the total area of timber lands whose rivers run into the St. Lawrence and Lake Ontario is 161,911 square miles.

The principal part of the forest lands of British North America belongs to the Crown, but vested in the Provincial Government, in other words, they are public property, and are administered for the benefit of the people. The lumber manufacturer obtains the area on which he works, which is called a "timber berth or limit," by bidding the highest price for it at auction. It is generally supposed to be ten miles square, containing one hundred square miles, or 64,000 acres, but, owing to the topographical features of the country, the "limits" are of all sizes and shapes, from 24 square miles upward.

The limit holder becomes a yearly tenant of the Crown at a fixed ground-rent, and pays a slight duty per cubic foot of square timber taken out and on each saw log, but has no right in the land.

The areas covered by these leases or limits were as follows in 1894:—

Provinces.	Provincial. Sq. miles.	Dominion. Sq. miles.	Indian. Sq. miles.	Total. Sq. miles.
Ontario	21,574	—	983	22,557
Quebec	46,397	—	139	46,536
New Brunswick	6,371	—	17	6,388
Manitoba and Territories	2,707	—	—	2,707
British Columbia	820	421	8	1,249
Total	75,092	3,128	1,167	79,387

In the province of Manitoba and in the Territories and in the Railway Belt of British Columbia (40 miles wide by 300 miles long) the Dominion Government, filling the place of the Provincial Governments, owns the Crown lands and their forests.

In Nova Scotia there is no system of timber licences, the trees being sold with the land and not much timbered Crown land remaining. This is also the case with Prince Edward Island.

In the settled portions of the provinces the woodlands are in the hands of private owners, but contain comparatively little that can be classed as forest, though the census returns indicate that about one-third of the occupied land is in woodland and pasture, possibly leaving one-fourth for woodland.

In Quebec province no spruce tree can be cut that is less than 12 in. on the stump, but in Ontario the limit is 9 in. The limit for pine trees is 12 in. on the stump.

Much more timber has been destroyed by fire than by the lumberman's axe. The successive Governments have allowed settlers to locate in the centre of green pine districts—on land totally unsuitable for agriculture, and devastating fires have resulted in laying waste immense areas of the most valuable forest trees. It is satisfactory, however, to see that more care is now being taken of the forest wealth, and if the Government will give the limit holders more security from the dangers of destruction by fire, and if lumbermen do not cut the limits too severely, the present wooded areas can be cut over periodically for all time to come. The Ontario Government have a service of fire rangers during the dangerous months of the year on the recommendation of Mr. Aubrey White in 1886, half of the expense is borne by the lumbermen, and half by the Government, the number of rangers required is left to the limit holder.

It is quite impossible to arrive at anything like a reliable estimate of the present forest area or future supplies. The lumbermen are not disposed to give much information, and almost every writer who touches the subject gives a different estimate.

The following approximate estimate is based upon returns of the Provincial and Dominion Governments, reports of surveyors of the Crown Lands and other departments, the Geological Survey, and other trustworthy sources:—

Provinces.	Total Area. Sq. miles.	Forest and Woodland. Sq. miles.	Wood- land. p. c.
Ontario	219,650	102,118	46.47
Quebec	227,500	116,521	51.22
New Brunswick	23,100	14,766	52.55
Nova Scotia	20,532	6,464	31.45
Prince Edward Island	2,000	797	39.85
Manitoba	64,066	25,626	40.03
British Columbia	382,300	285,554	74.69
Territories	2,71,481	696,952	27.39
Total	2,315,647	1,248,798	37.66

It must not be supposed that this area is all forest, much, though wooded, being covered with stunted trees.

The Hon. Sir Henri Joly has studied the question for many years, and from the following extract in a report he made to the Minister of Agriculture at Ottawa, his views of the subject will be gained:—

He set forth the difficulty of an inquiry which had for its object to calculate the contents of growing forests scattered over half a continent, from the Atlantic to the Pacific.

"Let us try and make an inventory of the timber resources of the Dominion, beginning in the west. On the Pacific shores of the Dominion, in British Columbia, the bountiful gifts of Providence are still stored up for us and the forests have been scarcely attacked by the lumberman. From the Rocky Mountains to the Province of Ontario there are scattered here and there certain tracts of well-timbered land, but they are the exception, and which timber will be required for the local wants of the people who are now beginning to settle our fertile prairies, and it will never, I think, contribute to swell the bulk of our timber exports.

"The great forest of Canada *par excellence*, is spread over that vast territory watered by the Ottawa, the St. Maurice, the Saguenay, and their tributaries, over one hundred thousand square miles in extent. Before drawing your attention to it, I will mention our remaining timber limits that cannot compare with it either for size or resources. They are found in the Georgian Bay country; the Muskoka and Nipissing regions; the eastern townships of Quebec and south shore of St. Lawrence to the Gulf; the region on the north shore of the St. Lawrence, from the Saguenay to the Bersiamis, and perhaps still lower down as far as Mingan; and the country watered by the St. John, the Miramichi, the Restigouche, and their tributaries. These timber limits in many places are scattered and isolated; they have with few exceptions (such as the Bersiamis at the east and some newly discovered pine tracts at the west on Lake Superior) been worked for a long time and cannot be expected to supply much longer any considerable quantity of first-quality pine, but they still contain an immense quantity of spruce, sufficient for a great many years' supply if carefully worked and protected. I will now return to the great Canadian forest, our great pine country with its wonderful network of streams and its three great arteries, the Ottawa, the St. Maurice, and the Saguenay. Does it begin to show signs of exhaustion? Look at the map of that

great region and you will see how little of it is now left untouched. On the Ontario side all the most accessible tributaries of the Ottawa—the Madawaska, the Bonnechere, the Mississippi, the Petewawa, and others—have been worked for years. The lumbermen are now round the eastern end of Lake Nipissing with the Matawan for an outlet that can only be reached by a land road; they are still much further north on the shores of the Montreal River.

"On the Quebec side they have nearly reached the headwaters of all the great tributaries of the Ottawa, the Rivière Rouge, the Rivière du Lièvre, the Gatineau, with the Jean de Terre and Lake Kakibonka, and the Lac des Rapides. They are now working 30 miles higher up the Ottawa, as the river runs, on Lake Teniscamingue and the Kippewa.

"On the St. Maurice they are as far up as Lake Manouan on the western side of the river. Its great tributaries on the eastern side, the Bostonais and the Rivière Croche, have been deprived of the greater part of their fine pine; it is now sought at the head-waters of those rivers.

"As for the Saguenay region, it still contains a good deal of spruce, but there is only a limited extent of pine still untouched, or nearly so, south of Lake St. John, between the Metabetchouan and the head-waters of the Rivière Croche, near Commissioners' Lake and Bouchette's Lake. There is a little pine left north of Lake St. John, and a certain quantity on the river Shipsha and in the lower Saguenay on the Ste. Marguerite and Petit St. Jean, &c. As for the large rivers that flow into Lake St. Jean—the Chamouchoua, Mistassine, and Peribonca, the pine that was on the lower part of these rivers has been nearly all cut, and the remainder of their course, from their distant northern sources, is through an immense burnt-up wilderness where the vegetable soil has been consumed by fire.

"That huge tract of lumber country between the Ottawa and the St. Maurice, that separated (or rather appeared to separate) the lumbermen working on those two rivers by what seemed an inexhaustible and endless forest—that huge tract is tapped through and through, and the Ottawa lumberman has met the St. Maurice lumberman on the shores of Lake Manouan."

Mr. Joly concludes his run through the great Canadian forest with the following statement—

"In a very short time since the beginning of the century we have overrun our forests, picking out the finest pine, and we have impoverished them to a serious extent, and what makes it worse, impoverished the country too, for, owing to the force of circumstances, our timber export trade has not given Canada such a return as she had a right to expect. There still remains to us a great deal of spruce and second-rate pine, which for generations to come will be in excess of our local wants if we are careful; but the really fine pine required to keep up our great timber export trade to its present standard is getting very scarce and inaccessible, and I fear that we must prepare for a sudden and considerable falling-off."

The market value of both pine and spruce limits have increased very much of late years. At the last sale of Government limits in Ontario, in 1892, the very high price of 17,500 dols. per square mile was paid by Gilmour & Co. for a pine limit in the Nipissing, Algoma, Thunder Bay, and Rainy Lake District, but it must be added that this included a considerable area of virgin pine, but it did not include the hardwoods. At the same sale another buyer paid 12,700 dols. per square mile. In addition to this lump sum, the lumberman has to pay the annual rent and stumpage dues. These figures show a great advance on any previous sales, and the increase in prices recently is largely due to the increasing number of American buyers who have competed. For spruce limits in Quebec province the highest that has been paid at auction is 125 dols. per square mile, and this is five times the price paid twenty or thirty years ago. But limits have changed hands by private sale at 1,000 dols. per square mile.

The provincial Government of Ontario, recognising the importance of some steps being taken to regulate the cutting of timber, so as to husband the remaining forests, and to protect the young second-growth pine in the burned-over areas, created in 1883 a Department of Forestry. The present Clerk of Forestry, Mr. Thomas Southworth, was appointed to the post in 1895, and has this year published his first report, which is full of interesting information and useful suggestions.

Mr. Southworth, speaking of Forestry in his province, says:—Owing to the timber policy of Ontario—which in a

more important features coincided with that generally adopted throughout Canada—the question of future forestry operations in this Province is rendered comparatively simple. It has been in marked contrast with the course pursued in the United States, where the Government in dealing with large timbered tracts of land have, in selling the timber, disposed of the fee simple of the soil to capitalists and speculators. This renders the difficulty of adopting a policy of forest preservation much greater than if the public had retained the ownership of the land, as large corporat and private interests stand in the way of any change of system; and the right to deal with tracts of land originally parted with for comparatively trifling considerations must now in many cases be bought back at enormous expense. Ontario, keeping in view the fundamental principle of "the land for the settler" has wisely avoided this mistake. In the early days of the Province it was necessary for the settlers to cut down and burn the valuable timber in clearing their farms, but when government was organised it was soon found advisable to sell the standing timber to lumbermen, retaining the land which it occupied for the settler. This policy served the double purpose of assisting the farmer in his clearing operations, and lightening the burden of taxation, as the proceeds from timber sales formed a large portion of the provincial revenue. Until comparatively recent times, the possibility of a lumber famine or the disastrous effects of too thorough clearing on agriculture and climate, was little thought of. When the conditions prevailing at that time are borne in mind it is hardly surprising that our legislators, in their desire to divide the land among the people as it was needed for their homes, overlooked the necessity of providing for the maintenance of a due proportion of woodland in the settled area, either by restrictions upon the cutting of the trees or by the reservation of certain tracts to be kept always in wood. That we have suffered to some extent from this cause is evidenced by the drying up during the summer of many streams and springs which formerly maintained an even flow throughout the year. But despite any unfavourable climatic change which may be traceable to the policy of the indiscriminate opening up of lands for settlement, accompanied by over-clearance, it is fortunate for us that we have escaped the more injurious and less excusable mistake made by our neighbours of the United States in alienating the fee simple of large tracts to capitalists at nominal prices. It is moreover worthy of note that the timber and land policy of Ontario has so far been in the direction of the principles of modern scientific forestry. The timber has been treated as a crop, to be harvested when ripe, and not left to over-maturity and decay. Most of the area thus far denuded is good agricultural land and has in the main wisely been devoted to cultivation—although, as already remarked, the individual landowners, doubtless for want of proper knowledge, have not in all cases realised the fact that portions of their farms might be better suited for permanent woodland than for tillage, with the result that an insufficient wood crop is left in some of the older settled parts of the Province. That error it is possible to rectify, and the farmers of Ontario are too intelligent not to appreciate the wisdom of so doing.

In the process of converting Ontario from a wilderness to a thriving community, we have now reached a section of heavily wooded country, differing in many respects from the fertile region of Southern Ontario. Running from east to west across the Province is an elevated ridge commonly spoken of as the "height of land" forming the water-shed from which the streams flow north to Hudson's Bay and south to the great lakes and the St. Lawrence. This ridge is the source of our principal streams which provide water powers of great value in many places. Though for the most part rocky, and affording little land suitable for the plough, it is heavily clothed with timber, providing a magnificent reservoir as a feeder to our rivers, and a mine of wealth to the Province. The white pine, the greatest of our timber trees, is abundant throughout this region and for some distance northwards. Beyond the northern limit of the pines a vast forest of valuable spruce extends away to the Arctic circle around the shores of the great inland ocean, Hudson's Bay. This is destined to be in the future the great source of supplies for the manufacture of paper. As yet this territory has been but little explored by the lumbermen, and, in fact, only imperfect surveys have been made of it. This great area of land, much of it unfitted for general agriculture, is excellently suited for the production of successive growths of timber, and by the application of the simplest principles

THE WOOD INDUSTRIES OF CANADA.

of forestry will ensure an adequate supply for all possible future requirements and an extensive system of water storage. To accomplish this it is not necessary to keep these northern forests as locked-up capital, but to dispose of the timber as it matures, and to see that lumbering operations are so conducted as to provide for the natural regeneration of the forest growth. All that is requisite for this purpose is to protect the partially-denuded tracts from fire, and Nature will do the rest; not, perhaps, so quickly or with so commercially judicious a selection of varieties as if aided by the skill of the forester, but successfully nevertheless.

Mr. Southworth, acting on the suggestion of the Commissioner of Crown Lands, requested the Crown timber agents to report on the reproduction of pine in the burned areas, and from the reports sent in it appears that over large tracts of the forest lands young pine is springing up and growing vigorously, which only require protection to become as valuable timber as ever was cut. Alluding to the general ideas concerning the reproduction of white pine, he says:—

"A general impression exists, endorsed to some extent by scientific authority, that something like a natural law of rotation of crops prevails, in accordance with which pine, when removed, is invariably succeeded by deciduous trees. The information comprised in the reports renders it abundantly evident that this is a popular error, due to insufficient consideration of all the conditions in connection with the reproduction of forest vegetation. The fact that the clearance of pine is generally followed by a growth of other varieties is due entirely to the agency of fires and the destruction of pine seeds and the remaining parent trees.

In a fire-swept region, where the ravage has been complete or nearly so, the character of the new vegetation depends upon the seeds which are first deposited upon the soil, and hence the varieties having downy or light seed-vessels, which may be borne long distances by the wind, are as a rule those which form the bulk of the second growth. Where pine has been removed, and no fire has taken place, it is invariably succeeded by its own kind, and not until the land has been twice burned over is it so exterminated as to give place to the second growth of inferior varieties. That the contrary opinion has so long prevailed is altogether due to the circumstance that lumbering operations and the influx of settlement upon pine-covered land are so generally followed by repeated fires that second growth of the less valuable deciduous trees is the usual rule.

"Practically all that needs to be done in order to maintain our timber supply in perpetuity and secure all the other advantages accruing from the presence of large forest tracts is to retain in the possession of the Crown all such timbered land as is not well adapted for agriculture, and to protect it adequately from fire. Were this done the apprehension of the exhaustion of our timber resources would no longer be even a remote possibility. Large as the demands upon our forests are, their reproductive capacity, provided the ravages of fire can be suppressed, is many times greater."

The reproductive power of spruce is much greater than that of the white pine, and the forests in Quebec, on the north of the St. Lawrence and in New Brunswick, can be cut over every fifteen or twenty years, and will furnish good saw-logs, and it is to these extensive spruce areas that much of the pulpwood required in the United States in the near future will be derived.



Preservation of Forest Areas from Fire.



THE following letter was written by Mr. W. C. Edwards, M.P., to the Commissioner of Crown Lands, Quebec:—

The preservation of the forests from the devastations of fire is alike most important to the province and to the limit holders, and the judicious and careful cutting of the timber upon the limits is also very important to the province, if, perhaps, not so fully important to the operators of to-day.

I shall first endeavour to deal with the former question, that is, the preservation of the forests, and I shall deal more particularly with the portion of the province with which I am most familiar, viz., that portion drained by the tributaries of the Ottawa, from the Long Sault Rapids at Grenville to the head of Lake Temiscamingue, and I take it that the conditions here are a fair sample of existing conditions all over the province. Before the advent of the settler and the lumbermen this district of country was immensely rich in pine, and to a less extent in spruce, cedar, hemlock, and other woods. For the last 65 years or more, and perhaps more particularly for the past 30 or 40 years, the lumberman's axe has been busily engaged in cutting down the pine trees and converting them into an article of commerce, with the result of yielding to the province a large annual revenue, furnishing an article for foreign export, which has contributed largely towards paying for our foreign imports, and at the same time has given very large employment to labour, and furnishing a large home market for our farmers' produce; with the result to the operators themselves, that the great bulk of them have been unsuccessful, and either retired from the trade penniless or died poor men. Comparatively few have been fairly successful, and a very limited number, after a long struggle for many years, may be termed as having been really successful.

Had no other factor appeared, I think it is safe to say that the present rate of production might go on for many decades to come, and I think I might say for some ages to come, for I firmly believe that considering the natural growth, with no other instrumentality of removal or destruction than the lumberman's axe, the percentage of the depletion of the pine forests would even to-day be almost imperceptible, and the final exhaustion would be many years in the future, but how many it would be very difficult to calculate. I think, however, it would be quite safe to say from one hundred or two hundred years.

With this asset, as it might and would be to-day, but for one factor, the province could complacently look upon its present unhappy debt, as it would have nothing to fear, but alas, this factor, viz., fire, has worked the most serious destruction in the forests of the province. I think I am safe within bounds when I say that in the region of country with which I am dealing twenty times as much merchantable timber has been destroyed by fire as has been cut and taken away by the lumbermen, to say nothing of the young and undressed pine destroyed at the same time, for fire destroys indiscriminately, while the judicious lumberman preserves the young and growing pine for future use. Adding to the quantity already mentioned the young pine, and the loss through fire is alarmingly increased. I will not undertake to say that this enormous loss could be wholly averted, but I can safely say that it could have been largely averted.

The sources of these unhappy bush fires are not very numerous, and by far the greatest source is illegitimate settlement and squatting upon the limits. It is quite safe to say that the loss to the province from this source reaches hundreds of millions of dollars. In a less degree, there is the danger from fishermen and hunting and camping parties, the clearing of lumber farms, from the lumbermen's drives, and from lightning. The Indian may possibly be responsible for some fires, but they are few and far between I am sure. In my own experience I have never known a case,

known or supposed, to have originated from this source. I know of two or three burnings that cannot be accounted for in any other way than from lightning, but these must be few, as rain almost always accompanies lightning; but in any case this is the least of all the dangers and one that cannot be guarded against. All the others, however, can be guarded against, and beginning with the first and most important danger, I hope you will pardon me for saying that no efficient remedy has yet been applied. A few years ago a charge called "fire tax" was introduced, but I am perfectly candid in saying that I know of no results whatever, excepting the payment of the charge. I have never seen or heard of a fire ranger anywhere on any limits that we or any other lumbermen possess.

And if you will allow me to offer my suggestions for the remedy, they are as follows:—

In the first place I would allow no surveys or laying out of townships whatever in timbered districts, and more especially where such districts are unfitted for settlement. In the next place, I would allow no squatting whatever on limits excepting as approved jointly by the Commissioner of Crown Lands and the holders of limits, and only where such are required for stopping places for the actual necessities of the lumbermen. If this is done, by far the greatest danger will be removed; but I will go further, and would suggest the organisation of brigades of fire rangers over the entire province; the brigades to be greater or smaller according to the values to be guarded and the possibilities surrounding the several situations to be so guarded. The whole grand system of organisation is one that would require a good deal of consideration and arrangement of detail, and it would be difficult to enter into a discussion of the whole subject through correspondence. Whether you would appoint one general head for the whole province, and district heads under him, is a matter for your own consideration, and possibly you might think well of consulting the lumbermen on this point. But to come down to narrower limits, I will take for discussion the Gatineau district. The Gilmours and ourselves are the largest holders of limits on that river. Now it is a great question in my mind, whether there should be two organisations dealing with this district separately, or whether there should be one organisation dealing with the whole. There are some grounds for and against each scheme, and this is a matter that should be considered carefully, but on general principles I would divide the territory into districts with one chief ranger over each district with a sufficient number of men under each to keep a close guard on all settled districts contiguous to the limits, to guard all roads leading to and through the limits, and, in fact, to guard in every way against the setting of fire, and to put out fires if unfortunately such occur. Of course the organisation would have to be empowered to call help when such is required and is obtainable.

I would suggest that the fire rangers be named by the lumbermen and appointed by the Commissioner of Crown Lands, the Crown and the lumbermen each to contribute one-half the payment of their salaries. An important matter would be the appointment of wise and judicious men, who would create a good feeling among the settlers and impress upon them the great and important truth, that the preservation of the forests and the continuance of the lumber trade is their salvation from two sources, viz., in supplying them with both work and markets for their produce, and also in averting to as late a day as possible direct taxation, which must surely come when the revenue from the forests ceases altogether or is lessened very much. The nature of the season would always have some influence on the number of men required, a generally rainy season would call for a less number of guardians than a generally dry season, but this matter could easily be regulated according to the necessities.

Coming now to the minor dangers. It is a great question in my mind as to the wisdom of leasing lakes for fishing purposes. I, myself, would prefer that it should not be

done, as I consider it a source of danger, but certainly gunning, excepting by Indians, should be prohibited on the limits, so far as it is possible, during any very dry season, and far better if camping parties and fishermen could be kept off also. As to lumbermen's farms, great losses have occurred in some instances in years gone by in clearing same, but this danger I think is largely past, the interest of the lumbermen themselves will provide against further danger from this source. But the last danger I mentioned, viz. lumbermen's drives, is a great source of danger and should be carefully guarded against. The plan we have adopted ourselves is this: on each drive going through a wooded country we appoint a careful and reliable man, whose only duty is to watch and guard against the starting fires. His duty is to walk up and down the ground being operated upon, and see to it that fires do not start from smoking or from any other source, also to guard the camp fire, and remain behind as the camping party move forward, and see that no seed for starting a forest fire is left behind. This system, or something similar, should, I think, be put in force over the entire province.

Now I will refer to the second question I mentioned in beginning this letter, viz. that of the careful cutting of the limits, and in dealing with this question I wish also to include the matter of saving the young pine as well as other timber. Now the conditions in the region of country with which I am dealing, and which I take it is a sample of the conditions all over the province, are these: fire has destroyed the greater portion of the thickly pine-timbered country. With the exception of very narrow areas the lumbermen have gone over the balance and have cut the better portion of the timber, and what is now left for the province and the operating lumbermen of to-day is the remaining large pine, of generally more inferior quality, and also the small growing pine, and the other woods, such as spruce, hemlock, ash, basswood, &c., which, if not possessing commercial value to-day, will, at the same time, be of value in the not very remote future, if preserved from fire. As to operating, my view is that the conditions and regulations should be such as to make it an object for the lumberman to cut in the most careful and economical way, wasting nothing that can be turned to any profitable account whatever, and save and preserve the young timber, and in every way strive to preserve the life of our forests and the lumber industry.

It is too true that hundreds of millions of dollars' worth of assets of the province have vanished in smoke, and it is also true that a very few years more of similar conditions

will see the end of the lumber trade and nearly all revenue from same. Untold value has been lost to the province, and the percentage of forest wealth remaining is comparatively small. At the same time, under careful and judicious management, the value of what remains can be much enhanced and its life very greatly prolonged, and to accomplish this the Department of Crown Lands and the lumbermen must join hands, all party and political differences must vanish, and no other sentiments prevail than those of patriotism towards the province and the preservation of the lumber trade. The position is alike a most serious one for the province and the lumbermen. In very many instances to-day the bulk of the possessions of the lumbermen is the young growing pine and other woods on their limits, and it is largely to this source the province will have to look for revenue for near approaching years, and the preservation not only of the young pine forests, but of all green forest country, is one of the utmost importance, for as the pine becomes exhausted, other woods will come in, and, bad as the conditions are to-day, at the same time a large revenue, extending over many years to come, can be saved for the province if the necessary precautions are carried out.

Another serious source of loss to the province, and at the same time a great wrong to limit holders, is a practice which is continually going on, of buying lots in surveyed townships ostensibly for settlement, but really for the purpose of securing at nominal cost the standing timber. For instance, in our case all the limits we hold are old limits, which were very greatly cut over before coming into our possession. In buying we were influenced in the price paid, in nearly every purchase, by the quantity of other timber apart from pine on the limits, but we find that we are pursued both on the North Nation River and the Gatineau by men who are robbing both the Crown and ourselves, by buying up lots at nominal prices on which we have paid ground rent for years, doing us out of our just rights, and at the same time getting quantities of timber from the Crown for comparatively nothing. Fire, and this system are the great enemies of the province and the licence holders, and they are two evils which in the best and truest interest of the province require immediate and most efficient remedy. I have stated only what I know to be true. It makes my heart sore every time I go up the Gatineau River to witness the devastation by fire in what was once a grand pine country, and also to drive through the young forests of young pine growing vigorously, but at the same time only growing and awaiting similar destruction.

Canadian Lumbering.



ledge of mechanism and engineering. These are some of the requisites to carry on this business from the forest to the ship, and in which the capital is often invested for from two to three years before it can be turned over.

Having secured the limits, a party of experienced scouts, generally Indians or half-breeds, are sent out to examine the land, and seek out groves of valuable timber. These self-taught surveyors are very sharp, exploring the length and breadth of the unknown territory, and reporting on the value of its timber, the situation and capabilities of its streams for floating out timber, and the facilities for hauling and transportation.

are such extensive and varied operations in the business of the successful Canadian lumberman that he must of necessity possess a combination of qualifications seldom required in other businesses of equal magnitude, but less intricacy and detail—judgment, foresight, administrative ability, power of organisation, acquaintance with commercial law, skill in finance, and a know-

Having, with the aid of these scouts, selected a desirable grove, a shanty is constructed. The stores for the lumbermen are usually sent up to the forest shanty late in the autumn, and all preparations made to commence the work of felling as soon as the sap is down.

A few figures will show what quantities of provisions a firm has to supply in the course of a year in the getting out of 150,000 logs. This service requires during the winter season, in the woods, 450 men getting out the logs, 300 men piling and forwarding, and 300 teamsters with the same number of teams.

The average provisions required for such a gang of men is as follows:—

825 barrels of pork	3,750 gallons of syrup
900 barrels of flour	7,500 lb. of tea
925 bushels of beans	1,875 lb. of soap
37,000 bushels of oats	6,000 lb. of tobacco
300 tons of hay	60 cross-cut saws
1,100 grindstones	225 sleighs
75 doz. of axes	3,750 lb. of rope
1,500 boom chains (7 ft. each)	900 pairs of blankets
45 mats	

costing at a low estimate, 54,367 dol. These figures tend to show that the lumber trade of the Ottawa consumes a large amount of the agricultural and other products of the province, and is of benefit to the settlers.

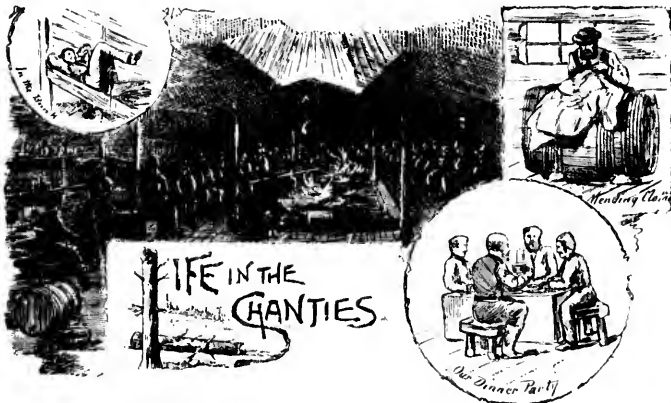
About March or April commences the arduous and dangerous labour of driving the logs down the streams to the mills.

The number of logs which the lumbermen cut in a single winter is almost incredible, and the business of conveying them to the nearest lake or river gives employment to numbers of additional men and oxen. By hauling the logs over the cliffs, and dragging them down ravines, the lumbermen, before the thaw sets in, collect along the banks of the various tributaries millions of feet of timber; and when the ice-bound streams become free, their more arduous and dangerous labour commences, and great activity is displayed in getting ready for the "start" or "drive" usually about March or April. If the stream is not large enough for "cribs," the logs are drifted down separately, the lumbermen keeping up with them either along shore or in canoes, and keeping the stragglers well together with long poles. When the larger stream is reached "cribs" are formed and the stream carries them down with its gang of men and provisions on board. The Ottawa is navigable from its upper waters to its mouth for cribs and rafts of timber, though it is sometimes necessary at rapids or falls, where no slides exist, to break up the crib and remake it after the separate sticks have floated

over the falls. A boom is usually thrown across the stream below the rapids to prevent the timber floating down too far. In places where the width of the river will admit it, the "cribs" are fastened together forming a raft, on board of which, with plenty of provisions, sail set, and a fair wind, the lumberman enjoys some rest after his previous toils. The life of lumbermen is full of adventure and peril, but they are a hardy and vigorous race and seem to enjoy the most robust health and care little for the fatigues they undergo. During the summer the shanties and lakes become a perfect solitude.

These are only the first operations in the lumber manufacturers' business; during the summer the work of manufacturing goes on, and considering the magnitude, expense, and intricacy of the business, it is not surprising that the Canadian manufacturers prefer to sell their goods to the shippers for cash, rather than enter upon direct transactions with firms over sea, on perhaps less advantageous terms.

The following illustrated account of a visit to a logging camp will, we are sure, be read with interest



time a mess of fresh fish to vary their accustomed diet. We were now high up among the hills, in the heart of the lumber region, a section visited only by lumbermen or sportsmen in any season of the year.

We were made heartily welcome by the lumbermen; and the cook, who is an absolute sovereign in his own domain, ushered us into the shanty where the men live, and took us under his especial care. While we disposed of our wraps and warmed our shins at the great fire in the centre of the shanty he prepared a steaming supper. Boiled beef, pork, potatoes, baked beans, molasses, home-made

bread, tea and sugar were placed before us. To a set of hungry men, whose appetites had been sharpened by the bracing winter air, there could be nothing more inviting. Everything was of the best quality, and admirably cooked and served. In honour of the visitors a table was set. The "van," a high, square box, containing the most necessary clothing requisites for the men, such as shirts, socks, mitts, mufflers, boots, and moccasins, which are sold to such as need them, was converted into a table for our use, for the shanty men themselves forego the luxury of a table. As for us, we needed neither gold nor silver dishes, neither Worcester sauce, French mustard, nor condiment of any sort, nor tonic

to quicken appetite. Not a shantyman of them all could have done more ample justice to the viands placed before us. "Make yourselves at home," said the cook—and we did. Aftersupper the party indulged in a veritable *dolce far niente*. Some of us smoked, and there were pipes, cigars, cigarettes, tobacco, cut and uncut, at our disposal. The cigars and cigarettes, of course, belonged to our

It was glorious moonlight when we reached the shanties at last, and gave our horses over to the willing hands of the lumbermen. After a drive of more than seventy miles we had reached our destination, a group of low-built but comfortable-looking cabins in the heart of the wilderness, where nearly fifty men, remote from the busy outer world, cheerily pursue their daily toil for months without other companionship than that afforded by the visits of such rare intruders as ourselves.

Moonlight at the shanties! Crisp air and sparkling snow, the latter contrasting with sombre shadows among the evergreens. Snow on the ground, on the trees, on the low-browed cabins—everywhere. And over all



THE SHANTIES.

the deep silence of the wilderness. Aloft, the radiant moon, flooding with soft light the strange, wild scene. The contrast between this and the noisy, bustling streets of the city could not but force itself upon us all.

All round about the land is heavily timbered with spruce, pine, and tamarac, the first-named largely predominating. From the lake an abundant supply of good water is obtained, and from its depths, too, the men are able to secure at any



THE MORNING CALL.

party. Imagine a burly shantyman smoking a cigarette! As well imagine him breakfasting on an ice cream. Basking in the warmth of the great fire we served our own dessert in the form of stories. The cook, to whose skill we had just paid the highest compliment that could be paid, was in capital humour, and as a story-teller also won our deepest admiration. His stock of yarns was fresh, sparkling, and if some were a trifle wonderful we did not mind. The exploits of lumbermen and incidents of lumber life were told in a racy manner, and were punctuated by the laughter of as merry a party as ever gathered round a winter camp fire. Stories of all kinds were indulged in, and the reputation of one Baron Munchausen was more than once during the evening in imminent danger of eclipse.

Presently the comforting warmth of the fire, the soothing influence of the weed, and the natural effects of our journey began to tell upon us, and, like tired children, we climbed sleepily into our bunks. I expected that when these forty odd shanty-men got fairly settled down to business we should have a snoring concert that would almost start the ice in the neighbouring stream. But they slumbered as peacefully as children. Here and there a slight groan at intervals was the only sound.

I had resolved to get up at the first call in the morning. But when three or four alarm clocks began operations at 4 a.m., as if they had a contract to wake the whole county, I half repented my resolve. It was very early, and I was very tired; but a strong mental effort triumphed over bodily weariness, and I arose to note the morning preparations of the men. They were prompt to rise and dress and prepare for the morning meal, which was served punctually at five o'clock, and consisted of meat, baked beans, bread, and tea. It was as good an appetizer as one needed just to note the relish with which those muscular fellows attacked the steaming dishes.

There was no confusion and no delay in preparing for

deer or caribou, nor did we see anything more than foot-prints. The clear sound of a signal trumpet indicated our near approach to the men, and soon the shouts of axemen and teamsters were heard echoing through the woods. The first evidence of real work that met our gaze was a pair of oxen hauling logs from the "slide" to a roll-way.

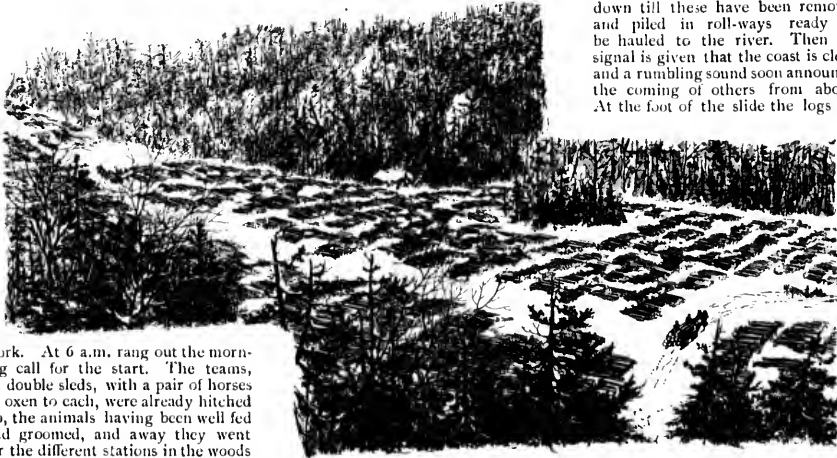
The axemen, or choppers, were at work away up the mountain side, and thither our steps were bent. It was a stiff climb, over rocks and through the bushes.

Once there the foreman, our guide, explained the mode of operations. The head chopper first goes over the ground and selects the trees to be felled. Generally two axemen work together, one at each side of a tree, and the chips fly like sparks from an anvil. As they near the heart of the tree, a shiver passing through its tall form follows each blow, and presently the top begins to sway and bend. The notch cut by the axeman on the side toward which the tree is intended to fall is a little lower than that cut by his mate. The former ceases cutting, the latter drives the keen, wedge-like blade of his axe home, the tree totters, and impelled by the greater force behind gets crashing forward to the ground. An expert axeman can cause a tree to fall from its perpendicular position in whatever line he chooses. Once down, the lordly tree is quickly stripped of its branches and is then cut into logs by the sawyers. The mark of the firm is then cut upon each and they are ready to be piled in roll-ways or hauled to the "slide." This is a narrow sluiceway made of logs, winding serpent-like down the hillside and ending near the brink of a precipice. We saw one of these slides that appeared to be fully half a mile long. The logs are rolled into it, end on, and shoot with

downward to the brink, over which they go with terrific speed, to strike like a cannon ball the frozen earth 150 feet below. When a dozen or so have been collected at the foot of the slide, the trumpet call rings out and no more are sent down till these have been removed and piled in roll-ways ready to be hauled to the river. Then the signal is given that the coast is clear, and a rumbling sound soon announces the coming of others from above. At the foot of the slide the logs are



FELLING.



LOGS ON THE FROZEN SURFACE OF THE RIVER.

work. At 6 a.m. rang out the morning call for the start. The teams, 15 double sleds, with a pair of horses or oxen to each, were already hitched up, the animals having been well fed and groomed, and away they went for the different stations in the woods to begin the day's work.

After a hearty breakfast our party set out for a visit to the scene of operations. We had before us a walk of a couple of miles through the deep woods, along the road already taken by the teams. On the way we saw numerous tracks of rabbits and foxes, but none of

loaded on "bob-sleds," eight to thirteen at a load, according to their size, and hauled away to the river, on whose frozen surface they are spread out to await the breaking up of the ice. We visited

the river, and saw 20,000 to 30,000 pieces, forming a veritable river of logs.

We spent the whole of Saturday in the bush, and got a very good idea of lumbering operations. Where very extensive operations are carried on by a firm having timber limits, the men are divided into gangs, that may number anywhere from 20 to 50. There is in such cases a superintendent, who goes from gang to gang and has a general oversight of all the work done. Each gang has its own foreman, who enters in a book each evening an account of the day's work. Of late, the most of the lumbering, however, is done by jobbers, who are independent of the regular shantymen. They take contracts to deliver a certain number of logs at the lake or river.

We spent Saturday evening, after our return from the woods, in story-telling, and retired early, for the day's jaunt had been fatiguing. We were not among the "early birds" next morning. When I climbed out my city companions were still wrapped in slumber. I breakfasted and left the shanty to look around, and after strolling about the shanties I went down on the lake shore and noticed a number of men, quite a distance out, fishing. Walking over I found that they were in luck, as the array of speckled beauties they had captured amply testified. Their bait was simply a bit of raw meat.

During the period of our stay in the woods the weather was unfavourable for hunting, and the Nimrods of our party failed to get in their work. Neither bear, caribou, deer, nor fox was seen. Even the half-dozen or so of squirrels that we saw were too nimble to be brought down.



A VETERAN SHANTYMAN.

One veteran of sixty years or so, whose long hair and full beard were almost white. This man has been familiar with the woods since boyhood, and to-day, though he owns some twenty or fifteen thousand dollars' worth of property in a thriving portion of the province, yet every winter finds him at the shanties. He loves the life, and only the weight of years will ever cause him to abandon his old-time winter haunts. We were treated with the greatest consideration by the men, every one of whom manifested a desire to contribute in some way to our comfort and pleasure.

In shanty life, next to the shanty foreman, the most important figure is the cook. If he be a surly fellow, he can make it decidedly unpleasant for the crew. The cook of our acquaintance proved himself to be a prince of good fellows. Attached to each crew there is also a carpenter, whose duty it is to mend sleds and other broken gear.

We had ample time to study the life of the men at the shanties. They work from daylight till dark, with an interval for dinner. When a long distance from the shanty their dinner is taken to them. If possible, the shanties are always built near a lake or river, as was the case with ours. There were some forty-five men in this shanty. It was built of flattened logs, with the chinks carefully caulked with moss to exclude both wind and storm. The floor was made of flattened logs. The roof was supported in the middle by four stout posts, forming a square, and about twenty feet apart. Within this square, and therefore in the very middle of the shanty, was the heart or centre of shanty life—the huge, blazing fire, which, like that of the sacred mountain of the old fire-worshippers, never dies—at least so long as the men

remain in camp. This fireplace is called the camboose. There is no chimney, only a large square opening in the roof, over the fireplace, which not only gives egress to the smoke, but affords perfect ventilation. A strong wooden post, or "crane," serves to support the various pots, kettles and boilers over the fire. At the end of the shanty, opposite the entrance, and also along the two sides, are an upper and a lower tier of "bunks," where the men sleep side by side. At meal time the men sit on benches round the fire, and each helps himself, neither tables nor waiters being required. A point that struck me forcibly as well as favourably was the cleanliness of the men. There is an abundance of soap, water, and towels, as well as a large looking-glass, and always before meals the men have a good scrub. At supper each man takes a pint cup of tea from the huge boiler, and a great slice of home-made bread, hot or cold pork as he prefers, and beans and pea-soup. They have sturdy appetites, and this kind of fare, which to a city man might threaten dyspepsia, is eaten with a relish it does one good to see. The bread, by the way, is the best I ever saw. If during my lifetime the problem of aerial navigation is solved, I should like nothing better than a lightning excursion one afternoon to the shanties, to procure a 10 or 15 pound loaf of that bread with which to regale myself and friends at a 5-o'clock tea. I am sure we should all enjoy it. And, *apropos*, I must not forget the "Scotch buns," so pleasing to our palates. If it were not for fear of my cook I should positively declare that I envied those rough fellows their daily bill of fare.

The fire is the only light needed in the shanty. And when you talk of comfort, put me down for a seat before that shanty fire, with its eight or a dozen pieces of wood, each four ft. long, sending the flames leaping upward toward the skylight, through which, if the flame were not too brilliant, might be seen the stars, keeping their nightly vigil over all. The men smoke, and talk, and sing: some hang up their socks or mitts or other articles of clothing to be dried; some sharpen their axes; the teamsters see that their horses and oxen are properly attended. Presently one slips away to bunk and then another, till finally the fire is deserted, and the only sound that breaks the stillness is the crackling of the burning sticks or an occasional sound from among the cosy blankets.

When Sunday comes the routine is disturbed for a day. There is no ringing of alarm clocks, no morning call for the start. The teamsters have to be early astir to care for their animals, but the rest of the men rise at their leisure. For this day their time is their own, and it is consumed in a variety of ways. Some of the men go fishing in the lake near by, some go farther, to the frozen river, for the same purpose. Some go hunting. Others remain at camp and mend their clothes, spin yarns, or otherwise amuse themselves.

One thing that struck us forcibly in studying the life of the men was the excellence of their behaviour. This is no doubt in some measure due to the total absence of intoxicating liquors of any kind. One of the most rigid rules is that prohibiting the use of liquor by the men in camp. We greatly enjoyed our visit to the shanties and bade our friends good-bye with something of regret.

We left for home on Monday, after a hearty dinner. It was a bright, calm, beautiful afternoon, fully verifying the forecast of the shanty weather prophets of the night before. When we entered the clearings we found that our road had completely disappeared, for a heavy snowfall had completely filled the track. The new-fallen snow was so dazzling in the brilliant sunshine as to seriously affect our eyes. Here and there, however, bushes had been planted in the snow to mark the road, with a view to just such an experience as ours, and we managed somehow to flounder along. The nearer we came to the town the deeper the snow, and just before reaching the latter place a field covered with huge drifts had to be crossed. It was toilsome work for man and beast, for every hundred feet or so we would lose the road and get into a depth of soft snow that made progress next to impossible. Our course was an interminable zigzag. Fortunately we met but one sleigh—fortunately for ourselves and others, for it was with extreme difficulty that we passed this one without disaster. Once off the beaten track there appeared no bottom to the drifts. The lights gleaming over the snow from the windows of the town was a welcome beacon, and the bright interior of the hotel as cheery a place as weary man could wish.

The White Pine Supply.



It is difficult to arrive at satisfactory conclusions concerning the white pine supply, because the conditions of the trade are undergoing constant changes. It is stated by some that the supply is becoming rapidly exhausted; the size of the saw logs is diminishing, and Mr. G. Johnson in his "Forest Wealth of Canada," from statistical information he received, draws a gloomy picture of the trade. He summarises his conclusions as follows:—(1) That the first quality pine has nearly disappeared. (2) That of second quality pine there is a considerable supply.

(3) That of other timber woods there is a considerable supply. (4) That we are within measurable distance of the time when, with the exception of spruce, as to wood, and of British Columbia as to provinces, Canada shall cease to be a wood-exporting country.

Taking the first of his conclusions, it cannot be denied that pine of the great size and splendid qualities of years gone by is not so plentiful in the market, and the supply of really first quality forms a much less proportion of the export, but that a great quantity of remarkably fine trees still exist, scattered through the timber limits and the Crown Lands is well known. The preponderance of smaller sizes and lower qualities, it is held by some, may reasonably be attributed to the present method of cutting, as it now pays to manufacture trees that were years ago not considered worth felling. In support of his conclusion that the forests are becoming exhausted, Mr. Johnson quotes returns from the cutters showing a diminution to the average size of the logs year by year.

TIMBER.		Average cubic feet per piece.	
		1865.	1893.
Waney white pine	.....	80	58
Square white pine	.....	65	44

From which it would appear that waney white pine was 38 per cent. larger in 1865 than in 1893, and square white pine 50 per cent.

PINE SAW LOGS.		Average size, board measure.	
		1857.	1893.
Ontario	.....	122½	98½
Quebec	.....	138	127½

On talking this matter over with Mr. Johnson, he maintained that the present severe cutting of the forests existed before 1865, but others think that it is wrong to conclude from these figures that the size of the existing trees is less than when the forests were differently exploited. Much of the timber and many of the logs now used would not have been touched by the lumberman in former years. Also when a tree was felled in many cases only one log was taken, and the smaller end of the tree discarded, but now two or three logs will be taken to the mill from such a tree, and, of course, the top logs being used, a smaller average will result.

To show that it is now general to cut smaller trees, it may be quoted that in the Province of Quebec the rates of dues chargeable on pine logs of a diameter of eleven inches or less, made out of the top of trees cut on timber limits, have been fixed at 80 cents instead of one dollar, because the rates of dues on the small tops was too high to make it profitable to float them to the mill, and the leaving of these small parts of the trees on the ground constituted a danger in spreading forest fires.

The second and third conclusions above referred to are acquiesced in by every authority.

As regards the fourth conclusion, which raises the great and much discussed question of the duration of the forests of the Dominion to supply the export trade. Much has been written on this subject, and many prophecies have been made, which have not been fulfilled. It was said over twenty years ago that the supply of white pine would be exhausted in ten years, but the trade appears to go on still from year to year without inconvenience and interruption. Some portion of the lower part of the Province of Ontario has been denuded of pine, and consequently the lumberman has to go further for his supplies, but with the opening

of new lines of railway and the improvement of water communication, the existing forests keep up an adequate supply. In the districts of Ontario which have not yet been developed, much of the pine is growing, interspersed with hardwoods, and where it grows under these conditions it is usually of good quality and size.

In 1893 Mr. Edwards, M.P. (see *Hansard* 1893, page 3319), said: "There are those who believe that our pine lumber is very nearly exhausted, and has been most largely exhausted at the instance of the lumberman. This, Mr. Speaker, is not at all the case. There is another source from which the forests of Canada have suffered, and far more extensively than from the lumberman's axe. I refer to forest fires and to fires which are brought about by the settlement of the country; not in every case by legitimate settlement, but very largely by illegitimate settlement. It is safe to say, and I am sure that every lumberman in this House will bear me out in the statement, that ten times the amount of forest wealth has been destroyed in Canada through that instrumentality than has been cut by the lumbermen, and those who desire to protect our forests should devote themselves to advocating the care of our forests and discouraging in every way this illegitimate settlement. If this is done I will venture, this statement, that you may let our timber be cut even as it is being cut to-day, and it will last this country for at least one hundred, perhaps two hundred, years to come."

Before the Select Committee of the Legislative Assembly of Quebec in 1894, Mr. Edwards gave the following interesting evidence concerning the pine trade:—

"The profits on spruce are larger than on pine. The pine of to-day is very remote; and for the operations in the pine lumber trade of to-day the investment is large. In the next place, the investment for improvements is large, because you have to improve the streams for a great distance; and, moreover, you have to put your supplies in one year before operations begin. We are buying supplies now that will be consumed next winter. All our oats, hay, pork, flour—in fact, everything that goes into the operations—are being bought and paid for now, and next September our men go up to the woods, and the logs are cut. Now, a portion only of these logs will reach the mills next year. That portion is sawed, and a small portion of it is realised on; but the bulk of it is not realised on till the next year. Then the logs that remain behind come down, and the same thing follows; so that the average may be taken as two and a half years.

"Now, in the spruce operations, you simply put in your supplies the year you operate. You get the logs the same year, and you realise upon them largely the same year. It is a very short operation compared with the other. The cost of taking out the logs is nothing as compared with the cost of taking out pine. And having regard to all these points, and also having regard to the fact that in the investment in a spruce limit you have an investment that can be kept in perpetuity, so long as you take care of the property, I regard no investment in Canada as good as an investment in a spruce limit, and prefer it to pine.

"As regards red pine, the quantity is, of course, to some extent limited. I think east of the Gatineau there is very little red pine in the country. Red pine is not of the commercial value of white pine. It comes immediately into competition with the Georgia pine, which is preferred to our red pine; so that the red pine is not a saleable article. And while I certainly attach commercial value to the red pine, it is not nearly so valuable as white pine. If, however, you ask me if I attach value, I make the statement here, that I attach value to every green thing that grows upon a timber limit.

"As pine becomes less, I consider the value of other woods enhanced. I might say this, that for the last year or two I have been contemplating the idea of commencing to operate our hard woods.

"I consider the pine, spruce, red pine, birch, maple, hemlock, tamarac, and cedar of commercial value. Beech, I think, will come in too. Whitewood and basswood also; in fact, in the purchasing of any of our limits we have been governed to some extent by the whole of the timber on the limits irrespective of what that timber might be.

"I think that the proportions of the present production of pine will not be fully maintained. There must be some diminution. If fire is kept out and the pine territory is preserved, I do not think that anyone can venture an opinion; but it will last for a very great number of years. Possibly fifty years, providing fire is kept out. Lumbermen are human just as other people are, and the lumbermen will very readily and gladly join in promoting the future of that asset for the province of Quebec, if it is understood that it is to be preserved; but you can understand very well that, if it is not to be preserved, lumbermen must get something out for their past years of labour and saving, and they will realise on what is most realisable. We are in our own case, as I explained, acting in the very opposite way. We are realising far less than we could realise. We could realise in four or five years as much as we will realise in fifteen years the way we are cutting, but we are doing that with regard to the future. Now, we act on that principle in the confidence that we are to be protected. So that you will observe that, not only as regards the question of fire, but also as regards the operations of the lumbermen themselves, the future of the lumber trade can be very greatly prolonged by careful cutting and careful manipulation on the part of the lumbermen on their own limits, and there is no doubt that can be done. I do not think there is any one single lumberman on the Ottawa River who to-day is possessed of any

wealth at all, but that wealth is invested in the limits and mills he possesses. The investment in mills and similar property is very large. The pine timber being exhausted, his mill property, in almost every instance the total asset, is valueless, and if reasonable hope is held out to him at all that the Government is to co-operate with the lumberman in the preservation of the forest for the future there is every reason why the lumberman will do so.

"My candid opinion is that the Province of Quebec has the best asset in North America. I will give you my reasons. There is more money made to-day in cutting timber in the Provinces of Ontario—far more—because the timber is more immediately available. There is more large timber and of better quality, but they have not got the young and growing timber that there is in the Province of Quebec. Now, some regard the question this way: that when the pine timber is exhausted, the lumber trade will cease. I do not so regard it at all. I regard it that all the timber on the limits will yet come in and be available as a commercial asset to the Province; and, while I frankly believe that the greatest possible loss has taken place to the Province of Quebec in consequence of the burning of the pine forests, I yet believe that if the people of the Province to-day rouse themselves, waken up to what is their truest and best interests, and preserve the forests of the Province, they will have a source of revenue for all time."

The Wood-pulp Industry.



THE rapid development of the manufacture of woodpulp all over the world, and the acknowledged superiority of Canadian spruce for that purpose, causes apprehension in the minds of many as to the effect it will exercise on the future of the spruce trade and the forests of the Dominion. It has already raised the price of spruce limits in the market, and it will doubtless have the effect of increasing the price of spruce lumber. The subject of cutting spruce was dealt with by a Select Committee of the Legislative Assembly of Quebec last year, and the Hon. Sir Henri Joly d'Lotbiniere gave it as his opinion that strict rules should be enforced to prevent the cutting of small trees for this purpose, and he pointed out that the Government only received two-fifths of the revenue from pulp logs they would from spruce saw logs; so that there is great encouragement to make pulpwood to those who will not consider the future, and who simply want to make a profit for the present. Then there is another thing, in making pulpwood of course neither mill nor staff is required nor organisation, and all that sort of thing, which are required when logs are sawn into boards.

By the courtesy of Mr. G. Johnson, the Government statistician at Ottawa, we are enabled to print the following up-to-date information concerning the Wood Pulp Industry.

Paper made in Canada from woodpulp is almost entirely supplying the great demand of the newspapers of the Dominion. Woodpulp paper is also largely used within the country for many other purposes, and some is being exported.

The exports of woodpulp were not recorded in the Dominion Trade and Navigation Returns till 1890, since when they are given as follows:—

		Dols.				Dols.	
1890	80,005	1893	...	...	388,092
1891	188,198	1894	...	...	547,217
1892	219,458	1895	...	...	590,874

In 1894 and 1895 the destination of these exports was as follows:—

		1894		1895	
		Dols.		Dols.	
Great Britain	178,255	...	251,848
France	—	...	2,640
Germany	452	...	—
Belgium	254	...	—
United States	368,256	...	335,385
Total	547,217	...	590,874

Canadian woodpulp has been very favourably received in Great Britain. In his report for 1894, Mr. Dyke, the Canadian Government Commercial Agent at Liverpool, says:—

"In the early part of the year I had some correspondence

with one of the largest paper mills in this district, and they informed me that they used about 10,000 tons of dry pulp annually, and that of this about 1,200 tons was Canadian; they added that Canadian pulp is better than that from Scandinavia, more evenly made, and the texture seems better adapted for paper making. . . . It is a generally expressed opinion now, among paper makers in the north here, that Canadian pulp is distinctly superior to that of Norway, and still more so compared with Swedish pulp. Much of this superiority, we believe, is to be attributed to the nature of the wood itself. The fibre seems to 'mill' better, and is certainly of a tougher and finer texture. We think Canadian pulp will ultimately command from 125 dols. to 250 dols. more per ton than Scandinavian on the ground of quality. At all events we are sure that Canadian pulp will always now command a substantial preference in the market, and we trust, with the help of this preference, they will be able to maintain and improve their position. There is a good opening for sulphite pulp, but the price will need to be rather less than 5250 dols. We believe it can be produced in Canada for a good deal less than that. The industry is in a state of transition on account of the rapid improvements which keep being made in the necessary plant and methods of production, but that is really advantageous to Canadian enterprise, because it would enter the field with the benefit of all the costly experiments which have been made in this country and on the Continent. This, together with the superior nature of its wood, should enable Canada to take a leading place in this industry."

The High Commissioner, Sir Charles Tupper, Bart., in his report for 1894, says:—"My inquiries in connection with Canadian woodpulp were made in the chief centres of the paper trade, viz., in London, Lancashire, and Scotland, and I am gratified to be able to report that there was practical unanimity as to the superiority of the Canadian article over Scandinavian. . . . In connection with this question—Quality—I am informed that in March last the highest price, viz., 26 8s. (2117 dols.) paid for mechanical pulp this year, was obtained for the Canadian article. . . . With regard to chemical pulp, I am advised that of the various processes now known for the manufacture of chemical pulp, that for the production of sulphite pulp is probably the best adapted to the circumstances existing in Canada. Pyrites and lime are well disseminated throughout the country, and are easily and economically procurable at the centres of manufacture. Sulphite pulp offers a good margin for handling and is high in favour with paper mills. In Scandinavia the future of sulphite is well recognised, and old mills are being converted and new mills put up for this process. With the advantages of better raw material and a lower cost of produc-

THE WOOD INDUSTRIES OF CANADA

tion, it is believed by those best able to judge, that Canada should easily hold her own in connection with the manufacture of the article for the market on this side. . . . The Canadian sulphite received so far has been well spoken of. Very little, however, relatively, has come forward, the mills finding no doubt locally a market for all they produce. Of late a New Brunswick mill has sent over small parcels to Glasgow, which have given satisfaction, and further supplies are on their way. Some sulphite pulp from Ottawa has also been mentioned in flattering terms.

Besides being a material for paper of various kinds, news, printing, writing, wrapping, mill-board, &c., woodpulp has been utilised for the manufacture of many other articles. Among these are pails, dishes, and other hollow ware, paper, parchment, cotton-wool for hospital dressings, cotton-yarn and cloth, silk-yarn and fabrics, cigar boxes, medals, cornices, panels, and other architectural details, picture frames, car wheels, steam pipes, water pipes, telegraph poles, electric conduits, roofing material, coffins, boats, cigar holders, carpets, mattresses, lead pencils, artificial straws, shoe heels, vases and ornaments, furniture, horse shoes, spools and bobbins, tool handles, buttons, cycle bar handles, fruit cans, hats, pinions for machinery, pulleys, letters for signs, substitutes for building stone and for boards, piano cases, tiles, paint to protect metals, paving bricks, screws, fibre chamois, &c.

The vastness of the market for woodpulp may be partially shown by extracts from the trade returns of the United Kingdom and other countries.

The British imports since 1887 (before which woodpulp was not given separately) were as follows: the total imports being shown as well as those from Canada and the United States:

7 per cent., while Germany has fallen off. Nor do the British returns do full justice to Canada, some Canadian pulp shipped from Portland, Me., in winter being credited to the United States. It must also be remembered in comparing the British and Canadian returns, that the fiscal year ends with December in the United Kingdom, the with June in Canada.

The above tables show the vast and rapidly increasing demand for woodpulp in the United Kingdom. Canada has made great advances in the last three years, but still supplied so small a portion of this demand that an enormous market is evidently open in the Mother Country to the exports of woodpulp.

The imports by the United States of woodpulp since 1889 have been as follows, the total quantity and the share supplied by Canada being shown:—

Year.	Total U.S. Imports.		From Canada	
	Tons net.	Dols.	Tons net.	Dols.
1890	48,695	1,814,356	7,424	185,016
1891	48,513	1,602,680	10,555	308,078
1892	41,118	1,829,113	12,559	393,658
1893	63,565	2,968,884	14,241	39,661
1894	35,587	1,664,547	10,016	323,095
1895	24,440	958,009	13,029	285,849

Here again there is a considerable market open to the Canadian woodpulp manufacturer.

The High Commissioner in his report for 1894, says:— "The imports of mechanical pulp into France have almost recovered the position they occupied in 1891—when the imports were abnormally high in anticipation of the new tariff—notwithstanding the duty now imposed under the new

IMPORTS OF WOODPULP BY UNITED KINGDOM.

Year.	Total imports.		From Norway.		From Canada.		From United States.	
	Tons.	Dols.	Tons.	Dols.	Tons.	Dols.	Tons.	Dols.
1887	79,533	2,488,613	58,546	1,468,118	—	—	—	—
1888	110,369	3,315,941	77,523	1,993,937	—	—	500	19,467
1889	122,179	3,361,368	89,622	2,077,814	10	2,000	19	730
1890	117,837	3,731,965	97,279	2,135,634	95	1,314	192	6,453
1891	156,609	4,141,655	103,512	2,124,208	—	—	—	—
1892	190,646	4,774,322	122,215	2,375,693	17	414	—	—
1893	215,920	5,753,423	125,879	2,619,532	7,570	195,494	5,569	76,193
1894	279,765	6,971,013	162,316	3,381,939	23,751	493,160	13,190	235,980
1895	297,095	7,661,603	173,898	3,911,491	16,708	263,365	976	34,534

The following are the sources whence the United Kingdom obtained its supplies of woodpulp in 1894 and 1895:—

COUNTRIES FROM WHICH THE UNITED KINGDOM IMPORTED WOODPULP.	1894.		1895.	
	Tons.	Dols.	Tons.	Dols.
Canada	23,751	493,160	16,768	269,565
Newfoundland	—	—	710	12,162
Russia	6,65	247,616	5,234	145,931
Sweden	51,998	1,674,235	83,704	2,574,233
Norway	162,316	3,381,939	173,898	3,911,491
Denmark	1,842	87,006	734	30,465
Germany	7,422	371,263	4,835	200,049
Holland	7,316	323,940	6,016	270,533
Belgium	505	22,197	2,660	145,995
France	—	—	1	39
Portugal	1,622	66,386	505	18,931
Austrian Territory	2,848	143,859	1,054	49,825
United States	13,191	235,980	976	32,534
Other Foreign Countries	275	13,432	—	—
Total	279,765	6,971,013	297,095	7,661,603

The *World's Paper Trade Review* says that in 1893 the British imports of woodpulp were distributed among the countries as follows:—

Norway	45 1/2 per cent.	Austria	2 1/2 per cent.
Sweden	27 1/2 "	United States	1 1/2 "
Germany	9 "	Portugal	1 "
Holland	5 1/2 "	Denmark	3 "
Canada	3 1/2 "	Other Countries	1 "
Russia	3 "		

Since then for 1894 and 1895 Canada has advanced to the third place, its proportion for the two years averaging over

tariff. But chemical pulp has increased very much, the imports to date being about twice the amount imported in 1892, and as wood pulp is included in the French Treaty, the position is an encouraging one for the development of the trade.

France makes some woodpulp (chiefly from imported wood), but not enough for its own requirements. It has been importing pulp largely from Norway and Sweden for paper-making. This is another market for the Canadian pulp maker, a beginning having been made in 1895 by sending to France pulp to the value of 2,640 dols. The treaty with France admits our wood pulp at the minimum tariff.

The Canada pulp factories are being rapidly increased in number and capacity in Quebec, Ontario, and Nova Scotia, besides one each in New Brunswick and British Columbia, while others are in course of erection or are contemplated, and old establishments are making additions to their machinery. Pulp factories were not mentioned in the Dominion Census of 1871, but in 1881 and 1891 they were returned as follows:—

Year.	Capital invested.	Number employed.	Wages.	Raw material.	Product.
	Dols.		Dols.	Dols.	Dols.
1881.	92,000	68	15,720	9,400	63,000
1891.	2,900,907	1,025	292,099	469,845	1,057,810

Since then the increase has still been more rapid. Exact statistics of the industry are not available, but there are over 30 pulp factories in Canada, with a yearly output estimated approximately at 1,500,000 tons, about a third being sulphite.

The United States Market.



THE United States is undoubtedly the best customer the Canadian lumberman has, and some think that the trade will continue to grow in volume, notwithstanding the proposed duty, for the American people have destroyed all their own large forests; in the Northern States. A well-known Ottawa lumberman predicts that in five years' time the Ottawa mills will be supplying lumber to

Chicago.

The official returns show an enormous increase in the exports of Canadian logs to the United States in the twelve years from 1882 to 1893. In 1882 they amounted to 46,450,000 ft. B.M., 274,083 dols. value; in 1893 to 198,021,000 ft. B.M., 1,507,000 dols. value.

The bulk of this increase was in pine logs from 1,313,000 ft. B.M., 16,001 dols. value in 1882, to 127,062,000 ft. B.M., 1,056,355 dols. value in 1893. The ratio of increase is rapidly accelerating; a division into three periods of four years shows the following results:—

Four-year periods.	Ft. B.M.	Dols.	Average ft.	Dols.
1882-5 ...	4,335,000	37,943	1,083,750	9,483
1886-9 ...	20,526,000	171,856	5,134,500	42,964
1890-3 ...	269,868,000	2,282,802	67,467,000	578,700

Thus the yearly average of about one million feet in the first four years grew to five millions in the next period and to nearly sixty-seven and a half millions in the period just ended.

By far the greater portion, practically the whole, of these pine logs, were from the province of Ontario.

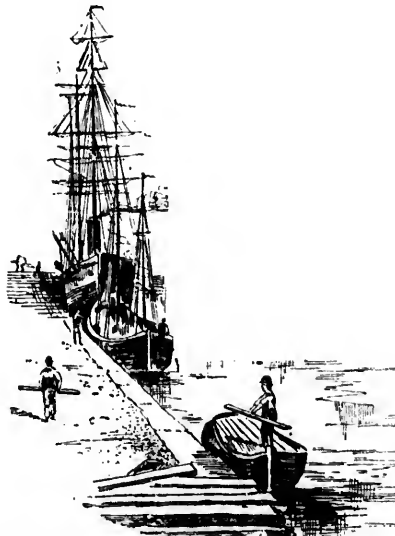
In spruce and hemlock, mostly from the province of Quebec, there was also a considerable increase, making with that in pine logs, almost the whole of the total increase of logs exported to the United States.

The imports of logs from the United States were far smaller than the exports to that country. The imports reported by the Customs Department are much less than the exports reported by the United States, which give only their own produce, while the Canadian figures include logs imported through the United States from elsewhere.

The business of rafting logs on the lakes has been successfully conducted for many years on Lake Huron, immense quantities having been handled. The invention of the bagboom has made log towing on the lakes practically as safe as towing on the river, and by this means rafts of 3,000,000 to 5,000,000 ft. each are brought to the Saginaw river. The repeal of the export duty on logs, exacted by the Canadian Government, greatly stimulated the rafting of logs across Lake Huron to Michigan mills. In 1891 no less than 80,000,000 ft. were brought to the Saginaw river, and in 1892 a much larger quantity came over, as figures given below will show. Large quantities of logs are also rafted from Upper Michigan and Lake Superior points to Saginaw and Lake Huron shore mills. The following figures show the quantities rafted in 1892:—

From Georgian Bay		Feet.
For Emery Lumber Co.		35,000,000
" Saginaw Lumber and Sill Co.		27,000,000
" Spanish River Lumber Co.		22,000,000
" Sage & Emery		12,000,000
" J. W. Howry & Sons		22,000,000
" Sibley & Bevinger		22,000,000
" Wm Peter		10,500,000
" Merrill & Ring		6,000,000
" Moore Lumber Co.		18,000,000
" Eddy Bros. & Co.		4,000,000
Miscellaneous		6,000,000
Total, 1892..... ..		184,500,000
" 1891..... ..		80,000,000
From Upper Lake Points.		
For S. G. M. Gates..... ..		20,000,000
" Saxe Bros.		2,500,000
" Fisher & Hurst		15,000,000
" C. K. Eddy & Son		4,000,000
" other parties		22,000,000
Total		63,500,000

Of the Canada logs, about 40,000,000 were rafted to Tawas Bay mills, and the rest came to the Saginaw river. The log rafting business is only in its infancy, and Saginaw river mills will receive immense supplies of logs from this source for many years to come.



The Quebec District.



QUEBEC HARBOUR.

It would be quite impossible to write about Quebec, even from a strictly commercial standpoint, without alluding to the unrivalled and commanding position the city occupies on the shores of one of the grandest rivers of the world. As a natural fortress, as a shipping port, as a picturesque city, it stands without a peer on the American Continent. Many eminent writers have attempted to describe its unique beauties and its wondrous loveliness of its surroundings, but were unable to convey its many charms, and the brush of the pen is not able to depict the ever-varying beauties of the city by St. Lawrence and the grandeur of the hills and plains that surround old Quebec.

From the great preponderance of the French-speaking population, the visitor can hardly realise that he is in a part of the British possessions; the Continental appearance of the houses and streets would lead one to think that he was in a provincial town in France, but still there is too much English spoken in commercial circles for that, and very soon the ear and eye get accustomed to the strange and happy co-mingling of races which characterises modern Quebec.

As the port in British North America best situated for shipping timber in the log, Quebec always has, and doubtless always will, stand pre-eminent, for nature has endowed her with every requisite and facility for being the depot for that trade. The shipment of balk timber has declined in all the timber-producing countries of the world, and it is therefore no matter of surprise, nor is it any fault of the Quebec merchants, that it has fallen off there. As great a volume of wood is probably being now shipped from the St. Lawrence as ever, but a large proportion of it goes forward in the shape of deals and boards. Our contractors, shipbuilders, carpenters and joiners, &c., now wish to buy wood converted more nearly to the sizes in which it is to be used, and the same revolution has taken place in the supplies from the Prussian, Swedish, and pitch pine ports.

It is recorded that the first timber shipped to Europe from Canada was sent from Quebec by Talon in 1667. Lieutenant Hocquart sent timber and boards to Rochefort in 1735, but the export to England began in the early days of the present century, when the Continental ports were closed to us by Napoleon. The trade grew rapidly, and as many as 1,350 square-rigged ships have entered the river yearly to load timber. The trade appears to have reached its zenith about 1864, when 20,032,520 cubic feet of white pine timber were exported. Since then the trade has gradually declined to 2,838,000 ft. in 1895. In pine deals from this port the falling off is very pronounced. In 1880, 5,823,263 standards were shipped, against 501,200 last year. But the decline in the shipments of all sawn goods is counter-balanced when the quantities now sent from Montreal are taken into account.

The steady increase in the value of white pine deals over a series of years has been very great. The fair average value for 1st quality was given in 1855 at £12, and in 1864 at £23 to £25 per standard. Spruce values have not risen in proportion. In 1855 it was quoted at £6 per standard, and £8 to £8 10s. in 1894.

The supplanting of wood by iron for shipbuilding was a serious blow to the Quebec oak trade, and the shipments seem to have shown a steady falling off. Thus, in 1874, 3,433,280 cubic feet were exported, but last year only 809,560, but for the last ten years it has been mostly near a million feet, twice only going up to 1,500,000.

Red pine shows a steady falling off from 5,182,320 cubic feet in 1845 to 326,080 last year. This is doubtless due to the low price at which pitch pine has been sold, but shipments of red pine are now being made to England for sleepers.

The export of tamarac has ceased for some years, in fact, since 1878, in which year a disease broke out affecting this tree as well as spruce; but a little has been again shipped this year.

The oak stave trade which was at one time an important

business, has died out, and not a single stave now leaves the port.

Birch, too, has declined considerably during the last nine years, which is attributed to the substitution of cheap African mahogany for furniture making, for which birch was extensively used.

The only kind of timber that holds its own in the province of Quebec is spruce, and now it is admitted that it is the best wood for making pulp for paper, better values will, doubtless, be obtained. There is comparatively little pine left in this province, but there are practically inexhaustible supplies of spruce in the woods that are properly nursed and not worked too severely; but in the part of Quebec province south of the St. Lawrence, which is intersected by railways and lies near the States, the denudation of the forests has been going on at a rapid rate.

The assortment of spruce deals is gradually becoming more severe, and what were formerly classed in three qualities are now being assorted in five or six. Recently some shipments have been made of spruce boards, and this may indicate a new feature in the trade.

it reaches the coves. The drams or cribs of oak have a curious appearance when lying on the ground at low water, the logs being held together for floating by transverse pieces of light wood to keep them from sinking, and the transverse pieces are secured by withes, and a large surface of these drams looks at first sight like a field of dry sticks, but when in the water little of them can be seen, the light transverse pieces just keeping the logs, as it were, between wind and water. These oak logs are first rafted, say to Toledo, a distance of 200 or 300 miles; they are then taken by schooner across Lakes Erie and Ontario to Garden Island, where they are rafted into drams by the forwarding agents, the Kelvin Company, of Kingston, or at Collins Bay, by the Collins Bay Rafting Company, both of which places are close to Kingston, and start on their voyage down the St. Lawrence, a distance of 500 miles, which includes the running of the La Chine and other rapids. In a dram of oak there are probably 12,000 cubic feet.

It is a remarkable circumstance in connection with the oak trade that several Quebec firms have manufactured this timber in the State of Arkansas, and notwithstanding the



THE LOUISE DOCK, QUEBEC.

The timber trade in Quebec at one time found employment for from 5,000 to 6,000 labourers, and when it was the greatest shipbuilding port of the world 40 or 50 ships were built in a single year, and found work for several thousand artisans. There were in the palm days some twenty firms in the port engaged in the square timber trade, but this number is now reduced to four houses.

A drive along the river towards Sillery, where the timber trade was always carried on, presents a scene of desolation. Passing under the shadow of the Citadel rock, there is little to be encountered for several miles but deserted shipyards, empty coves, and closed cottages. When trade was in full swing the coves extended for a distance of ten miles on both sides of the river—as far as from Sillery to Cap Rouge on the Quebec side, and from the Chaudière to the Indian Cove on the Levis side of the river. Now they extend hardly a mile on the one side, with two or three coves near Levis.

The square oak shipped at Quebec now comes largely from Ohio and Michigan, and travels at least 1,200 miles before

fact that the wood could be delivered *via* New Orleans to Great Britain at something like 10¢ per ft. less than by bringing it, say, 1,000 miles to Quebec for shipment, still the latter route was adopted. The only explanation, perhaps, lies in the fact that wood, when floated down to the port of shipment, is prevented from checking, and is in better condition.

The waney pine comes mainly from Michigan, and when floated the lower tiers of the dram are fastened together by means of iron dogs, and the wood being lighter than oak two or three layers of logs are floated together, and a dram contains from 35 to 50,000 cubic feet.

The wintering timber in the coves is stacked in what are called "moulinettes," that is, the logs are piled in tiers crosswise alternately.

For shipment from the coves the logs are secured each one by a separate dog, with a chain running through the eyes, and when any particular log is required to be put into the ship the dogs are knocked out and the log floated out from between the others.

THE WOOD INDUSTRIES OF CANADA.

The timber rafts are received at Cap Rouge by the Cap Rouge Pier & Wharf Company as agents, on account of the sellers. The manager of this concern is Mr. N. Flood.

A year or two ago a report was made to the Local Government in Quebec as to the depreciation in the value of the timber coves, owing to the withdrawal of the square timber trade, which showed that the depreciation in value in fifteen years amounted to 4,000,000 dols., but notwithstanding that depreciation and also the absolute abandonment of shipbuilding, which, at one time, employed thousands of workmen, and consumed considerable quantities of hardwoods, besides a large demand for tools and implements, the people of Quebec are not standing idly aside, but have turned their attention to several smaller industries for which the inhabitants are well adapted, and shoe factories, glove factories, corset works, and other light industries have sprung up.

A most important project is the proposed extension of the new Parry Sound railway from Ottawa to Quebec, which, in conjunction with the deepening and widening of the St. Lawrence canal, will, it is hoped, convert Quebec into a depot for the shipment of the products of the Great North-West Territories. This railway would reduce the distance for grain shipments from Duluth to Liverpool 800 miles, compared with the present route *via* Buffalo and New York. The work of the enlargement of the canal, which is being carried on by the Government, to enable large barges and steamers carrying 100,000 bushels of grain in one bottom, instead of in the present 7 ft. draft barges, will entirely change the

engaged in shipping simply, others as manufacturers only, whilst some are both manufacturers and shippers. These three classes, with the necessary brokers and agents, go to make up the timber trade of the port, and the following are some notes concerning the *personnel* and operations of the firms now carrying on business, which, we think, will be found interesting to our readers.

KING BROTHERS, LIMITED, are extensive manufacturers of spruce and pine, and have been now for many years in the trade, the firm having been established in 1829 by the late Mr. Charles King, who erected his first mill at St. Antoine de l'illy. There are now three partners in the firm, viz., Mr. Edmund Alexander King, Mr. Charles King, and Mr. James King. King Brothers are noted for their careful and reliable selection of shipments, and their operations are carried on over a large area and in various localities.

Their principal sources of supply are the following:—Grand Pabos Mill is situated on the Gaspé coast in the Baie des Chaleur district. The timber for this mill is taken from limits of the Crown covering an area of over 500 square miles, and is for the most part spruce, but there is also a considerable quantity of pine of the first quality, known in the locality as "Corky" pine, and in the Quebec market as the best kind of yellow pine. The capacity of this mill is about 10,000,000 ft. B.M. for the season.

The seigniorship of Matapédia, comprising an area of some 125 square miles, being all the land three miles deep around Lake Matapédia, and which is the private property of the firm, is situated in the county of Rimouski, and furnishes



THE UPPER AND LOWER MILLS OF KING BROS., LIMITED, ON THE RIVER OUELLE.

features of the St. Lawrence navigation, and when the port is brought into communication with the railway systems of the Grand Trunk, Quebec Central, and the Intercolonial railways on the South Shore, by a bridge across the river near Quebec, there is reason to look forward to an increase in the volume and prosperity of the shipping trade and that the best natural port of the St. Lawrence may gradually become the depot for the grain shipments from the interior and regain her position as the chief transshipping port of British North America.

The harbour is unrivalled in extent and every facility and accommodation is offered to ships loading and unloading in the Louise Dock and Basin.

Another important development is the commencement of cold storage facilities for the preservation of perishable commodities of all kinds, and the Government have promised aid so that a continuous line of cold storages may be established throughout the country, and the productions of the farmers thereby be collected in good condition and sent to Quebec for shipment.

The Quebecers are keeping good heart, and notwithstanding the trials from depression in trade they have passed through during the last twenty years, are hopeful that they have a brighter prospect before them in the near future, and that their shipping trade will again flourish, and the productions of the province will increase in value.

As regards the exportation of wood, some firms are

to the mill at Cedar Hall annually some 6,000,000 to 8,000,000 ft. B.M., principally spruce. Cedar Hall being situated on the line of the Intercolonial Railway, the lumber can be sent by rail to be shipped by water either from Dalhousie, at the head of the Baie des Chaleur, or from Rimouski, or Rivière du Loup on the St. Lawrence. On the seigniorship there is an immense quantity of the best quality of cedar, a timber now largely used for making shingles, railway sleepers, telegraph and telephone posts, also for boat building, and many other purposes. In connection with this mill the firm also holds some limits from the Crown, the timber from which is brought to the mill by streams flowing into the Lake Matapédia.

At Rivière Ouelle, on the line of the Intercolonial Railway are two more mills, with a joint capacity of about 8,000,000 ft. B.M. per annum. The illustration shows these two mills, which are close to each other, both working from the same supply of logs. The timber is furnished from private land, of which the firm holds a considerable area, and from about 350 square miles of limits held from the Crown. The wood is chiefly spruce, but there still remains a quantity of pine. For the superior quality of both spruce and pine the mill has had, for a long time, a well deserved reputation in the trade.

The seigniorship of St. Jean des Chailons, in the County of Lotbinière, comprising an area of 135 square miles, the private property of the firm, is another prolific source of

THE WOOD INDUSTRIES OF CANADA.

supply. This is most advantageously situated, being only about 50 miles from Quebec by water, and having a railway through it, the length of which is 30 miles, running from Lyster Station, on the line of the Grand Trunk Railway, to St. Jean des Chaillons, on the banks of the St. Lawrence. The timber is, therefore, available both by railway and water for the market of the United States, and for the English and European markets by way of Quebec. The territory furnishes at present timber for three mills, two of which, one at Kingsburg and the other at Brousscaus, on the line of the railway running through it, known as the

on the line of the Quebec Central Railway, shipments from which are made mainly to the American market a small portion being produced for the English market, which is shipped by Quebec. The capacity of these mills may be estimated at 10,000,000 to 12,000,000 ft.

In addition to the above, King Brothers have the control of the output of several other small mills situated at different points.

The business has recently been converted into a joint-stock company, the shares of which are all held by the family. We may add that King Brothers are also largely



W. & J. SHARPLES COVE AT SILLERY, NEAR QUEBEC.

Lotbiniere and Megantic Railway, and one at Hadlow, in the port of Quebec. The combined capacity of these three mills is about 16,000,000 ft. B.M.

At Lyster, on the line of the Grand Trunk Railway, about forty miles from Quebec, is another mill, with an annual capacity of 7 to 8 million ft. B.M. The supplies for this mill are drawn from King Brothers' own private lands, from limits of the Crown, and from the lands of proprietors who get out and furnish the logs.

Three other mills, owned by King Brothers, are situated

interested in the asbestos business, owning mines of this material in the well-known Thetford district, from the principal one of which, the Hampden Mine, is furnished the finest asbestos fibre in the market.

W. & J. SHARPLES is the oldest firm in the square timber trade, having been established in 1830 by Mr. William Sharples, of Liverpool. The business was afterwards taken over by his son, Mr. Henry Sharples about 1842. Richard Wainwright & Charles Sharples, and then the late Hon. John Sharples next conducted the business and sub-

THE WOOD INDUSTRIES OF CANADA.

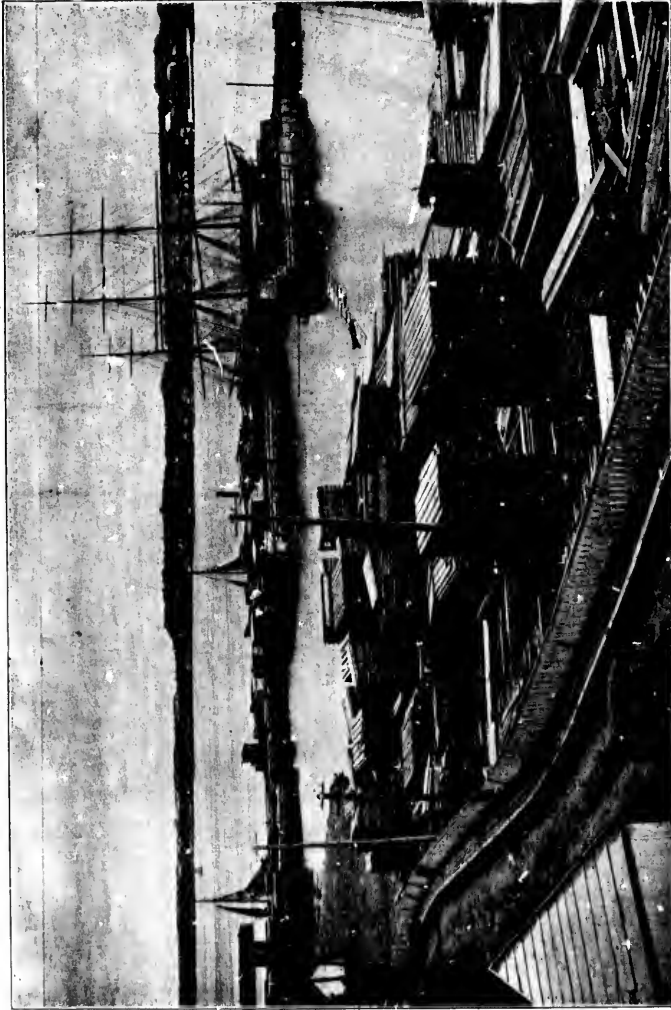
sequently his sons, only one of whom remains in the shipping business, viz., the Hon. John Sharples who is now sole proprietor of the firm. They ship about 2,000,000 cubic feet of timber of all kinds during the season, and about 50,000,000 ft., board measure, of pine deals and sidings.

They possess two coves above Quebec, the Sillery cove, devoted entirely to square timber, and the Bridgewater cove, where they have large piling grounds for deals for shipment, of both of which we give illustrations. Their hammer mark is the dollar sign, which is registered.

The agents of this firm in Glasgow are Edmiston &

borne for the best part of a century the title of the "King of the Saguenay," the present sovereign being the Hon. Evan John Price, who is now sole proprietor of the firm. Mr. William Price, who came to Canada in 1810, was the founder of the house, and erected the first saw-mills at Chicoutimi and Tadoussac. On the death of Mr. Wm. Price the style of the firm was changed to Price & Son, and in 1867 to Price Bros. All goods manufactured or shipped by this firm are hammer-marked with the letter P.

They have now fourteen mills in operation in various parts of the province, one of the oldest of which is the



W. & J. SHARPLES' PILING GROUNDS NEAR QUEBEC.

Mitchells, in London Price & Pierce, and in Liverpool Thos. B. Neale & Co. In addition to Mr. Sharples, who usually visits England yearly, the importers are called upon each new year by Mr. Wm. Powell and Mr. Harcourt Smith, who pay a visit over the water every year for the purpose of making sales.

PRICE BROS. & CO. stand pre-eminent as the largest manufacturers and shippers of spruce deals in the province of Quebec. In the Saguenay Valley the business operations of the Price family are really a history of the settlement of that locality, the heads of that firm having

Batiscan Mill, situated on a river of that name about sixty miles above Quebec, on the north shore of the St. Lawrence. This mill has a never-failing water supply for power, and has a capacity of turning out from 3,000 to 4,000 Petersburg standards during the working season from June to October. Ships and steamers can load at the wharf, which is cheap and sheltered. The 1st quality deals manufactured here are marked "Batiscan."

The St. Thomas Mill, situated forty miles below Quebec on the south shore, is a steam mill, with good loading facilities.

On a branch of the river St. Thomas, at Cape St. Ignace, is another steam mill. The deals manufactured here are shipped at St. Thomas, from which place it is only five miles distant.

A water mill is situated at Trois Saumons, the deals from which are also shipped at St. Thomas. The capacity of the three above-named mills is about 12,000 standards.

Last year a new steam mill was built at Trois Pistoles, about 120 miles above Quebec, on the south shore. The anchorage there is good for loading ships of any size, and the capacity of the mill is from 2,000 to 3,000 standards.

The Metis Steam Mill is situated about 120 miles below Quebec, on the south shore; and the Metane Mill, about 200 miles; the latter, which has been worked by water, is now being fitted up as a steam mill. At Anquin, on the Intercolonial Railway, a mill is placed, the logs are floated to the mill, and the deals are delivered to Campton, Dalhousie, or Metis for shipment. The capacity of above series of mills is about 4,000 standards each.

On the far-famed Saguenay River this firm have four mills, from which they ship their well known spruce deals. This remarkable river is navigable for ships of the deepest draft for 60 miles. On account of the very swift current, a very powerful tug is provided for the convenience of ships coming up to load, there being no possible anchorage on the river except at the mills. The Chicoutimi mill

is situated in the town of that name at the head of the navigation. The mill at Grand Bay (or Ha-Ha Bay) is driven by water-power. The other mills are situated at L'Anse St. Jean and at St. Etienne. The total capacity of these mills is 20,000 standards per season.

Two additional mills, in the Lake St. John district, at the source of the Saguenay, must not be omitted. They are some 60 miles above Chicoutimi, to which place the deals are railed.

Besides the above, the firm handle the cuts of other mills in the province.

Mr. Evan John Price takes an active interest in all commercial matters relating to the development of the Dominion, and he is president and managing director of the A Gravel Factory at Echemin. The shipments of the firm are chiefly to Great Britain, the Continent, South America and Australia, and their agents in the United Kingdom are Price and Pierce, of London. The Hon. Evan John Price still resides at the old family homestead near Quebec.

THE BURSTALL FIRM is one of the oldest engaged in the export of woodgoods from Canada, having been established in the City of Quebec by the late Henry Burstall in the year 1832, 64 years ago. He came from Hull, England, and was shortly afterwards joined by his brother Edward. The business was carried on for many years under the style of H. & E. Burstall. On the retirement of Mr. H. Burstall in 1856 it was changed to E. Burstall & Co. In 1857 Mr. John Burstall, a nephew of the brothers, was admitted a partner, and when a few years afterwards Mr. Edward Burstall retired, it was again changed to J. Burstall & Co., and has so remained ever since.

About the year 1863 Mr. E. Stanley Smith, of Liverpool, joined the firm, and remained a partner for some ten or twelve years, when he retired. Mr. W. H. Robinson then became a member, as representing Messrs. Harrison, Robinson, & Co., of Liverpool. Mr. Robinson died in 1876, and the following year Mr. F. Billingsley, for many years in the employ, was admitted into partnership, along with Mr. H. T. Walcot, who remained in the firm for ten years. Mr.

John Burstall, who had been head of the firm for some thirty-five years, died in England on February 26th last.

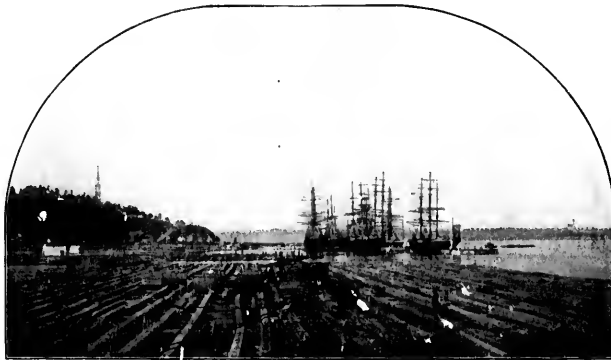
The business is now conducted by Messrs. F. Billingsley, who has been connected with it for over forty years, and John F. Burstall, son of the late Mr. John Burstall.

The firm has a branch office at Montreal, and another in London, England. It has for more than half a century done a large annual export trade, and before the advent of the steam carrying trade, for a long series of years exported annually to Great Britain from 100 to 200 cargoes of timber and deals. Since the introduction of steam a large portion of the business is done at Montreal.

Their registered trade mark, A.A. and A.B., on first-class and good fair average square pine timber respectively, are well known in Great Britain.

Their principal trade is in the export of pine deals and lumber from Montreal, from whence they send many millions of feet annually, their trade stamp, J. B. & Co., on deals, being also well known. The square timber is

shipped chiefly from Cap Rouge, the receiving depot above Quebec for rafts coming down the St. Lawrence; some, however, is shipped from Indian Cove at Levis. The spruce deal shipping is done from the wharves of the Quebec Warehouse Company, South Quebec, at the receiving depot for birch and other timber and deals. Mr. Billingsley is president of that company.





DOBELL, BECKETT, & CO'S LUMBER COVES AT SILLERY.

DOBELL, BECKETT, & CO. are the largest shippers on the St. Lawrence of pine deals and square timber taken together. They have no mills, but confine their operations entirely to shipping. The firm has been established about thirty-five years, and assumed the present style in 1887. The personnel consists of the Hon. Richard R. Dobell, of Quebec; Mr. Thos. Beckett, of London; Mr.



THE HON. R. R. DOBELL.

Thomas Stevenson, of London; Mr. Lorenzo Evans, of Quebec; and Mr. W. M. Dobell, of Montreal, with a house in London, under the style of R. R. Dobell & Co. Their goods are all hammer-marked with their registered

mark  or .

They own two coves above Quebec, namely, Lemesuriers and Bowen's Coves, at the latter of which are deep-water piers for loading vessels at all states of the tide.

At Montreal they have storage accommodation for square

THE WOOD INDUSTRIES OF CANADA

The Indian Cove is probably the largest in the port, and was at one time occupied by Gilmour & Co. It has deep water loading piers, and is used by several timber shippers in the port for loading. The Montreal branch of the firm is carried on under the style of McLean, Kennedy, & Co., and the London branch as Kennedy, McLean, & Co. Mr. Harold Kennedy is a member of the Quebec Harbour Commission.

THE McARTHUR BROS. CO., Limited.--This company was originally McArthur Bros., consisting of John McArthur, Alexander McArthur, and Peter McArthur.

timber, they soon became considerable shippers. In 1886 the firm was formed into a joint stock company, the shares all being held in the family, and is now carried on under the style of the McArthur Bros. Company, Limited. Since that time the business of the firm has been greatly extended, under the management of Mr. H. T. Walcot, of 17, Gracechurch Street, London, England, who acts as agent and representative on that side of the Atlantic, and of Mr. Edward Harper Wade, who acts as Quebec manager and superintendent, and exercises a close supervision over shipments. Two of the original members of the firm and com-



HAROLD KENNEDY'S TIMBER COVE, NEAR QUEBEC, LOOKING SOUTH.

They carried on for many years a steadily increasing business in the manufacture of timber for the markets of the United Kingdom, selling all their production to the Quebec merchants. Finding in dull times and years of depression a difficulty in disposing of their timber, and realising that in good times and years of active business a large profit was made by the middleman, they decided to enter upon the shipping business by consigning to and selling on contract in the English, Scotch, and Irish markets. Being the owners of extensive timber limits, and manufacturers of their own

company have passed away. The death of Mr. John McArthur the senior brother in the firm who attended to the Ontario business, took place some years ago, and was followed in 1895 by that of Mr. Alexander McArthur, who was well known and much respected and liked by very many connected with the trade throughout the United Kingdom, who, from a business acquaintance, gradually came to regard him as a close friend. He at one time crossed the Atlantic each winter in connection with the business. Since the decease of these two of the brothers, Mr. Neil Gordon and Mr. H.

W. Bickell, of Toronto, have been made shareholders and directors, having for some time been connected with the concern. Mr. Peter McArthur, the remaining and younger brother of the old firm, and who formerly attended to the United States business, and to everything connected with the production of the timber, is now president of the company. In addition to shipping timber of their own manufacture, made on their own limits, the firm also buys largely from Western and Ottawa manufacturers, who sell in the Quebec market. They also carry on a large business in pine deals, buying year by year the Gilmour Hull mill cutting of the famous ABC deals, cut from the well-known Gatineau soft yellow pine, and the Gilmour Trenton and Canoe Lake pine deals, made from saw-logs cut on the highest priced limits ever sold in Canada. The company is also interested in the Collins Ray Rafting and Forwarding Company, employed in bringing timber from the West to Quebec, Mr. Peter McArthur being president. As vessel owners, they run steamboats and sailing ships on the Canadian and American Lakes. Their head office is in Toronto, with branches in Detroit, Michigan, Montreal, and Quebec. They now hold most valuable timber limits, covering a great extent of country in various sections. They have very considerable mining interests in gold, silver, lead and copper, both in Canada and the United States. Their specialty, however, is Waney Board Pine, which they largely manufacture, and distinguish with registered mark M A B, and registered stamp A in circle. This wood has always been recognised as very superior, and is well known in all consuming markets. The McArthur brothers are of good Scotch origin, the family having settled at Lancaster, in the Glengarry country, west of Montreal, where the eldest brother, Mr. Archibald McArthur, who is not connected with the business, still occupies the old homestead, and is universally esteemed and respected.

Mr. Edward Harper Wade, who manages the Quebec business, is a native of Liverpool, England. In 1861 he entered the office of Messrs. Sharples & Co. in his native town, in 1870 was transferred to Quebec, and remained with the firm till 1877, visiting England each winter and taking an active part in the business as salesman. He then took a similar position with Messrs. Roberts, Smith, & Co., and remained with them till the retirement of Mr. Joseph Roberts in 1880, when he was taken into partnership by Mr. R. H. Smith, and for six years carried on business under the style of Smith, Wade, & Co. On Mr. Smith retiring, Mr. H. P. Walcot, who had been a partner for nine years in Messrs. John Burstall & Co., joined the firm. In 1890 Mr. Walcot became agent in England of the McArthur Bros. Company, Limited, and Mr. Wade the Quebec manager of the same concern.

The shipping booms of the company are at New London Cove, in the harbour of Quebec, and vessels loaded by them moor at New Liverpool Cove, the property of Mr. Wade, where there is specially safe and ample deep water accommodation for steamers and sailing ships of all sizes.

BENNETT & CO. are manufacturers' agents, and have been in the business since 1875, and the two partners are sons of the late Mr. Benson Bennett, who was well known at one time as the largest millowner and manufacturer of pine and spruce deals in Quebec. Among the various mills for which Bennett & Co. act as agents are those of Sir Henri de Joly Lotbinière in the Seigneurie of Lotbinière and the mills of the Hon. J. K. Ward, of Montreal, for both of which they have been agents for many years. They are also agents for the sale of the Delaware, Lackawanna, & Western Railroad Company's anthracite coal.

H. R. GOODDAY & CO.—Mr. Horace Richardson Goodday carries on business under above style, as shipper of spruce, pine and hardwoods. The specialty of the firm is spruce, and their shipments, comprising the Breakey brand, aggregate from 10,000 to 15,000 standards per season. Their registered trade mark is H in G. The brands on the Breakey cut are 2 1sts, 22 2nds, 222 3rds, 2222 4ths. Mr. H. R. Goodday is the son of Mr. H. G. Goodday, late of Paris, Havre and London, who has been well known for many years to Continental buyers, having acted in Europe for Baltic, Russian, Canadian, and American shippers, and who served his apprenticeship with the well-known house of G. F. Neame & Co. They are represented in the United Kingdom by Foy, Morgan, & Co.

E. L. SEWELL has been in the business since 1881, and is a spruce manufacturer, owning three mills, one on the St. Lawrence, 30 miles above Quebec, and two on the

Lake St. John Railway. He manufactures solely for the English market, and the capacity of the mills is about 25,000,000 ft. board measure. He does not ship himself, but disposes of his productions each year to one of the shipping firms.

ROSS & CO., who were at one time considerable shippers from Quebec, now entirely confine their manufacturing operations to the Ottawa district, having disposed of their mills and spruce forests in Quebec to American firms for the manufacture of pulpwood.

H. M. PRICE & CO.'S business is a continuation of the firm of Hall & Price, who were the successors of the late G. B. Hall, who were the owners of the celebrated Montmorency Mills. These mills were the oldest in Canada, having been started in 1815, and from them an extensive export to England was carried on, but they were sold some years ago, and discontinued as a saw-mill. This firm has one saw-mill in operation at Price's Siding, in the township of Whitton, on the Tring branch of the Quebec Central Railway, the capacity of which is about 8,000,000 ft., and two other mills on the Grand Trunk Railway. They are manufacturers only, and dispose of their production to shippers, but are largely interested in the trade in larch railway ties and sleepers, bark, and pulpwood to the States.


DUNN & CO. are probably more largely interested in the oak timber trade than any other firm here. This business was established from 45 to 50 years ago by Mr. Timothy H. Dunn, who is still living, and is the *doyen* of the timber trade of the port. Notwithstanding his increasing years, he still takes a lively interest in the trade. Mr. Stuart H. Duon is now the sole proprietor of the firm. They draw their supplies of timber from Ohio and Michigan, and are agents for the well-known makes of Mr. Kelsey, of Detroit, Mich. (K mark), and of Mr. Chenevert, of Defiance, Ohio (CJ mark).

W. H. WILSON made arrangements early last year with A. F. & D. Mackay, of Liverpool, to carry on from Quebec a shipping and agency business, and he ships all kinds of timber, including large quantities of birch and hardwoods. Mr. Wilson is a Canadian born, and has had a thorough experience of all the different branches of the timber business from the woods to the ship. He has made many annual trips to England for the purpose of making sales; and he also acts for W. & J. Sharples in Sunderland, Liverpool, and the Tees ports, where he usually places several cargoes annually. He handles the well-known manufactures of Mr. J. S. Murphy, who operates largely in hardwoods in Western Ontario. Last year Mr. Wilson handled the finest parcel of birch ever supposed to have been shipped from this port, and which was manufactured by Mr. Veilleux, of Levis.

CARBRAY ROUTH, & CO., Quebec and Montreal.—This firm was founded in 1869 by Messrs. Felix Carbray & Francis Alexander Routh, who are still at the helm. The latter is a son of the late Sir Randolph Routh, of London, England, and, therefore, brother of the eminent mathematician of the University of Cambridge. Those gentlemen, from a small beginning, have, by hard work and honourable dealings, built up a large and lucrative trade. Their business has been of the character of general commission and shipping. They are also selling agents for several important saw-mills. They also execute orders for all kinds of wood goods, and have done a large business with Great Britain, France, Portugal, Australia, and South America. Mr. Carbray is a prominent man in public life, and represents the business division of the City of Quebec in the Parliament of the Province of Quebec. He is also Consul for Portugal at Quebec, whilst Mr. Routh fills the same position as Portuguese representative in Montreal.

D. R. McLEOD, as his name suggests, is a native of Scotland, who is now in business as a broker between manufacturers and shippers, also as agent for the sale of timber limits. He has been in the port over thirty-six years, and was at one time a shipper, and is still largely interested in spruce, pine timber and spool wood. He was compelled by impaired health to give up his shipping business some years ago. Mr. McLeod is well known in England and Scotland, and no man is better liked or respected in Quebec. He is now president of the St. Andrew's Society, one of the oldest charities in the Dominion.

BENSON & CO.—Mr. E. W. Benson trades under the name of the old firm of his father and uncle, and he bears a name well known to the Quebec trade. Mr. Benson is a Yorkshireman, from Whitby, and was brought up for the navy, but after nine years at sea, he married and

settled in Canada in 1874. He buys on commission, imports, and guarantees shipments, and sells on contract. The exports are spruce, and all kinds of hardwood, both in the log and sawn; his chief business, however, is in maple and hardwoods, making a speciality of oak, in which he is a recognised authority in the trade. He is a thoroughly practical man, having acquired his knowledge of the trade by actual experience, for several years as cutter in spruce, and five years in the woods in different parts of the Canadas and United States in the hardwood trade. He visits the United Kingdom and Continent every year to call on his customers, by all of whom he is regarded as a careful and reliable shipper. He also manufactures square birch timber in the West and the Quebec districts, and his registered brand is . Mr. Benson's father started

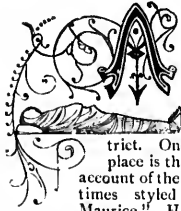
the timber business in 1843, in conjunction with his cousin, Mr. Ed. H. Chapman, a director of the Bank of England, who for many years supplied the Imperial Government with wood goods. He is a nephew of the

late Matthew Hutton Chaytor, chairman of the Alliance Bank and National Discount Corporation of London.

J. BELL FORSYTH is a name well known in Canada, from the publication for so many years of the annual statistics of the trade of Quebec by the late firm of J. Bell Forsyth & Co., who were for many years engaged in the commission business in lumber. The annual statement is still continued under the old name, but Mr. Forsyth is now the collector of customs for the port.

Of the mills that were at one time working near Quebec, only two or three small ones now remain. Mr. Henry Atkinson runs a spruce mill at Etchemin and one at St. Raymond, both driven by water-power, and Mr. J. Breakey has a water-power mill at Chaudière, with a capacity of some 25,000,000 ft. The Edson Fitch Company's splint factory is a little distance from Levis, and close by is the works of the A. Gravel Lumber Company, who manufacture boxboards for the English market and all kinds of joinery for local consumption.

Mills between Quebec and Montreal.



AFTER leaving the Quebec district, or, rather, after passing the Batiscan River, the first mills up the St. Lawrence are at Three Rivers, about halfway to Montreal. They derive their supplies from the forests in the St. Maurice River district. One of the best-known mills at this place is that of Mr. Alex Baptist, who, on account of the extensive limits he owns, is sometimes styled the "Lumber King of the St. Maurice." His father was one of the pioneers of the trade. His usual cut is about 300,000 logs per season of pine and spruce. The mill runs day and night during the season, and the twenty-four hours' capacity is 160,000 ft. This production mostly reaches the English market.

At the same place is the Warren Curtis Mill, which has a capacity of 100,000 ft. per day of ten hours. The logs cut are about two-thirds pine and one-third spruce, and amount to about 200,000 each year, also the mill of the St. Maurice Lumber Company, where spruce logs are manufactured for paper making.

On the St. Maurice River is situated the Laurentide's Pulp Mill at Grand Mère, manufacturing sixty-five tons per day. They cut some 280,000 spruce logs yearly.

A little higher up the St. Lawrence widens out, and is called Lake St. Peter, near the shores of which the Tourville Lumber Mills Company have three mills—one on the north shore at Louiseville and two on the south shore at

power, being equipped with two Prescott band mills, a gang and twin circular saws, cutting about 2,000 logs per day of 11 hours, or nearly 3,000 logs per day with band saws running



THE WARREN CURTIS MILL.

at night. It is lighted by electricity, and a day and night gang have been working steadily for the past two or three months. This mill is considered one of the most modern and complete of its kind in the country.

They have also a fine water-power lumber mill at Montcalm, where they engage in the manufacture of clapboards for the American markets, also at Montcalm a stone flour mill and a mill for cutting farmers' logs and lumber for local wants.

The company own the powerful tug "Charlemagne" and a number of barges, and owing to the close proximity of their Charlemagne mill to Montreal,

lumber can be brought up to the city in a few hours.

The company are going largely into the manufacture of dressed spruce lumber, feeling sure that the demand for same will keep on increasing yearly.

The president of the company is Mr. Robert Reford, of Montreal, senior member of the firm of Robert Reford & Co., large shipping agents and owners; Mr. Reford is also president of the Mount Royal Milling & Manufacturing Company, of Montreal and Victoria, B.C., and a director of the Bank of Toronto.

The manager is Mr. Alexander McLaurin, formerly of East Templeton, who is well known to the timber trade throughout the country.



THE CHARLEMAGNE AND LAC OUAREAU CO.'S MILL.

Pierreville and Niclet. The office of this company is in Montreal.

CHARLEMAGNE & LAC OUAREAU LUMBER CO., LTD—The limits of this company are situated in the counties of Joliette, Montcalm and Barthier, in the province of Quebec, and comprise about 600 square miles of timber, composed largely of spruce, pine, birch, hemlock and ash. The number of men employed during the past season was 250, while the output is about 30 million feet, the bulk of which is shipped to Great Britain and the United States.

The principal mill is located at Charlemagne, some 12 miles below Montreal, at the junction of the L'Assomption, Ottawa and St. Lawrence rivers. It is operated by steam

The Montreal District.



MONTREAL HARBOUR.

MONTREAL has become the commercial and financial capital of Canada, and has now a population of upwards of 300,000, two-thirds of whom are French speaking. The business portion of the city is more modern in appearance than Quebec, and lofty stone buildings have been erected in the principal streets. The offices occupied by the leading banks, insurance companies, and wholesale dry goods firms, &c., are as handsome and imposing as can be seen anywhere. The numerous fine churches of the various denominations are a notable feature of the city both from their number and their architectural excellence. Standing on Mount Royal (from which the place derives its name), looking over the city to the St. Lawrence, spanned by the tubular railway bridge of a mile and a quarter in length, a magnificent panoramic view of the city and neighbourhood can be obtained.

Being situated at the head of the navigation of the St. Lawrence, Montreal has become the great trans-shipping port for the produce of Western Canada and the Great North-West Territories of the United States. The deepening of the channels of the river above Quebec has made the port of Montreal what it now is. They have been deepened from 15 ft. to 27½ ft., and a movement is on foot to increase the depth to 30 ft. in order to admit the largest vessels afloat. The canal system of Canada, too, is a very important feature in the trade of the St. Lawrence. Most of the canals have a depth of 9 ft. to 12 ft., but steps are being taken to deepen them to a minimum of 14 ft., thus opening up improved water communication through the great lakes to the west, and as water traffic is by far the cheapest means of transportation, this scheme when carried through will form a great feature of the St. Lawrence route, and probably bring more traffic to Montreal than to Quebec. In 1895, 640 seagoing vessels arrived in the port, with a total tonnage of 1,069,386. The value of the merchandise

imported was 37,466,103 dols. and of that exported 40,348,287 dols. The export consisted largely of grain, cheese, apples, lumber, live stock, cattle, sheep, horses, &c.

About twenty years ago the export of deals from Ottawa *via* Montreal was commenced by Dohell, Beckett, & Co., and it was with some reluctance that Allan Bros. were induced to carry the goods by one of their liners. From that time the trade has grown rapidly, as will be seen from the statement of yearly exports of wood goods of all kinds from the port since the commencement.

MEMO. OF LUMBER OF ALL KINDS SHIPPED FROM MONTREAL TO GREAT BRITAIN AND OTHER COUNTRIES.

Year.	No. of Feet.	No. of Tons.
1877	—	51,439
1878	—	11,634
1879	10,499,951	—
1880	11,348,120	—
1881	13,046,204	—
1882	21,724,637	—
1883	16,959,078	—
1884	31,457,265	—
1885	37,162,100	—
1886	28,912,376	—
1887	32,922,390	—
1888	117,320,721	—
1889	154,280,618	—
1890	162,565,353	—
1891	113,275,051	—
1892	172,701,625	—
1893	132,097,979	—
1894	189,610,029	—
1895	175,372,976	—
1896	201,131,226	to October 22nd.

In fact, Montreal is now the trans-shipping port for all the pine produce of the Ottawa Valley that is sent to Europe, South America, &c. The deals are conveyed during the season in barges, carrying an average of 145 standards each, down the Ottawa River and the Lachine Canal, and they are transferred direct from craft to the steamer.

The export of pine deals to England is mainly in the

THE WOOD INDUSTRIES OF CANADA.

hands of six or seven firms, four Quebec houses who have branch offices here, two Liverpool houses, and one Montreal firm.

The total shipments of last year did not vary much from the preceding one. Below we give particulars of shipments of each firm in 1894 and 1895:—

SHIPMENTS FROM MONTREAL, SEASON 1894.		Feet.
Dobell, Beckett, & Co.	...	44,368,013
Also 2,437,132 ft. loaded at Charlemagne.		
McArthur Bros. & Co., Limited	...	29,240,000
W. & J. Sharples	...	27,195,651
Robert Cox & Co.	...	25,859,909
Watson & Todd	...	20,096,020
J. Bursall & Co.	...	19,729,055
Total	...	166,488,628

SHIPMENTS FROM MONTREAL, SEASON 1895.		Feet.
Dobell, Beckett, & Co.	...	43,763,072
W. & J. Sharples	...	33,839,854
Robert Cox & Co.	...	23,699,684
J. Bursall & Co.	...	23,922,944
McArthur Bros. & Co.	...	15,778,000
Watson & Todd	...	10,924,000
Export Lumber Company	...	8,474,000
E. H. Lemay	...	3,600,679
McLean, Kennedy, & Co.	...	370,275
Wm. Ross & Co.	...	531,857
Benson & Co.	...	16,830
Total	...	169,384,195

In writing about Quebec it was mentioned that the deal trade had shifted from that port, and the forest produce that at one time was shipped in the shape of square timber is now sent away from Montreal cut into deals and boards, and it is looked upon as impossible that the trade will ever revert to the old channels. The tendency of modern shipping operations is for vessels to load wherever possible at the head of the navigation, and a hundred miles or so up a good navigable river makes no increase in either freights or insurance. The removal of the deal trade from Quebec was he result of causes already explained, but it was taken away much sooner than would otherwise have been the case, in consequence of the arbitrary and unwarrantable conduct of the stevedores and labourers, who insisted on conditions the shippers were unable to accept, and claimed a higher rate of wages than that ruling in Montreal. Thus they drove the trade away and impoverished themselves.

Some square and waney pine, as well as birch and hardwood logs, are shipped from this port, but to carry on an extensive trade in timber there is not such good or ample accommodation as at Quebec, for there is here practically no rise or fall of the tide.

Montreal is practically a free port for shipping, and frequently lower freights are accepted than to Quebec. The shippers here, too, have a great advantage in being able to contract over the season with the steamship lines to carry sawn timber at a fixed low freight.

At the head of the list of Montreal shippers stands the name of Dobell, Beckett, & Co., and the resident partner is Mr. W. M. Dobell, the son of the senior partner. They were the first Quebec house to open an office here, and they have a timber-piling ground, and sheds for storing lumber under cover, situated on the Lachine Canal. In addition to the large season operations, they receive the bulk of their square timber by rail from Ottawa and the various points during the winter. It is prepared for shipment at their wharf, and stored in "moulinettes" on the ice, to be ready for shipment in the spring, as soon as the weather breaks.

The McArthur Bros. Co., Limited, have an office here in charge of Mr. G. M. Nicholson.

W. & J. Sharples also have an office, which is managed by Mr. Brennan.

The interests of Robert Cox & Co., whose operations in

lumber are well known in the Liverpool market, are attended to here by Mr. S. Barker. The following are the totals of this firm's shipments during the past five years:—

SEASONS 1891 to 1895.		Feet.
1891	...	22,613,387
1892	...	28,081,745
1893	...	20,901,801
1894	...	25,859,909
1895	...	28,499,674
Total	...	125,957,526

Watson & Todd, who are also well known in the Liverpool market, are represented by Mr. Martin Power.

The Quebec shippers, J. Bursall & Co.'s office here is managed by Mr. J. D. Anderson, who has had a long experience in the Canadian timber trade.

Mr. E. H. Lemay has been shipping from this port to England for the past few years. He also ships to the West Indies and South America. Mr. Lemay is a member of the Harbour Commission.

The shipbrokers who most largely handle deal shipments are Elder, Dempster, & Co., McLean, Kenne ly, & Co., and Carbray & Routh. The shipments are made either in the vessels of the various steamship lines or by tramp steamers, and a considerable proportion of the tramp tonnage is loaded by Elder, Dempster, & Co. This firm was carried on under the style of Harling, Ronald, & Co., but last year it was amalgamated with Elder, Dempster, & Co. of Liverpool, and Mr. Harling, who was previously in the Canadian trade in Liverpool, came out to Montreal to work up the business, and this season they have loaded about 80 steamers at Montreal and Quebec, and have probably done the largest shipping business at this port. During the season of 1896 they have forwarded to England 22,500 standards of deals as follows:—10,000 standards to Bristol, 7,500 standards to London, and 5,000 by tramp steamers to various ports. They are agents for the Dominion Line freight boats, which run to Bristol and London.

The view of Montreal Harbour given is taken from the Custom House, and shows Commissioners' Street, in which thoroughfare many of the timber shippers' and shipbrokers' offices are situated.

There is only one export saw-mill in the vicinity of Montreal, the Mona Mill, owned by the Hon. J. K. Ward. It is on the Lachine Canal, about two miles from the centre of the city. Mr. Ward's limits are situated along the River Rouge, a tributary of the Ottawa. The logs are ratted at the mouth of the Rouge in cribs, and come down the Ottawa River to Lachine, being towed down the canal by steamers. The product is disposed of in the United States, British, and local markets. In addition to the lumber manufactured at the mill, Mr. Ward purchases a considerable quantity in the Ottawa district, his annual transactions averaging from 15 to 20,000,000 ft.

The Hon. J. K. Ward was born in the Isle of Man in 1819. He served as a carpenter for some years, and in 1842 emigrated to the United States, and shortly afterwards entered into business at Troy, N.Y., purchasing a planing mill, which he successfully conducted until 1853, when he removed to Canada. After prospecting for a time, he purchased a mill property on the Maskinonge river, in the province of Quebec, where he spent ten years. In 1863 he moved to Three Rivers and took over the property of Norcross, Philips, & Co., which he afterwards sold to an American firm, and commenced business at his present place. Mr. Ward has always taken a deep interest in the question of forestry.

The office of the Charlemagne and Lac Ouareau Lumber Company, Limited, are here; also the offices of the Tourville Lumber Company, and the Export Lumber Company, of New York, who export largely to South America, have a resident agent in the city during the shipping season.



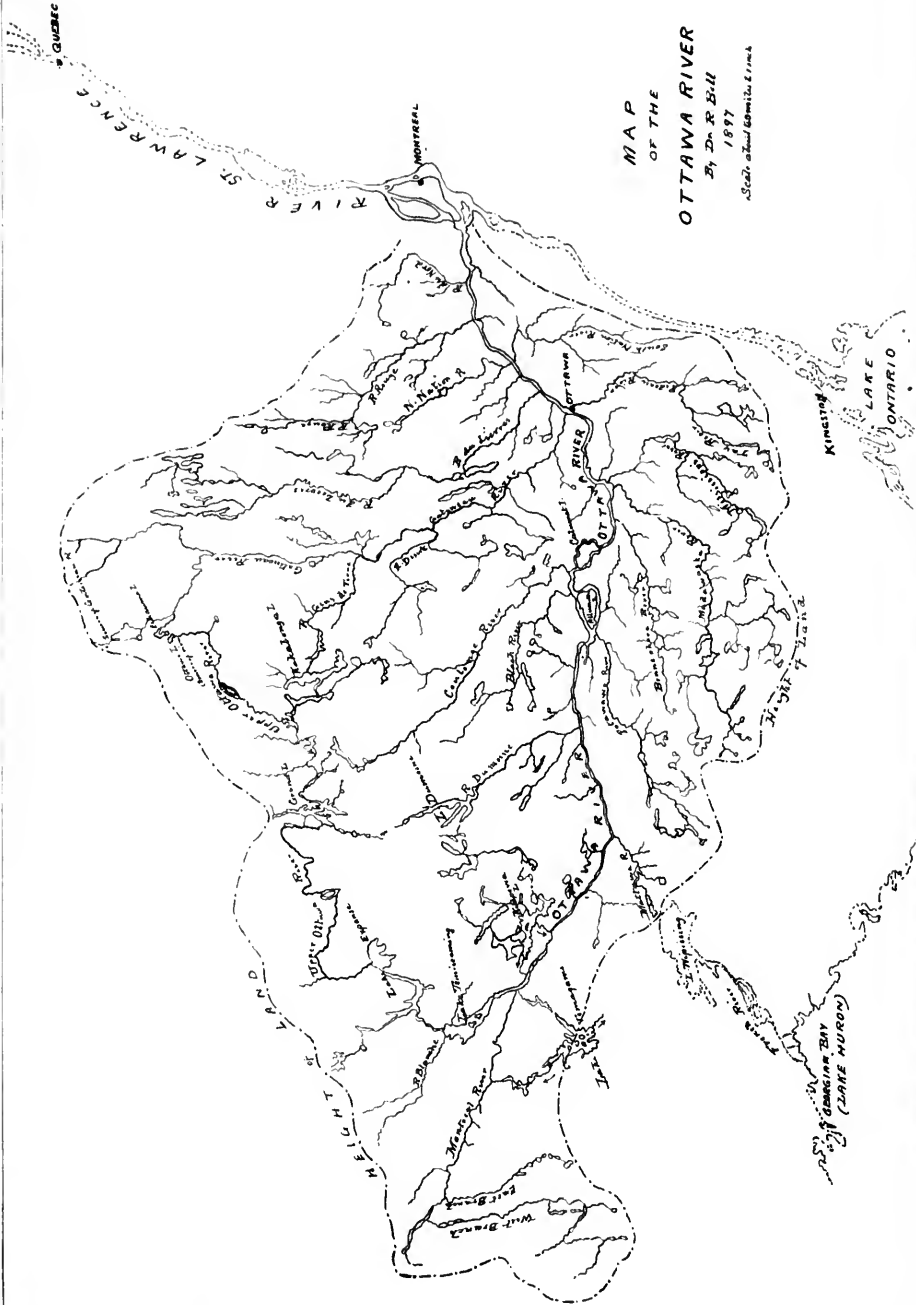
THE WOOD INDUSTRIES OF CANADA

MAP OF THE OTTAWA RIVER

By Dr. R. Bill

1897

Scale about 60 miles to 1 inch



The Ottawa District.



THE OTTAWA RIVER AND PARLIAMENT BUILDINGS, SHOWING PLACE WHERE CRIBS OF TIMBER ARE RAFTED AFTER PASSING THROUGH THE SLIDE.



THE Ottawa valley is the centre of the pine lumber trade, and is a thriving district. It includes the country on both banks of the River Ottawa (or Grand River as it was formerly called), that on the north shore being in the province of Quebec, and that on the south in the province of Ontario. The Ottawa is a tributary of the St. Lawrence, into which river it falls at the western extremity of the Island of Montreal. Its length is about 600 miles. On its course the River Gatineau, which is about 300 miles in length, separates the valley towards its centre, in a line nearly perpendicular running from north to south. It is estimated that over 30,000 square miles of territory are drained by the Ottawa and its tributaries.

The district of the Ottawa valley (as may be seen on reference to our map) may be said to commence about Grenville and Hawkesbury on the east, and to extend to Des Joachim in the west, comprising on the north shore the counties of Ottawa and Pontiac, which are subdivided into townships of about ten miles square, of Prescott, Russell, Grenville, Carleton, Lanark, and Renfrew. It is intersected throughout, on both sides of the Ottawa river, with numerous large tributary streams, many of them surpassing the largest rivers of Great Britain. Of those flowing from the north the principal are the Nation, the du Lievre, the Gatineau, the Coulonge, and the du Moine. On the south side are the Madawaska, the Bonaventure, and the Petawawa. The southern side of the Ottawa is a good agricultural country, being less mountainous than the north shore, but the valleys and rivers traversing the latter, and the tract lying between the Laurentian Hills and the Ottawa is also good for farming.

Ottawa is now a handsome and well-built city, and is the seat of the Dominion Government. The streets are broad and well paved, and the public buildings and private residences are a credit to a community which can only boast of sixty years' existence. The glory of the city, however, is the Government buildings, which are a conspicuous object from whatever quarter the town is approached. In speaking of them, Lovell says, "their splendour, their fine commanding site, together with the beauty of the surrounding scenery,

place them in a very enviable position compared with other structures used for similar purposes, and must ever be objects of interest to the tourist and stranger, and pride to the people of Canada." In the above illustration a view of these buildings appears.

Like all other progressive Canadian cities, Ottawa is provided with a perfect system of electric street railways, and prosperity and comfort pervades the place.

The city was founded by Colonel By, and was known by the name of Bytown for many years. The site on which the greater part of the town now stands was given in payment as a debt for wages to a settler named Sparks, some sixty years ago, who benefited largely by the rise in value of the land, and the principal street bears his name.

Ottawa owes its existence, undoubtedly, to the Chaudière Falls, which made it the metropolis of the Canadian lumber trade, but it has benefited largely by the transference of the seat of Government there.

On the north bank of the river Ottawa, and separated only by the Chaudière Falls, lies the town of Hull, also an important lumber centre. This town was established in the last century, and the story of the first settlement made here by Philemon Wright, the difficulties he surmounted, and his dealings with the Indians, is very romantic.

Philemon Wright was the first lumberman on the Ottawa river. He came from Woburn, in the United States, arriving at the Chaudière Falls—or the Asticon, as called by the Indians—as early as the year 1796. It was not till 1797 that he finally decided to make his home in Canada, and on October 20th, 1799, he and two companions pitched upon the site of the future city of Hull. He finally quitted Woburn for Canada on February 2nd, 1800. He was accompanied by five families, and had in his train 14 horses, eight oxen, and seven sleighs. The first tree was felled on the site of the homestead on March 7th of the same year. He brought the first square timber from the Ottawa to Quebec in the year 1807. He built the first slide on the Hull side of the river in 1829, and was elected the first member to represent the County of Ottawa in 1830.

About 18 years prior to this the first saw-mill on the Ottawa had been built at Point Fortune, by a Mr. Story. It boasted one upright saw, and it is recorded that when the man in charge gighed back the carriage for a fresh cut he

would sit down on the log and take his dinner, and was about done by the time the cut was finished. With the present saws the same can now be done in four seconds.

The "Chaudière Mills," as they are known in the trade, are those saw-mills which derive power from the falls of that name. On the Ottawa side are the mills of Mr. J. R. Booth, and Bronsons and Weston, and on the Hull side the mills of the Hull Lumber Company (Buell & Hurdman), and the E. B. Eddy Company's extensive match, woodenware, and pulp works.

At the "Rideau Falls," at New Edinburgh, are the planing and dimension mills of W. C. Edwards & Co., Limited, besides which there are several steam saw-mills in Ottawa and Hull.

The illustration we print of the Chaudière Falls (or as the name literally means "Boiling Kettle or Cauldron," a name given by the first French settlers to falls in various parts of the country), conveys an idea of what a tremendous flow of water is constantly passing over these precipitous rocks 30 ft. high, and the illustration of the winter aspect of the scene is no less striking. In the spring the flood so fills the channel that the falls are quite obliterated, the whole river from shore to shore being a grand rapid.



CHAUDIÈRE FALLS.

In September the rocks below the falls are quite bare, and can be visited in safety; perhaps the falls are at their finest in July, when a thin covering of water softens the rugged outlines of the lower rocks, and the kettle is sending up volumes of "steam."

During the season of 1896 there has been an active demand for 12 in. pine boards from the South American market, and if political affairs remain quiet in that part of the world, and no fresh wars are entered upon, the demand may continue to increase. As the deals from South America are manufactured from the same kind of logs as those used for the makes for the English market, it forms a feature of the trade that ought not to be disregarded. The demand from the United States this year is expected to be very heavy, and will be welcomed to work off stocks of lower grades which have accumulated during the recent depression and political excitement in the States. The really good pine timber that comes in the market is all readily snapped up.

The manufacturers of pine lumber and square timber in the Ottawa district sell all their production that is sent to England or anywhere overseas, without exception, to firms who make it their business solely to ship to foreign importers, and they therefore have only an indirect interest in the fluctuations of the European markets. The lumber manufacturers do a ready-money business with the shippers; all transactions are practically for cash; that is, at ten or, at most, thirty days.

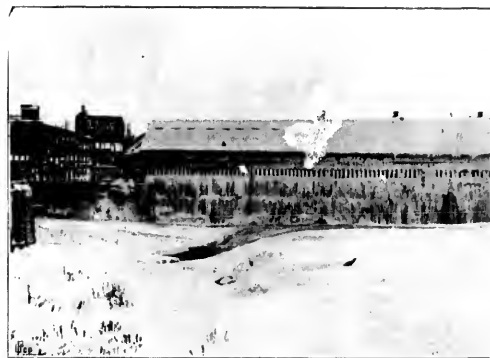
LUMBER PRODUCT OF OTTAWA DISTRICT IN 1896.

	Feet.
J. R. Booth, Ottawa.....	115,000,000
Buell, Hurdman, & Co., Hull.....	55,000,000
McLachlin Bros., Arnprior.....	540,000,000
Bronson, Weston, & Co., Ottawa.....	52,000,000
Hawkesbury Lumber Company.....	54,000,000

	Feet.
W. C. Edwards & Co., Rockland.....	43,000,000
Gillis Bros., Braside.....	35,000,000
Gilmour & Hughes, Hull.....	30,000,000
Shepard & Morse Company, New Edinburgh.....	25,000,000
Canada Lumber Company, Carleton Place.....	20,000,000
W. Mason & Sons, Ottawa.....	15,000,000
Pembroke Lumber Company, Colinet.....	12,000,000
Ottawa Lumber Company, Colinet.....	12,000,000
Ross Bros., Buckingham.....	11,000,000
MacLaren Estate, Buckingham.....	10,000,000
Klock Bros., Arnprior.....	8,000,000
Giles & Co., Arnprior.....	3,500,000
Total.....	552,500,000

The saw-mills are all worked during the season at the highest speed it is possible to attain with the latest and most improved machinery. With the present last saving machinery it is found that under skillful management better results can be obtained than with the older and slower machines. The machines work with such rapidity that with all their skill and training the operatives are unable always to keep pace with the saws, and faulty work is sometimes the result. There are, however, saw-mills working at less excitement and a pressure at which really good

manufactured lumber is produced. The woodworking machinery used in the Canadian mills is to a limited extent manufactured in the colony. The William Hamilton Manufacturing Company, Limited, of Peterboro', Ontario, have done much to develop saw-mill tools to suit the export manufacturers, and the Waterous Engine Company, of Brantford, are engaged in the manufacture of sawmill plant of all kinds, including a system of automatic conveyors for lumber. They are also the licensees for the manufacture in Canada of the Edw. P. Allen Co.'s celebrated band-saw machines. At Galt, in Ontario, which is situated near a large furniture manufacturing area, there are several wood-



WINTER SCENE.

working engineers, amongst which the best known are McGregor, Gourlay, & Co., Cowan & Co., and Carr Bros. At Berlin, Ont., Jackson, Cochrane, & Co. are situated. American machinery also is used, and most large mills are fitted with one or more of the celebrated oscillating gangs (or gates, as they are called) of Wickes Bros., of East Saginaw.

The mills in this district, being mainly engaged in the same trade, bear many points of resemblance, particularly as to the cutting and handling of the logs and lumber, so that from the following detailed descriptions of one or two representative mills a good general idea of the methods of manufacture in vogue can be obtained. All the mills and yards in this district are lighted by electricity.

The following particulars of the establishments and personnel of the various firms engaged in the export business in Ottawa will, we think, be perused with interest by our readers. The firms most familiar to our English readers are the three shippers of lumber, Dobell, Beckett, & Co., Robert Cox & Co., and Watson & Todd.

DOBELL, BECKETT, & CO., of Montreal, Quebec, and London, have an office in Ottawa, under the management of Mr. R. M. Beckett.

ROBERT COX & CO., of Liverpool, who have offices here (Ottawa), and at Montreal, are one of the largest shippers of pine lumber from the Ottawa district. From the statistics given under the heading of Montreal, it will be seen that the operations of this firm are very extensive.



H. W. TODD.

WATSON & TODD.—This firm is carried on by Hugh William Todd and John Watson Todd, who are the sole remaining partners, whose portraits we give.



J. W. TODD.

The former gentleman joined Mr. R. A. Watson in partnership in 1871, who retired in March, 1877, leaving


Mr. H. W. Todd in the business. He was joined by his brother, Mr. John Watson Todd, on 1st July, 1881, since which time the concern has been carried on by the two brothers, very successfully.

In the year 1888 they opened an office at the Canada Dock (169, Regent Road), and their direct imports in pine have been very considerable. Mr. J. W. Todd told our representative they have probably handled for the United States and Great Britain during the last six months about thirty-two million feet of pine.

The firm are directly represented during the whole of the shipping season by their staff at Ottawa, Canada. They have offices also, with their own staff, managed by Mr. Martin Power, at 205, Commissioner's Street, Montreal.

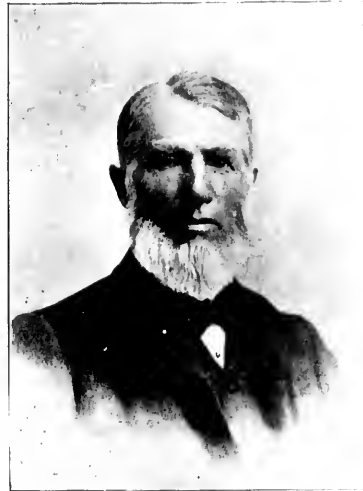
Mr. J. W. Todd covers a wide tract of country in both Canada and the United States, buying, at times, the entire cuts of different mills, in goods suitable for the English market.

They not only import to Liverpool, London, and Glasgow but also to the various ports throughout Great Britain.

Their brand  is now well known in the trade.

Two other Quebec shippers are represented here during the shipping season—viz, W. & J. Sharples and J. Burstall & Co.

J. R. BOOTH.—The saw-mills belonging to this firm at the Chaudière Falls have the largest output of any saw-



J. R. BOOTH.

mills on the American Continent, and probably in the world. They are worked on the limestone bluffs at the falls of the river, where millions of gallons of water boil over on their course to the St. Lawrence. The water-wheels are of 4,000 horse power, and the capacity of the mill is 120,000,000 feet of lumber a year. Much of this is shipped to the States. About 45,000,000 feet go to England, mostly in the shape of deals, and some to South America. The mill and lumber yards cover 160 acres, and the timber limits, at the head waters of the Ottawa, from which the firm draw their supply of logs, extend over 5,000 square miles. The mill is at work day and night during the cutting season, and employment is given to 1,800 men at the mill and in the woods.

A visit to such a mill as this is amazing and instructive. The machinery runs at such high speed, and the whole place is fitted with automatic carriers for the logs, deals, boards, slabs, and refuse, that the wood in all stages of manufacture at first seems to move about by magic. But in all this apparent confusion there is method. It is interesting to follow the logs going in at one end of the mill and coming out a few minutes after as manufactured

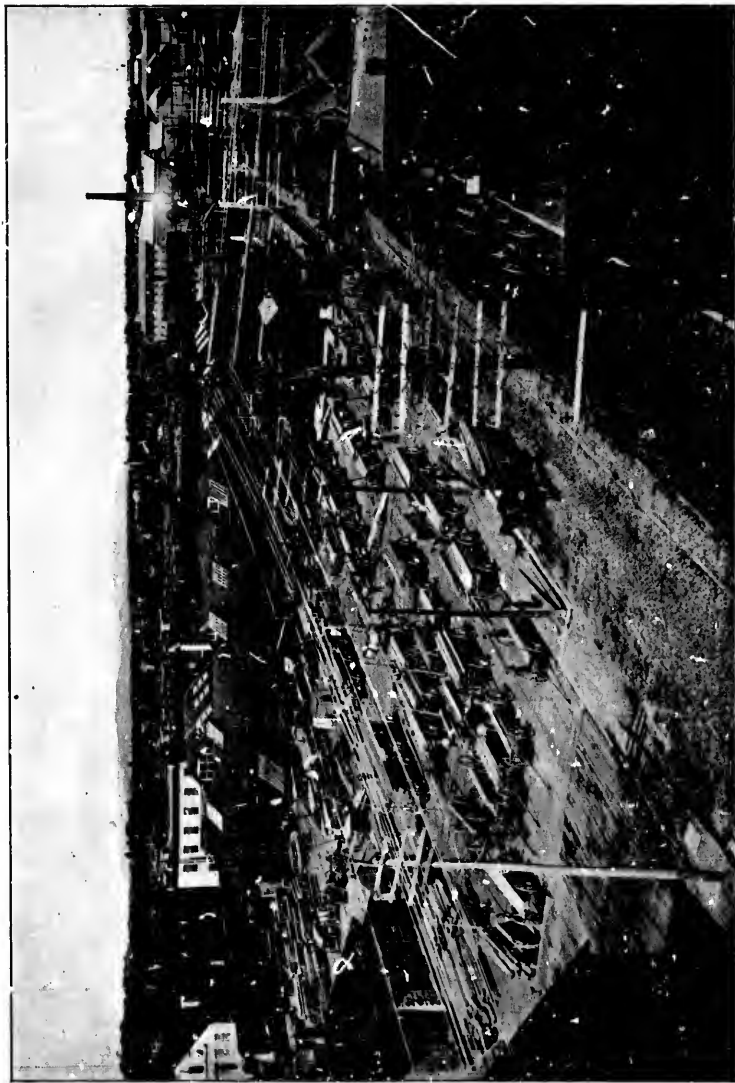
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THE WOOD INDUSTRIES OF CANADA.

stuff. Looking out on the water at the back of the mill one sees a square mile or more of pine logs floating in the booms waiting for the saw. These timber ponds are connected by telephone to the furthest extremity with the mill. The logs as required are steered to the bottom of a chute, over which an endless chain passes. The logs drawn up by the chain are either passed to the bandsaws or twin-circulars to be slabbed, and then on to the gang-saws to be converted

chute at the water's level, their further movements are entirely controlled by machinery well managed.

The immense bandsaws, of course, cut only one board at a time of any thickness desired, but the speed with which the truck comes up to the saw and returns automatically for the second cut is surprising. Two men on the moving truck handle the log from their side, while an operator close to the saw controls the truck and the dogs, or niggers,



GENERAL VIEW OF J. R. BOOTH'S MILL BEFORE THE FIRE.

into deals or boards. They then travel on continuously moving rollers to the "butting" tables, at which operators, who manipulate a battery of circular saws on swinging arboars, watch the approaching boards, and saw off their ends, so as to get the greatest possible length out of them—16 ft. is the limit. If the edges of the board are rough or uneven it first passes to the edgers and afterwards to the "butting" table. As soon as the logs are pushed into the

by which the logs are turned and held ready for a cut. These dogs perform their function with appalling power and speed. There is no escape from their clutches, and a board is bound to be true when it leaves the saw.

The boards are now ready to be conveyed to the yard, and are carried on endless chains to the assortment platform, illustrated on the next page, and transferred to the cars for conveyance to their destinations.

It is all the intricate auxiliary machinery for conveying and handling the stuff which enables the mill to record such an output. It would be an impossibility to handle the amount of stuff by hand labour or without automatic machinery. The largest logs and planks are tossed about with lightning rapidity, as though they were mere toys. The outside slabs and refuse are conveyed on rollers to the outside of the mill, where they are received at the top of the inclined table by circular saws which cut them into even lengths; they then pass into troughs and move along on an endless chain, and as they pass are sorted by men placed at intervals, who take out the various pieces, according to what they are suited for, and throw them on to trucks, which are wheeled away as they become loaded.

Most people in the timber trade in England are more or less familiar with the large American circular saws, but it is necessary to see them actually at work at high pressure to gain an idea of their capacities or the speed at which they can be used. The logs are here cut quite wet, just as they leave the water, and of course a higher speed can be used than with dry timber, but it is surprising to see the rate at which the saw passes through the wet logs in a cloud of spray.

The machine which attracts the attention most is the large "gang saw," or what is known as "Wickes oscillating gate," a most powerful machine, and of which we give illustrations and particulars on another page.

A night visit to this mill is most weird and enchanting.

Everywhere, even the booms are lighted brilliantly by electricity in every part, and the same routine goes on as in the day time. The gangs and circulars, buzzing and vibrating, keep up their merry tune, the logs come up the chute, the deals and boards are sorted and piled for delivery, and the roar of the neighbouring Chaudiere Falls is the everlasting accompaniment.

Mr. J. R. Booth, whose portrait we give to our readers, is a remarkable man, and his business career is an example of what may be done by industry and perseverance. Forty-four years ago he was a millwright in Ottawa, with no capital but his skill and industry. He rented a mill, and ran its one saw for eight months. Then fire destroyed it. There was a small mill lying idle on the present site of Mr. Booth's great establishment. It was rented by men who intended to start in business, but the trade fell through, and the young millwright secured a lease of it for 10 years. He started on a small scale with a single saw. His first encouragement came in the shape of a contract for furnishing lumber for the Parliament buildings, awarded in competition with other bidders. He worked out his contract at a substantial profit, and purchased the saw-mill after three years' occupancy. That was in 1860. In war times his business was very slack, and he was compelled to take a partner, but the outlook was so doubtful that the latter retired at the end of a year. Mr. Booth had a large stock of lumber on hand, and shortly after his partner left a brisk demand sprang up, and he sold all he had. This gave him a good start. About this time several tracts of timber land along the Ottawa River were offered for sale, comprising the estate of John Egan, who had owned a tremendous quantity of timber. Mr. Booth was doing a small business with the bank, and the officials had confidence enough in him to advance a sum, for which he paid 7 per cent. interest. With this money he secured a large limit at a fraction of its value, and increased the capacity of his mill by putting in two gang saws. He used all the money he made and all that he could get credit for in buying more timber limits, running largely into debt. This proved to be a wise policy. To-day

he owns more fine timber-land than any other man in the Dominion.

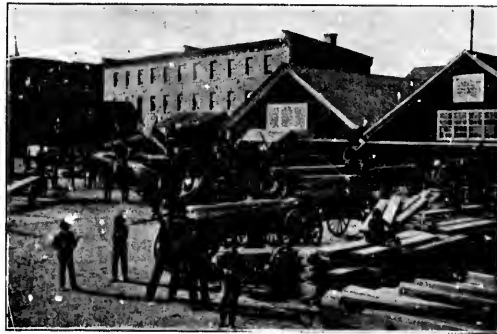
Having more supplies to draw upon, and a bigger market opening, Mr. Booth again added to his mill plant. Fortune favoured him, and in 1882 another big addition was necessary. In 1892 he had 15 band saws and four gates in operation. This saw-mill turned out more lumber than any other in the world. Fire destroyed it in May, 1894. In the fall of 1893 he had purchased a mill adjoining the burned property. He fitted this up, and by running it night and day has managed to keep abreast of the flood of logs coming down the river.

Of late years Mr. Booth has been building a railway to Parry Sound, of which we give particulars in a separate article.

The illustration we give of the general view of Mr. Booth's mill was taken before the destruction of the new mill in 1894, which contained fourteen large band saws, four gangs, four twin-circulars, and a quantity of smaller machinery.

In the forests surrounding Lake Nipissing Mr. Booth's lumbermen cut hundreds of thousands of logs. When he purchased these limits years ago, before the railroad touched the shores of the lake, there were many doubts expressed as to his wisdom. The outlet for the waters of Lake Nipissing is the Georgian Bay, and how Mr. Booth proposed to get his logs to Ottawa was somewhat of a mystery. Five miles from Lake Nipissing to the north-east is the Mattawa River, an important tributary of the Ottawa.

Between Nipissing and the Mattawa is the rise of land separating the waters of the north and east from those of the west and south. Mr. Booth put down five miles of track connecting the two bodies of water, and built a great barge on which he floated a standard size locomotive from the Canadian Pacific Railway to his isolated track—a feat that was applauded far and wide in that region. For twelve years that locomotive has been puffing back and forth transferring logs over the watershed. A little settlement has sprung up at Wisawasa, the post-office station at the



J. R. BOOTH'S ASSORTMENT AND LOADING PLATFORM.

Nipissing end. A little woollen mill nestles at the bank of the stream which, farther along, furnishes the power to operate the machinery of the log transfer station. A dozen hands are employed. The wool furnished by the surrounding country is spun and woven into a surprising variety of warm and serviceable fabrics, which find a market not merely in the surrounding country, but even in Ottawa and other cities.

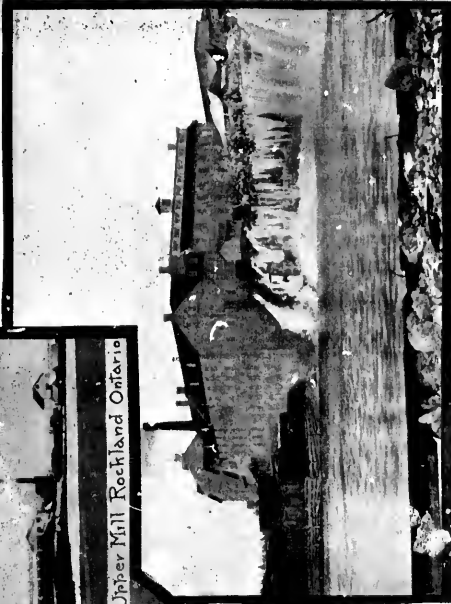
W. C. EDWARDS & CO., LIMITED.—One of the most extensive and best-known firms of lumber manufacturers in the Ottawa district is that of W. C. Edwards & Co., Limited, whose headquarters are at Rockland, Ontario, with branch mills and a city office at Ottawa. The firm consists of W. C. Edwards, M.P., as president, J. C. Edwards, John A. Cameron, James Wood, and John A. Cameron, jun.

Both in the English and United States markets the concern is well known, and their production is held in high estimation for good quality and manufacture, the "Edwards' cut" of deals being regarded in England as a "crack" stock.

At Rockland, on the river Ottawa a little over twenty miles below the town, they have two mills, the larger of which is employed in manufacturing deals and planks for the English market, and the smaller ones turning out boards, principally for the States.



The Western Lumber Yard & Rockland Mill



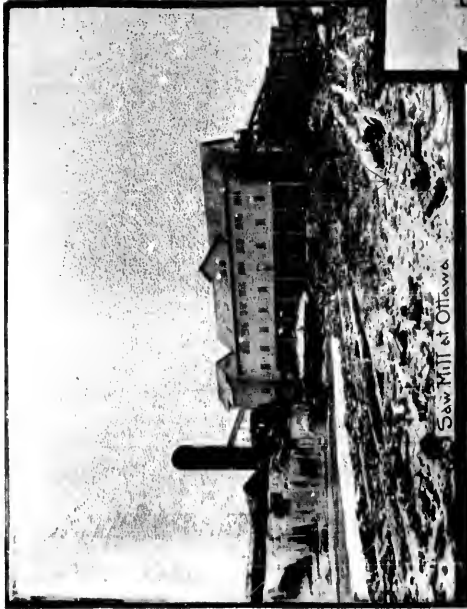
Sash and Door Factory Ottawa At the Rideau Falls

W.C. EDWARDS & CO. LTD. SAWMILLS



Upper Mill Rockland Ontario

SASH & DOOR LUMBER YARDS



Saw Mill at Ottawa



Upper Mill at Rideau Falls

Sash and Door Factory, Ottawa At the Rideau Falls



Rockland Timber Yard



Rockland Mill from timber yard



Interior of the Lunge Mill Rockland



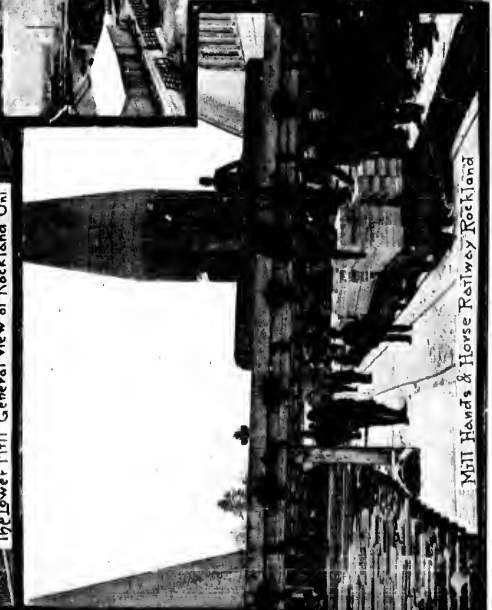
Rockland
Ontario



Ottawa
Canada



The Lower Mill General view of Rockland Ont



Mill Hands & Horse Railway Rockland

Members of the Board of Directors of the Rideau Falls

Regarding it from all points of view, the main mill is the most complete and efficient to be found in Canada or elsewhere. You can trace in the perfect order and arrangement of the machinery and appliances to secure economy in labour, maximum of production, and safety and comfort of operatives, the organising mind of Mr. Edwards, the president. The architectural features of the mill, placed on a point of land jutting into the river, is, as will be seen from the accompanying illustration, picturesque and businesslike; indeed, it is an ideal site for a saw-mill. The building is sound and substantial, resting on granite foundations. On the ground level area are placed a pair of engines, with 24 in. cylinders and 3 ft. stroke, furnishing about 700-h.p., and they are fed by twelve boilers, in which is consumed the sawdust; also all the shafting and driving gear for the mill, which is on the floor above. The saw-mill machinery is of the best and latest design. There is no crowding, but in all the gangways ample room for circulation, and the saws and conveying machinery are so arranged, and the operations performed so smoothly, that the course of manufacture almost appears to work automatically. Two large Wickes gangs, a pair of twin-circulars, two large band-saws, besides three small band-saws for splitting, and two circulars, are always running, and the daily capacity of this mill is as large as any in the district. The sawdust is conveyed by cyclones direct to the furnaces, and the waste wood is consumed in a furnace 1.45 ft. high and 30 ft. in diameter, built in the yard. The booms of saw logs in the river extend along all the water space between the two mills—over half a mile—where a stock of 100,000 logs usually lies, and a reserve stock of logs is kept in one of the bays of the river close by.

The second mill, at Rockland, is a board mill, somewhat smaller than the lumber mill, but equally substantial in construction, as will be seen by the illustration, and equally well designed. It contains a gang saw and trimmers, also tie and shingle machines, &c. Power is supplied by a pair of engines, 22 in. diameter and 3 ft. stroke, supplying 300-h.p., and fed by five boilers.

The river frontage of the property is a mile in extent, and it is docked the entire length, so that there is unlimited accommodation for loading goods for water carriage. The back of the yard is skirted all the way by the track of the Canada Atlantic Railway, sidings from which run into various parts of the yard, by means of which ready connections can be made with the railway systems of the United States.

The ample stock of manufactured wood carried by the firm is carefully piled according to description and quality in the spacious yards, which stretch for a mile in length by a quarter of that measure in width, but with a clear space of 300 yards preserved around each mill. At the east and west ends of the yards the board stocks are piled, and in the centre spaces the deals. A considerable stock of red pine sleeper blocks for the English market has been made this year, a part of which is in stock and piled in the yards, as well as large stocks of sawn laths, shingles, &c.

The noticeable features of this yard are the carefully-thought-out facilities which prevail for the ready and economical handling of the lumber, both from the mills for distribution through the yards and from the stacks for loading to rail or craft. The yards are a picture of neatness and order, and are an example of what administrative skill can accomplish in the conduct of the lumber business.

The head offices of the company are situated near the main mill, and close by are the electric light generating stations for lighting the mill and the fire-engine house.

About 800 men are employed at these mills, and their occupation is continuous throughout the year, because when the river is frozen up and raw material is unobtainable, they go up into the woods to manufacture saw-logs.

The timber limits owned by the firm are situated in the Ottawa Valley on the North Nation, Gatineau, Kippewa, Dumoine, Cologne, and Black Rivers, tributaries of the Ottawa River. They contain some of the best pine in the district, and are carefully worked with regard to continuous supplies in the future. In some of the districts pine is reproducing itself freely, and on some of the worked area pine is being cultivated from seed with satisfactory results.

The Ottawa mills of the firm are situated at New Edin-

burgh, and are worked by water power from the Rideau Falls, and are under the sole management of Mr. James Wood. One of the mills is used for sawing up lumber, and obtains power from three Stephenson duplex turbine-wheels, generating 700-h.p. The machinery consists of one Allis and two Prescott band saws, and a Wickes gang, with necessary trimmers, edgers, &c.

The planing mill at the New Edinburgh mills is one of the most complete establishments of its kind in Canada, and consists of seven buildings devoted to planing, sawing, drying and storing. At the entrance are the offices of the superintendent of the sash and door factory, Mr. Armstrong. The large stone building in the front contains the draughtsmen's offices, at the back of which is the large work-room and cutting-up department. The sash and blind department and box factory are fully equipped with improved machinery. The dry kiln is 48x48 ft., and is situated above the boiler-room. On the first story are the door department, where the pine doors for export are manufactured, and the finishing and paint room, with glassroom above. A store room, 40x100, is situated above the box factory. The third story is used for storage purposes. The building is heated by the Sturtevant hot-air system. In the engine-room are two boilers of 85-h.p. each, which are used for heating and drying, and drive a small engine at night. A Stephenson duplex water-wheel of 100-h.p., supplied by a 40 ft. head from the Rideau Falls, operates the machinery.

Another building is a frame structure, 84x36 ft. The ground floor is used for storing kiln-dried lumber, and the top floor for the sashes and doors.

The planing mill proper is 130x35 ft., the ground floor containing the planing and moulding machines and resaws, and the top floor being devoted to mouldings. Beneath the building is a Stephenson duplex water-wheel of 200 h.p. and 43 ft. head.

In a two-story building, 24x96 ft., are stored the fancy hardwoods and other kiln-dried lumber, while in another building, 132x48 ft., the dressed lumber is taken care of. A shed of two stories, 156x48 ft., has recently been completed, which will be used for rough lumber, and will have a capacity of one million ft. The heavy hardwood shed is 134x20 ft., and is situated alongside the new offices.

Mr. W. C. Edwards is a man of ability and strong individuality. He created the establishment at Rockland by his own perseverance and energy, and he has all along and still personally manages the concern. When he first selected the spot for his mills there were only two families living in the locality, and now the village has a population of 1,300, who are entirely dependent on this business for their support. The mill hands are nearly all French Canadians who are an industrious and skillful race of people. This article would be incomplete without the following brief history of the business and biographical sketch of the founder.

Mr. W. C. Edwards, M.P., is a native Canadian, having been born in Clarence, Russell County. His father was a native of Portsmouth, England, and settled in Canada in 1820. Having entered business at the age of 19, in the employ of Cameron & Edwards, lumbermen, of Thurso, with whom he remained some years, Mr. Edwards, in 1868, formed a partnership with Mr. James Wood. They erected a small mill at Rockland, on the River Ottawa, and traded as W. C. Edwards & Co. Their venture proved so successful that in 1871 Cameron & Edwards gave up their establishment at Thurso and joined with W. C. Edwards & Co., at Rockland, erecting a larger mill, which caused their business to steadily increase until 1875, when the locality was visited by a fire, which unfortunately destroyed the entire property of the firm, including a large stock of timber. To add to their misfortunes, their insurance did not cover one-third of the loss. With their usual energy and grit, the firm went to work the same year to rebuild, and the spring of 1876 saw them at work again.

Mr. Edwards has for many years been a Justice of the Peace and Reeve of Rockland, President of the Agricultural Society, and has been elected four times in succession M.P. for Russell. His practical knowledge of the timber trade and agriculture lends weight to his remarks, and enables him to wield a strong influence in the House when these subjects are up for discussion.

It is surprising how such a busy man, with so much on

his hands as the personal management of a business of such magnitude, can make time to attend to public affairs, but when once a man gains prominence in such matters it is difficult to withdraw. Mr. Edwards' political ambition does not appear to be commensurate with his opportunities. His extensive business interests constitute a powerful political influence in those constituencies surrounding the county he represents in Parliament, and although wielded in no drastic fashion, it contributed largely at the last general election to the return of half-a-dozen supporters of the Hon. Wilfrid Laurier from constituencies previously represented by Conservatives. It is well known that the Liberal leader acknowledged this by offering Mr. Edwards a portfolio in the new Cabinet, which he was strongly urged by the local lumber interest to accept. But he chose rather to devote to an increasing business those talents which would have made him a valuable acquisition to the Liberal administration.

W. MASON & SONS.—This firm own a steam saw-mill situated at Bayswater, Ottawa, equipped with latest improved machinery, of which we give an illustration below. The capacity of the mill is from 60,000 ft. to 90,000 ft. board measure of timber, deals, and lumber, 35,000 shingles, and 40,000 laths per day. Spacious yards, extending over 24 acres, and giving piling room for 10 to 12 million feet of lumber, besides other goods, surround the mill. A Canada Pacific Railway siding extends into the yard, and the C.A. Railway and docks are also very convenient. The firm does a large local trade in timber, rough and dressed lumber, &c., and also a considerable export trade both to Great Britain and the U.S.

The present members of the above firm are Messrs. George Mason and Wm. Thomas Mason. The business was originally started by Messrs. Robert & George Mason in 1861, who ran a small dimension mill at the Chaudière. About the year 1868 they sold the business to their father, Mr. Wm. Mason, who purchased the present site, on which he erected a small mill and conducted the business with Mr. Robert Mason, his eldest son, as manager, until 1886, when his three sons, Robert, George, and Philip N., were taken into partnership.

Mr. Wm. Mason died in April, 1888, and the business was carried on by the sons until November, 1889, when Robert and Philip sold their interest to George and Wm. T. Mason, who have since carried on the business.



W. MASON & SONS' MILLS, BAYSWATER, OTTAWA.

THE E. B. EDDY COMPANY carry on an extensive and varied wood manufacturing business on the Chaudière at Hull, where matches, woodenware, pails and tubs, wood-pulp, paper, &c., are produced in enormous quantities. Mr. Eddy was at one time largely interested in the lumber business, owning extensive limits, and running saw-mills for cutting deals, &c., but the firm now use all their wood in making their own specialties. Mr. Eddy is identified with the growth of the city of Hull. When he first came to the place, and commenced the manufacture of matches in 1854, the population consisted of about 100 persons; the city now contains 13,000. His concern now employs about 2,000 hands, but when he was conducting the lumber business, the total number employed was 3,500. Mr. Eddy has been the pioneer in many successful local developments; he was the first to float saw-logs to the north shore of the Chaudière

Falls, and was the introducer of the electric light to the district. Although he has been busily engaged in extensive business for so many years, Mr. Eddy preserves a wonderful activity, and he has this year returned from an extended trip to Europe, which included a visit to Sweden.



R. THACKRAY'S JOINERY WORKS, OTTAWA.
J. D. DAVIDSON, MANAGER.

R. THACKRAY'S JOINERY WORKS, Ottawa, has the largest saw-mill in Canada, and I think it can also claim to have the best equipped and most complete joinery establishment in that owned by Mr. R. Thackray. The manufacture of joinery, especially pine doors to Europe, is—as it certainly should be—a growing business from the colony. Both Mr. Thackray and his energetic manager, Mr. James Davidson, understand the trade and have made it their study. At frequent intervals one or the other takes a trip to England to watch the market there and see how their productions are appreciated. The firm have a good local trade in planed wood of all kinds, plain and ornamental doors, sashes, blinds, &c., and are largely interested in local building operations.

Like most of the wood-working firms in Ottawa, Mr. Thackray's has suffered from fire. The business was established in 1876, and in 1890 the factory was entirely destroyed. This happened in June, and to show the energy and resources of our Canadian manufacturers, a larger and more complete factory was ready for work in August of the same year.

The ruling idea on the other side of the Atlantic is to have in wood-working factories every possible labour-saving machine, and that of the latest and best design, therefore with what appears a moderate staff of hands much more is produced than with us. Much attention is also paid to the design of the mill and the position of the machines for handling the stuff in course of manufacture. Ample kiln-drying accommodation is provided, so that only seasoned stuff shall be used. All these points are carried out to their perfection in Mr. Thackray's mill, and he is thus able to turn out a well-finished, sound door.

The dowel door is generally conceded by all who have handled them to be the neatest, most durable, and best. It has a better appearance in the white than the old-fashioned mortice and tenon door, is less likely to cast, and is stronger, because in the hardwood dowels used the grain of the wood runs at right angles to the frame, and if anyone will try to take one of these doors to pieces he will at once see the value of the principle.

In Canada the front doors of dwellings are more artistically treated than with us, and very varied and beautiful designs of doors, both solid and with lights, are everywhere seen. At Mr. Thackray's showroom a number of fine specimens can be seen. If these goods were once introduced into England they should go well for the better class of dwellings, and the somewhat cheaper series ought to prove of service to the speculative builder.

Mr. Thackray is also a lumberman, and draws his supply

of the raw material from limits in Ottawa County, which places him in an advantageous position.

His factory is situated in Sparks Street, which is the main thoroughfare of the town, and extends back to

ment, manufactured by Hvet & Smith, of Detroit; Andrews of Chicago, and Standard Dry Kiln Company, of Indianapolis, Indiana. Their united capacity is in the neighbourhood of 160,000 feet board measure.



R. THACKRAY'S CAR.

Queen Street. It is a handsome brick structure of three stories and a basement, and is filled with the most improved machinery for saving labour and insuring good work. Some of our joinery establishments could take points in the

The offices, as will be seen from the illustration, stand level with the street, and in the windows are displayed specimens of ornamental joinery.

Mr. Thackray is ably assisted in the business by his sons



R. THACKRAY'S CAR.

rapidity with which the operations are effected by some of the American tools.

In all joinery goods it is essential that the wood should be well seasoned, and there are three kilns in this establish-

and stepsons. Mr. James Davidson is general manager, Mr. R. J. Davidson attends to the sash, door, and blind department, whilst the sales and delivery portion is looked after by Mr. W. Thackray

THE WOOD INDUSTRIES OF CANADA

The illustrations on the previous page show two of the six cars which Mr. Thackray paraded in the annual labour demonstration in Ottawa last September.

1808, and were enlarged and improved from time to time. They are supplied with power from the Ottawa River. A very substantial stone dam, about 1,200 ft. in length, crosses



THE HAWKESBURY LUMBER CO'S MILLS.

Importers of pine doors would do well to communicate direct with Mr. Thackray, or with his agent in Liverpool, Mr. T. E. Nettle.

Mr. Thackray has been shipping doors and box boards to England for a number of years, and a proof that his goods are appreciated is that his trade in that direction is constantly increasing.

Amongst the saw-mills in the Ottawa district, the following are the principal firms engaged in manufacturing for export:—

THE HAWKESBURY LUMBER COMPANY.—The Hawkesbury mills, of which we give two illustrations, are situated on the Ottawa River, in the County of Prescott, Ontario, on the first break on the Ottawa, half-way between



HIRAM ROBINSON.

from the Ontario side of the Ottawa to a large island, giving the necessary head. The property remained in the hands of the Hamilton family until the death of the Hon. John Hamilton in 1888, when it became the property of the Hawkesbury Lumber Company, Limited, the company being composed of Hiram Robinson, president; H. K. Egan, managing director; and R. L. Blackburn, secretary. Mr. Robinson, whose portrait we present, has spent all his business life in connection with the Hawkesbury mills. Mr. H. K. Egan is the son of the late Hon. John Egan, who was well known in the Ottawa trade earlier in the century, and whose principal operations were confined to the square and waney timber trade, and he took out as many as 100 rafts in a single



THE HAWKESBURY LUMBER CO'S MILLS.

Ottawa city and Montreal. The mills were first founded by Thomas Mears in the year 1804, and subsequently became the property of William and George Hamilton in the year

year. Mr. H. K. Egan has been connected with the trade all his life, and was one of the promoters of the Ottawa ship canal; there is no man in the district who has had more

practical experience of all branches of the trade, or one who is better posted in all the movements of the markets.

These mills were amongst the first large saw-mills established on the Ottawa river, and their output has been principally deals for the English market, where their brand H is well known. The supplies are drawn from limits on the Du Moine, Black and Swoyo Rivers in Quebec Province, and on the Petawawa River in Ontario.

The sawmill is situated at Braeside, on the Ontario shore of Chats Lake, an expansion of the Ottawa River, and some 40 miles above Ottawa City. At the time of purchase it had a capacity of 80,000 ft. per day of 11 hours, but has been enlarged and remodelled till now it has a capacity of 250,000 ft. in the same time. The machinery consists of twin circulars, a 56-in. double cant gang, and two band saws, with all necessary steam feeds and canters, edgers, butters, resaws.



GILLIES BROS. CO.'S, LTD., MILLS, BRAESIDE, ONT.

In May last two of the mills were destroyed by fire. One of these was a spare mill and used only in the early spring. Of the remaining mills, three in number, one is furnished with a Wickes oscillating gate, a pair of twin circulars, and a large circular, having two double edgers, &c.; another is a band mill with double edge and butters, with piling, lath two shingle machines, and band resaw, the third mill having two doubling gangs, with their accompanying slabbing gangs, and double edgers, and one circular splitter.

In an additional building is contained a slab splitter and butter, also a deal edger and butter. It is probable that the company will add another mill at an early date.

There are in connection with the mills 17 miles of double piling tram car tracks and a piling capacity for 80 million feet of lumber. The town of Hawkesbury and the Hawkesbury mills have both rail and navigation facilities

lath and picket machinery, &c. These are driven by a cross compound condensing engine, with cylinders of 26 in. and 46 in. diameter and 40 in. stroke, supplied by a battery of eleven boilers. There is also a 25 horse-power engine driving deal trimming saws, and an independent engine and dynamo for electric lighting. The piling ground has a capacity of 40,000,000 ft., the lumber being loaded directly from piles into the railway cars, there being some five miles of track owned by the company, and connected directly with main line of the Canadian Pacific Railway. The Ottawa, Arnprior and Parry Sound Railway also runs within two miles of the yard, with which connection will probably be made shortly.

During the early years of the firm, square timber for the British market was extensively manufactured in addition to sawn lumber, but of late years little has been done in this way. During the present winter, however, they will



GILLIES BROS. CO.'S, LTD., MILLS, BRAESIDE, ONT.

GILLIES BROS. CO., LTD.—The firm of Gillies Bros., consisting of James, William, John, and David Gillies, four sons of the late John Gillies (himself a prominent lumberman on the Mississippi, a tributary of the Ottawa River, a generation ago), commenced business at Braeside in the year 1873, buying the mills at that place, and the limits on the Chouonge River belonging to the Rev. Henry Usborne, and have since been actively engaged in the manufacture of sawn lumber and square timber.

take out a considerable quantity of square and waney white pine of large size and fine quality, which has been sold to a leading Quebec exporting house.

Until lately the mill has sawn mostly for United States and South American markets, where its product has enjoyed a reputation for good manufacture and regular grading. During the past two or three seasons, however, the company has turned its attention to British markets, and by continued careful attention hope to win for their goods a similar re-

putation there. In the past, Messrs. W. & J. Sharples, of Quebec, have bought their red deals; and Messrs. Watson & Todd, of Liverpool, England, their white pine deals. Messrs. Watson & Todd also take their 1897 cut of white pine deals. The company also manufacture boards and planks, regular English stock size, as well as sidings of all thicknesses. Their total output last season exceeded 35,000,000 ft. B.M.

The firm employs some 250 men at the mills, and 600 in the woods, and have over 1,200 square miles of timber limits, all of which are on waters tributary to the mill. In 1894 the firm was changed to a joint stock company, known as the Gillies Bros. Co., Limited, with the four members of the original firm and four sons as the shareholders and directors, thus making three consecutive generations who have been engaged in the business.

R. H. KLOCK & CO.—Messrs. James B. and Robert A. Klock comprise the firm of R. H. Klock & Co., whose head offices are at Klock's Mills, Ont. Besides manufacturing sawn lumber they have for many years been

brick, stone and iron, 24x56 ft., and contains one 125 horse-power boiler and a 75 horse-power engine, with arc and incandescent dynamo to light the mill and lumber yard. In the mill there are 300 electric lamps of 15 candle-power each. The power house also contains one Worthington Underwriter pump, capable of throwing 1,000 gallons of water per minute, with four hose attachments. The fire protection is the Grinnell sprinkler system, there being over 900 sprinkler heads in the mill, supplied by a tank holding 24,000 gallons of water elevated 95 feet above the ground. The said tank is also supplied by the Underwriter pump mentioned above.

In the lumber yard there are ten miles of small railway tracks to carry the lumber from mill to yard, which requires 250 lumber cars. There are also five miles of standard gauge tracks laid with 50 lb. steel rails to accommodate cars to load lumber for shipment over the Ottawa, Arnprior, & Parry Sound Railway. The mill contains three Allis band-saws and one Wickes gang, two six and one four saw-edges, and two eleven saw-trimmers. The



THE ST. ANTHONY CO'S MILLS, WHITNEY, ONT.

engaged in the square timber business, and purpose taking out a small raft during the approaching winter. Their mills are located at the following points: one steam saw-mill, with lath and shingle mills and planer, at Bonfield, Ont.; one steam mill at Moore Lake and one band and circular mill at Aylmer, Quebec.

ST. ANTHONY LUMBER COMPANY.—Located at Whitney, at the foot of Long Lake, 144 miles west of the City of Ottawa, is situated one of the most complete saw-mills in Canada. The proprietors are the St. Anthony Lumber Company, which is composed of Messrs. E. M. Fowler, of Chicago; Arthur Hill, of Saginaw; and E. C. Whitney, the manager, located at Ottawa.

The company purchased limits from Messrs. Perley & Pattee, of Ottawa, in 1892, and have since secured other limits, until to-day they possess nearly 120 square miles from which to draw their supply of logs. These limits are on the head waters of the Madawaska and its tributaries, and are said to be among the best in Ontario. They contain a vast amount of virgin white pine. Their property at Whitney consists of some 1,200 acres.

The mill was erected in the spring of 1895, and on July 25th sawing was commenced. The main building is 85x238 ft., with shingle mill 48x52 ft., and lumber sled 32x276 ft. The saw floor of mill is without posts, the roof being supported by a truss. The engine and boiler house is 81x82 ft., built of brick, stone and iron, covered by an iron roof. It contains eight boilers, 60 in. x 20 ft., each boiler having eighteen 6 in. flues. The engine is an Allis Corliss of 900 horse-power. The power house is of

mill is supplied with all the latest and best labour-saving machinery, such as steam niggers, steam fed, steam flippers and kickers, required to handle logs and lumber.

The output of the mill is white pine lumber, lath, and shingles. The capacity is 200,000 ft. per day of 10 hours. Over 300 men are employed at the mill, and about 500 in the woods in winter.

McLACHLIN, BROS.—The mills of the above firm are situated at Arnprior, at the confluence of the Madawaska and Ottawa rivers. Here a little more than forty years ago the late Daniel McLachlin purchased the water power and 400 acres of land in the township of McNab, within the limits of which the municipality now stands. Among the first buildings to be erected by Mr. McLachlin was a water-power saw-mill. This was in the year 1862. A little later another mill was built, and both these mills have been running every season since without intermission. A third mill, operated by steam, was built in 1871 on the shore of Chats Lake, but was destroyed by fire four years later. It has since been replaced by another, built by the present firm, while in the year 1872 a fourth mill was constructed.

The two last-named mills are equipped with every possible appliance which science has invented for the manufacture of lumber, and the quality of the manufactured product speaks well for the enterprise of the proprietors.

During the sawing season 700 men are employed, and from 900 to 1,000 are engaged in logging operations in the woods. The annual output has reached as high as 80,000,000 ft., although last season only 55,000,000 ft. were

manufactured. The piling ground is said to be among the largest in the world, there being ten miles of track.

The firm of McLachlin Bros. are owners of very extensive limits on the Madawaska, Bonchehere, Petawawa, Amable du Fond and Coulogne rivers, and a few years ago purchased 500 miles of virgin timber land on the Upper Ottawa. Their logs are taken a distance of about 400 miles, and two seasons are sometimes required for floating them to the mills. The business to-day is carried on by Messrs. H. F. McLachlin and Claude McLachlin, surviving sons of the late Daniel McLachlin.

The firm of **GILMOUR & CO.**, Trenton, have run a large saw-mill at Trenton since 1875, in connection with which they have had a planing mill and door factory, and a portion of the production has been shipped to England. In 1892 they purchased extensive limits in the Lake Nipissing district, and they have erected a fine, large mill at Canoe Lake, which, being on the route of the new Parry Sound Line, is, therefore, in direct railway communication with Ottawa, and they are transferring some of the machinery from Trenton to the new mill. They have some splendid pine on these limits, and this winter they are taking out waxy board pine for the English market. The name of Gilmour has been long known and respected in the timber trade, and it is 30 years ago since they commenced shipping square and waxy timber from Quebec.

The **RATHBUN COMPANY**, Deseronto, is well known in Britain, the Cape, and Australia, as manufacturers of pine doors, mouldings, match splints, &c., but it is not generally known that it is one of the largest trading concerns in Canada, and an establishment in which the conversion of the products of the forest to their fullest extent is carried on as an exact science.

The factory, or it would be better to say the town—for almost everyone of the 4,000 inhabitants depends directly or indirectly on the Rathbun Company—was established by the father of the present managing director, Mr. Edward W. Rathbun, in 1848, and the scientific principle of the original plan on which the works were started has been steadily worked out, with such success that numerous flourishing industries depending on forest products for the raw material have crystallised round the saw-mill business, till the works have grown to their present gigantic proportions.

The company own large timber limits on the rivers flowing into the Bay of Quinte, on which Deseronto is situated, and they are worked in such a manner as to secure a permanent sufficiency of timber to justify the establishment of substantial industries at this locality. Other features of great importance are the economic manipulation of the coarse and refuse products of the forests to enlarge and perpetuate the yield therefrom, and the profitable utilisation of the waste of the mill.

The plan adopted by this company was inspired by the frequent depressions in the lumber trade which influenced operators at such periods to cut the choicest trees, which alone would yield a margin of profit, and thus lowering the average quality and value of the timber remaining.

Some idea of the extensive operations carried on at Deseronto and neighbourhood, which provide employment all the year round to about 3,000 men, will be gathered from the following list of departments or interdependent businesses, each one the logic and natural outcome of some other, and all dependent in the end on forest supplies.

In addition to the large saw-mill there is a sash and door factory turning out about 500 doors per day. There is also in detached buildings:—

The machine and blacksmith shop.

The locomotive shop.

The shipyard, for building and repairing vessels plying on the lakes and rivers.

The car shops, in which are built freight and passenger railway cars for both steam and electric railways.

The cedar mill, where sleepers, shingles, and bill timber are manufactured.

The wholesale coal department.

The chemical works, consisting of 16 kilns, in which the waste hardwoods are utilised for distillation. A cord of wood produces about 45 bushels of charcoal, quantities of alcohol, acetate of lime, oil of tar, pitch and pyrolignite of iron.

All the gas required for lighting the factories is made on the spot, and even the refuse of the mill, such as wet bark or rotten stuff, is consumed in specially constructed furnaces, which feed four steam boilers of 100 h.p. each. Little of the sawdust is burnt as fuel, but is utilised in the terra-cotta factory. The company own a patent for making porous

fireproof building material from the requisite proportions of sawdust and clay mixed, pressed, and dried, and burned in kilns. The sawdust consumed in the process of burning furnishes largely the fuel required to render the product of the hardness and porosity required. It is about one-third the weight per cubic foot of ordinary building brick, but still retains ample strength.

The operations carried on by the Rathbun Company offer to Canadians an object lesson as to what can be done in developing the manufactured wood trade with Great Britain. They are exporting there, and to the Colonies, pine doors, mouldings, electric casings, piano keyboards and rails, lumber, both pine and hardwood, besides many sundry articles, amongst which are match splints, broom-handles, knife-boards, dowels, curtain prices and ends, brackets, &c.

In addition to the saw-mill at Deseronto, they own and operate one at Campbellford, on the River Trent, one at Lindsay, and one at Gravenhurst. They have distributing yards or agencies for the sale of their products at most of the towns in Ontario, also at Oswego, N.Y., and purchasing agencies at Toronto, Ottawa, and Orillia.

They control extensive Portland cement works at Napanee Mills, also three lines of railway, one of which is electric, and a steam navigation company.

There are few businesses of such a varied and intricate character and with such extensive ramifications as that controlled by the Rathbun Company, Deseronto.

It is impossible in a short article to do more than briefly allude to the many interesting processes carried on at the works, but the success of the undertaking is due to the fact that every operation is carried on and worked out with the object of utilising every portion of the produce of the forest, and profitably converting it by skill and science into some article useful to the community.

The British and Colonial agency for this business is in the hands of Messrs. Bryce, Junior, & White, of 22, Basinghall Street, London, E.C., and 107, Bath Street, Glasgow.

THE PEMBROKE LUMBER COMPANY, whose mills are at Pembroke, Ont., on the Canadian Pacific Railway Company's main line, is composed of the following:—Judge Thos. Deacon, President; John Bromley, Manager; Hon. P. White, late Speaker of the House of Commons; A. T. White, C. Chapman, and Mrs. A. Dunlop.

This is an old-established business, formerly owned by W. R. Thistle & Co. Their mills are especially fitted out for sawing dimension timber of all lengths, ship decking, building material, carrels, gutter stock, and white pine squares for turning, etc., but all kinds of thin lumber, including red and white pine deals for the English market, are also being manufactured in large quantities.

The daily capacity is 70,000 ft., quite a large proportion of which is shipped to the European market and to the United States.

THE HULL LUMBER COMPANY, LIMITED, next to J. R. Booth's, own the largest mill at the Chaudière. This business was some years carried on under the style of Buell, Hurdman, & Co., but was taken over recently by the above-named company, which is composed of A. A. Buell, of Burlington, president; W. G. White, of Albany, New York, vice-president; F. W. Avery and C. E. Read, of Ottawa, as treasurer and secretary respectively; the two last-named gentlemen act also as managing directors of the business. The two mills operated by the company are at Hull, and are furnished with the most efficient machinery. The daily capacity of the two mills is about 465,000 ft. board measure.

THE BRONSONS & WESTON LUMBER CO., LD.—This well-known Chaudière mill was established in 1833; indeed, they were the first to take up land at this locality to build a mill on a large scale. The Hon. E. H. Bronson is president and general manager, and Mr. L. Cramell secretary-treasurer of the Company. They operate by water power two saw-mills and a shingle and lath mill, with a capacity of 300,000 ft. in 10 hours. Their average output is about 20,000,000 ft., a large part of which is for the United States market.

GILMOUR & HUGHSON own large limits on the Gatineau river, and run three large sawmills, the largest being at Hull, on the Ottawa, and two smaller ones at Chelsea, about eight miles up the river. At the Hull mill steam power is used, two engines of 500 h.p. each, and ten boilers with a capacity of 1,500 h.p. As the lumber leaves the mill it is passed to the cars on rollers in an unique manner by means of a swing table. The capacity of this mill

is 250,000 ft. per day. A very clever device is used at this mill for automatically counting the logs as they are drawn up the endless chain, the invention of Mr. John Craigie, the mechanical superintendent. The Chelsea mills are worked by water power and have a combined capacity of about 33,000 ft. per day. The lumber is conveyed to a large lumber yard at Ironsides by means of a water flume 3½ miles in length, 2ft. wide, and 20 in. deep. The deals made by this firm are exported to England, but they also manufacture largely for the United States market. Their production consists very largely of first quality pine, last season as much as 45 per cent.

THE IMPERIAL LUMBER COMPANY, LTD., of Warren, Ont., whose head office is in Toronto, do an extensive business in timber and lumber throughout Canada and the Eastern States, and, having commenced exporting to Great Britain a couple of years ago, they found it necessary, in order to meet the increased business, to open a London office, which was done last year.

The Company makes most of its shipments from Montreal, but does not ship either waney boards or square timber, confining its operations to deals and boards, and one of its greatest objects is to acquire a reputation for a high standard of quality.

The mills, which are situated at a place called Warren, on the C.P.R., a little to the north-west of Lake Nipissing, were unfortunately burnt down in April last year, but have now been rebuilt with modern improvements.

The president of the company is Mr. Chas. D. Warren, of Toronto, who is also president of the Traders' Bank of Toronto, senior partner of the firm of Warren Bros. & Boomer (wholesale tea, coffee, etc., merchant-), one of the largest firms of its kind in Canada. Mr. Warren is also president of the Metropolitan Street Railway, and Electrical Railway in Toronto, and a director of the Manufacturers' Life Assurance Company of Canada.

The vice-president of the Company is Mr. Geo. M. Warren, who has the management of the mills.

The Parry Sound Railway.



R. R. J. R. BOOTH, of Ottawa, has recently built a new railway which runs from Ottawa to Parry Sound, and traverses a fine timber country, and two mills are already erected on the route.

He turned his attention to railroads first to get an outlet for his lumber. He helped to get the Canada Atlantic to Ottawa, in order that there might be a more direct route to Atlantic ports and inland cities. He financed the project from beginning to end, and the structure was ready for trains in the remarkably short space of nine months.

The building of the bridge over the St. Lawrence was a noteworthy feat of engineering. The site is at the head of the Coteau rapids, thirty-seven miles west of Montreal. The river at this point is divided by two islands into three channels. The north, or steamboat, channel is 885 ft. in width. The centre channel is 2,210 ft. wide, and the south channel 930 ft. The total length of the bridge from north to south shore is 6,150 ft., or 1½ miles. The banks and intervening islands are low, and slope toward the water. For this reason a low-level bridge, with a swing over the steamboat channel, was decided upon.

In the steamboat channel the velocity of the current is seven miles an hour, and the dredges and barges used in the construction were in constant danger of being run into and sunk. The current was six miles an hour in the other channels, and the navigation of the tugs and barges was exceedingly difficult. The first caisson was lowered by hydraulic jacks from the deck of the barges, but this method was slow and was abandoned for the block-and-tackle system. Difficulty was experienced in placing the caisson adjoining the pivot pier on the south side, owing to the great depth of water, 30 feet, and the velocity of the current, which at this point is the swiftest in the vicinity of the bridge. The swell made by passing steamboats was severely felt. The caisson capsized after two unsuccessful attempts to place it, and its load of railway iron fell into the excavation. The next attempt to place it was successful, and no further trouble was experienced at this point. The pivot caisson, on account of its form of construction, presented a tremendous resistance to the current, five tugs and a large sidewheel steamer being unable to holl it in the swift water. Eight anchors, each hove with a 1½-inch steel wire cable, were let go 1,000 feet above the bridge line, and the cables slacked away while the caisson dropped

back into position. A floating plant furnished the electric light for night work. The superstructure is of the riveted lattice type. The spans were erected in a sheltered bay, three miles distant from the bridge, and taken on barges, floated into place and lowered on to the masonry. Notwithstanding the velocity of the current, the work was very successfully carried out. This was the first instance in which a large number of spans had been made ready and stored until it was desirable to place them on the masonry, and also the first time false work had been so built that the spans, when assembled, could be moved off it and loaded on barges, without tearing down any portion of the false work or interrupting the work of erection. The erection of the superstructure was begun September 1st, 1889, and the last span was floated into position February 19th, 1890. Trains were going over the bridge the following morning.

After its completion, Mr. Booth decided to build the Algonquin Park Air Line from Ottawa to Parry Sound. A party of 25 surveyors was sent out in the fall of 1891, drawing provisions on a hand sled. They endured severe hardships and privations. There were said to be insurmountable engineering difficulties, but a satisfactory route was found, and in July, 1892, work was begun at Carp, the next station west of Ottawa. That year 56 miles were built. In 1893, work was begun eastward from Parry Sound, and 52 miles altogether were constructed. Seventy-two miles of rails, from Eganville to Whitney, were laid in 1894. Last year 30 miles were built, and this year will close with 50 miles, the last stretch of track, to the credit of the contractors.

The grades are easy. The start at Ottawa is 250 ft. above sea level. At Summit cut the limit, 2,000 ft. above sea level, is reached. From there the grade descends to 580 ft. above the sea at Georgian Bay. From Whitney to the summit, the rise is so gradual as to figure only 1 per cent. a mile.

The location of the terminus of the road at Parry Sound is especially fortunate. On the western side of the Indian Reservation on Parry Island the engineers found a natural harbour with a perfectly protected channel, deep enough for the largest steamship on the lakes, and three-eighths of a mile in width. Docks, a roundhouse, and other railroad buildings, and two grain elevators, each of 1,000,000 bushels capacity, will be erected at the Parry Sound terminus during the coming year.

The Square Timber Trade.



THE square timber trade of Ottawa was, twenty or thirty years ago, an important industry, and in those days there was a constant procession of rafts down the river during the season. The decline of this trade has already been dealt with under Quebec. Last year only four rafts came down, but amongst them was one of remarkably fine timber brought down by Mr. W. Mackay, and purchased by Dobell, Beckett, & Co., of which we give an illustration. There are, however, some signs of an increase in this trade. During the past season a full average of recent years has been taken out, and this winter it is currently reported that more square timber will be manufactured than for many years past. Messrs. Gilmour & Co. are taking out square timber at their limits on Canoe

Lake. The Gillies Bros. Co., of Carlton Place, are manufacturing some fine waney and square pine, and R. H. Klock & Co. are taking out two rafts, about 350,000 ft. square, and waney; and the Shepherd & Morse Lumber Company are getting out square timber this year for the English market.

Amongst the square timber dealers at Ottawa, Mr. Wm. Mackay and Mr. A. Fraser are well known in the trade. The former gentleman commenced shantying in 1841, and went into business on his own account in 1843, taking out his first raft on the Madawaska river in that year. Since that time he has brought down a raft every year, and his mark, WM, is well known in the English market.

The same in the manufacture of squared timber is enormous, especially when it is of large growth, and will

square over 18 in. It may be taken that 20 per cent., and that of the best clear stuff, is wasted. When the logs are manufactured into lumber much of this waste is avoided.

The operations of this trade are extremely laborious and full of adventure. In following the course of manufacture and transport, when the whole quantity required has been hauled out of the woods, which is generally accomplished

which usually contains 100,000 cub. ft. Each crib consists of 26 to 36 pieces, and contains from 800 to 1,000 cub. ft.

The raft descends the various falls on the river by inclined planes, called "slides," erected expressly for this purpose. A single crib is passed at a time, so that when all are over, the raft must be "hauled" up again, or remade. This occurs as often as slides have to be passed.



WM. MACKAY'S SQUARE TIMBER RAFT.

by the middle of March, and when the ice breaks up, it is floated down to the main river, and formed into cribs of logs (each 24 ft. in width, so that they will just pass down the slides) by "string pieces," "traverses," or "withes, care being taken to avoid injuring the timber by any attachment. Seventy, eighty, or a hundred of these cribs form a raft

We give an illustration of the timber slide a with a crib passing through; and, also, at the beginning of the Ottawa Section, an illustration of the point on the river where the cribs are collected and "rebanded" into the raft again, which operation has to be performed many times between the forest and Quebec.



A CRIB OF TIMBER PASSING THROUGH THE SLIDE.

New Brunswick.

UNTIL the year 1784 the province of New Brunswick formed part of Nova Scotia, but in the latter year, after an influx of Loyalist exiles from the newly constituted republic of the United States a new province was erected, and named New Brunswick. This province is situated between the parallels of 43 and 48 deg. north latitude, and the meridians of 63 deg. 45 min. and 67 deg. 50 min. west longitude. The greatest length north and south is about 230 miles, and the greatest width about 190 miles. It will be observed that the province has water on the south, east, and part of the north sides, the whole giving a seaboard of about 545 miles. It will further be noted that there are two great river systems, the St. John and Miramichi, with another important one, the Restigouche; while there are numerous smaller rivers, which, with lakes, intersect the province in every direction, affording facilities for floating timber from the interior to the coast. And where this is not possible the railway provides the means; for in proportion to population New Brunswick has probably more miles of railway than any other country in the world. The population of the province, according to the census of 1891, was 321,263.

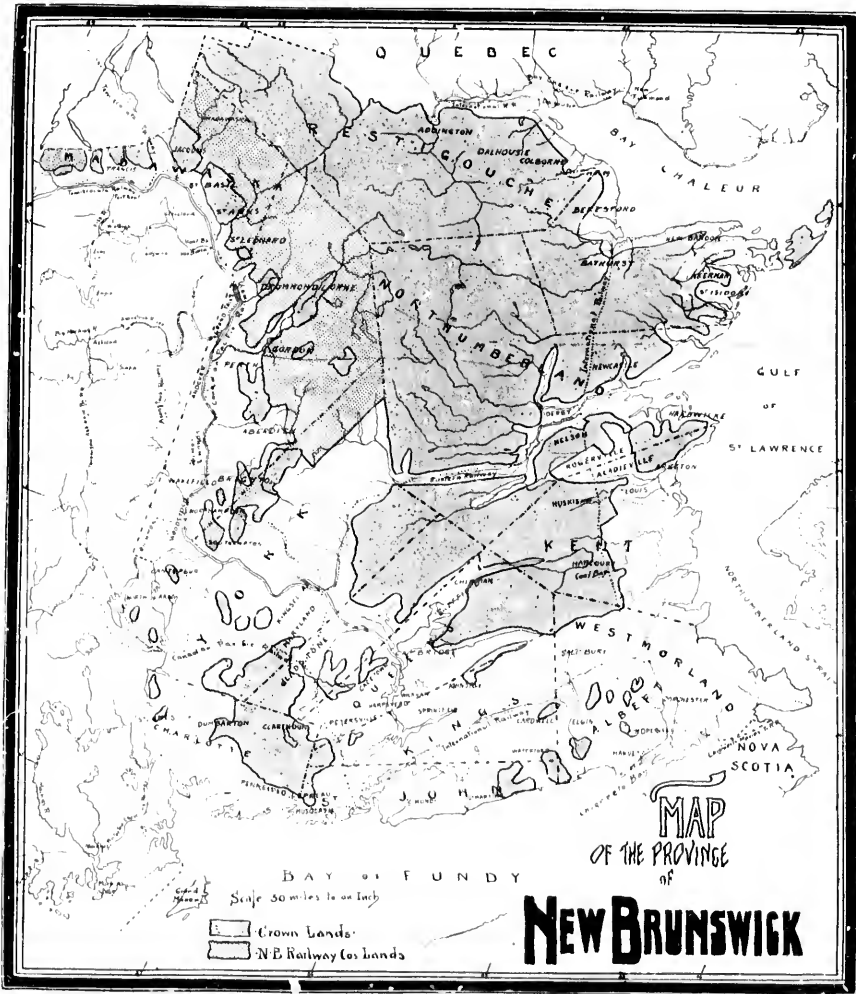
A glance at the accompanying map will not only show that the province has excellent facilities in river systems and seaports for the prosecution of the wood-exporting trade, but it will also show that a very large section of the area of the province is still covered with standing timber. The total area of the province is 17,400,000 acres. Of this amount some 10,000,000 acres are granted, and over 7,400,000 acres are ungranted. Of the latter some 4,400,000 acres are held under licence by lumber operators, but there are still 3,000,000 vacant, and a large portion of this is not even surveyed. But in addition to this total of about 7,400,000 acres partly under licence and partly not, the 10,000,000 acres of granted lands include 1,647,772 acres of valuable timber lands, owned by the New Brunswick Railway Company, who secured it between the years 1873 and 1879 as a bonus in connection with the building of a line from Fredericton to Woodstock, and points further up the St. John River. This gives a total of over 9,000,000 acres of timber lands. But to this again must be added much more (included in the 10,000,000 acres of granted lands) of valuable timber land held by private owners. For example, Alex. Gibson owns 200,000 acres on Nashwaak, and some in other places; the Nova Scotia Land Company have still a considerable tract, and numerous individual operators own each from a thousand up to nearly forty thousand acres. If, therefore, we add together all the granted and ungranted timber lands in the province we get a total that must exceed three-fifths of the total area of the province. It is true that this is not all virgin forest. With the exception of the 3,000,000 acres of Crown lands still ungranted most of it is operated on to some extent, though not in the case of the leased Crown lands and New Brunswick Railway lands (over 6,000,000 acres in the two) in such a way as to exhaust the forest. It is safe to say, from the data furnished by the Crown Lands Department and the New Brunswick Railway Company, that there are over 10,000,000 acres of timber land in New Brunswick to-day on which lumbering operations of some sort could be carried on. Of course, there would be a good deal of small timber on this land, the larger sizes having been removed from all sections operated on.

As to the kinds of timber found on these lands, it may be

said that spruce predominates. Only a remnant is left of the pine forests of former days. Other woods found in abundance are cedar, birch, maple, beech, and hemlock, with also some ash, poplar, and others of less commercial value. The export business is at present confined to spruce and birch, with a little maple and beech, for transatlantic markets; and spruce, cedar, and a little hemlock for the American market, and spruce chiefly for other markets. What pine is cut goes to various markets, but is a small item.

From the fact that so much land is unsurveyed it is impossible to give even an approximate estimate of the quantity of any kind of timber standing in New Brunswick, and according to an estimate made by the Crown Lands Department, an acre of green spruce, with the logs cut to 9 in. at the top, would yield an average of about 3,000 ft.; but Alex. Gibson states that 30 years ago he could get 10,000 of merchantable logs off an acre. After 10 years a tract that had been culled to 9 or 10 in. would again be in condition to yield merchantable logs. While neither cedar nor hemlock will grow again when once cut out, the spruce will reproduce itself rapidly. The Crown lands officers state the yearly natural growth of spruce to be 4 per cent. Some of the operators claim this is too low an estimate, especially in some sections.

Speaking now of the Crown lands (owned by the province, and administered by the Government), it may be stated that they are leased in blocks of one or more square miles, and for a term of 25 years. An applicant must deposit the upset price of 8 dol. per square mile, and then at a public auction duly advertised must be prepared to meet competition; for the block will go to the highest bidder. Sometimes the operators agree among themselves as to certain blocks, and will not bid against each other, each securing his lot at the upset price; at other times there is fierce competition, as in December last, when some lots on Miramichi waters were bid up to one hundred and ninety dollars per square mile. It is claimed that the long lease system, adopted in 1893, which enables a lessee to renew his licence from year to year for 25 years, is much better for the forest, since under the old system it was to his interest to clear off everything possible during the year he held the lease, as a competitor might relieve him of it the next year. The stumpage on spruce, pine, or hardwood logs is one dollar per thousand superficial feet, on pine timber up to 14 in. it is one dollar per ton, with 25 cents for each additional inch; on spruce timber 50 cents per ton; on hardwood timber up to 14 in. square, 90 cents; on cedar logs, 80 cents per thousand feet, with proportionate charges on other products. The Crown lands are divided into 28 districts, and Government scalers scale the logs and report to the Department, which levies stumpage accordingly, the amounts being payable on August 1st of each year. Hemlock, which was formerly cut in large quantities for the bark alone, the wood being left to rot, is now charged stumpage on the full scale. In addition to the land bonus and stumpage the lessee must also pay the annual licence of four dollars per square mile. He may be required in any year or every year (to prevent the locking up of lands by speculators) to cut, at the discretion of the Surveyor-General, an amount equal at least to 10,000 sup. ft. of lumber for each square mile held by him, or pay the stumpage on that amount; but of course the regulation is not enforced so as to be oppressive. The rate of stumpage or the annual licence fee may be increased at the discretion of the Government. Every pine or spruce tree cut must make a log at least 18 ft. long and



to in. at the top end. It is not necessary in this article to give any fuller particulars of the law relating to Crown timber lands. Anyone desiring a copy of the Act can get it on application to the Surveyor-General. The total amount of stumpage collected on Crown lands in 1895 was 100,143 dols. Speaking generally, about 100,000,000 sup. ft. of timber are cut each year on Crown lands. The mileage receipts in 1895 (licence fees and receipts of sales) was 42,000 dols. The total receipts from Crown lands in 1896 were greater than in 1895. There are a score or more of the large operators who hold from 100 to over 400 square miles each of timber limits on Crown lands.

The following is a statement of the lumber cut on Crown lands in the year ending October 31st, 1895:—Spruce and pine logs (nearly all spruce), 81,289,061 sup. ft.; hemlock logs, 15,815,314 sup. ft.; cedar logs, 9,676,642 sup. ft.; hardwood logs, 116,246 sup. ft.; hardwood timber, 398½ tons; spool wood, 2,881,200 superficial feet; 9,506 pieces piling; and small quantities of posts, poles, railway ties, firewood, and other minor products.

The 1,647,772 acres held by the New Brunswick Railway Company include some of the finest timber lands in the province, stretching from the South-West Miramichi waters across the Tobique valley to the head waters of the Restigouche. Every acre of this property is under lease to lumber operators, and it yields a large cut of timber every year. The stumpage charge is a dollar and a-half per thousand feet. The company have never sold any of this land, and guard it carefully, having a number of scalers and foresters constantly on the move. They have not suffered much of late years from forest fires. The stumpage on other private lands ranges from a dollar and a-half to two dollars and a-half, according to location and facilities.

There is no system of forestry in New Brunswick. There is a fire law, but lacking machinery and funds it is not very strictly enforced. Every year, therefore, witnesses some depletion of the forest wealth of the province by fire, quite large tracts being sometimes swept by the flames. Private owners are also frequent sufferers, through the carelessness of some settler, or hunting or fishing party. When the fire has run its course there is nothing for it but to fell the timber as soon as possible.

On all these lands where operations have been carried on, the heavy spruce timber is pretty well cleared off, but there is an abundance of ordinary sized trees. Of course the tracts nearest the great rivers have been most cut upon, and each year sees the operators on the great rivers farther away from the point of shipment. The portable or small rotary mill is utilised a great deal on small tracts of private lands, and the annual product of these mills aggregates a very large quantity. While large mills are most numerous near the mouths of the great rivers, there are many scattered through the interior, with facilities for shipping their product by rail, or, as on the upper St. John, floating it to the port of shipment. Fuller particulars with regard to the mills appear in the articles on the several districts.

While spruce is the great article of export, chiefly in the form of deals, there is a very large cut of cedar to make shingles for the United States and local markets. A good deal of hemlock is converted into boards and sent to the States to be used for boarding-in buildings, making under-floors, and other such purposes, and birch is found in abundance in nearly all parts of the province. In addition to the timber and planks with which the trade is familiar, birch is to a limited extent converted into spool wood, and this branch should be capable of development. Spool wood is shipped from the Miramichi, and farther north, and last year a St. John shipper secured a fairly large quantity in the adjoining county of Kings, shipped it to Glasgow, and made a fair profit for himself and the manufacturer. It brought about £12 10s. per standard. This wood is sawed 4 ft. to 5 ft. long, and 1 in., 1½ in., or 1¾ in. square. Birch planks are sawed from 2 in. to 5 in. in thickness. The trade in birch is capable of great development, at least there is plenty of the wood to be had. The price paid for birch timber delivered at St. John last year was about 5.75 dols. per ton, to average 15 in., with 1 dol. per ton more or less as the average went an inch above or an inch below that average; while planks were worth 11 dols. per thousand feet.

In the spruce trade, there is quite a business in car bottoms, 7 ft. long, 2½ in. thick, and 7 in. wide. In a section where the trees are small it is more profitable to cut

the spruce in this form, for it pays better than deals made from small logs.

Of beech and maple there is nothing to be said further than that they are plentiful, but not utilised to any extent as yet, except for fuel.

From the lower St. John waters and ports in the Bay of Fundy, many thousands of loads of spruce firewood are sent by schooner every year to the lime-burning towns of Maine, and some pulpwood was exported to that State last year.

The pulp industry will undoubtedly have a great development in New Brunswick. There are at present two large sulphite fibre mills in the province, close together on the Miramichi. With so much spruce forest available, the increase of this industry is only a question of a few years. There are four pulp mills in Nova Scotia. In Maine, which adjoins New Brunswick, the business has grown enormously. New Brunswick has the forests, and must eventually have more of the business. There are numerous available sites for pulp mills, with excellent means of communication with the markets. Not only on the great rivers, but along the very extensive coast line pulp mills will presently be found in operation, for in every direction the wood suitable for this purpose is to be found, and, as already noted, the province is well provided with railways, tapping fresh sources of supply. Those districts from which the large timber has been cut would still afford a good supply for pulp mills. The pulp-wood forests of the New England States are being rapidly thinned, and already attention is being directed to New Brunswick as a field for operations.

With regard to the future of the lumber trade of New Brunswick, despite the large annual cut, it will be very many years before the forest wealth can be exhausted. Indeed, there is no good reason why, with a proper system of conservation, the spruce forests should not be a source of wealth for a very extended period, while yielding annually a very large quantity of lumber. It is probable that while the pulp industry will rise to prominence, there will also be a tendency on the part of manufacturers of lumber to produce a more completely finished article, and ship less in the form of deals.

In the general article on the St. John district, which follows this one, reference is made to the relation of the large shippers to the export trade. In regard to the trade with Great Britain, it may be noted here that the system of long credits in the latter country is a cogent reason why so few of the individual manufacturers ship direct. An operator begins to get his logs in September or October. He has to pay as he goes along, and he does not begin to ship until early in the next summer, continuing until October. Take an October cargo as an example. He has been carrying that in some form (log or deal) for a year. If the drives hung up he carries it two years. He sends it across and sells it at four or six months. The strain is too great. Were there a system of cash down on receipt of bills of lading there would be a far greater inducement for individual manufacturers to ship direct. Such a system is workable, for the experience of one or two operators has proved it. Manufacturers are always ready for business on business terms.

We may conclude this article very properly with a statement of the total exports of forest products from New Brunswick for the fiscal year ending June 30th, 1895. The figures for 1896 are not available at time of writing, but the total would probably be somewhat in excess of that for 1895; for the shipments to transatlantic ports were very heavy, and a falling off in trade with the United States was probably counter-balanced by this, and by greatly increased shipments to South America. The trade and navigation report for the fiscal year, 1895, states the total value of forest exports that year to have been 4,933,013 dols., of which 2,763,853 dols. went to ports in the British empire, chiefly, of course, the British Islands, and 2,011,248 dols. to the United States, leaving 157,912 for other countries, including Argentina, France, Spain, Africa, and West India. The quantities and values are:—

	Sup. Ft.	Dols.
Spruce and other deals	115,444,800	2,995,286
Spruce ends	10,911,280	93,260
Pine deals	2,055,240	39,478
Planks and boards	65,537,500	657,943
Scantlings	15,138,000	127,761

THE WOOD INDUSTRIES OF CANADA.

	Pieces.		Tons.	Dols.
Shingles	229,762,000	430,909	—	20,160
Laths	205,473,000	230,070	—	364
Palings	1,746,000	12,267	—	19,544
Picke's	183,000	1,596	—	4,186
Knees, &c.	7,894	4,657	—	4,929
Railway ties	94,731	14,638	—	20,552
				1,934
Firewood	28,712	48,507	—	1,149
Bark for tanning	25,758	113,536	—	576
Lathwood	630	1,430	—	5,197
	Tons.	Dols.		
B. ch timber	6,759	44,233		
White pine timber	475	5,673		
Wood pulp	—	87,274		
Spool wood and spools	—	38,108		
Other kinds lumber	—	—	—	—
Sticks, box	—	—	—	—
Sheds, oth.	—	—	—	—
Wood for pulp	—	—	—	—
Other articles	—	—	—	—
Piling	—	—	—	—
Poles	—	—	—	—
Posts	—	—	—	—
Masts and spars	—	—	—	—
Spruce lathens	—	—	—	—

The value of spool wood and spools, and of wood pulp, given in the above table, is in addition to the previously-named total value of 4,933,013 dols., and raises the grand total to over five million dollars.

The St. John District.



A VIEW IN ST. JOHN HARBOUR.



THE first fact to be noted in connection with the lumber trade of the Port of St. John is that the supply comes in three ways. There is, first, that which is cut at the St. John mills, or manufactured farther up the river and brought down in lighters or scows; second, there is the supply brought in lighters from a dozen small ports around the head of the Bay of Fundy, some from the New Brunswick, and some from the Nova Scotia side of the bay; third, there is the supply brought in by rail from mills in the interior of the province.

Taking first the St. John River sources of supply, it must be noted that this river, which is over 450 miles long, and has numerous tributaries, several expanding into lakes, drains an immense territory, not only in New Brunswick, but in the State of Maine and the Province of Quebec. Reference to any good map will show that in the portion of Quebec lying between the St. Lawrence river and the border

of Maine and north-western New Brunswick, the summit of the watershed, which there runs parallel with the St. Lawrence, is seldom more, and often less, than 30 miles from that river. The result of this is that a very large section of Quebec is drained southward by streams running toward or forming part of the St. John system. During the present season, for example, W. H. Murray, of St. John, has a crew operating within 50 miles of the City of Quebec, and he and several other St. John operators are largely interested in timber lands in that province. In the same way, a very large section of Northern Maine is drained by the St. John system, and here also the mills at the port of St. John secure a very large quantity of logs.

Dealing first with Quebec, it is to be noted that the timber lands in that province are held under lease from the Government. Almost all the lands in the region to which this article refers are already under lease. The law provides that such lands are to be leased at public auction. If a man desires a block that is not yet under lease, or the

lease of which may have been allowed to drop, he makes application, and names a price. This is advertised, and his offer is made the upset price at a public sale. The highest bidder then secures the lease, and it can be renewed for a practically indefinite term on payment of charges, one of which is the payment of an annual fee of three dollars per square mile; this rate, however, being subject to change at any time by the Government. He must also pay 65 cents per thousand feet for stumpage. Again, a large portion of these lands is surveyed into 100-acre lots, and any *bonafide* settler may go in anywhere after securing a location ticket, for which he pays eight dollars, and take possession of a lot. He is given three years in which to pay twenty-two dollars more, and become the owner of the lot. The result of this system is that some of the very best lots are thus taken up, and the lumber operator must buy his timber over again from these settlers. Of course he does not have to pay an annual licence fee on lots thus taken up by settlers. The law further provides that a man having twelve children may secure a lot without charge, and there appear to be many such men. The effect of this taking up of small lots is that operators must have a large number of scattered camps in the woods; and they also buy a lot of timber from the settlers, who cut and haul it to the streams.

On the shores of Temiscouata Lake the land for a depth of several miles from the shore on all sides was granted under seigniorial tenure under the old French *regime*, and

enterprising lumberman and storckeeper has his store built so that half of it is in Quebec and half in Maine. A Maine customs officer would be likely to find him busy in the Canadian end of his store, beyond the reach of Maine laws, and a Canadian customs official would no doubt find him over in Maine. It is said that he literally sleeps with his head in one country and his feet in the other, and can afford to smile at the trade restrictions of both.

Regarding New Brunswick lands and regulations, the reader is referred to the general article on New Brunswick.

Operators in New Brunswick, Quebec, and Maine are met by a different system of scaling in each. In Quebec, on all logs up to 18 ft. the top is taken; on all above that the diameter of butt and top are taken, added together and divided by two. It therefore pays the operator to cut short lengths. In Maine the top is always taken, and an allowance made for an additional inch in all logs over 25 ft. Hence logs may profitably be cut long in Maine. In New Brunswick the diameter of the top is also taken, and an allowance made on logs over 24 ft., and in this province all lengths are even. For example, a log 27½ ft. would be scaled as 26 ft., and one 25 ft. 11 in. would be taken as 24 ft., and so on.

It is next to be noted that in New Brunswick and Maine the stumpage dues are payable on the first day of July, succeeding the winter's operations; but in Quebec, if the logs are to be taken out of the province, it



LOWER PART OF ST. JOHN HAREOUR.

is now owned by individuals, the larger portion by Mr. Thomas, the United States consul in Sweden. There are valuable timber lands in rear of this on all sides, owned by St. John operators. It is also a great hunting and fishing region, which abounds in big game. It may be observed in passing that the Temiscouata railway runs through the lake region, from River du Loup on the St. Lawrence, to Edmundston on the St. John, and thirty miles up the valley of the latter to a place called Connors. A great deal of lumber, chiefly cedar shingles, goes over this railway and its connections to the United States market. This railway forms a link across country between the Intercolonial Canadian Pacific railways. Speaking of cedar, the law requires that it shall be manufactured in the province, unless it can be shown that this is practically impossible; and though some Quebec cedar comes to St. John, the great bulk of the logs are spruce, with a little pine intermingled.

Coming now to the State of Maine, there are in that state no Government lands, except such as are held for school purposes. The timber lands being owned by private citizens, the lumber operator has only the latter to reckon with. The stumpage in Maine is higher than in New Brunswick. The Customs regulations give rise to some interesting conditions in lumbering along the border. Generally, an operator on the Quebec side of the line, close to the boundary, cuts also in Maine. Horses are dutiable under the U.S. tariff, but if a horse goes over the line and returns the same day there is no trouble. As a result, camps are sometimes pitched in Quebec, and the men and teams go across every morning and back every night from their work on the Maine side of the boundary. At one place an

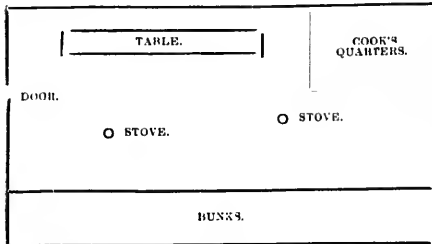
must all be paid before they are taken from the landings. All charges are a lien on the logs, some of them, as the log-driving and boom company's charges, until the deals are piled on the millman's wharf. The labour lien does not follow the logs out of the state or province in which they are produced, and must be put on within thirty days of completion of work.

We come now to the cutting of the logs. While these firms having mills at Fredericton or farther up the St. John River carry on their own operations in the woods, the St. John city manufacturers generally make contracts, at so much per thousand feet, for the cutting, driving, rafting, and towing of the logs to St. John. The contract provides that ten per cent. of batten logs will be accepted at full price, but all above that of battens realises only two-thirds price. It is said that the loss on one batten log brought from the head of the river would equal the profit on two full-sized logs, hence this provision in the contract. Logs must be 11 in. or more at the top, and batten logs are 8 to 10 in. inclusive. Most of the latter are cut on the lower waters of the St. John, within a short distance. Of all the logs that come down the river, fully eighty per cent. are 11 in. and up at the top, and run from 14 to 40 ft. in length.

Operations in the woods on St. John waters begin as early as September, and crews and supplies are going forward from that time until the winter has fairly set in. In the past the axe was used altogether in felling trees, and it is to a very large extent used yet, by some operators now use the saw, and this method is growing in favour. By the old method, the stump remaining would contain from three to five feet of the best of the log, according to the depth of snow. While the operations could not be carried on with

THE WOOD INDUSTRIES OF CANADA.

out snow, it is of course possible to have too much or too little. In an average winter there is three to four feet. If much less or much more, the work is more difficult. As to the lumber camps, one for a small crew is designed something like this:



A larger one, for, say, 100 men or more, is usually made with the cook's quarters and the eating room extending across one end, with the rest of the camp devoted to sleeping purposes, having two huge "ram-down" stoves, and the famous "deacon seat"—a long bench, between the stoves and the bunks. Directly opposite this camp are the hovels for the horses, and at either end, completing a kind of square (though the structures are not connected with each other) are the office for the "boss," known as the "beaver house," and the carpenter and blacksmith shop. The camp invariably

men (they work from daylight till dark), are from sixteen to twenty dollars per month, with board. The camp is always located near a stream. From the stump to the landing the logs are hauled from half a mile to as much as six miles. The main hauling road is kept in good condition, and a watering sled for sprinkling the road and icing it smooth, is a feature of some of the camps. Of course the camps and their outfit vary according to size of crew, but, speaking generally, the men are all comfortably provided for, and to the sturdy country youth a winter in the woods is regarded as a pleasant experience. Where camps are not too remote the newspapers are more or less regularly received, and in the New Brunswick region a travelling missionary visits the camps and holds occasional services, while the ladies of the Women's Christian Temperance Union send considerable literature and desirable knick-knacks to many of them. Then there are pedlars. These gentry, with watches, jewellery, cutlery, and all sorts of small wares, visit the camps in large numbers. They sell to the men and accept orders on the employers. Thousands of dollars' worth of goods are thus bought by the men in the camps every winter. It has become a regular branch of trade, and the pedlars, of course, make good profits. There has been a vast change since the time, some seventy-five years ago, when Benjamin Glasier, the pioneer operator on the St. John, would go up river in boats in the fall, with men and supplies, in search of choice pine timber, and not be heard of again until they came down with their drive in the spring. Very few camps



GRAND FALLS, ST. JOHN'S RIVER.



GORGE AT GRAND FALLS FILLED WITH LOGS.

ably faces toward the south. The writer was shown a diagram of one of Randolph & Baker's lumber camps, occupied by a crew of 50 or 60 men on Grand River, above Grand Falls, last winter. The camp, built of timber and boards, was 148 ft. long and 25 ft. wide. In one end was the cook-house and dining-room. Adjoining it was a store room, and then a sleeping room for the men, with two huge heating stoves in it, and two bunks on each side, one above the other, the men sleeping side by side, with heads to the wall. Next to this was the granary, then a room for hay, and at the extreme end, farthest from the cook-house, a hovel for twelve horses. In a separate structure was the office of the camp, with bunks for the "boss" and some others. Still another building contained hay and room for thirty more horses; while apart from all these was the carpenter and blacksmith shop. The food of the men consists of pork and beans, fresh beef, codfish, potatoes, bread (and especially ginger bread), butter, granulated sugar, molasses, and tea. In fact they live remarkably well. Wages for

are now so remote that there is not pretty regular communication throughout the winter. Perfect discipline is maintained in camp, where the cook's word is law.

In bringing the logs down in the spring, the contractor is able to avail himself of various agencies. There are three log-driving companies. One of these, the Madawaska Log Driving Company, takes the logs at the mouth of the Allegash, away up in Maine, and brings them down to Grand Falls. The St. John River Log Driving Company takes them then to the Fredericton Boom Company's limits, which extend from ten miles above Fredericton to about ten miles below that city. There is also a driving company on the Tobique, the chief tributary in New Brunswick, joining the main river below Grand Falls, and on which the annual cut is about 30,000,000 ft. The Grand Falls, which are 225 miles from the mouth of the St. John River, have a perpendicular fall of 74 ft., and below them is a narrow and deep gorge, through which the waters pour with great force. There is no canal around these falls, and the logs are floated over them. Last year 95,000,000 ft. of logs

tumbled over the falls, which in height and scenic beauty are among the famous waterfalls of the world. When anything like a jam forms at the foot of the falls there is always some loss by the breaking of logs. The driving of the logs such a great distance is always an uncertain quantity, and there are some hung up every season.

An interesting feature of the drives on the main river is the "wangan" boat. There is a "wangan" in every winter camp. It is the chest in which are stored socks, mitts, pipes, tobacco, and other small supplies. The "wangan" boat is a long, quite broad, flat bottomed boat, on which is the cook house, and a cabin and office for the "boss." The men camp along shore wherever night finds them, and by means of the "wangan" the cook is always able to have their meals ready. The boats used, called batteaux, are shallow, sharp pointed at each end, and made of overlapping strips of narrow board. They can be navigated by the initiated almost as quickly and easily as the Indian canoe.

When the logs arrive at the boom limits, the boom company's men take them in charge. To avoid mistakes, every log is marked before leaving the woods, so that at the end of the season the boom company's returns show not only the amount rafted for each operator, but the quantity turned in by each of his contractors, whether from Quebec, Maine, or New Brunswick. Logs found without any mark are sold at public auction, and the proceeds divided, pro rata, among the owners of marked logs.

But before leaving the drives reference must be made to Pond's patent shear boom. This boom, consisting of two or more sticks of timber fastened together at the ends, is made fast to the shore at its upper end. All along the boom are placed rudders, controlled by a winch from the shore. When it is desired to extend the lower end of the boom out into the stream the rudders are thrown at such an angle that the power of the

current striking them will force the boom itself up stream and hold it there at any angle. These shear booms are placed wherever necessary to prevent the logs from running into pockets along shore, to keep them in the main channel, also to direct them into the main booms. They are controlled by a company, and there is a separate charge for the accommodation they provide.

In connection with the raftering by the Loom Company, there is a provision which enables any operator in urgent need of logs at his mill to get them hurried along without going into the main booms at all. He may arrange with people living along the river above the boom limits to make a small boom to pick up the logs bearing his marks, raft them, and deliver them at Springhill, above Fredericton, from whence they are towed direct to St. John. Over 9,000,000 ft. was so rafted last year. After the logs have been rafted there are two towing companies—D. D. Glasier & Son and Tapley Bros.—whose steam tugs take and deliver the rafts in safe water near St. John, or deliver them at the mills. The river, half a mile above the head of the harbour, enters a narrow and rocky gorge, and at the entrance there is, when the tide is out of the harbour below, a fall over which no craft can safely pass. At high tide there is at the same spot a fall in the other direction, the tide rising higher than the level of the river above. Hence the descriptive term, "reversible falls." At half tide vessels can pass in perfect safety in smooth water. Four of the mills are located below the "falls," the others above. The gorge near the

falls is spanned by railway and traffic bridges of great height.

To return to the logs, the stumpage charge in Maine is 2 dols. per thousand ft. for spruce, 2.50 dols. for cedar, and 4 dols. to 5 dols. for pine. In Quebec the rate is 1.50 dols on spruce and pine (including the 65 cents. to the Government). As before noted, very few cedar logs are taken from Quebec. The scaling charges, which in Maine are shared by the landowner and the operator, are about 10 cents. per 1,000 ft. The first item of expense after the logs have been placed on the landings is the cost (from 50 cents. to 1 dol. per 1,000) of driving them to the territory of the nearest log-driving company. Then the latter must be paid for their work. The rate of the Malawaska Company varies from 16 to 20 cents. per 1,000; that of the St. John River Log Driving Company, is 20 cents. (the legal limit is 21 cents) The shear boom tolls are 10 cents. The Fredericton Boom Company charges 75 cents. for rafting spruce and pine, and 1.00 dol. for cedar, full scale. The towing companies charge 55 cents. on spruce and pine, and about 90 cents. per joint of 1,750 ft. on cedar. There is an additional charge of 30 cents. for the survey, booming and delivering of the logs to the mills above the falls. For delivery to mills below the falls which can only be passed by vessels at what is termed half-tide in the harbour, there is a little further charge. There are thus, at the lowest estimate, charges of over 4 dols. per 1,000 ft. on spruce from Quebec,

and it may, and generally is, greater from these sources alone, to say nothing of the expense incurred, in cutting the logs, and the margin of loss that is inevitable before they reach the mills. Although log-driving begins in April, it is the middle of June before the first rafts reach the mills at St. John. It is, therefore, necessary to reserve a stock for spring sawing.

During the season of 1896, the Fredericton



LOGS LODGED IN GRAND FALLS.

Boom Co. rafted 110,721,702 ft. of spruce, 6,730,446 ft. of pine, 19,318,170 ft. of cedar, 313,310 ft. of hemlock, and 139 tons of timber. This makes a total of 137,084,152 ft. There was rafted at Springhill, as already explained, 9,330,320 ft., and about 8,000,000 ft. was hauled out by numerous small operators to the banks of the river at various points above Fredericton, and rafted. About 15,000,000 ft. was got out on what may be termed the lower St. John waters, in Queen's and Sunbury counties, and here rafted. This would make a total cut on St. John waters, exclusive of the Nashwaak, where Alex. Gibson & Sons, Ltd., cut and manufacture over 30,000,000 ft. per year, of about 170,000,000 ft. Roughly speaking, about 75,000,000 ft. of this came from New Brunswick lands, including Gibson's cut, the St. John region yielded last year considerably over 200,000,000 ft. The cedar is all made into shingles for the United States, West India, and local markets. The total quantity of pine floated down the St. John does not exceed 10,000,000 ft. per year. It comes almost wholly from Maine and Quebec. Fire and the axe have robbed the St. John valley in New Brunswick of almost all of its valuable pine. Years ago 22-in. pine timber was floated from above Fredericton (which is 85 miles from St. John), and sold in St. John at four dollars per ton. Today such timber would easily bring twenty dollars, but it is not available. Of birch timber and logs, which are cut chiefly between Fredericton and Grand Falls, and floated to St. John, the annual output is

about 12,000 tons. This timber runs largely to 15 in. Considerable quantities of the logs are cut into planks. All of the birch goes to the English market. The supply of birch timber in the province is quite large, and the output sometimes exceeds the capacity of the market. But where formerly a 16 in. average was required, it is now possible to market 14 in. and even 13 in. birch timber. It costs the shipper from five and a half to six dollars per ton. It is interesting to note in connection with the St. John river that last season a million feet of deals manufactured at Andover were floated a hundred miles, and a larger quantity from Pokiok, forty miles, to the mouth of the Nashwaak, and with the millions of feet of Gibson's deals, towed in scows eighty-five miles further to St. John. The deals cut by the Fredericton mills are brought in lighters to St. John for reshipment to British ports, or are sent direct by vessel to the American market. The product of a few other mills along river comes down the same way, and from the lower waters come large quantities of spruce firewood, to be marketed at the line shipping ports of Rockland, Rockport and Thomaston, in Maine.

During the last few years the increase of small rotary mills, or the use of portable rotaries, has considerably affected the supply of logs to St. John mills. These smaller mills, when first introduced, cut very unevenly. They have been greatly improved, and more care is now taken, but as a rule their product does not equal that of a gang mill in evenness of manufacture. These portable mills have multiplied rapidly in the province, and the product of a large number comes by rail to St. John for reshipment. A portable mill can easily be set up wherever there is a little belt of timber near a railway, and operations carried on throughout the winter. As an illustration of the quantity received by rail, it may be noted that last summer, when a number of steamers would be in port loading, it was not uncommon to see from 120 to over 200 carloads of lumber on the track at the deep water terminus of the Intercolonial Railway, and this supply kept up by continuous receipts for days at a time. And there were also some small receipts by the Canadian Pacific Railway at the other side of the harbour.

As already noted, the St. John mills receive spruce logs from Maine, Quebec, and New Brunswick. Those from Maine cost about 90 cents per 1,000 ft. at the mills; those from Quebec, 80 cents to 85 cents; those from New Brunswick land 75 cents to 80 cents. The longest logs come from Maine, which is explained by the different method of scaling in that State as compared with Quebec. So far as quality of wood is concerned there is no appreciable difference.

Speaking now of the mills at St. John, there are fourteen firms operating some sixteen mills, cutting from 10,000,000 to 25,000,000 ft. each per year, though there is, of course, considerable variation in different seasons. Nearly all of the mills are closed during the winter. About ten of these mills are owned by firms who came to St. John from the United States a good many years ago, and established the mills to cut the logs brought down from Maine. At that time, and down to 1814, there was a duty on New Brunswick and other Canadian lumber imported into the States, but the lumber manufactured from Maine logs was admitted free. Hence, an important little colony of enterprising American citizens was established at St. John. Since the duty on Canadian lumber was abolished by the American Congress, these mills have cut more or less provincial logs, along with those cut on the Aroostook in Maine. Aroostook is the name given to the St. John river in northern Maine. Another factor affecting the Aroostook business, so far as St. John mills are concerned, has been the extension of a railway to that region and the erection of mills, the product of which is sent by rail to the American market. But, as already noted, some 45,000,000 ft. of Maine logs came to the St. John mills last year. Now that the Protectionist party has triumphed in the United States, the duty on Canadian lumber, which United States manufacturers are urgently demanding, and which the American colony at St. John would view with satisfaction, may be reimposed. It would, of course, affect the provincial lumber trade to some extent, but in prosperous times would not materially reduce the quantity exported to that market.

We come now to speak of St. John as a point of shipment to the world's markets. From the days when the earliest British settlers cut and exported timber for masts for the King's ships, down through the period of the rise,

growth, and decline of shipbuilding, to the present time, when its annual export of forest products varies from a little below to a little above three million dollars in value, St. John, New Brunswick (not St. Johns or St. John's) has been an important centre of the lumber trade. The city, which was founded by loyalist exiles from the newly constituted Republic of the United States in 1783, has now a population approaching 50,000. It lies at the mouth of the great river, already described, and has a fine harbour, open all the year round. Within the last two years St. John has assumed great importance as the chief Canadian port for the export of western produce and live stock to the British Islands from the close till the opening of navigation on the St. Lawrence. During the present winter, for example, St. John has direct steamship service to Liverpool, London, Glasgow, Aberdeen, Belfast, Dublin, and Antwerp, and a French port. The Liverpool service is a weekly one, the London and Glasgow service fortnightly, and the Irish and Continental monthly. There has been a service to London for some years, but the beginning of the larger winter business was in the winter of 1895-96, so that it has had quite a phenomenal development. And it is destined to assume greater proportions yearly, for St. John is the Atlantic terminus of the Canadian Pacific Railway, which spans the Continent, and also has connection through the Intercolonial Railway with the whole Grand Trunk system. The port is a safe one, and easy of access. An investigation by the Board of Trade of the city, covering a period of ten years, proved that the percentage of loss of tonnage coming in or going out of the Bay of Fundy to and from St. John was less than that in the approach to any other Atlantic port, regarding which information could be obtained. The low rate of marine insurance is, perhaps, the most convincing evidence. The city has made, and is still making, large expenditures in harbour works to accommodate the increased trade, and is in a position to handle all that comes.

Reverting to the lumber trade, the earliest was in large pine timber, then pine and spruce, then spruce and pine, and now it is practically all in spruce. The building of wooden ships was a great industry, and thirty years ago gave constant employment to two thousand men or more. As many as thirty or forty ships would be built in a year, and many of the finest and fleetest merchantmen of former days were launched at St. John. It is not many years since St. John was the fourth shipbuilding port in the British empire, but since 1876, or even earlier, the business has steadily declined, until during the last few years not a craft of any kind was launched at the port; while through sales to Norwegian and others, and losses at sea, the large sailing vessels now owned in St. John are but a pitiful remnant. But many smaller vessels are owned in the place, and the people are beginning to invest in steam tonnage. The "Mantinea," launched on the Clyde last year, is owned in St. John, and a larger steamship is now building for the same parties. The "Mantinea" made a great record, carrying deals from New Brunswick to Manchester last season. When shipbuilding declined, more attention was paid to the lumber trade and other industries, and the city now has factories of many kinds. St. John is a bright, energetic, progressive, modern city, that has overcome the effects of many severe blows, notably a fearful scourge by fire in 1877.

As early as 1790 there were two saw-mills at St. John. Of course they were of very primitive design. In 1822 a steam-engine and boiler were imported from the works of Boulton & Watt, of Birmingham, Eng., and a steam mill was started that year in presence of the Governors of both New Brunswick and Nova Scotia. The first cargo from this mill went in the same year to Cork, Ireland. Mills increased rapidly. As a starting point, the exports of that year, 1822, may be cited as follows:—Pine timber, 70,122 tons; birch timber, 7,520 tons; masts and spars, 2,147; poles, 333; lathwood, 10,047 cords; boards, planks and deals, 8,277,000 ft.; staves, 2,372,000 pieces; shingles, 2,842,000 pieces; shooks, 268 batches. Ten years later the export of deals, boards, planks and scantling had increased to 22,000,000 ft.; in 1842, to 43,000,000 ft.; in 1852, to 186,314,000 ft.; in 1862 there was a falling off; in 1872, to 239,639,000 ft.; in 1882, to 264,670,000 ft. In more recent years the quantity has fluctuated between the last-named figures and 300,000,000 ft. This is, of course, exclusive of laths, shingles, box-stuff, cordwood, and some other products, including a small amount of timber. The total value of lumber of all kinds exported to all parts from St. John in 1892 was 3,311,061 dollars; in 1893, 3,228,175 dollars; in 1894, 2,599,053 dollars; in 1895,

2,929,916. The figures for 1896 are not available at time of writing, but will not vary very materially from those of 1895.

While pine has given place to spruce, and the trade has been subjected to the inevitable fluctuations as to markets and prices, notably receiving a severe blow when England abolished the duties on Baltic timber in 1860; and in a smaller way when bags and casks were substituted for hoxes by the West India sugar planters; the method of manufacture has also greatly changed. Gangs succeeded the single saw, and the gang is gradually giving place to the band-saw. In the woods the axe is giving place to the saw. The rise of the portable rotary mill has already been alluded to.

The export trade of St. John has suffered a decline in recent years by the rise of West Bay, Grindstone Island, and one or two other places at the head of the Bay of Fundy, as points of direct shipment to transatlantic ports. Years ago all the deals cut in that region came in lighters to St. John. But there arose some dissatisfaction as to the survey of deals, and trouble also arose over the question of wages paid to ship labourers. Some bold spirits, therefore, determined to try direct shipment from the places named, where all charges would be less. The experiment was a success, and probably seventy million feet of deals was shipped direct last season from West Bay (including Parrsboro'), Grindstone Island, Hopewell Cape (including Hillsboro'), and possibly one or two other points, direct to British ports. There are still, however, a great many deals, averaging perhaps, 40,000,000 ft. per year, brought from small ports up the bay to St. John for re-shipment. They are brought in by rail or in vessels of 50 to 140 tons, which are laid alongside the big sailers or steamers and discharged direct into them.

In purchasing deals from the St. John city mills the broker or shipper takes delivery of them on the mill wharf. They are of great service to him in correcting his averages or saving demurrage. For example, he may have several vessels loading. Contrary winds or severe storm may detain the lighters from points up the bay, or from the receipts by lighter and railway he may be unable to secure proper averages. In such a case he can at once draw from the local mill supply, which thus constitutes a very valuable reserve. It enables him to control the averages, and give prompt despatch to his vessels.

We have now to consider the distribution of the exports of lumber from St. John. There are now three important markets—the British Islands, the United States, and South America, with shipments also to the West Indies, Canary Islands, France, Spain, and Australia. To the British market are sent deals, deal ends, battens, and some scantling and boards. The deals for this trade are sevens, nines, and elevens, 3 in. thick, and an average length of 14½ to 15 ft., not to be less than 14½ ft. A desirable cargo is 50 per cent. of sevens, 20 per cent. of eights, and 50 per cent. of nines. The United States takes deals, planks, boards, scantling, piling, latins, shingles, firewood, and some pulpwood. That market requires deals to average 18 to 20 ft. It will take sixes, eights, nines, tens, or twelves, but has no use for elevens and wants very few sevens. The most desirable length is 25 ft., and there is a demand for 2 in. stuff, though New York will take 3 and 4 in. The demand runs mostly for eights, tens, and twelves. It should be noted that deal ends are pieces 3 to 9 ft. long, and they bring only two-thirds price. They are only used to make broken stowage, and not shipped because of their commercial value. A random deal cargo, suitable for the New York market, would be of 4x8, 4x10, and 4x12, 3 and 4 in., and averaging 18 to 22 ft. Scantling, as a rule, are cut to order. South America takes only scantling and boards. The scantling may be 2x2, 2x3, 3x3, 3x4, 3x6, or 4x4; in fact, almost any size is acceptable, and from 12 to 30 ft. Boards run from 1x3 to 1x12, and 12 to 16 ft., but 50 per cent. should be 10 ft., and with a large percentage 1x6, which is used for fencing. The shipments are chiefly to Buenos Ayres and Rosario, with some to Montevideo. An attempt was made last year to reopen trade with Brazil, with which country St. John formerly had considerable trade. A cargo of deals, 3x9, and 14 ft. and up, was sent. Some deals, 3x7 and 3x12, 10 ft. and up, were shipped last year to Australia, and much more would have gone but for the high freights. To the Canary Islands go mixed cargoes of spruce and pine, and to the West Indies pine boards, all sizes, also shingles and box stuff. Regarding South American trade, it may be noted that the business was larger and more profitable last year than for a number of years past, but not

equal to that of eight or nine years ago, either in volume or returns.

The next point to consider is the relation of the shipper to the lumber trade of the provinces. Of course, some manufacturers are also shippers, but the great bulk of the shipments are made to transatlantic ports by a few persons, two of whom, with headquarters at St. John, are not manufacturers, but merely buyers, though also to a considerable extent backers of manufacturers. Practically, all the deals shipped from St. John last year were sent forward by three men, only one of whom is a manufacturer. The shipper makes his contracts at all times, and is always open for business. He makes contracts in the fall with a good many operators, and in many different localities. A contract may be for a few hundred thousand or several million feet. If St. John is to be the port of shipment, the deals are to be delivered on the wharf; if a port up the bay, they must be placed alongside vessel. At several of the Gulf ports they must also be delivered alongside vessel. It costs the shipper, when he has to do it, eighty cents, or 3s. 6d. per standard, to batteau or lighter deals from the wharf to the vessel. It needs to be explained just here that while the popular measurement for all transactions in the provinces and the United States is a thousand feet, the moment the deals reach the wharf for export to the other side, the standard (1,980 feet) becomes the basis of calculation. The shipper must also pay the cost of survey, 6d. per standard, and the insurance on wharf and in transit to vessel. As sales on the other side are mostly c.i.f., he is not clear of the cargo till it reaches its destination. Very few deals are sent on consignment. If a contract is made to carry a lot of deals from some port to a range of ports on the other side, the destination of each cargo is nearly always fixed before sailing. As to the cost of deals to the shipper, the range at the ports up the bay last season was from 750 dols. to 1025 dols. per thousand feet for bright deals. All Bay of Fundy deals are bright, as they are either taken direct from wharf or from lighter. The cost on wharf at St. John ranged from 10 dols. to 1050 dols. The relation of the shipper to the small manufacturer is a very important one, and this fact does not seem to be fully appreciated abroad. As a matter of fact, a very large proportion of the small operators receive financial assistance from the St. John shippers. It is at best a risky business, and there is always a percentage of dead loss, but without this system the business could not be carried on. The small manufacturer invariably wants cash on delivery, and an advance as well. The writer was shown a lot of contracts for this season's work, running from a few hundred thousand to a million feet each, and in every one was the clause "cash on delivery, except — dollars advanced when required." And the advance was in some cases quite a stiff figure. Thus the shipper must not only pay advances and the balance on delivery, but when he sells the deals on the other side it is usually at four or six months. Should an operator's logs be hung up, there is a year's delay. Sometimes also a provincial merchant will act as middleman between the shipper and a number of small operators. The shipper backs the middleman, and if the latter fail in business there is still greater loss to the former than if he suffered now and then through one of the smaller men. These facts will explain why foreign buyers are not in closer touch with the producer. Of course there are large operators who can and do market their own product, but when the foreign buyer begins to talk with the small operator he is met by the fact that he must make advances and take risks which, with his limited knowledge, he usually prefers not to do.

There is, of course, always an opportunity for a reliable firm abroad to buy direct from the mills at St. John, although the latter, as a rule, sell to the large shippers already referred to. They do not usually care to ship to the other side on consignment on their own account, for in this there are risks which they in their turn are not anxious to assume. They might strike an active market, and receive the best of treatment, and they might not. Therefore, they usually prefer to sell on the wharf at St. John. The large shippers from St. John are **W. MALCOLM MACKAY, GEORGE MCKEAN, and ALEX. GIBSON & SONS LIMITED**, the last named being also manufacturers. Reference is elsewhere made to this firm, and the shipments of all three are also elsewhere given. George McKean shipped deals last season not only from St. John, but from West Bay, Grindstone Island, Hopewell Cape, Pugwash, Baie Verte, Shediac, Dalhousie, Campbell-

ton, Nouvelle (Quebec), and from Halifax and St. Margaret's Bay. He has been in the trade for many years, and bears a high reputation for careful, painstaking and upright business methods. His English correspondents are Price and Pierce of London.

With regard to shipments to the United States, except in the case of one or two St. John mills which have their own houses in Boston or New York, the business is generally done through brokers. A lumber merchant in an American city, desiring a cargo, gives the schedule or specification to a broker, who sends a circular letter to a lot of manufacturers, making an offer, or asking one. In this way the order is filled. Of course there are also a good many "random" cargoes sent forward during the season, to be sold to best advantage on arrival. The South American business is done for the most part through New York houses, who place orders with provincial mills.

A notable change has come over the method of shipping deals to European ports. The steamship is more and more taking the place of the sailer, and the opening up of the regular winter trade by steamship with various British ports will hereafter cause a further change, as parcels of deals will be sent forward regularly by these lines to Liverpool, Glasgow, Belfast, and Dublin, and possibly other ports. During the present winter, for example, the lines to Belfast and Dublin will carry several thousand standards to those ports, and space was also booked early in the season on the lines to Liverpool and Glasgow. Regarding rates of freights the range last year was from 35s. to 57s. 6d. The lumber sent to South America goes in handy sized barques and large schooners. Freights to Buenos Ayres last year ranged from 7.50 dol. to 9 dol. Shipments to the United States are altogether by schooners.

In addition to the large shippers from St. John, there are at least two firms who play an important part as between the shipper and the small manufacturer. For instance, last year the St. John firm of **TUFTS & CO.**, though not manufacturers, sold thirty million feet to the shippers. They supply some of the small manufacturers and take their output, buy deals from some, or act as brokers for others, the deals coming in by rail or schooner. In the same way, **JOHN E. MOORE** last year handled thirty-five million feet, his firm supplying manufacturers to quite a large extent and handling their product.

With regard to the future of the St. John trade, it is felt that there will be an increasing difficulty in keeping up the supply of logs for the St. John mills. These mills, it is estimated, have a total cutting capacity of about two hundred million feet. Of course, through accident or other cause, one or more may not cut nearly up to their capacity, but each year sees the log supply more distant or encroached upon by mills erected closer to the stump; and some operators express the opinion that the next ten years will see a very noticeable decline of the cut by these mills.

As regards cost of getting logs, both supplies and men can be got cheaper for the Quebec than the Maine or New Brunswick sources of timber supply for the St. John district. But all the timber is not remote from St. John. There is a small mill cutting deals this winter so close to the city that the product is hauled by teams to the city wharves. The logs are cut close to the mill.

GEO. E. BARNHILL is well-known as a St. John manufacturer and occasional direct shipper of deals to the British markets, where the product of his mill has an excellent reputation. Mr. Barnhill has been in the lumber trade of his life. His mill is situated at Pleasant Point, a couple of miles above the head of St. John Harbour, where he has ample wharves for piling and shipping the product. The mill is equipped with a gang, and machines for making laths, staves, and heading. Mr. Barnhill manufactures for the British, United States, and South American markets, and generally sells the goods on the wharf. When he does make direct shipment of a cargo to a Transatlantic port, every deal is stamped with his name, "G. E. Barnhill." Great piles of deals so stamped were on his wharf when the writer visited the mill in December. Mr. Barnhill's annual cut is about 12,000,000 feet. Most of his logs are cut on leased timber lands in northern New Brunswick, Quebec, and Arrostook. The cut is practically all spruce. The mill is equipped with all machinery requisite to produce well-manufactured lumber, and care is taken to ensure this result.

PURVES & MURCHIE, formerly W. C. Purves, have a splendidly equipped new mill at the head of St. John Harbour, on the site of one destroyed by fire a couple of years ago. The new mill was operated last season, and

during this winter additional plant is being added, giving it a total capacity of about 14,000,000 feet. The equipment, which is modern in every respect, includes a gang, an improved double rotary, edgers, trimmers, lath and box machines. The product is a fine class of lumber, running evenly, and well finished. The firm get part of their log supply in Maine, part in Quebec, and this year are getting out five to six million feet in New Brunswick. Practically all of it is spruce, but there is a little pine and cedar, the latter being sold to other manufacturers. The firm own about fifty square miles of timber limits in New Brunswick. Two-thirds of their cut is of deals for the British market. Most of the balance goes to the United States, but some to South America. Shipments to the United States are made direct. Deals for England are usually sold to shippers, although in years past Mr. Purves has made direct shipments. This gentleman has had the experience of a lifetime in the St. John lumber trade. His partner, N. H. Murchie, is a young man who was brought up to the business, but his father and grandfather are both still engaged in lumbering, the latter, Mr. James Murchie, being the veteran of the St. Croix and one of the best known of New Brunswick operators.

The firm of **HILYARD BROS.** is one of the oldest among St. John mill-owners. The late Thos. Hilyard established the business in 1853, and since his death, in 1873, his sons, Thomas F. and Henry Hilyard, have carried it on. The firm formerly built many ships, but that industry declined. They have, however, special facilities on their property for repairing vessels, and their "blocks" are much in use. Their mill is situated at the head of St. John Harbour, where they have fifteen acres for yards and wharves. The capacity of the mill is 10,000,000 to 11,000,000 feet per year, and it is equipped with gang and single saw, lath, box, and keg machines. They cut a little pine, but nine-tenths of the output is spruce. Last season they cut lumber for the United Kingdom, United States, South America, Spain, France, and the West Indies. The firm have two hundred square miles of timber lands leased from the Provincial Government and the New Brunswick Railway Company. It is chiefly on the Tobique river, but they have also some on Grand Lake. On their lands are spruce, cedar, and a little pine. Their cedar logs are sold to other mills. Most of their spruce lumber went last year to the United Kingdom. The firm have a large local trade in boxes, kegs, and staves, and make some pickets and box stuff for export. Hilyard Bros. export direct to the United States, but for other markets their product is usually sold to other shippers. Their mill is well equipped, and produces a well-manufactured article and the firm have a high reputation in the trade.

The following United States firms have mills at St. John, but are only interested in United States trade, as they only sell for other markets when the price is very tempting and the American market very dull. They cut some for South America, and last year cut some for the English market, but under normal conditions their relations are almost altogether with their own country, any South American business being done through New York houses. The firms cut together well up to a hundred million feet in a year, the range being from a capacity of ten by the smallest to over 30 millions by the largest firm. The cut, of course, varies a good deal from year to year. The firms are:—**STETSON, COTLER & CO., MILLER & WOODMAN, S. T. KING & SONS, J. B. WARNER & CO., CHARLES MILLER, ZUNN BROTHERS, L. M. JEWETT, JAMES HAMILTON & CO.**

Mr. W. H. MURRAY is probably more widely known in the territory drained by the St. John River than any other mill-owner and lumberman on those waters. For forty-five years he has been engaged in the business, and his father was also a lumberman in the days when pine timber was the product floated down the river. Until 1878 Mr. Murray resided and operated mills at Springhill, some miles above Fredericton on the St. John River. But in 1868 he had acquired an interest in the mill property at Marble Cove, just above the "falls," about a mile above the head of St. John Harbour, including the mill and 15 acres of land fronting on deep water. In 1876 the mill was destroyed by fire. In the same year the present buildings were erected, and in 1882 Mr. Murray became sole proprietor. He has since made many improvements in the plant, until the mill is one of the best equipped on the river. It has gang and rotary for long lumber, and machines for making laths, boxes, coop crates, clog and such small products. The greater portion of the output is in deals, for the English market, but some of the product goes to the United States and some to South

THE WOOD INDUSTRIES OF CANADA

W·H·MURRAY'S MILLS AND WHARVES

MARBLE COVE ST. JOHN N·B.



The Mill at Marble Cove



America, being sold in nearly all cases direct from the wharf. There are ample wharves and yards, with dry houses. Mr. Murray manufactures about 17,000,000 ft. of logs, but this does not nearly represent the extent of his operations. His annual cut of spruce, pine, and cedar logs is about 40,000,000 feet, and he therefore has many millions to sell to other mills. Over 900 square miles of timber limits, situate on the Big Black, St. Francis, and Main rivers, and Termisouata Lake, are held by him in reserve, and from year to year have an increasing value. Mr. Murray, although 65 years of age, maintains a close personal oversight of his extensive operations, which he directs with the energy of youth. On all matters concerning the lumber industry he is an unquestioned authority. He holds the important office of president of the St. John River Log Driving Company, and is a director of the Fredericton Boom Company. In Mr. J. Fraser Gregory, his confidential clerk or manager, Mr. Murray has a valuable assistant. Mr. Gregory, for a young man, has acquired a remarkable knowledge of everything relating to lumbering on St. John waters, and the writer of the general article on the St. John district is much indebted to him for much valuable aid, as well as for several of the photographs accompanying it. For Mr. Gregory is a



RANDOLPH AND BAKER'S MILL

very skilful amateur photographer, and in his frequent trips to the camps or drives has secured a fine collection of pictures. Mr. Murray reposes complete confidence in the ability of Mr. Gregory in all business matters, and the latter is also secretary-treasurer of the St. John River Log Driving Company, and St. John manager of D. D. Glasier & Son's fleet of tug-boats on the river.

RANDOLPH & BAKER are one of the leading firms of lumber manufacturers in St. John. Their cut last season was 21,400,000 ft., which is about the average yearly production of their mill. At time of writing there are 12,000,000 ft. of deals, etc., piled on their wharves. This is all sold, and awaiting shipment to the British market. Practically their whole cut last year was for that market, but some years they ship considerable to the United States. The village of Randolph, which their industry has built, is on the shore of the St. John river, about three miles above the harbour of St. John. They can hold 3,000,000 ft. of logs at once in the boom along the shore by their mills, and they have a quarter of a mile of wharf-front at the mills, where schooners and lighters can take cargo. The firm's mill, of which an illustration is given, is equipped with two gangs, three lath machines, a stove machine, and a heading machine. Live rolls and gravitation carry all the products from the mills to the wharves, every possible labour-saving appliance being utilised throughout the mill. The sawdust is carried by belts to the furnaces and burned. The other mill refuse is also burned there, or in two huge modern lime-kilns that are connected by a tramway with the saw-mill. Right in rear of the saw mill are inexhaustible quarries of the finest quality of limestone. The haul

from quarry to kilns is only about 1,400 ft., and as the latter are on a lower elevation beside the wharves, the stone is simply hauled out and dumped into the top of the kilns, while the fuel is run down on tramcars from the saw-mill to the furnaces below. Huge sheds hold the barrelled lime. The firm make their own barrels, which roll by gravitation from the coopers' shop into the kilns. In 1894 the firm turned out 65,000 barrels of lime. It is chiefly sold in the United States, but the duty hampers operations in that market. Nowhere in the world, perhaps, is there an opportunity for the joint prosecution of the lumber and lime industry equal to this. C. P. Baker, and his son, C. J. Baker, live at Randolph, which is a singularly picturesque and beautiful spot. The firm own eighteen houses, that furnish twenty-six tenements. They employ about 165 men in summer. Their lumber, nearly all spruce, comes down the St. John river. A. F. Randolph, of this firm, is president of the Fredericton Boom Company and of the People's Bank of Fredericton, where he lives. Their deals for the British market have been generally sold to local shippers. W. Malcolm Mackay handled their cut last year.

An experience of forty-four years as manufacturers and exporters of lumber lies behind the present-day operations of the firm of **ANDRE CUSHING & CO.** During the last year they erected a splendid modern mill on the site of the one destroyed by fire, and on the same site on which their first mill was established in 1852. The place is called Union Point, at the edge of the famous "reversible" falls, on the St. John river, about a mile above the head of St. John harbour.

Before entering upon a description of their mill, a view of which is pre-ented in their advertisement on another page, it may be observed that the long experience of this firm places them in an exceptionally favourable position as manufacturers and importers. Twice they suffered the loss of their mill through fire, and each time saw a new structure rise, equipped with better machinery; and the mill of to-day has the most modern appliances, including hand-saws for cutting any size of lumber in the most satisfactory manner. Their annual cut is about thirty million feet of spruce and pine, chiefly the former; and during the last year they shipped lumber direct to United States ports, Argentine, Brazil, Australia, West Indies, and Canary Islands, and sold a lot of deals for shipment to British ports. Their sources of supply are three: the State of Maine, the Province of Quebec, and New Brunswick. All of the logs come down the St. John river. About half of the total comes from Maine, and there the firm carry on their own operations in the woods. Of the balance, about half comes from Quebec and half from New Brunswick. No firm in the provinces ships to a wider range of foreign parts than

Messrs. Cushing & Co. The cargo they sent to Brazil last season was the first that had gone there from St. John for some years. Regarding South American trade, this firm are admirably equipped for cutting to suit that market. During last summer they loaded several cargoes for a New York firm of brokers for shipment to Buenos Ayres. The brokers sent their own inspector, Mr. Tordoff, to oversee the stowing of the cargoes. In an interview with a representative of the *St. John Daily Sun*, Mr. Tordoff said:—

"I am agreeably surprised at the quality of the lumber being sent to the vessel by Cushing & Co. I have in my time inspected cargoes of spruce and pine at almost all the important shipping ports in Canada and the United States. The spruce lumber which Cushing & Co. are supplying for this cargo is the equal in appearance and quality of any lumber I have ever seen. It is fully as good in point of manufacture as the best Ottawa pine it has ever been my duty to inspect, and I have handled some of the choicest cargoes ever loaded. This is a general cargo as far as sizes go, and I can safely say that no fault can be found with a single piece of it."

Representing a house which ships many millions of lumber every year to South America, Mr. Tordoff should be a competent witness. All the lumber shipped by Cushing & Co. to foreign ports is branded with their initials, "A. C. & Co."

Their mill is a large, as well as a splendidly equipped one. The mill proper is 226 x 60 ft., three stories, on a stone and brick foundation; the floors are respectively 16, 12, and 12 ft. in height, affording exceptionally good light. The boiler-house is 48 x 96 x 22 ft., and contains six boilers. It is removed 13 ft. from the mill, and outside of the drive all connections are of metal. The mill is provided with double engines of 500 h.p. To facilitate night work, a dynamo supplies 325 electric lights, including 10 arc lights for the yards and wharves. The mill has a capacity of 150,000 sup. ft. per day, or 45,000,000 ft. annually, without any night running. Having procured so complete an equipment, the firm are confident that the brand A. C. & Co. will always be recognised as representing lumber well manufactured.

T. McAVITY & SONS, brassfounders, manufacturers of engineers' supplies, etc., whose advertisement appears in this issue, with illustrations of some of their specialities, have been established in successful business for over half a century, their trade extending throughout Canada, and to the United States, England, and Australasia. The attention of engineers and steam fitters is especially directed to their announcement.

The Fredericton District.



ST. JOHN RIVER, JUST BELOW FREDERICTON.

THE city of Fredericton, on the St. John river, 85 miles from its mouth, is a very beautiful little city of some ten thousand inhabitants, and is the capital and seat of Government of New Brunswick. The river here is about half-a-mile wide, and just opposite the lower end of the town is the mouth of the Nashwaak, the stream on which Alex. Gibson & Sons, Ltd., cut annually about 30,000,000 feet of lumber, their town of Marysville being three miles up the Nashwaak.

Fredericton is the headquarters of the Fredericton Boom Company, which rafted about 137,000,000 feet of logs last season at its booms above and below the city. The company employs from 500 to 550 men and begins work in the early part of May, usually concluding its work in October. There are twelve booms in all, but the rafting is done in two of them, one two miles and the other three miles long. The work has been greatly facilitated of late years by a loading machine invented by W. P. Hanebry, superintendent. There are almost innumerable marks on the logs,

coming as they do from so many different contractors; but long experience enables the "catch marker" to detect those of each mill-owner as they pass singly, and the "sorters" are able without difficulty to separate and send the logs to the "hitchers," who put them in ratlines, about 25 logs in each. But these, for accuracy, are again examined as they pass to the boom-pole machine, under which they are floated, and two boom poles thrown on each ratline. Thence they go on to the "bottom makers," who pin the boom poles, and they are floated next to the loading machine. This is composed of a steam hoisting machine, and an ingenious combination of chain and platform, so arranged that the loaders, or logs for the top of the raft, are floated over a sunken chain and by it hoisted upon a platform which throws them down upon the raft; the machine at once reverts automatically to its former position, and is ready to load the next raft. This machine will load 800 joints in a day, but the average is about 2,500 per week, as compared with 1,200 joints under the old system, when horses

lumber direct for the United States market, but deals for transatlantic ports are taken to St. John in lighters. There are several mills at Fredericton, cutting together from twenty-five to thirty million feet of logs each year. There are also some mills of small capacity scattered along the river above Fredericton, for nearly two hundred miles. Indeed, there is one very large mill on the Aroostook, away up in the State of Maine. It has already been noted that deals from some up-river mills are floated to Fredericton. The product of others is shipped by rail, chiefly to the United States market.

There are several large tracts of hemlock on the St. John between Fredericton and Woodstock, from which lumber is cut and shipped to the United States.

Fredericton has been regarded as an admirable site for a large pulp mill, and the late Edward Jack, C.E., just prior to his death, a year or two since, was devoting much attention to the subject. It was stated that a company had secured an option on a favourable site. It is pointed out that there is abundance of spruce to be got, both by rail and



DONALD FRASER & SONS' ABERDEEN MILL, FREDERICTON.

and men had to do the work. A finished joint contains 30 logs. A machine takes the place of 15 or 20 men, a former there had to be several loading places, with men and teams for each. Under the old system the company was seldom able to complete the work of rafting before the river closed in the fall. Now there is no difficulty in that respect. After the rafts have passed from the surveyors to the towing companies, the boom company's responsibility ceases. There are always some unmarked logs. These are sorted out and sold at auction, the proceeds being divided *pro rata* among the various log-owners interested. The boom company has a factory connected with its offices, where it manufactures wedges and pins for its own work. Hon. A. F. Randolph is president and treasurer of the company, and the other directors are W. H. Murray, C. F. Woodman, E. L. Jewett, and H. S. Miller.

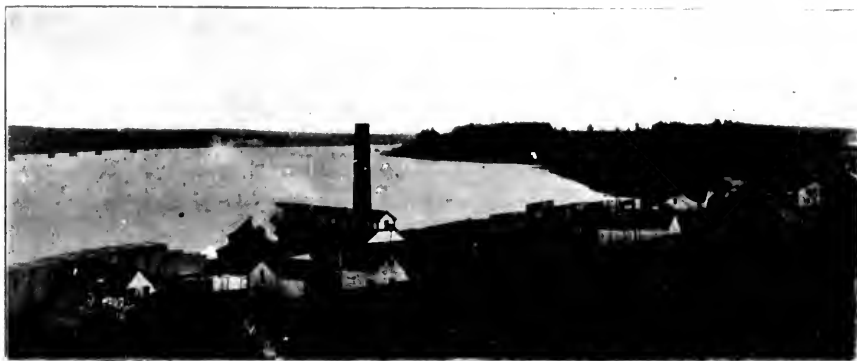
Large schooners go up the river to Fredericton and load

water, while only a short distance away, in Queen's County is a valuable coal deposit.

Many Scottish readers of THE TIMBER TRADES JOURNAL will recognise an old acquaintance in Donald Fraser, of DONALD FRASER & SONS, Aberdeen Mill, Fredericton. Mr. Fraser is an Aberdeen man, having been from 1868 to 1872 of the firm of A. & D. Fraser, timber merchants, King Street, Aberdeen. Mr. Fraser removed to New Brunswick and engaged in the lumbering business. He has a mill at River de Chute, 88 miles above Fredericton, and on August 13th, 1894, began operations in his new "Aberdeen Mill" at Fredericton, of which, together with his house and a portion of the yards, a picture is here presented. The river runs close beside the mill. The firm cut over eight million feet in this mill last year, and about one million feet at River de Chute. The mill here shown is equipped with a rotary of the most modern type, cutting an even and excellent class of lumber. The output last year was chiefly

spruce deals for the English market, sold to the shippers; but the firm also manufactured about six million cedar shingles, a lot of laths and clap-boards, and filled some orders for dimension lumber for the United States market.

firm of James Murchie & Sons, who have mills at several points in New Brunswick. The members of the firm of Hale & Murchie are, therefore, thoroughly representative men. The Victoria mill is connected both by rail and water



HALE & MURCHIE'S VICTORIA MILL, FREDERICTON.

The logs are all got in New Brunswick. Associated with Mr. Fraser are his sons, Donald Fraser, jun., and Archibald Fraser.

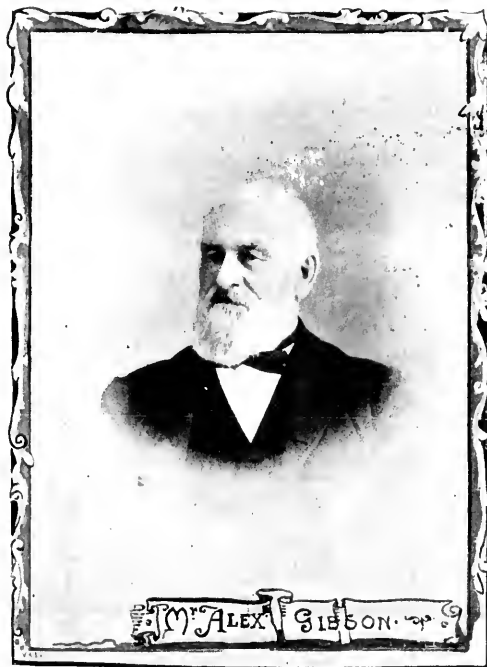
HALE & MURCHIE have a large mill known as the Victoria Mill at the river side, a mile or more below Fredericton. The main structure is 175 ft. by 40 ft., and there are the engine-house and several other buildings in addition. The mill is equipped with gang, rotary, two lath machines, and planer. The product is an excellent quality of deals, boards, scantlings (all dimensions), laths, and finished clapboards. The firm cut about 12,000,000 feet of logs, but only manufacture themselves about nine millions. The logs are cut on the Tobique, and except for a little pine are all spruce timber. Some three or four million feet of deals were sold last year for shipment to England. A good deal of the output went by rail to St. Stephen for export, chiefly to the United States. Fred H. Hale, M.P., who lives at Woodstock, and represents Carleton county in the Canadian Parliament, is the managing partner, and formerly owned mills at Woodstock, floating the deals in rafts down to Fredericton, sometimes five or six million feet in a year. Mr. Hale has been connected with the lumber trade for a quarter of a century or more, and has a thorough knowledge of the timber resources of the upper St. John district. His partner, George A. Murchie, lives in Calais, Me., and is also of the

routes with the markets, and has excellent facilities for the manufacture and shipment of lumber.

R. A. ESTEY has a mill at Fredericton, cutting some four or five million feet annually of spruce and cedar.

The mill owned by the late John A. Morrison, now controlled by **JAMES MURCHIE & SONS**, of Calais, cuts about five million feet of cedar into shingles.

Reference has already been made to **ALEX. GIBSON & SONS, LTD.**, whose deals are placed on lighters at the mouth of the Nashwaak, opposite Fredericton. Alex. Gibson is termed the "Lumber King" of New Brunswick. With three mills at Marysville and two at Blackville, he has marketed from his own mills a thousand million feet of deals, etc., in the last thirty years. He owns over two hundred thousand acres of timber lands, and has other large tracts under lease. His annual cut of lumber is about forty millions, and this year will exceed that quantity, while he generally buys as much as he cuts, and is, therefore, a very large shipper. Last year's annual special issue of this journal devoted four pages to illustrations and descriptions of the mills and timber property and trade of this firm. Mr. Gibson is the owner of the Canada Eastern Railway, and also of a large cotton mill at Marysville. He is the largest individual employer of labour in New Brunswick, and the most striking personality in the industrial life of the province.



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The Miramichi District.



THE MIRAMICHI RIVER AT CHATHAM.



THE Miramichi river is closely associated with the beginnings of the timber trade of Canada. It had, like the St. John, its pine timber period and its prosperous days of shipbuilding. The trade of the present day is chiefly in spruce deals, with some business in spool wood, and the pulp industry growing in importance. This great river, some 220 miles in extreme length, has numerous important tributaries, and drains an area of many thousands of square miles. In one direction, its largest tributary, the South-West Miramichi, has its sources so close to some tributaries of the St. John that they practically interlace, and a man may start in a canoe from the mouth of the Miramichi, go up the South-West stream, and by a portage of only six miles launch out on St. John waters and float to the city of St. John. Some of the lumber camps on the head waters of the South West are so close to the St. John that they get their supplies from towns in the valley of the latter stream. A tributary of the South West reaches down into York County almost to the valley of the Nashwaak, another feeder of the St. John; while the North-West Miramichi extends away up to within three or four miles of the Nepisiguit, a river that empties into Bay Chaleur, and then turns away westward towards the Restigouche. It is said there are little streams rising on the border of the State of Maine that flow eastward to form part of the Miramichi system. The North-West and South-West, which together form the main Miramichi, unite their waters about twenty-five miles from the beautiful bay into which the river broadens at its mouth. Starting at the junction of the two, and going up the South-West, we find flowing into it from the South, the Barnaby river; then, from the north, the Penouas, which has itself an important feeder in the Dangarvon; next, from the north, the Bartholomew, the logs from which are cut at Blackville and the deals taken by rail to the mouth of the Nashwaak, and floated to St. John for export; also, from the south, the Cains river, which rises in York County and flows through a corner of Sunbury into Northumberland. All these streams are the scene of important logging operations. Turning now to the North-West branch, we find that it has a large tributary called the Little South-West, which runs back quite near at one point to the Renous, and has its own source in lakes away over in Victoria County. The other important tributary of the North-West is called

the Sevogl, and besides it there are several smaller ones. The North-West is not as important a stream as the South-West in volume or length. From the duck, goose, and brant shooting district at its mouth, the prolific salmon pools on the upper waters, and the woods and barrens where moose, caribou, bears, and other big game abound, the Miramichi region is a sportsman's paradise. The map of New Brunswick shows clearly what a wide range there is between the sources of the most northerly and most southerly streams forming part of the Miramichi system, and also how far the stream extends westward toward the state of Maine. In winter there are logging camps scattered all over that vast region, sending logs to the streams, to make up the sixty to eighty million feet that is cut each year on the Miramichi waters. Probably the longest drive on the river is about 140 miles, while the shortest is only a few miles. The haul from the stump to the stream varies from a short distance to as much as six miles. Crews number from a dozen to a hundred men or more, and wages range from fifteen to twenty dollars, with some workmen getting as high as twenty-four dollars per month. While some of the manufacturers get their logs cut and hauled by contract, most of them send in their own crews and supplies. Some crews are in the woods as early as August, but generally sneaking the operations are in full swing by October 1st. The stream-driving begins in April, and the first logs arrive at the mills generally about the 1st May.

The great bulk of the cut is spruce, although on the lands drained by the Miramichi are to be found abundance of cedar, hemlock, birch, maple, and beech. Of course some hardwood is cut, also some cedar and hemlock, while about five per cent. of the total cut is of pine; but spruce is the great staple. The spruce logs cut on the Miramichi range from 14 to 30 feet, and ten inches and up at the top end. Each operator on the South-West, if he is on one of its tributaries, floats his own logs to the main South-West stream, where a log-driving company takes charge of them and floats them to the boom limits, which begin about nine miles above Newcastle and extend three miles. The cost of driving from the brow to the boom is about one dollar per thousand feet, and rafting fifty-five cents. Each manufacturer tows his own rafts to his mills. There is no log-driving company on the North-West, but there is a boom company which charges forty-five cents for rafting spruce, and fifty cents for rafting cedar. Including land bonus and licence, stumpage

dues, and the cost of cutting and delivering at the mills, the cost of logs last year was about \$7.75 per thousand feet, and this year the figure will probably be a little higher.

The quantity of logs rafted through the South-West boom each year since 1890 was as follows:—

Year	Sup. ft.
1890	67,492,000
1891	34,397,000
1892	49,469,000
1893	57,799,000
1894	39,449,000
1895	50,057,000
1896	54,000,000

The above figures illustrate the difference in the facilities, or rather of the seasons, for driving logs. In addition to what comes through the booms, there were each year a few million feet, probably not exceeding four or five in a season, rafted above and below the booms. The amounts rafted at the North-West booms were:—

Year	Sup. ft.
1889	8,000,000
1890	17,000,000
1891	9,000,000
1892	14,998,000
1893	9,315,000
1894	14,830,000
1895	14,297,000

The average is thus about 12,000,000 ft. for the North-West and 50,000,000 for the South-West booms, with a few millions each year that are not passed through the booms. A considerable portion of the cut on the North-West is in small lots from numerous owners of granted lands. The Miramichi region has at various times suffered a good deal from forest fires. The operators say the flames have done more than the axe to destroy the forests during the last half century, while the great Miramichi fire of 1825 is on record as one of the greatest calamities in provincial history, attended as it was by much loss of life as well as property.

We come now to speak of the mills and their work. There are nearly a dozen mills on the thirteen miles of river between Loggieville and Bridgetown. Loggieville, Chatham, and Nelson are on the south shore, and Douglastown, Newcastle, and Bridgetown on the north side. Chatham and Newcastle are enterprising towns, and there are probably fifteen thousand people living in these towns, and along that thirteen miles of river, and the fine farming districts stretching back from the river. With the lumber industry, the valuable salmon and other fisheries in the river and bay, and the fertile lands contiguous, the people of Miramichi are fortunately situated.

The mills begin sawing about May 1st, sometimes a little earlier, and continue until the middle of November, though some are closed earlier. It is worth noticing that the first steam saw-mill ever erected in Canada was built on the Miramichi at Chatham, on the site now occupied by the mill of William Richards. It was owned by Hon. Joseph Cunard, and was set in motion with great ceremony in presence of Sir Howard Douglas, Governor of the province. That mill had five gates, and it was predicted that the monster would strip the whole region of its timber in twenty years. Probably any one of the larger mills on the river to day would with one gate cut as much as that old mill with five, and still there are logs to saw.

The cut of spruce is almost exclusively for transatlantic markets and almost wholly for the United Kingdom and Ireland, though there are also small shipments each year to France, Spain, and Mediterranean ports, South America, and Australia. The deals cut are chiefly sevens, nines, and elevens, with some eights and other sizes, all to average 14 ft. to 15 ft. in length. An average run of logs made into merchantable deals will give a specification of about 50 per cent. 3 x 9, 35 per cent. 3 x 7 and 3 x 8, and the balance 3 x 11; besides the usual run of boards, scantling, fourth quality deals and ends. A million feet of logs will give from 70 to 75 per cent. of sevens, nines, and elevens, and the balance in boards, scantling, etc. The average price of deals on the wharf last season was about 10 dollars per thousand feet. Contracts have been made for next season at 10 dollars, and in some cases at 10 1/2 dollars per thousand superficial feet. In speaking of the lumber shipped from the Miramichi, it must be pointed out that the total includable a considerable quantity, probably 15,000,000 ft., that is not cut on the river, but along the streams, emptying into the bay, both from north and south,

outside of the mouth of the river. This winter, for example J. B. Snowball is cutting logs on the head waters of the Tabusintac, at a point about 70 miles north from his office in Chatham, yet he has to float those logs nearly 60 miles out into the bay, and then tow the rafts 30 miles down shore and up the river to his mill at Chatham. Ernest Hutchison also gets some logs on this stream, and tows them past Chatham to Douglastown. On the Big and Little Tracadie rivers, emptying into the gulf 50 miles up the coast from Chatham, J. B. Snowball gets out about 9,000,000 ft., and cuts it at a mill at their mouth, carrying the deals in lighters to Chatham for export; and still farther up the coast, some sixty miles from Chatham, is the Pokemouche river, down which logs are floated and towed to Chatham. On the south side of the mouth of the Miramichi are also some small streams, from which logs are in like manner towed to Chatham mills. Again, there is a mill owned by William Richards at Boiestown, some sixty miles from Chatham, but situated on the South-West Miramichi. The deals cut there, some two or three million feet, are brought by rail to Chatham for export, for the Canada Eastern Railway, which connects Chatham with Fredericton, carries deals to both places. Those from Boiestown go past Blackville to Chatham, and those from Backville past Boiestown to the mouth of the Nashwaak, opposite Fredericton. Boiestown, though nearer Fredericton, ships to Chatham; Blackville, though nearer Chatham, ships to Fredericton.

There are unsurpassed facilities for loading ships on the Miramichi. It is a magnificent river from its mouth up for more than twenty miles. For example, the river at Chatham is fully three-quarters of a mile wide, with over twenty feet of water at any wharf, and forty-five feet at the principal one, with a depth of eighty feet in mid-stream. At all the mills above Loggieville the ships can take their cargoes direct from the mill wharves. When the mills are all running, and the river is full of ships, there is great activity, thousands of men being employed. It is also to be noted the Miramichi district is well served by railways, and can ship timber to the United States market by rail as well as by water.

The total Miramichi ship masts to transatlantic ports last year were 108,000,000 superficial feet. There were also shipments of shingles, laths, and other small lumber to the States, and some local trade with Prince Edward Island and Nova Scotia.

It is not probable that the present average cut of seventy million feet or thereabouts on the Miramichi will be increased, but rather decreased. Nor will the average be greatly increased in any one year, because of the difficulties attendant upon river driving, as so much depends upon the weather in winter and spring. Every year sees some timber hung up.

It may be noted that practically all of the timber lands tributary to the Miramichi are Crown lands, or lands owned by the New Brunswick Railway Company. There are no very extensive tracts held in fee simple. Under the regular regulations governing the cutting of timber on these lands, there is a chance for the spruce forests to reproduce themselves; and thus, while the average size of logs has been decreasing, there is no absolute clearing of the lands; and they will, therefore, be a source of timber wealth for many years to come. Certainly the more desirable tracts are becoming more and more remote, and a decrease in the output, and an increase in the price must be looked for as the years pass, but there is no danger of a sudden extinction of the industry. This has reference to spruce. As to the other woods, their time of great usefulness is still of the future.

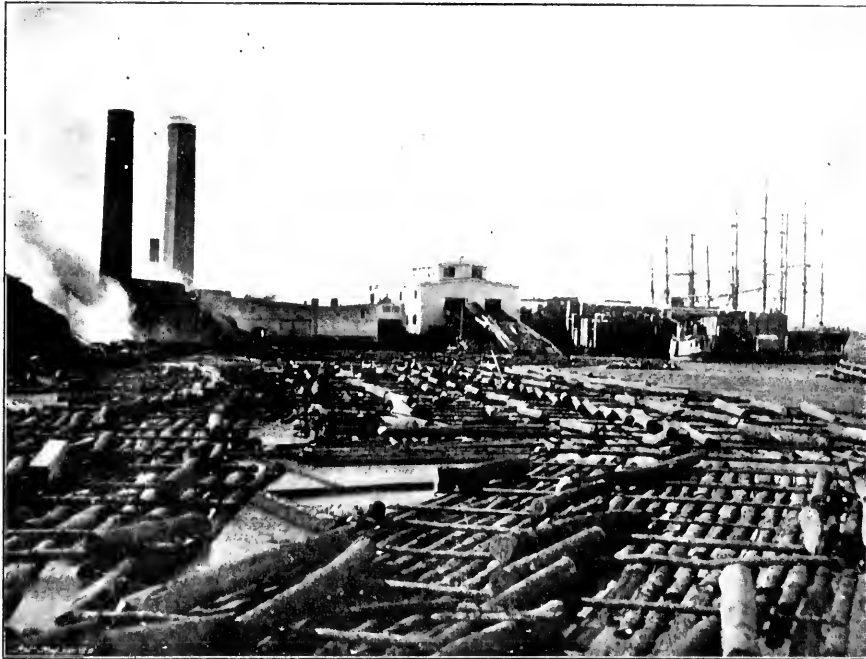
The advent of the pulp mill has caused some stir in timber circles on the Miramichi, especially as one company has appeared at the booms as a keen competitor with the sawmill-owners for possession of the small spruce logs offered for sale. As a measure of self-protection the mill-owners bid up the price, and virtually agreed to take a larger proportion of the small-sized logs at full price from the parties offering logs for sale. The chief effect of the pulp-wood operations is the cutting of small trees that would in a few years make saw-logs. The pulp mills will take logs running down to six inches at the top. They buy a great deal from small operators in various places near the mills, but at least one company has secured the lease of some blocks of Crown timber lands, and manifests a desire to secure more. While everybody recognises that the pulp business is certain to grow in extent, opinions differ widely as to the attitude the Government should maintain with regard to the

size of trees the pulp makers should be allowed to cut down. There are two mills on the Miramichi making sulphite fibre, but there are as yet no mills for mechanical pulp. The wood taken is spruce only, and may vary from a small saw log down to a stick five or six inches at the top end. The wood is chipped, sorted by machinery, cooked in brick-lined steel digestors, in a solution of sulphurous acid, for about eleven hours, then treated as paper stock and run over machines and dried. It is shipped in an air-dried condition, in tightly-compressed bales. The wood costs the mills about five dollars per thousand feet for near-by, ordinary stock, but large sizes brought from the head waters have cost one company as high as six dollars and a half. One of the mills uses about ten million superficial feet in a year, the other expects to require about twelve million feet.

The spool wood industry of New Brunswick has its

their own price, to the combine, and his mills are idle; while other operators who sold some last year are unable to make any contracts for the present year. The market is limited, and the combine have control of considerable tracts of birch timber land for their own supply.

The Hon. J. B. SNOWBALL, member of the Senate of Canada, and manufacturer and shipper of lumber on the Miramichi, is personally known to the trade from Algiers to Scotland. Each year he visits some of the markets where he sells. His annual Miramichi wood trade circular, issued for the last eighteen years, has been a valuable epitome of the timber trade of New Brunswick, and in a more general way of Nova Scotia also, with trans-atlantic ports. As a manufacturer, Senator Snowball has been identified with the Miramichi trade for over thirty years. His mill at Chatham, an illustration of which we give, cut last year some



J. B. SNOWBALL'S MILL AT CHATHAM.

greatest development on the Miramichi, where some three or four million feet are got out each year. The wood is of birch, and the logs are cut for the mill in four-foot lengths, down to five inches at the top end. Many of the logs run to 20 feet or more in length. Clark, Skillings, & Co., of Glasgow, have three mills, cutting 2,500,000 ft. in a year. One mill cuts 10,000 ft. per day, and the firm's Miramichi manager, Mr. Charles D. Manny, says that in each day's cut there is an unavoidable waste of at least 1,200 ft. of good spool stock. If the spools were made here, it could be utilised. It is stated on good authority that spools could be made on the ground in New Brunswick and shipped across at very little greater cost than that of making and shipping the spool wood. Just now, however, the spool wood industry is in a peculiar position. The great thread combine has led to a movement on the part of that corporation to control its spool wood supply. As a result, James Aiton, of Newcastle, who has been in the business twenty-five years, finds himself with two years' cut on hand that he cannot sell, except at

26,000,000 feet, and that at Tracadie, thirty miles up the coast, 9,000,000 feet. All of these deals were not shipped, but he purchased some, and his total shipments were 35,000,000 feet. He owns 453 miles of timber limits on Crown lands, and has a twenty-two years' operating privilege on 150 miles more.

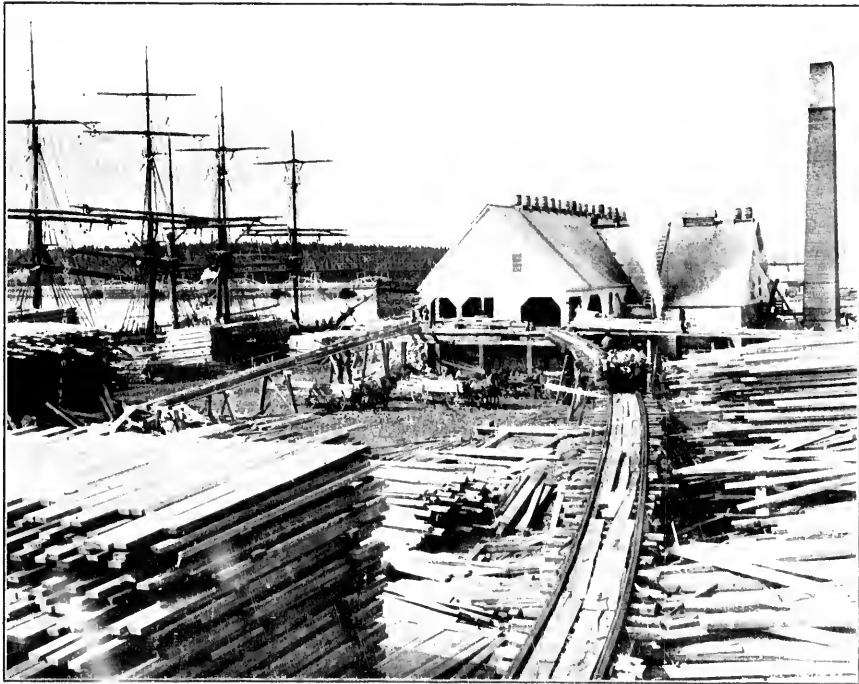
F. E. NEALE is well known to the trade on both sides of the ocean. He is a native of Liverpool, and was in the trade there for seven years. Mr. Neale has been on the Miramichi for some nine years. He is not a manufacturer, but a shipper and buyers' agent. He has acquired a thorough knowledge of the Miramichi timber trade, and has been very successful in his business, buying direct from the manufacturers on behalf of English firms. Last year Mr. Neale bought and shipped eleven million feet of deals to Great Britain and Ireland. Firms wishing to buy direct would do well to communicate with him.

Bridgetown, the home of **E. SINCLAIR**, a short distance above Newcastle, is one of the prettiest spots along the

river. Mr. Sinclair has here a fine mill, a view of which appears, equipped with a Milwaukee rotary, and lath-wood and shingle machines. Ships load direct from the wharves. He cuts annually about 5,000,000 ft. Some is cut into deals for the British market, and some into dimension lumber for markets in the neighbouring provinces, where it is carried in his own vessels. The laths and shingles go to the American market. The cut, of course, is chiefly spruce and the mill turns out fine lumber. Mr. Sinclair owned at the close of last year over 140 square miles of timber limits on Crown lands, and has since acquired additional blocks, some of them sharply competed for at the public sales. He is the owner in fee simple of Heaubair's Island, about a mile long and half a mile wide, in the Miramichi, close to his home, and on this island is a fine growth of spruce that is every year increasing in value. Aside from an honourable and

are shipped by the firm themselves to the United States, while they supply staves for barrels for the pork packers on Prince Edward Island. The cut of deals is sold by Mr. Lynch for the British market. There are ample yards and deep water wharves for direct shipment from the mill side.

W. A. HICKSON has a large mill, admirably situated at Newcastle, with deep-water wharves beside it, the deals being shipped direct from the wharf. The mill is equipped with a gang, which cuts about nine million feet each year. Four shingle machines turn out about ten million shingles, which, with the laths, go to the United States market. The great bulk of the cut is of spruce deals for the British market. He has not been a direct shipper, but has sold to shippers at the mill wharves. Mr. Hickson has been manufacturing deals at his present mill for over ten years, and is thoroughly conversant with the Miramichi timber



E. SINCLAIR'S MILL, AT BRIDGETOWN.

successful business career, it is but repeating the universal expression of those who know him to say that Mr. Sinclair is one of the most popular men on the north shore of New Brunswick.

SARGEANT BROS., at Nelson, just across the river from Newcastle, have a fine mill, admirably equipped, that cuts from nine to ten million feet each year. The mill was built by the late Charles Sargeant some twenty years ago, and is now operated by his sons, John H. and Charles Sargeant - the former as business manager, the latter as superintendent of the mill. They are probably the youngest mill-owners in the provinces, John being 24 and Charles 23 years of age. Both have had thorough training in every branch of the business. During the last few years they have not cut and shipped direct to the British market, but have cut logs by contract for T. Lynch, of Fredericton, a well known operator on the Miramichi waters. The mill, besides a gang, is equipped with lath, stave, and shingle machinery. The cut of laths is at out four millions, and these and the shingles

trade, and the requirements of the markets for which he manufactures.

Of the other operators, **WILLIAM RICHARDS** has a mill at Chatham, and a small one at Bon-town; **E. HUTCHISON** has a large mill at Douglastown; **D & J. RITCHIE & CO.** are erecting a new mill at Newcastle, to replace one destroyed by fire; **GEORGE BURCHILL & SONS** have one at Nelson; and **T. W. FLETT** a gang mill and small box mill at Upper Nelson; **GEORGE J. VAUGHAN** owns the former steved mill property at Leggieville; and **L. DOYLE** a smaller mill near Douglastown. The **MARITIME SULPHITE FIBRE CO. LTD.** have their mill at Chatham, and the **MASTERMAN SULPHITE PULP CO. LTD.**, are located across the river from Chatham.

Associate with the lumber business is that of the **MILLER TANNING EXTRACT CO.**, Millerton, Miramichi, which uses the bark from several million feet (perhaps seven or eight) of hemlock, the stripped logs being converted into boards for the United States market.

The Restigouche District.



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HE Restigouche district differs from those of the St. John and Miramichi in that while the latter have reached their highest limit of production the Restigouche cut of timber is still increasing. For there is a great deal of virgin forest on the Restigouche waters, capable of producing a much larger annual cut than the figures of past years. Spruce and cedar predominate, but there is also some pine and a good deal of birch, maple, and

John. There are logging camps on the Restigouche and Tobique, not more than five miles apart, but the logs reach the sea at points several hundred miles apart. The Upsalquitch reaches down close to the Nepisiguit. Bearing in mind what has been said of the reach of the various streams, and their tributaries in other districts, it will be seen that New Brunswick is intersected in a most remarkable manner. The Muskoka Lumber Co., which owns over four hundred square miles of timber limits on the Restigouche and Kedgewick, and stretching down towards the Upper St.



KILGOUR SHIVES' MILL AT CAMPBELLTOWN.

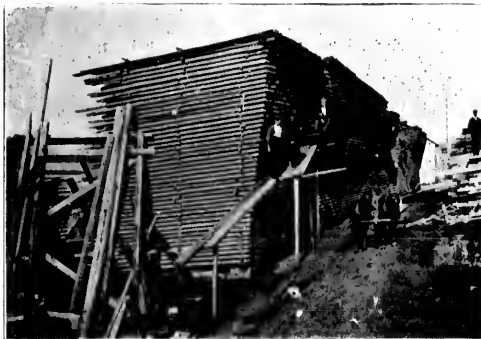
Nowhere else in the province is cedar so plentiful, and at present over one-half of the timber floated down the river is cedar. In addition there are numerous small mills scattered through the county cutting cedar shingles, and it would be a conservative estimate to place the cut of shingles in Restigouche County last year, at nearly 200,000,000. All of these are exported, some by rail and some by water, to the United States market. Of the logs from which shingles were cut last year, not more than half were brought down the river, the others being cut near the line of railway. As the heavier spruce timber on Restigouche waters has not been cleaned up, the operators are able to get somewhat larger logs than those in other parts of the province. Hence, instead of contracting for logs nine or ten inches and up at the top end, the rule is eleven inches and up. The spruce cut in the Restigouche mills into deals yields 45 per cent. of nines, 20 per cent. of eights, 22 per cent. of sevens, eights, and battens, and 10 per cent. of twelve inches and up. The logs are 16 to 22 feet long, and average 16½ to 17 feet.

The Restigouche river, which empties into Bay Chaleur, forms part of the boundary between New Brunswick and Quebec, and receives tributaries from both provinces. It is about 200 miles long, and one of the most famous salmon rivers in the world. Its principal tributaries are the Metapedia, Patapedia, and Kedgewick from the north, and the Upsalquitch from the south. Those from the north drain a portion of Quebec, and hence many Quebec logs come down to the mills near the mouth of the river. It is said that two-thirds of this year's cut of spruce will come from Quebec lands. The main river reaches down so close to the St. John that the waters of the two systems practically unite, and one may go in a canoe from the mouth of the Restigouche, almost without lifting the craft, to the mouth of the St.

John waters, will be able to float part of its timber to Campbellton, near the mouth of the Restigouche, and part to St. John.

While most of the lands drained by the Restigouche system in New Brunswick are owned by the Crown, there are some granted lands, and it also drains some of the lands of the New Brunswick Railway Company, described in previous article. Thus logs brought to the mills are from four sources, as follows:—from Quebec lands, from New Brunswick Crown lands, from New Brunswick Railway Company lands, and from other lands held in fee simple.

While there are logs cut quite close to the booms, there are drives brought in from points 75 miles up the river. The boom is 4 miles above Campbellton, and the limits extend for 9 miles. Each operator brings his own drive to the boom limits. The charge for rafting including shear boom charges, is 55 cents per 1,000 ft. for spruce and 70 cents for cedar. Cedar logs are cut 10 to 20 ft. long and 10 in. and up at the top end. Spruce logs cost about \$6.50 per 1,000 ft. at the mills, and those under 11 in. at the top end are two-thirds price.



LUMBER PILE AT KILGOUR SHIVES' MILL.

The Restigouche is a very good stream for log driving. The timber lands adjacent are nearly all under lease to various operators, but as yet only a comparatively small portion is operated on. Following are the quantities of logs floated down the river in the last three years:—

	Sup. ft. spruce.	Sup. ft. cedar.
1894	15,000,000	6,000,000.
1895	15,000,000	9,000,000.
1896	20,000,000	13,000,000.

There was also brought out in 1894 some 34 tons pine timber; in 1895, 95 tons; in 1896, 155 tons. While there is now practically no birch or other hardwood cut, the supply of these woods is very large. On the Restigouche, as else-

where, there is abundant opportunity for the development of the pulp industry.

We come now to speak of the shipping ports. For many years Dalhousie was the only shipping port of any importance, or of which anything was known abroad. Logs were cut at various points near by, and floated to the mill there, or deals were brought there by rail from Quebec points for export. But a powerful rival, and one of steadily growing importance, has arisen in Campbellton, some sixteen miles up the river. Mills were erected there, logging operations were extended farther up the river, the railway was extended down to deep water, the channel dredged, and Campbellton developed into a lumber centre of great importance. Not only does it ship the cut of its own mills, but large quantities of deals from Quebec province are brought in by rail and loaded on ships and steamers at the railway wharves. There was a great deal of opposition of the interested kind to be overcome, and much prejudice, but the fact is now established that Campbellton is destined to become an important lumber shipping port. The official map shows 15 ft. 9 in. to 20 ft. 7 in. in the channel at low water, spring tides; and 25 ft. 9 in. to 30 ft. 7 in. at high water, spring tides. During the last season the *Ramsdalen* (s) went out drawing 19 ft. 7 in. of water, before the dredging had been completed, and the *Ardanigh* (s) went out, drawing 17½ ft. at neap tide. There is a rise of 10 feet on a spring and 7 feet on a neap tide. It is estimated that about sixteen million feet of deals cut in the province of Quebec were shipped last year from Campbellton, Oak Bay (just across the river), and Dalhousie. There is twenty feet of water at the wharf at Dalhousie, which is also an excellent shipping port.

Campbellton, which is a divisional point on the Intercolonial Railway, will derive additional importance from the fact that the Bay Chaleur railway, running down the north shore of the bay, is to be operated hereafter as part of the Intercolonial system. A railway is also projected, to run from Campbellton across New Brunswick to Grand Falls or Van Buren, Maine, or the St. John River, connecting with the Bangor and Aroostook railway, through a very richly timbered region. A divisional point, at the head of navigation, with several railways making it a point of junction, the town of Campbellton, which has had a very rapid growth in the last few years, must continue to advance in population and importance. Dalhousie, the terminus of a short branch line of the Intercolonial Railway, is not so fortunately situated, though its facilities as a shipping port are unquestionable.

Apart from cedar shingles, the Restigouche mills cut very little lumber for the American market. **GEORGE MOFFAT**, the Dalhousie mill owner, cuts deals for the British market. At Campbellton there are three mills, those of **KILGOUR SHIVES**, **DAVID RICHARDS**, and **W. W. DOHERTY**, which, in addition to shingles, cut deals for the British market. Over at Oak Bay, on the Quebec shore, **J. D. SOWERBY**, also manufactures deals. There are a number of mills which cut cedar shingles only, and it is estimated that 75,000,000 shingles were manufactured last year within a dozen miles of Campbellton. Cedar will produce about 8,000 shingles to 1,000 superficial feet. A machine will cut about 15,000 per day, and they are divided into five classes, ranging from sixty cents to two dollars per thousand at the mill.

KILGOUR SHIVES, of whose mill a view is presented, is very largely interested in the Restigouche district. The mill is situated at Campbellton, and is equipped with modern machinery for the production of spruce deals, palings, planed and machel boards, box stuff, and shingles. Mr. Shives holds the lease of nearly three hundred square miles of valuable timber lands. His cut of logs this winter will be about eight million feet of spruce and cedar. Deals are cut with a Merg gang, and for cedar there are seven shingle machines. The products of this mill go to a wide range of markets. The shingles go to the United States. The deals, palings, planed and machel lumber, go chiefly to English and Irish ports, although last year Mr. Shives shipped two cargoes to River Plate and two to Marseilles, France. Mr. Shives cuts his lumber carefully, and in piling the deals in his ample yards now follows the method of the Quebec and Ottawa districts, piling them on edge instead of flat. Mr. Shives is recognised as one of the most enterprising and progressive timber owners and manufacturers in northern New Brunswick.

The total shipments from Campbellton and Dalhousie to transatlantic ports are elsewhere set forth. While, as already stated, the lumber cut on this river is capable of great expansion, it by no means follows that there will be a very notable increase; for the great bulk of the timber lands are under lease to a few large operators, who are in no hurry to reduce the possibility of producing a large proportion of wide deals, by exhausting the forests in a short period of time. Their present aim is rather to conserve the forest wealth by making a limited yearly output of logs.

The Bathurst District.

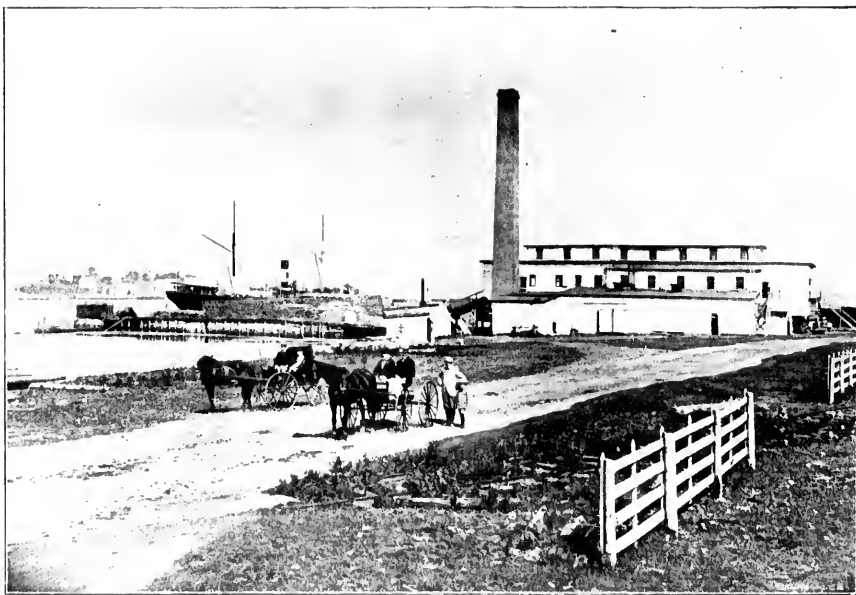


BATHURST is a small town at the mouth of the Nepisiguit river, in Gloucester county. There is a broad harbour inside the bar, with a channel through which vessels drawing 13 feet of water may go up to the mills. Large vessels usually go up and load until they draw 13 feet of water, and go outside the bar, where there is splendid anchorage, and complete their cargo from lighters. Besides the Nepisiguit, which is about eighty miles long, and has its source in a chain of small lakes, there are over half a dozen shorter streams emptying into Bathurst basin. From the north side are Little, Middle, Tetagouche, Grant's Brook, Millstream, Nigadoo, and Elm Tree streams, and from the south Bass river. Down these various streams are floated ten to fifteen million feet of logs each year. The stream driving is usually easy, and logs are not often hung up. Most of the cut is of spruce, but there is also some pine, cedar, and birch. There are two large and three or four small mills in the vicinity of the harbour. For a number of years past only one mill was cutting at Bathurst for the transatlantic markets, but now there are two, both of them

under strong management; and the lumber industry around Bathurst is in a healthier condition than for many years. Some of the logs that come into the mills are cut from granted lands, but there are in Gloucester county, tributary to the Bathurst mills, large tracts of Crown lands, on which is valuable timber. Here, as in other portions of the province, there is besides the spruce timber a good deal of birch (yellow and white), and other hardwoods; also cedar and hemlock, and quite a sprinkling of pine. The cut of the large mills is chiefly spruce deals, with some pine and birch; but there are also a good many cedar shingles cut for the United States market. The owners of the large mills have leases of crown timber lands, and thus a constant source of supply for their saws. A railway runs from Bathurst along the south shore of Bay Chaleur to the gulf coast at Shippegan, and connects at Pokemouche Siding with the Gulf Shore line which is being extended from there southward toward the mouth of the Miramichi, opening up a most valuable timber region. There are valuable timber lands all along this line, and at Burnsville, some thirty-six miles from Bathurst, there is a mill, the product of which, some two or three million feet of spruce and birch, is railed to Bathurst for export. This region is rich in wood suitable for manufacturing pulp, and that industry is certain to have a notable development. There is a practically

unlimited supply of spruce of an excellent quality. Bathurst has railway connection with all parts of the continent, being on the main line of the Intercolonial Railway; and the latter connects at Gloucester Junction, near Bathurst, with the Caraquet line. The latter line runs to Shippegan, and last year a line, called the Gulf Shore Road, was extended down the Gulf Coast from a point called Pokemouche Sidling to Tracadie. Reference was made in the Miramichi article to Snowball's mill at Tracadie. These railways connect that mill with the region north. As there is 30 ft. of water at Shippegan, which has been declared by Sanford Fleming, C.E., to be an excellent terminal point for a fast steamship line to Europe, it would be an easy matter to carry lumber or pulp by rail from any point on the Caraquet or Gulf Shore lines for export from Shippegan. A strong American company has a block of fifty square miles of land near Tracadie, bearing, it is estimated, 100,000,000 ft. of timber, and this company propose this year to erect a mill near Tracadie, and ship their lumber by the Gulf Shore, Caraquet, and Intercolonial railways, or by water from Shippegan to the United States market. The Caraquet and Gulf Shore lines open up an exceedingly rich region, in soil, timber, fish, and game.

and the liquidators, W. H. Thorne and Richard Turner, and the business is carried on under the name of Adams, Burns, & Co., with T. D. Adams, resident manager. The property includes mills at Bathurst and Burnsville, stores, offices and cottages at Bathurst, some eight or ten thousand acres of fine timber land on the line of the Caraquet railway, the lease of 150 square miles of Crown timber land at Burnsville, and 250 square miles on the streams emptying into Bathurst basin; also the Gulf Shore Railway, which, with the Caraquet line, gives a total length of eighty miles, connected by the latter line, with their mills at Burnsville and Bathurst. These railways, connected as already stated, with the Intercolonial system, traverse a country rich in soil and timber, and contiguous to coast waters from which salmon, lobsters, oysters, mackerel, cod, herring, smelt, and other fish, are taken in abundance for shipment abroad, while the coast region from Shippegan down to Tracadie and Miramichi is one of the best in the world for wild goose, brant and duck shooting. Adams, Burns, & Co. assumed control something more than a year ago. Last year their deals were sold on the wharf, but hereafter they will probably ship direct to transatlantic ports as was formerly done. Their total ship-



ADAMS, BURNS & CO.'S MILL AT BATHURST.

Speaking again of Bathurst, the three or four small mills near there cut some four or five million feet of lumber, chiefly for the provincial and United States markets, but also some deals for the British market. The total shipments from Bathurst to Transatlantic ports last year were seven to eight millions. This year they will be much larger, as one firm had only got fairly settled down to business toward the close of last season, and the other had some logs hung up. This year's shipments should reach or exceed fifteen million feet. As to sizes, the deals cut at Bathurst run about the same as those cut on the Miramichi. It may be added that there is room for a large increase in the export of lumber from the Bathurst district, as the timber supply is large and log-driving generally easy. The advent of financially strong companies has made a great change for the better in the timber prospects of the region. Deals cut at Bathurst have an excellent reputation, and are always in demand.

ADAMS, BURNS & CO. are the proprietors of the mills and other property formerly held by the St. Lawrence Lumber Co., Ltd., in New Brunswick. The property was bought by Adams & Co., of New York, from the receivers in London

ment this year will be from eight to ten millions. About one quarter of this firm's cut this year will be pine. Their birch lumber, from 1½ to 5 inches thick, is marked with their own initials, for it is of exceptionally fine quality. Both white and yellow birch are abundant on their lands, and they cut the latter exclusively. The mill at Burnsville has water power, and cuts two to three million feet. There is here an exceptionally fine site for a pulp mill, with an unlimited supply of wood and pure water. Adams, Burns, & Co. are financially a strong company and very enterprising, having extended their railway and otherwise improved the property since they assumed control. Mr. P. J. Burns, who has been for twenty years the superintendent of the mill at Bathurst, of which a view is here given, still fills that position—a guarantee of good work. Mr. T. D. Adams is a most competent and energetic manager, and understands the business thoroughly.

THE SUMNER CO. whose headquarters are at Moncton, are very extensively interested in the Bathurst district. They purchased the old Stewart Mill and other buildings and property on the north side of the harbour, and put modern machinery in the mill in time for last season's saw-

ing. The mill is now equipped for excellent work, and has a capacity for about eight million feet.



THE SUMNER CO.'S MILL AT BATHURST.

The cut this year will be six or seven million feet, most of it spruce, but some pine, cedar, and birch. There are lath and shingle machines in the mill, and the firm also make onion boxes for export to Bermuda. The Sumner Company are very largely interested in timber lands in New Brunswick, holding the lease of 200 square

miles of Crown timber lands. The firm are the largest shippers of railway ties in the province, and last year exported over 150,000 to the United States. The firm, in addition to their Bathurst mill, have a rotary mill in Kent county, cutting deals for this year's trade. Last year the firm sold their deals cut for the British market to W. M. Mackay, from their wharves, but they shipped lumber direct to the United States and the West Indies. They own several vessels. Since acquiring the Bathurst property the company have taken an important place among the lumber operators of New Brunswick. They also conduct a wholesale and retail hardware business in Moncton; and Fred W. Sumner, the managing director, represents Westmoreland county in the Legislature of the Province, and has been five times mayor of Moncton. W. H. T. Sumner, the other member of the firm, was one of the pioneer railway contractors of New Brunswick.

The St. Croix District.



HE St. Croix river forms part of the boundary between New Brunswick and the State of Maine, and its tributaries drain lands on both sides of the border. About thirty miles up from where the river empties into the Bay of Fundy, the towns of St. Stephen, N.B., and Calais, Me., are on opposite sides of the stream, and a little farther up Milltown, N.B., and Milltown, Me., face each other. The tide affects the river as far as St. Stephen and Calais, having a rise and fall of 24 feet. At high tide there is about 18 feet at the wharves. Schooners go up there and load, and at what is called the Ledge, four miles down, the largest steamers may take cargo.

Spruce, hemlock, birch and other hardwoods, and some small pine are found on the St. Croix. The river is about 75 miles long, and the main stream is formed by the junction of two quite large ones, one rising in New Brunswick, and the other in Maine. Most of the large timber has been cut, for the St. Croix has been an important shipping point for many years. The country has all been cut over, but there is still a large amount of small and medium stock, and extensive operations are still carried on. The mills are at Milltown, with one or two small ones farther up. Their total capacity is probably sixty million feet, but they do not cut over forty millions, and this year the total will fall a good deal below that figure. About half of the cut is spruce, and the other half hemlock and pine. The logs are cut on granted lands, and are cut down to seven inches at the top, for a log 20 feet long. Probably half the total cut comes from Maine. The lands are in the hands of a few wealthy firms, holding from 50 to 150 square miles each.

There are falls on the streams, and by damming some of the numerous small lakes great power could also

be developed on the upper St. Croix waters. The region is considered an excellent one for the production of wood from pulp. The stream is provided with good facilities for log-driving. In addition to the lumber cut at St. Croix mills there are probably twenty million feet brought into St. Stephen by rail from other mills for export. With the exception of some orange-boxes for Sicily, and some lumber cargoes to South America and the West Indies, the whole export trade is with the United States. The mills cut dimension lumber and frames to order, and never consign cargoes. Of the lumber brought in cars to the wharves, about fifteen million feet is from New Brunswick mills—chiefly on the Upper St. John river.

Of the operators on the St. Croix, **H. F. EATON & SONS**, of Calais, have several mills, and cut in an average year about twenty millions. They have cut as much as thirty millions. **JAMES MURCHIE & SONS**, of Calais, cut less on the St. Croix but besides three mills in one group at Milltown, they have one at Edmondston, one at Benton, one at Deer Lake, one, and an interest in another, at Fredericton, and one at Princeton. The latter is a box mill, owned by Mr. James Murchie. This firm cuts about thirty million feet of long lumber, twenty-eight million laths, and nearly a million box shooks, and sixty million shingles. **H. F. TODD & SONS**, of St. Stephen, were formerly large operators, but their cut is now small. **A. H. SAWYER**, of Calais, who ships via St. Stephen, has two mills on the upper St. John, cutting some even or eight million feet.

In St. John County, between the towns just described and the city of St. John, there are two small ports, St. George and Musquash, from which some lumber is exported. Usually one or two cargoes are shipped each year from Musquash to the British market. There is still considerable spruce in the regions adjacent to these small ports.

Shediac to Baie Verte.



HE first shipping port of any importance on the Gulf shore, south of Miramichi, is Richibucto, in Kent county. There are no large operators in Kent, and the county has been stripped of most of its large timber. There is a great deal of small spruce, and the facilities for pulp manufacture in the county have been discussed at considerable length in the local newspapers from time to time. A great many railway ties are cut in Kent county. Some spool wood for the syndicate is being cut in the county this season, for it has in some sections a fine growth of birch. Speaking generally, the county is well wooded, but the quantity of timber available for deal stock is small. **J. & T. JARDINE** and **EDWARD WALKER**, of Richibucto, are well known as shippers of deals to England. **ATKINSON & McLEOD** and **HENRY O'LEARY** are also in the trade there. **WILLIAM BRAIT**, at King-ton, and **J. D. IRVING**, at Buctouche, are other Kent county manufacturers; and small mills are numerous. There are no

large mills in all that section from Miramichi down the coast to Shediac. At the latter place the mill of **E. J. SMITH** cuts only some two or three million feet per year. Of the deals shipped from Shediac and Point du Chen: (which are near each other), some come down from Buctouche and other Kent county points; some come up from points along shore farther south; and some are brought in by rail. Numerous small mills contribute to the total is set forth in the annual statement of exports.

In the whole region from Shediac around to Baie Verte there is only one important firm of lumber operators, **J. L. BLACK & SON**, of Sackville, who are manufacturers and direct shippers of deals to the British market. They are owners of saw and grist mills, owners of large tracts of timber and farm lands, carry on farming and stock-raising on an extensive scale, and conduct also a large commercial business in the town of Sackville. Their chief lumber mill, of which we give an illustration, is situated at the head of tide on the Aboushagan river, four miles

from the Strait of Northumberland. The mouth of the stream is eight miles from Point du Chene, where the ships load, the deals being taken there in rafts from the mill. The firm have a second mill farther up the stream. Messrs. Black & Son own 15,000 acres of timber lands on the head of the river, and, in addition to their own cuts, purchase logs from the owners of adjoining lands. The

and a few shingles. The mills are equipped with water power gang, lath-cutter, and shingle machine, and the product is a well-manufactured article. The firm have found it to be more satisfactory to ship direct to the British market, their present English agents being Farnworth & Jardine. Mr. J. L. Black, the head of the firm, whose portrait appears, has had a very successful business career,

MILL
IN THE
FOREST

M. J. BLACK'S
SAWMILLS

J. L. Black

ABOU SHAGAN
NEW
BRUNSWICK

Mill Property

cut is mostly spruce, although they also ship considerable birch, beech, and maple, in the form of planks 14 to 4 inches thick, 7 inches and upwards wide, and 14 to 16 feet long. They cut about four million feet of logs themselves, and, including what they purchase, ship from six to seven million feet of lumber each year. The spruce is cut into deals, but-tens, long scantling, boards, planed and matched, laths,

and is one of the best-known men in the province; for, apart from lumber, he is the largest farmer and stock raiser in his parish, and his general store in Sackville is the centre of a very extensive business, covering every branch of general merchandise. Mr. Black represented Westmoreland county in the New Brunswick Legislature for seven years, but declined further service, being too active

THE WOOD INDUSTRIES OF CANADA.

a business man to devote a great deal of attention to politics. His son, Frank B. Black, was, at the beginning of this year, taken into partnership with him, under the firm name of J. L. Black & Son. There is a large amount of spruce cut in the district, but it is chiefly by portable mills. The lands are all owned by private individuals, and many of these cut on their own properties from five hundred to a thousand logs a year, delivering them at convenient points, or several owners will unite to furnish logs for a portable mill. The result of this is that these lands are being rapidly cleaned up. There are no large timber areas left in the section lying in the triangle formed by lines from Baie Verte and Shediac through to the head of the Bay of Fundy, having the Gulf coast line for its base. The rule in cutting logs in this region, from which the large timber has been culled, is to accept any tree that will make two logs of 14 to 15 ft. each, the smaller half 6 in. at the top end; but even smaller ones are cut. And every year the available area is growing less. Hence there must be a very notable decrease in shipments within the next ten years, possibly earlier. In addition to spruce, there is some hemlock and birch, maple and beech on these lands. Of the shipments from Shediac and Cape Tormentine a good deal, the product of portable mills, is taken to those points by rail. For example, some lumber cut in the upper part of Sackville, which is

close to the head of the Bay of Fundy, is railed to Tormentine, while some that is cut near Dorchester is taken the other way to Shediac; and at various points along the branch lines running to the two shipping points named portable mills are at work. The distance from Sackville to Cape Tormentine is about 36 miles; from Dorchester to Shediac (near Point du Chepe) 30 miles, and along shore from Point du Chepe to Tormentine about 50 miles. Passing round the cape, the largest mill near Baie Verte is that of **HAZEN COPP**, Port Elgin, who cuts two million feet, or a little more, per year. And passing on still to the Nova Scotia shipping ports of Tidnish, Northport, and Pugwash, the total shipments are made up in the same way of the product of numerous small mills, scattered wherever there is a bit of timber within easy distance of a shipping point by rail or water to the places named. And along this coast, just as around the head of the Bay of Fundy, the extent of the annual export must inevitably decrease. If markets are good, not much difference may be noted for a year or so, but the present rate of cutting is much greater than the average of growth, and therefore cannot be sustained.

M. WOOD & SONS, and **P. G. MAHONEY**, of Sackville, ship a few million feet of deals each year from the out-ports of Sackville. **J. S. HICKMAN**, of Amherst, ships a small quantity also, but his largest business is done through Tidnish, and Northport, farther down the coast.



Nova Scotia.



THE province of Nova Scotia is situated between 43° and 47° north latitude, and 60° and 67° west longitude. Its greatest length is about 300 miles and the width 80 to 100 miles. It is connected with New Brunswick by the narrow isthmus of Chignecto. The island of Cape Breton, which is part of Nova Scotia, is separate from the rest of the province by the narrow strait of Canso. The province has great wealth in its gold, coal, and iron mines, its fisheries and its shipping, while the fame of its apple-producing region is world-wide. The coast is indented by numerous good harbours. The climate of the province is healthy, and not severe in winter.

The area of the province is estimated to be 1,344,000 acres, of which nearly one-fifth is lakes and streams. The rivers are all short, as no point in the province is more than sixty miles from the sea.

So far as the lumbering industry is concerned, Nova Scotia offers a much smaller field than New Brunswick. The island of Cape Breton has practically no spruce timber that would make deal stock, though it has considerable hardwood. In the rest of the province the area of good timber lands is stated to be about 2,700,000 acres, of which over 2,000,000 acres are held by lumber operators in blocks of from a few thousand to, in one case, 250,000 acres, and in small lots by farmers. The officials of the Crown Lands Department say that while there is still a large area of lands ungranted, it would really be impossible to pick up any large tract of valuable timber property. For ten or fifteen years past the larger operators have been increasing their holdings, or new ones have come into the field, with the result that what Crown lands now remain are either inaccessible at present, through lack of railway facilities, or are not worth buying for their timber. It must be explained that there are no leases of Crown timber lands as in New Brunswick. The lands are bought, and held in fee simple, the only rights reserved by the Crown having relation to minerals. When, therefore, it is stated that a firm holds so many thousands or hundreds of thousands of acres, it is meant that they are the absolute owners. The only charge for Crown lands is forty cents per acre, and there is no land bonus or licence or stumpage charge. The only case where a stumpage rate is charged is where one operator secures the privilege of cutting on the property of another, and then the rate is decided by private arrangement. The Government has no regulations to enforce with regard to lumbering.

An official statement places the average stumpage production of the lands at 2,000 sup. ft. per acre of merchantable spruce, 1,500 ft. of hemlock, and 500 ft. of hardwood. This is computed as an average over the whole territory, as some lands yield only spruce, some hemlock, and others hardwood; while in some sections all are to some extent intermingled. Spruce and hardwood are the woods of commerce at present, and the proportion of hardwood cut is very small, and chiefly of birch. It is worth noting, however, that oak said to be equal for many purposes to the best American is found in Queen's, Lunenburg, and Shelburne counties. Spruce, hemlock, birch, beech, maple, ash, oak, poplar, and a little pine comprise the chief woods of Nova Scotia.

As all parts of the province are relatively near the coast there are no long drives, and the facilities for conveying the logs to the mills and the product from the mills to the ships are excellent. So far as the operations in the woods are concerned, they do not differ from the methods in New Brunswick except that the crews are smaller and there are a great many more rotary mills at work in proportion to the total cut. The axe is still the chief implement for cutting trees. The official statement before quoted states that the annual denudation of timber for export from Nova Scotia does not exceed 150,000,000 ft., and for local consumption is set down at 15,000,000 to 20,000,000 ft. more. It

is claimed that territory can be recultivated in fifteen years, which is allowing a longer period for growth than New Brunswick operators say is necessary in that province. The lands, except some around the head of the Bay of Fundy, have escaped any large fires, and the loss by fire annually is estimated to be not more than one per cent. With a cut not exceeding the annual total named above, it is claimed that the forestwealth of the province would reproduce itself so as to furnish a practically inexhaustible supply. But, as elsewhere shown, there has in the last year or two been unusual activity, especially on the lands of farmers and holders of small tracts, and this, it is now predicted, will reduce the total provincial cut very materially within the next few years. For the owners of large tracts will not greatly increase their output—indeed, they cannot, without soon stripping the lands of merchantable logs. All this, of course, has reference to spruce. There are some very fine belts of hardwood in Nova Scotia, from which the cut has as yet been small. The pine is pretty nearly exhausted.

It is unnecessary here to make more extended reference to the province as a whole, further than to give a few figures. The trade and navigator returns show that during the fiscal year ending June 30th, 1895, the total value of forest products exported from the province to all countries was a little over two million dollars. This included spruce and other lumber, 1,026,617 dollars; planks and boards, 696,376 dollars; laths, 60,616 dollars; firewood, 59,646 dollars; piling, 46,477 dollars; box and other shooks, 45,854 dollars; scantlings, 27,927 dollars; ends, 22,893 dollars; logs, 22,355 dollars; and various other articles from the value of a few hundreds up to ten thousand dollars. Shingles, which in New Brunswick figured for 450,000 dollars, only amounted to 9,423 dollars for the whole of Nova Scotia, which has no cedar of commercial value. The statement of last season's shipments to Transatlantic ports is elsewhere given, and, in addition, the province has a large trade with the United States, notably in piling, firewood, laths, and hemlock; and also with South America and the West Indies. The following table shows the countries to which the lumber was exported, with values, during the fiscal year 1895, above referred to:—

Country.	Value of lumber.
Great Britain	\$1,062,337
British Guiana	12,005
British West Indies... ..	111,076
British Africa	3,065
Newfoundland	16,280
Total British Empire	1,206,525
Argentine Republic	138,144
Brazil	5,791
France	10,652
Haiti... ..	9,558
Madeira	11,958
St. Pierre (Martinique)	13,517
Spain... ..	482
Spanish Possessions in Africa	12,190
United States	491,121
U. S. of Colombia	1,021
Uruguay	8,034
West Indies, Danish	1,027
" Dutch	1,148
" Spanish	114,039
	<hr/>
	828,273
Grand total	\$2,034,778

We pass now to a description of the different districts and shipping points. That portion around the head of the Bay of Fundy is treated of under the head of the Bay Ports.

The St. Mary's River District.



ST. MARY'S RIVER, and the shipping port of Liscomb at its mouth, are well known to British importers. This river flows into the Atlantic about 90 miles east of Halifax, and is the most easterly shipping port for lumber on that coast. From there all the way around Cape Breton Island, and up the gulf shore almost to Pictou, there is very little timber for export. But the St. Mary's river property is very valuable, and is now in the hands of a strong company. The **NOVA SCOTIA LUMBER COMPANY** own the mills, and about 70,000 acres of fine spruce lands on the head of the river. Expert cruisers have estimated that the company can cut 10,000,000 ft. a year for ten years, and then cut four or five millions a year for a practically unlimited period, as there is a hardy young growth, and fire does not spread in these forests. The spruce is of the tough, hardy nature peculiar to the coast lands. The company have some deals now on their wharf, and will cut this year about ten million feet. Were all the large logs taken off their property there would still remain a very fine chance for a pulp mill. The ten million feet referred to

above include about a million feet hauled into the river by farmers who own lands along its lower waters, and there is a large amount of such timber available, in addition to the company's own property. The river affords splendid water power, but the company employ steam in their mills. The logs from their own lands are driven from forty to fifty miles, and are easily floated. At the mouth of the river there is a gang and rotary mill, and also a mill for making box shooks. In addition to spruce there is a large quantity of very fine hardwood in this region. The product of the mills is lightered three miles to Liscomb, where the largest steamships can lie and load. When pulp mills multiply in Nova Scotia the St. Mary's River property will be of even greater value than it is at present. Reference is made to the Nova Scotia Lumber Company in the article on the Bay Ports, as the company own valuable property near Parrsboro, and ship from West Bay as well as St. Mary's River. Dr. C. W. Hewson, W. T. Pipes, Clarence Purdy, and Samuel Freeman, of Amherst; John W. and Job Seaman, of Barronsfield; and John Gillespie and G. K. Prescott, of Shulec, are members of the company.

The Sheet Harbour District.



SHEET HARBOUR, lying 45 miles to the eastward of Halifax, is, next to the latter, one of the finest harbours along the Atlantic coast of Nova Scotia. Into it flow the East, West, Little, Killag, and other small streams, which drain a very valuable spruce region. Deals from Sheet Harbour have long been known on the British and other European markets, and command a high price. Cable inquiries for "Sheet Harbour deals" show that they have a special value where known by the English and other importers. The spruce found in this region is of a very tough fibre, and the excellent mills produce a well-finished deal. There are both saw and pulp mills at Sheet Harbour. For the former, there is enough standing timber to turn off 150,000,000 feet of saw-logs in the next twenty years, and for the latter, an almost unlimited supply, for the region has never been swept by fire, and is covered with a thick, hardy growth. While much of the larger timber has been taken off, there is a good deal of still virgin forest, and the growth of the young spruce has been very rapid. Moreover, the annual cut has not been large enough to exhaust any portion of the lands. The rivers are short, and it is a very easy matter to get the logs to the mills, while there are splendid facilities for shipping the product. Large vessels can go to safe anchorage close to the mills, and lie in a land-locked harbour, having 22 to 24 feet of water, and more than twice that depth a short distance out. The mills on both the East and West rivers are operated by water-power, and either could get a 65-ft. head, if that were needed.

THE SHEET HARBOUR LUMBER CO. own nearly 40,000 acres of selected spruce timber lands on the West, Little, and Killag streams. The lands were selected and brought up by the predecessor of this company, and the transfer involved no less than 199 different deeds. As the average cut on this property for the last eight or ten years has been less than two millions, there has been opportunity for the smaller trees to increase in size. The company will get out about eight million feet this year. There is a well equipped gang mill at the mouth of the river, and in connection with it is a pulp mill, where the refuse of the sawmill is converted into mechanical pulp at the rate of about four or five tons per day. The additional plant only cost about 6,000 dollars, as water power is employed; and five men men do all the work. They can turn out from 40 to 50 dollars worth of

pulper day (for it is easily worth 12 dollars per ton at the mill) from refuse that would otherwise be wasted. The product of the saw-mill goes to the European markets; the pulp, of which more will be made this year than usual, goes to the United States. The latter business is capable of great development by utilising the forest as well as the mill refuse. The leading members of the Sheet Harbour Lumber Co. are:—Hon. A. R. Dickey, ex-Minister of Justice in the government of Canada; D. W. Douglas, of Douglas & Co.; N. A. Rhodes and N. Curry, of Rhodes, Curry & Co., Ltd., all of Amherst; and Samuel Baird of Leicester, N.E.

THE EAST RIVER LUMBER COMPANY owns 44,000 acres of exactly similar lands on the stream named. They have a mill equipped with gang and rotary and planer. Half a mile below the saw-mill is a completely-equipped sulphite pulp mill, that cost \$110,000. It is operated by steam power. Water is brought by gravitation through pipes laid to a lake a mile and a half distant. The sulphite mill has not been operated for a year or so, but the new company is assured that an expenditure of \$1,000 will put it in successful operation again. It is admirably located, has an ample supply of pure water, an enormous supply of spruce available, and is stands beside a wharf where there is twenty-two feet of water for ships to lie and load. During the present season the company are getting out four million feet of spruce. For several years past the cut has been six to eight million feet. This property has only recently been acquired, and at present the Hon. A. R. Dickey is the sole proprietor.

On the Moser River, lying east of the East River property, **HON. A. R. DICKEY** owns 18,000 acres of hardwood timber land, chiefly birch, with a large amount of black birch, also bird's-eye maple and other woods. Hon. Mr. Dickey has about 50,000,000 ft. of birch on this property, and during last summer cut several million feet, part of which is now at the mill. There is also some spruce scattered through the hardwood, and about 20 per cent. of the total cut each year is of spruce. There is a mill, with gang, rotary and planer, operated by water-power. A thousand ton ship loaded there last season. This is a very valuable hardwood property, and the wood is not surpassed in quality by any shipped from Nova Scotia. At Liscomb, still farther east, Hon. Mr. Dickey owns 4,000 acres of good spruce land and a mill site, but does not carry on any operations there.

The Halifax District.



HALIFAX FROM GEORGE ISLAND.

HALIFAX, with a population of about 40,000, is well known as an important military and naval station, as a port of call for the English mails in winter, and as a port with a magnificent harbor and a very widely extended trade. It is a port easily reached from all parts of the world, and its merchants and shipping men are wide-awake, enterprising and progressive. It has for a very long period enjoyed a large trade with the West Indies and South America, as well as with the British Islands, and other European ports. The harbour is about six miles in length by an average of one mile in breadth, deep and safe, and at the north end is connected with Bedford Basin, a splendid sheet of water six miles long and four miles wide. The facilities for loading ships at Halifax are excellent, as there is deep water and only a slight variation of the tide. Ships load beside the wharves, and there are no wharfage or dockage fees, in fact the port charges are merely nominal.

Although there are no sawmills at Halifax cutting for export trade, the port is, next to West Bay, the largest lumber shipping port in Nova Scotia. The deals are almost all brought in by rail, some from the vicinity of Windsor, which is near the waters of the Bay of Fundy, and some from Amherst, which is 138 miles away, and much nearer to Pugwash and Bate Verte. From points all along the line from Amherst to Halifax, are sent by rail to the latter port from Windsor to Halifax, deals are sent by rail to the latter port for shipment to trans-Atlantic ports. The cars of lumber are run right down to the wharves at deep water, and their freight loaded direct into the ships. Quick despatch is given to vessels. One shipper, for example, has loaded a steamer with 1,000 standards in six days. Shipments can be made at any time of the year, but of course the great bulk of the business is done in the summer. There is a little lumber brought in each season in schooners,

from coast ports, but it is a very small fraction of the whole. One branch of industry, associated with the lumber business to some extent, is likely to have a large development at Halifax. At St. Margaret's Bay, twenty miles west of the city, there is a splendid forest of hemlock, and this tree grows abundantly near other coast ports. It is pointed out that if large tanneries were established at Halifax, they could get the hemlock bark cheap, while the wood could be manufactured and marketed. The hides could be brought from South America in vessels that could take back cargoes on Cape Breton coal. The manufactured leather could be shipped to England. Water carriage could be utilised in every branch of the business, and with the admirable location of Halifax everything could be done at the minimum of cost. This is a matter that is just now attracting considerable attention, and appears to offer excellent inducement. Some, however, maintain that a place like St. Margaret's Bay itself would be the better location for the tanneries. There is no doubt that sooner or later the neighbourhood of these hemlock forests, either Halifax or elsewhere, will see a notable development along the lines indicated.

As to the future of the deal trade of Halifax, it is to be noted, that here, as in the eastern portion of the province, a considerable portion of the supply comes from the lands of farmers, whose properties cannot stand the strain for many years longer. Therefore a decrease in shipments may be looked for within the next five years at most.

In connection with Halifax may be mentioned Ship Harbour and Musquodoboit Harbour, lying between it and Sheet Harbour. There is considerable timber land on the streams tributary to these harbours, but the annual cut is small. At Musquodoboit, **HILL, FRENCH, & CO.**, cut about 5,000,000 ft. per annum; and at Ship Harbour, Hill and French cut about 3,000,000 ft. Neither is an important shipping port.

The St. Margaret's Bay District.

ENGLISH importers are familiar with the name of St. Margaret's Bay as a Nova Scotia lumber shipping port; for deal cargoes have been shipped annually from the port to the British market for more than twenty-five years past. Four streams, the Indian, Ingram, Hubbard, and East Rivers, each from 25 to 30 miles in length, empty into the head of St. Margaret's Bay, and

they in turn connect with lakes that intersect the territory drained by them. It is, therefore, a well-watered country, and one in which logging operations can be carried on with ease. The streams afford excellent facilities for driving, and logs are never "hung up."

Spruce, hemlock, and hardwood are found on the lands drained by these streams, the greatest portion being spruce and hemlock. The region has never been visited by fire

and the timber is, therefore, all in good condition. The annual cut has not been large, and consequently the forest shows no sign of exhaustion, further than that the very largest trees have been thinned out.

The spruce that grows here is the variety known as black spruce, and makes bright and attractive deals. The facilities for establishing mills for the manufacture of mechanical pulp are specially excellent. The expensive plant required makes water-power a very desirable accessory, and on these short rivers are several falls, and also places where, by the simple process of erecting dams, great power could readily be developed. Thus, with abundance of wood, pure water, water-power, and excellent shipping facilities, the chances for pulp manufacture are tempting to those interested in this industry. The black spruce makes a clean white pulp. The largest vessel afloat can easily load at St. Margaret's Bay. The mills are twenty-one miles west of Halifax. The annual shipments total about 10,000,000 ft. Logs are cut 9 in. and up at the top end, and the deals show the usual run of sevens, nines, and elevens. For years the firm of N. L. Todd & Co. owned the property at the head of St. Margaret's Bay, but a year ago last December it was purchased by the well-known firm of **YOUNG BROS. CO., LTD.**—This company have been engaged in the lumber business in Nova Scotia for more than twenty years. They shipped from the head of the Bay of Fundy carrying on their logging operations on lands owned

by them at River Herbert and other places in Cumberland County. This property they sold out, and in its place purchased that at St. Margaret's Bay, comprising a well-equipped mill, wharves, yards, houses, and 68,000 acres of well-timbered lands on the various streams already named in the preceding paragraphs. The mill is equipped with gang and rotary, lath machine, and machinery for turning out planed and tongued and grooved lumber. All the machinery is modern, as the mill was thoroughly refitted a few years ago. This company has always enjoyed an excellent reputation as manufacturers, and as a reliable business firm. The company has a paid-up capital of \$160,000—a sufficient guarantee of financial responsibility. Practically the whole cut of the mill goes to European ports, though there is some local trade with Halifax, and some shipments are made to South America and the United States. Some of the deals for the other side are consigned direct by themselves and some are sold to other shippers. Thus far the trade in planed lumber has been confined to local markets, but the company are well equipped to do an export trade in this line. The members of the company are B. F. Young, president; D. P. Young, treasurer; and C. W. Young, secretary. The offices are at St. Margaret's Bay, but C. W. Young lives at St. Stephen, New Brunswick, where he is largely interested in other manufacturing enterprises. Young Bros. Co., Ltd., are the only manufacturers and shippers at St. Margaret's Bay

The Bridgewater District.



WEST of St. Margaret's Bay a stream called the Gold River empties into Mahone Bay, but only a couple of million feet of lumber each year is cut on this property. Further west we come to the La Have River, and then the Medway, the Liverpool, Jordan, and some smaller streams.

Speaking generally of all this district, there are cleared lands along shore, then a belt on which is found hemlock and hardwood, and still further back, near the sources of the streams, forests of spruce and pine. This is the only part of Nova Scotia where pine is found in any considerable quantity.

A remarkable feature of this region is the great number of streams and small lakes intersecting it. Near the head waters of the La Have, a stream called the Nictaux rises, and flows in the opposite direction towards the Bay of Fundy. The tributaries of these two streams and the small lakes so interlace that they form practically two parts of the one system. And all over the country lying back from the shore, from St. Margaret's Bay to Tusket, the same wonderful network of streams and lakes exists, affording unrivalled opportunity for floating timber. By the simple damming of a small lake, a head of water can be got that will enable the lumbermen to float the log-down brooks that at the first glance would appear impassable. Each river, with its lake expansions, reaches over to the territory of its neighbour.

There are splendid water powers scattered on the different streams, and the mills are all operated without the aid of steam.

The great bulk of the valuable timber lands in all this region is owned by the firm of **E. D. DAVISON & SONS, LTD.** They own over 200,000 acres, and are therefore the largest land holders in the province. They are also the oldest firm operating in the province. For though the present firm was established on the Medway in 1840, and on the La Have in 1865, their ancestors have been getting timber in the district since 1760. Gradually they enlarged their holdings of timber lands, without greatly increasing their output of lumber, and as a result they are to-day the owners of tracts of timber on which no logs have ever been cut. On the La Have River they have 50,000 acres on which no logs have been cut for twenty years; and 30,000 acres on which none have ever been cut. It is estimated that their lands will produce an average of 4,000 feet of timber to the acre, which would give a total production, from all their property, of 800,000,000 ft. Probably a quarter of this is pine. On their Medway property of 40,000 acres,

they have about 60,000,000 ft. of hemlock. No operations have been carried on at Medway for two years. The present operations are conducted on the La Have and Nictaux, which, as before stated, flow in opposite directions, but have their sources practically intermingled. In order to secure the Nictaux lumber, they have a mill at a place called Alpena, which is also on the line of the Nova Scotia Central Railway, by which the manufactured lumber is taken to their shipping port of Bridgewater, or, for winter shipment, 19 miles further to Lunenburg. The firm have two mills at Bridgewater, which is 13 miles from the mouth of the La Have River. Vessels drawing 17 ft. of water go up to Bridgewater, and the very largest vessels can take cargo three miles below. The river is deep, and free from obstructions, and influenced by the tide as far as Bridgewater, the variation being about six ft. The Bridgewater mills are near each other, just above the town. One of the most valuable assets of the firm is the splendid water power which they here control. They own the land bordering on the river on both sides for three-and-a-half miles above the lower mill, and have it leased for another mile-and-a-half. On this five miles there is one water power affording a 10-foot head, above it one of 12 ft., then one of 19 ft., and lastly one of 20 ft. The first three are right beside the railway, and the fourth can be connected with it by a short branch or siding, for which the firm own the right. The first and second of these powers drive the two mills. The large mill has a huge furnace, 80 ft. high, for burning sawdust; the other is being fitted with carriers, and a burner of another style.

The mills are a marvelously equipped, and their finished product is a very fine class of lumber. Instead of slaughtering the logs, as is done in some mills, they aim to get good lumber, and as much of it as possible, using stock gauge and 13-gauge saws, instead of 8 or 9 gauge as in some mills. This gauge gives an extra board from each log, and the firm prefer the gauge of this class to the band-saw for successful work. Besides the yards at the mills, they have nearly half a mile of wharves just below the town, where the writer saw four million feet of lumber piled early in January, of which an order for 2,000,000 feet was received for South America on the day previous to his visit. Although the firm have such a large area of timber lands, they do not cut a large amount, being in no hurry to exhaust the forest. Their annual cut is from twelve to eighteen million feet, of which three-quarters goes to the Bridgewater mills and the balance to Alpena, on the Nictaux. The latter is generally held for winter shipment, being sent by rail to Lunenburg, which is



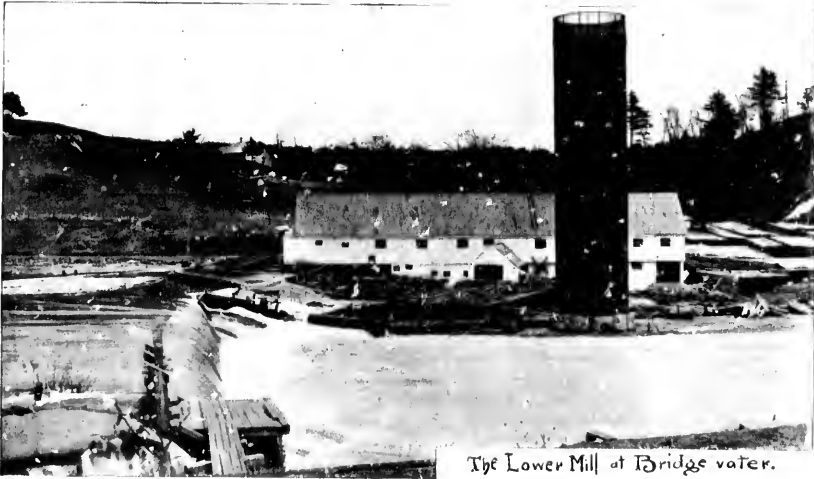
Mill at Port Medway



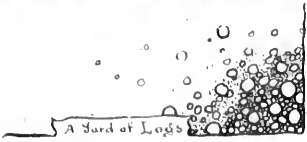
Wharves on the Medway



DAVISON'S
MILLS
&
WHARVES
AT
BRIDGEWATER



The Lower Mill at Bridgewater.



A Yard of Logs



Lumber Wharves at Bridgewater
NOVA
SCOTIA

19 miles from Bridgewater, and has an excellent harbour, open all the year round.

With regard to markets, it is to be noted that the shipments made by E. D. Davison & Sons, Limited, valued at 120,000 dols. to 160,000 dols. per year, do not figure in J. B. Snowball's Wood Trade Circular, which deals only with trans-Atlantic business, and therefore includes only about half the total trade of Nova Scotia, and in some years less than half of that of New Brunswick. The Bridgewater firm ship chiefly to South America, the West Indies, Madeira, and the Canary Islands. Some years, from half a million to a million feet goes to the United States, and they ship occasionally to Portugal. A good deal of trade is done with Portuguese houses, half a dozen vessels flying the flag of that country loading in the La Have last summer. No shipments have been made to the British Islands for several years.

In their logging operations, the firm, if cutting near a settlement, find it wiser to strip the land pretty clean; but in the deep woods nothing less than nine inches at the top is cut. But of four millions of pine cut at the Bridgewater mills last year, over half made ten-inch stock. Logs are cut as long as 50 feet, but the usual run of the manufactured lumber is 16 to 30 feet. There are so many streams and lakes, that the longest haul from the stump does not exceed three miles. The logs are driven from 25 to 50 miles. Operations begin in September or October in the woods, and driving about the first of April. The firm have expended many thousands of dollars in improving the streams and lakes on their vast timber areas. Wages are low, as men are plentiful in the fishing settlements in winter. The average is about 13 dols. per month, or considerably lower than in New Brunswick. Supplies can be easily and cheaply taken to the camps, which contain from twenty-five to thirty-five men. The products of the mills are deals, planks, scantlings, boards, laths, shingles, and box stuff. Of the total cut one-fourth is pine; the rest is spruce. To put it briefly, the firm can cut lumber to any size required, from a lath up to a board or deal 18 inches wide, or timber 14 inches square. The mills are provided with electric light.

The late E. D. Davison, who established the present firm's business on the Medway in 1843, was a man of keen foresight and remarkable business capacity. The same ability and enterprise were shown in the career of his son, C. H. Davison, who died last year, lamented by all who knew him. He it was who established the business at Bridgewater, whither the whole family removed later. Frank Davison, president, E. D. Davison, vice-president, and A. F. Davison, secretary, are the present members of the firm of E. D. Davison & Sons, Limited, one of the most enterprising and honourable, as well as the oldest, in the

trade in Nova Scotia. The firm's cable address is "Davison," Bridgewater.

The town of Bridgewater is about 60 miles west of Halifax. It is a flourishing town of over two thousand people, with quite a well-settled country about it. Sixteen miles above it, on the La Have, is a mechanical pulp mill, with water power, having a capacity of about 20 tons per day. As already noted, there is a splendid water-power much nearer the town. Besides lumber, there is gold-bearing quartz near Bridgewater, and stamp mills are successfully grinding the quartz at two points within half a mile of the town. The river has fine salmon and alewives fisheries, and the whole coast below is famous for its cod and other fisheries. The largest fishing fleet in Nova Scotia hails from the La Have and Lunenburg, requiring four thousand men to man the vessels.

About twenty miles west of the La Have River is Port Medway, to which flows the Medway River. E. D. Davison & Sons, Ltd., own a mill and valuable timber lands on this stream. Views of the port and mill are given. There is a mechanical pulp mill on the river at Mill Village, four miles above Medway, doing a good business. Twelve miles up is a system of lakes. The river and lakes afford great water power, there being at the foot of the largest a fall of 20 ft., with numerous rapids in the Medway below. A company has a charter to establish a pulp mill at the falls and build an electric tramway to Port Medway, put a steamer on the lakes, exploitate lands, and generally to develop a large enterprise. No definite action has yet been taken beyond securing the charter. The river has famous salmon fisheries, and the Malega and other gold mines are in this region, promising great wealth in the future. Most of the large timber has been cut, but there is an abundant smaller growth. With this and its water power the region is a promising one for a great extension of the pulp business.

Passing west from Medway, there is the Liverpool River, with a mechanical pulp mill at Milton, 120 and a half miles from the town at its mouth, and connected with it by an electric tramway. On the headwaters of the river and its lake system are tracts of spruce, from which the large timber has been taken. There is very little export trade from Liverpool. This region and the Medway were the seat of the first lumbering operations in Nova Scotia. Harlow and Kempton, at Milton, have a saw-mill, and wood-working factory, but do not export to any notable extent.

Still further west is the Gordon river, where H. W. Freeman manufactures a small quantity of lumber each year for export; but there are no large operators.

The last shipping point of any note for lumber on this coast is Tusket, to which reference is made under the head of "Inland Timber Areas," the lumber business of the place being controlled by Mr. Alfred Dickie.

Inland Timber Areas.



HERE is a very considerable area in Nova Scotia, the lumber from which is carried by rail to Halifax or Pictou for export. Beginning not far back from Canso, there is a valuable block stretching over to the St. Mary's River property described in another article. All along, on the rear of the St. Mary's River, Sheet Harbor, Ship Harbor, and other tracts bordering on the Atlantic, there are timber lands the output from which is taken to the railway. The Intercolonial railway, which runs through from New Brunswick to Halifax, has one branch running from Oxford Junction to Pugwash, and on to Pictou, and another branch running from Truro to Pictou, and on to Canso. From Canso to Truro is 123 miles, and from Truro to Halifax 62 miles. From Truro the other way to Oxford Junction is 42 miles, and from the latter place by the shore line to Pictou is 69 miles. From Windsor Junction, 74 miles from Halifax, the Dominion Atlantic Railway runs through to the Bay of Fundy coast and along it westward to Yarmouth. Now, along these various lines, from Oxford Junction to Truro, from Truro to Pictou and Canso and from Truro to Halifax and along the Dominion Atlantic to Windsor town, there is a good

deal of timber land, some of it in small and some in large blocks. There are no very large mills located on any of these lands, but many small ones are at work. In some cases the mills are quite close to the railway; in others it is possible to utilise small streams; in others small sluices, just wide enough and deep enough for a deal, are constructed for miles to carry the deals from the mill to a point on the railway. A good deal of this land has been cut over for the large timber, but there is still considerable virgin forest scattered through it. It will never produce a large annual cut, but is capable, under judicious management, of producing a considerable quantity annually for a practically unlimited period. The rule in cutting spruce on these lands is to take nothing below twelve inches at the butt. While some of the logs are cut on the lands of farmers, and while this source of supply must greatly decline, because of great activity in the last few years, the most of the lands are held by two large operators, who will be in no hurry to deplete their own source of supply. One operator declares that in his opinion the total cut of Nova Scotia will be done nearly one-third within three years, because the portable mills, by that time have cleared off most of the merchantable logs on farmers' lands and the smaller tracts, while the large owners, recognising

the increasing value of their properties, will not very materially increase their own annual cut. The region specially referred to in this article thus far does not extend any further west than a line drawn across the province from St. Margaret's Bay to Minas Basin.

T. G. McMULLEN, of Truro, was last year the largest operator in the whole province. He owns 150,000 acres of timber land, and his annual cut is about 20,000,000 feet, although last year he cut 26,000,000 feet. Mr. McMullen has been engaged in the trade for 25 years. He has a bar mill with a capacity of 40,000 feet per day on the St. Croix, near Windsor; two rotary mills on the Shubenacadie, near Truro, and a number of rotary mills at other points. One valuable block of 30,000 acres of his land lies between St. Mary's River and Canso. He has 5,000 acre near Parrsboro, but is getting the timber grow on that tract. On the St. Croix, near Windsor, he owns the land on both sides of the river, and around a lake 24 miles long, beginning five miles up from the mill. He has raised this lake 12 feet, and by means of gates is able to get water for steam driving at any time of the year. He could utilise here a force of 2,000 h.p., and the property would be of great value for the manufacture of pulp, as wood, water, and power are all at hand. On a large portion of Mr. McMullen's lands no logs have been cut, and, at a moderate rate of cutting, he estimates that he has a source of supply of 25 million per year perpetually. All his deals are shipped from Halifax and Pictou, chiefly from the former port. His

agents are Farnworth & Jardine, of Liverpool, who handle his lumber through their agents in England, Scotland, Ireland, and France. Lumber can be shipped from the port of Halifax at any time of the year, winter or summer. Mr. McMullen thinks the lumber shipment from Nova Scotia will be about the same for 1817 as it was for 1896.

ALFRED DICKIE, of Stewiacke, is now one of the largest operators in the province. He has been engaged in the business for eight years, and owns 65,000 acres of timber lands in Colchester, Pictou, Guysboro, and Halifax counties, and, along with T. N. McGrath, owns 18,000 acres more on Tusket River in Yarmouth and Digby counties. On all these lands is much valuable timber, and Mr. Dickie preserves it by purchasing part of his annual cut from other landowners. He has a gang and rotary mill at Stewiacke, and, besides the steam rotary at Tusket, nine others, principally small rotaries at various points. To his Stewiacke mill, logs are brought as far as forty miles down the Steviacke river. All the deals from the 68,000 acres first referred to are carried by rail to Halifax for export. All the lands at Tusket are tributary to the Tusket river, and the deals will be shipped from Tusket and other parts. In December, the barque "Ruby," 1,392 tons, was chartered to load in July, at Tusket. Mr. Dickie cuts deals, boards, scantlings, laths, and shooks, and ships to the British, French, North African, and U. S. markets. Contracts were made last fall for a cut of about thirty-two million feet, of which 20 millions is at Tusket. The annual cut hereafter will be between twenty and thirty millions.

Bay of Fundy Ports.



A LEADING operator expresses the view that last year's cut of lumber around the head of the Bay of Fundy will never be exceeded. He estimates that over 100,000,000 ft. of deals were cut in that region last year for the British market, besides the shipments of boards, scantling, laths, and piling to the United States (the board cut alone would be 10 per cent. of that of deals); and a considerable export to South America. The 100,000,000 ft. or more for British ports includes the quantity lightered to St. John for re-shipment, and the direct shipment from West Bay, Grindstone Island, Hopewell Cape, Alma, and one or two other small ports. It is to be noted that the cut in this region is by a very large number of small operators, getting out from less than a million to, in one case, fourteen million feet.

Beginning at St. John and going up the coast, the places and shipments, with point of re-shipment to British ports, are as follows:—Tynemouth Creek, five millions, St. John; Quaco, five millions, St. John; Big Salmon River, four to five millions, St. John; Little Salmon River, three millions, St. John; Goose Creek, one and a half millions, St. John; Point Wolfe, five millions, St. John; Alma, three and a half millions, mostly direct from Herring Cove, but some to St. John; West River, two millions, Grindstone Island; Crooked Creek, two and a half millions, Grindstone Island; also from this region the product of twenty or more rotaries taken by rail to the coast and lightered to Grindstone Island or Hopewell Cape, some eight millions in all, these rotaries being quite close together, and not more than twenty miles from the coast; next come Moncton, Dorchester, and Sackville, from which but little is shipped for the English market. Passing on to the Nova Scotia shore of the bay, there are—River Hebert, six million feet to Grindstone Island; also here and at Jogging, further on, several millions from small rotary mills; Two Rivers, two and a half millions, part to St. John and part to Grindstone Island; shulee, three and a half millions, St. John and Grindstone Island; Sands River, half a million, St. John; Apple River, eight millions, St. John; Eatonville, four millions, St. John; Advocate, two and a half millions, West Bay and St. John. The West Bay shipments are elsewhere given. The figures given in the above list are last year's cut for the British market at the places named. There have been some deals shipped direct from Five Islands, near West Bay, but

not a large quantity, and none last year, except what went by way of West Bay.

Nothing is more certain than that the cut around the head of the Bay of Fundy must decline to a marked extent. As already observed, a great many rotary mills have been at work. There has been a keen ambition to pick up desirable bits of timber, and the portable mills enabled the operators to clear small tracts which could not be made otherwise available. But these tracts are being thinned out very rapidly, and some firms, who cut several millions last year, have got their properties pretty well cleared up. A leading shipper predicts that next season's shipments from the Bay ports mentioned in this article, whether direct, or by way of St. John, will not be much more than two-thirds as large as those of last year. And at the recent rate of activity, a great decline of the large export trade from that region is only a question of a few years. Here is a sample of the items that one sees frequently in the small country newspapers of that section of the provinces. What it describes is multiplied over and over again in that region. "R. P. Soley's new portable mill of some 35 H.P., that has just finished sawing about 400,000 feet of deal at New Britain, Five Islands, will be moved to Lynn immediately, where it will be kept running at full speed all winter. J. S. Thompson, of New Britain, Five Islands, has gone into the woods for the winter, about two miles from his own residence, and has a number of men employed, logging for Mr. Laurence Peppard, of Great Village, whose portable mill will soon be in position in this locality. The cut here will likely reach 300,000 feet." It is thus that a great many millions of the year's annual output are produced. Here is another paragraph:—"Thun, 25 in the lumbering line are going to him at Big Brook, Lorne, where Mr. Alfred Dickie, of Stewiacke, has bought a large tract of timber. Already he has taken three steam mills in and a large number of men are going in."

An Amherst company sent an expert cruiser over the whole region between the New Brunswick border and Minas Basin, and his report was that in three or four years the only shipment would be of lumber cut by the few operators holding large tracts, and that some of these would have to show a reduced cut. The available small tracts of land, he said, would be cleaned up so far as merchantable logs were concerned.

Five has done a good deal of damage in this region.

One company have had 3,000 acres burned over. When this happens all the trees must be cut at once. It is stated that portable mills, and the inflammable refuse they leave, are responsible for many fires.

In connection with the Bay ports a reference may be made to the trade in piling. This class of lumber goes altogether to the United States. The sticks are required to average 40 ft., and 10 1/2 in. and up at the butt, at least half of a cargo to be 12 in. It may run to 6 in. at the top. There is a good deal of piling shipped, although the market is not an unlimited one, being sometimes overstocked. John E. Moore shipped 27,000 sticks from St. John in 1815, and about 16,000 in 1835. All of it came from points up the Bay, from which also many direct shipments are made. In one week last year, for example, E. I. WHITE & SON, at Sands River, cleared 14 schooners with cargoes of piling for United States ports.

It has been argued that this cutting of trees for piling spoiled what might, in a few years, be good logs from which to manufacture deals, and it has even been urged that an export duty should be levied on every stick of piling sent out of the province. So far as the region around the head of the Bay is concerned, however, there appears to be very little in the argument. There are sections where the spruce trees grow very tall, very straight and slender, with scarcely any branches till near the top, and they stand so thickly together that they cannot increase in diameter unless the forest is thinned out. As this would be impossible, and since nothing better than a batten log could ever be got out of them, the objection to cutting and shipping them as piling loses its force. At least, that is the opinion of persons who, from the dealers' standpoint, took the trouble to inquire carefully into the whole matter. Nevertheless, more or less good timber for deal stock is undoubtedly sacrificed to the demand for piling.

The largest operator in all this Bay region is CHARLES T. WHITE, who owns a mill and 40,000 acres of timber land at Apple River, Nova Scotia; and a mill and 30,000 acres of timber land at Point Wolfe, New Brunswick. At the two places last year, Mr. White cut about 14,000,000 feet of lumber for the British and South American markets, the latter taking about four million feet. Mr. White estimates that there is a hundred million feet of standing timber, chiefly spruce, on each of these properties; that is, each will yield about that quantity with proper care. With a moderate cut each year, the properties would be practically inexhaustible, as the young timber grows rapidly in that region. Vessels drawing 18 feet of water can load at Point Wolfe, where there is an easy and safe place to lie; but a vessel drawing 18 feet can only go out at spring tides. At Apple River, vessels drawing 10 to 18 feet load for South America, Mr. White having loaded as many as a dozen there for that market during the last year or two. Here, too, vessels lie in an easy berth. The mills cut an excellent quality of lumber, and Charles T. White, whose portrait we have pleasure in presenting, is known as a wide-awake business man of means and ability. His home is in Sussex, New Brunswick, but most of his time is spent at his mills. He is prepared to dispose of either or both of these timber properties to a purchaser who is willing to pay the price.

PRESKOTT & GILLESPIE own 17,000 acres of timber land at Sablee, and cut from three to four million feet each year for

the British market, shipping from Grimstone Island. Their property has all been cut over, but still bears a good deal of merchantable spruce timber.

THE SHULEE LUMBER COMPANY own 10,000 acres, of which about 3,000 has been swept by fire. On the remainder there is probably ten million feet of merchantable logs, and a thrifty young growth. About twenty-five million feet has been shipped from the property in eight years, and 125,000 pieces of piling.

THE NOVA SCOTIA LUMBER COMPANY referred to in the article on St. Mary's River, includes members of the Shulee Lumber Company and Messrs. Prescott & Gillespie, and, besides the St. Mary's river property, owns 31,000 acres at Economy, on Minas Basin, about 20 miles from Parrsboro. This property has not been operated on for six or seven years, and there will be no lumber cut this year, possibly none for two years. The spruce has grown very rapidly, and it is estimated that thirty-five or forty million feet is now large enough to cut. The property is one of the most valuable in the region around the head of the Bay. The deals will be shipped from West Bay, being taken out in lighters.

It may be added that this year the Nova Scotia Lumber Co., the Shulee Lumber Co., and Prescott & Gillespie, will put their deals together for sale and shipment. Including St. Mary's River cut, they together expect to market eighteen to twenty million feet.

THE NEWVILLE LUMBER CO. own 15,000 acres of spruce timber lands on the line of railway, ten or eleven miles from Parrsboro, having bought it from Young Bros. Co. About fifty or sixty million feet of spruce has been cut off this property in the last eighteen years, and it is estimated there is forty million feet of merchantable logs standing on it to-day, besides a thrifty smutler growth. That the spruce grows rapidly there is shown from the fact that this winter the present company are logging where Young Bros. & Co. had crews in eight years ago. There is a gang mill at Newville, and this year the cut will be six or seven millions. The deals are carried by rail to the company's own wharves at Parrsboro, and lightered to West Bay for export to the British market.

RHODES, CURRY & CO., LTD., of Amherst, whose advertisement appears elsewhere, are largely interested in timber lands. They own 15,000 acres along the Canadian Railway,

many miles from Amherst, and cut there from two to two-and-a-half million feet of lumber each year, the bulk for their manufacturing establishment, although a little is shipped to the United States, and a small cargo each year to South America. They are the members of the Sheet Metal Lumber Co. of the Newville Lumber Co.

S. H. WHITE & CO. own the property of a mill at Little Salmon River, and C. M. BOSTWICK & CO. at Big Salmon River, and the ALMA LUMBERING CO. at Alma. Each of these properties will yield a cut of several million feet of spruce timber annually in white pine, as well as watered logs of shanty timber, and will be valuable sources of supply for pulp mills. Of course the heavy timber has been cut out. C. & J. PRESCOTT at Crooked Creek, G. S. D. PRESCOTT on Apple River, and H. W. & W. R. ROURKE at Orléans, all in New Brunswick, are smaller owners and operators in the same area.

Playing over the New Brunswick coast, KELLY BROS. and PUGSLEY BROS. own a mill at Point Wolfe, and B. B. BARNHILL, of P. W. R., owns a mill at Sablee, and cut about



CHARLES T. WHITE.

three million feet each per year. The Shulee Lumber Co. is elsewhere referred to. **L. TUCKER**, of Parrsboro', has bought 12,000 acres on Moose River, and will cut five or six million feet, as will also **C. F. & F. R. EATON**, of Eatonville.

Following the Nova Scotia shore of the Bay of Fundy westward, the next operator of importance is **S. P. BENJAMIN** of Wolfville, who has a large track of land, some of it recently acquired, and who will erect a mill on the Avon river (which flows into Minas Basin) and will cut five or six million feet, to be sluiced four miles to tide water, and then lightered to Hantsport for shipment. His cut is chiefly for the South American market.

The beautiful and historic Annapolis Basin, an arm of the Bay of Fundy still farther west, and directly opposite to St. John, N.B., has an important lumber trade. **PICKLES & MILLS**, of Annapolis town, own about 15,000 acres on the Nictaux stream, and haul the lumber to the railway, on which it is brought to Annapolis for export. They cut four to five million feet, and ship chiefly to South America. The Bear River, which empties into Annapolis Basin twelve miles below Annapolis, is a very important stream, for its east and west branches, with the lakes along their course, drain a valuable timber area, and offer magnificent water power. While most of the heavy timber has been cut, there is still a supply for a moderate output for a long period; and for the supply of pulp mills an enormous quantity of small spruce. For this latter purpose, also, the splendid water offers special facilities. The town of Bear River is four miles up the stream, and vessels drawing 18 feet go up there to load. Half a mile above the town the east and west branches unite. Only a mile farther, on the east branch, is a cat-ract. A competent engineer has estimated that these falls would fill through the year two iron pipes three feet in diameter, carrying the water about a mile to a favourable site for a pulp mill, and there giving a 200-foot head. Five miles above the falls the same stream enlarges into a lake 6 miles long, and average of one mile in width. This lake itself could easily be raised to give a 12-foot head. Small tributaries connect with other lakes, and the west branch enlarges into a similar system, also affording an opportunity to utilise water power. All around these lakes are tracts of spruce, very easy to secure and float to the lower waters. In addition to the holdings of resident owners, amounting to many thousands of acres, there is a tract of 25,000 acres in the very best-watered district, owned by a United States company, now in liquidation, and it will probably be thrown on the market.

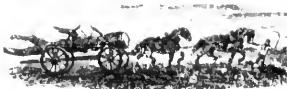
There is very little pine in this region, but considerable hemlock, and a great quantity of small and medium-sized spruce. That it was once heavily timbered is shown from the fact that Clarke Brothers, who own 8,000 acres on the river, got a million and a quarter feet of merchantable logs from 100 acres. Of course there is very little of such timber land now left in the vicinity. In connection with the establishment of the pulp industry in this region, it is to be noted that there is a regular schooner packet service from Bear River

to St. John, and a cheap rate by rail over the Dominion Atlantic Railway to Halifax, so that the English steamers from either port can be utilised; while schooners for the United States sail direct from Bear River. Thus, while the export lumber trade from Bear River at present amounts to only six or seven million feet per year, the facilities for manufacturing and shipping pulp promise for the district a much larger business in the future. And as South America is showing a demand for hemlock (an order for nearly a million feet being received last season), there will probably be an increase in the export trade in sawn lumber.

CLARKE BROTHERS are the only lumber manufacturers on Bear River. They have a rotary mill at head of tide, a gang mill at Morgantown, two miles above, and another rotary on one of the lakes. They own 10,000 acres of timber land, but are carefully preserving it, and of an annual cut of five to six and a half million feet, fully two-thirds of logs are bought from small land-owners near the river and lakes. Clarke Brothers ship to Cuba, South America, and the United States. Three large Cuban firms together take from two to three million feet per year from them. In addition to their Bear River output, the firm purchase about a million feet from parties farther down the basin, towards where it joins the Bay of Fundy. The firm own the land for a considerable distance on either side of the finest water power on the Bear River. They carry on a very extensive business as general merchants at Bear River, and are owners of five vessels, ranging from 150 to 500 tons, engaged in their own trade. They recently received an order from New York for a cargo of birch, beech, and maple lumber, to be used for interior finish of houses, which is a new departure in provincial trade. The members of the firm are W. W. and W. G. Clarke. Their card appears elsewhere in this issue.

Farther west, on the shore of St. Mary's Bay, which is another arm of the Bay of Fundy, is Weymouth, on the Sissiboa river, a stream that has its sources very close to those of the Bear River. At Weymouth, **CHAS. BURRILL CO.**, and **G. D. CAMPBELL** each cut about two million feet per year. Up the stream a few miles is a mechanical pulp mill, with a capacity of about twenty tons per day, in successful operation, shipping its product to the United States. Fourteen miles from Weymouth the firm of **LETHE LINEROS**, from old France have bought a large tract of land, and spent considerable money with a view to doing a lumber business, the product to be taken by a pole railway to Weymouth for shipment. They have not as yet operated to any extent. All the lumber shipped from Weymouth goes to the South American, West Indian and United States markets. A little below Weymouth, at Meteghan River, **BLACKADAR EROS**, cut from one to two million feet per year.

No other operations of any magnitude are carried on along this shore until we reach Tusket, to which reference is made elsewhere.



British Columbia.



PART from its mineral wealth, the timber lands of British Columbia constitute its chief resources; and now that their value is being recognised in the export markets, we may look with increasing confidence to the future to bring greater prosperity to the lumber trade of the province. Of the 382,300 square miles which form the area of British Columbia 285,554 are wooded—a large proportion, indicating the steady supply that can be assured for many years to come. In the past, forest fires have denuded the country of much of its timber, but they were hardly avoidable in the unsettled state of the Colony. Fortunately, as the greater part of the

and readiness to take an excellent finish. Hitherto the red cedar—a rich wood for interior work—has been better known; but the yellow cedar is steadily coming to the front. Cypress is grown in great profusion in Vancouver Island, but is most plentiful on the north coast, and has attained celebrity as the material out of which the Hydah Indians built their war canoes, sixty feet long. In the first illustration we give a view of a forest in British Columbia, affording some idea of the monarchs which grow in that wood-favoured country. Almost all the timber attains to great heights, and, as will be observed, the density of the woodland is considerable. Among the merchantable timbers is white spruce, which finds use in wood-pulp manufacture and in making doors, packing-cases, etc.; in the latter instance a very large supply being necessary to meet the wants of the



A BRITISH COLUMBIA FOREST.

best timber is near the coast, the fires were unable to effect any serious inroads upon the most accessible supplies—owing, of course, to the humidity of the climate and the dense forest growths there found.

Some few varieties of timber are found in the Colony, and of these Douglas fir has attained the widest celebrity. Probably its most important testimonial comes from Dr. Nansen, whose vessel, the "Fram," in the late Arctic voyage, was made of this wood. Experience in those northern regions showed its wonderful strength and elasticity, and should lead to its further popularity for similar purposes. Grown on the coast, the tree attains a height of 300 ft., for specimens have been found with a base circumference approaching 42 ft. Heights of 150 ft. may be classed as fair average sizes, with a diameter of 6 ft. Compared with Douglas fir, so far as strength is concerned, the yellow cedar grown in British Columbia merits attention for its large dimensions, durability,

various industries in tinned goods which thrive along the coast. When the supply of Douglas fir shows evidence of exhaustion, the colonists will probably regard hemlock as its successor. Among the many excellent cabinet woods in the province are, of course, localities where it is more profuse, and among these the best known are those on Vancouver Island, along the Fraser River, in the Westminster district, on the Burrard Inlet in South Vancouver, and the principal inlets of the coast as far as Knight's Inlet.

Looking at the commercial aspect of the British Columbia timber business, it is gratifying to note that the cloud of depression that long darkened the prospects has been lifted. According to the report of the British Columbia Board of Trade for 1905 the quantity cut during those twelve months was 1,228,464 feet, or about 40 per cent. more than in 1914, the foreign demand not only being con-

THE WOOD INDUSTRIES OF CANADA.



LOGS AT A MILL IN BRITISH COLUMBIA.

siderably larger but more widely distributed. The formation of the **CENTRAL LUMBER COMPANY**—a combination of the principal export mills on the Pacific Coast—has also improved prices for the exporters. To deal with the quantity of timber cut every year, over fifty saw-mills are engaged, the appearance of one of these, with its log supply ready to hand, being admirably depicted in our second view.

The chief shipping centres are Vancouver, Moodyville, New Westminster, Chatham, Vesuvius Bay, Victoria, and Metchosin Bay, and in 1890 the shipments were as follows:—

	Feet.
Germany	1,467,764
Liverpool	967,840
Plymouth	1,100,000
Granton	363,000

	Feet.
Gibraltar	1,797,000
Dieppe	101,000
London	2,484,255
Melbourne	2,816,336
Adelaide	3,396,340
Sydney	6,134,012
Delagoa Bay	3,694,996
Shanghai	8,637,392
Tientsin	2,722,383
San Francisco	1,240,972
Fremantle	3,335,549
Iquique	1,120,000
Valparaiso	4,520,077
Buenos Ayres	3,004,216

There were also a few minor shipments to other ports. Our illustration of the Hastings Saw-mill at Vancouver



OX TEAM HAULING LOGS TO THE ROYAL CITY MILLS CAMP.

THE WOOD INDUSTRIES OF CANADA.

shows the valuable railway and shipping facilities possessed by the **BRITISH COLUMBIA MILLS AND TRADING COMPANY**—the largest shippers in the province, and who can be approached through Messrs. Foy, Morgan, & Co. Located on Burrard Inlet, it is admirably placed for export business, eight vessels being able to load at the same time along its wharfrage and steamers of 3,000 tons having been

Mills, as well located as the head establishment. The Royal City Planing Mills have a river frontage of 1,650 ft., and the Canadian Pacific Railway also runs through the yard. Here are two saw-mills, a sash and door mill, two planing mills, and other branches, while the company have the further advantage of drawing their supply of logs from their own timber limits. For the Royal City Planing Mills, the timber



TRAIN OF LOGS, ROYAL CITY MILLS CAMP.

despatched therefrom, while the railway track of the Canadian Pacific Railway runs through the yards. Several acres are occupied by the premises, and the capacity of the saw-mills is 200,000 ft. per day, between 150 and 250 men being employed. At False Creek, Vancouver, the company has a branch establishment known as the Royal City Mills, while at New Westminster it operates the Royal City Planing

is obtained from limits on the coast and up the Fraser River, a powerful team of oxen being engaged in hauling logs for the mills. On the Fraser River the limit is fourteen miles from the bank and the logs are conveyed to the river by the logging train shown in our fourth sketch. This establishment is kept well employed on local demands, the foreign shipments being chiefly sent from Vancouver.



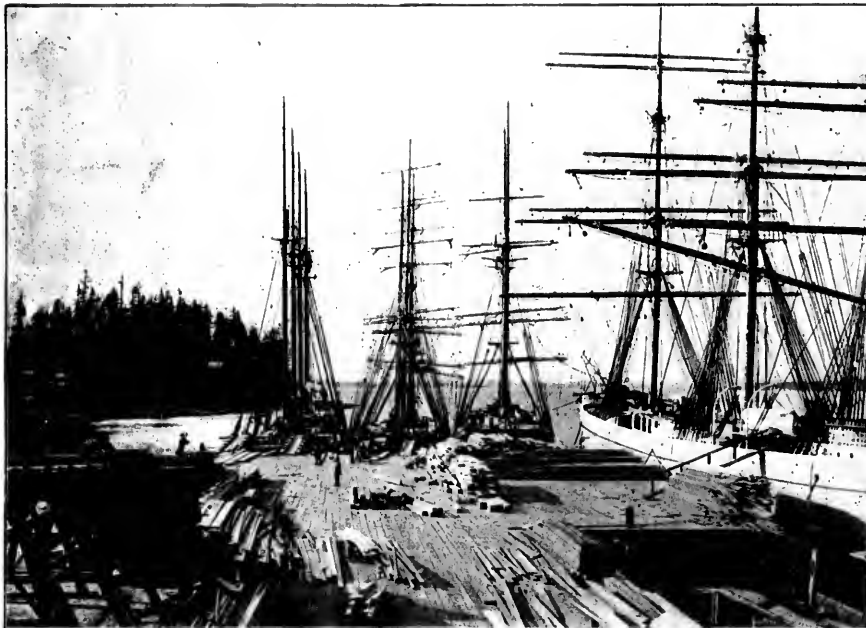
THE HASTINGS SAW-MILL, VANCOUVER.

THE WOOD INDUSTRIES OF CANADA.

Among the other leading concerns in British Columbia we would briefly refer to a few of the more important. The **BRUNETTE SAW-MILLS COMPANY, LTD.**, do a considerable export business, their output of lumber being 100,000 ft., and one of the special features of their trade being the manufacture of salmon-boxes.

business with the United States, their output of lumber being 15,000 ft. a day and of shingles 150,000 a day.

At Victoria **MESSRS. JAMES LEIG & SONS** operate the Point Ellis Saw and Planing Mills; and the **SAYWARD MILL AND TIMBER COMPANY, LTD.**, do a large export business to Australia and Canada; another important works



LOADING LUMBER FOR EXPORT.

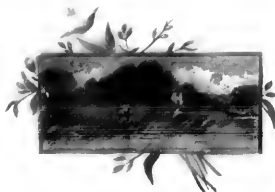
The **MOODYVILLE LAND AND SAW-MILL COMPANY** has its property immediately opposite Vancouver, having been established by the late Mr. Seth Moody several years ago. Since 1861 it has been under its present proprietorship. The equipment of the mill is of the most modern description, and the area of the timber lands owned by the company is both extensive and valuable. At Nanaimo the splendid saw-mill owned by **MR. ALBERT HASLAM** occasionally makes foreign shipments.

Making a specialty of red cedar the **PACIFIC COAST LUMBER CO. LTD.** of New Westminster, is doing capital

in the same city being the Capital Planing Mills, owned by **MESSRS. LEMON, GONNASON & CO.**

The **VICTORIA LUMBER AND MANUFACTURING COMPANY** own the mill at Chemainus, Vancouver Island. This is the only mill which did not join the combination of Californian, Puget Sound, and British Columbia mills formed eighteen months ago, and does a good business with China.

Five acres of land at Kaslo Harbour are owned by **MR. G. O. BUCHANAN**, who does a large local trade for the Kootenay Lake Saw-mills.



THE PROVINCE OF QUEBEC.

BRITISH NORTH AMERICA.

TIMBER.

White Pine and Spruce.—One of the very few countries still possessing any considerable quantity of the White Pine of Commerce, and, unquestionably, the most extensive body of White Spruce existing, and open to the development of the many and various branches of trade engaged in producing commercial commodities from this species of timber.

Hardwoods.—Tracts of large area heavily timbered with White Birch, in which the producers of Spools and articles of kindred nature are interested, await development; extensive groves of valuable Hardwoods, Birch, Maple, &c. stand ready for exploitation.

MINERALS, &c.

Iron ores of the magnetic, bog and chrome varieties, are abundant; copper exists in quantities, more than sufficient for the requirements of the country; our asbestos mines have a world-wide reputation; rich deposits of mica of different varieties have been located and partially developed; very considerable beds of ochre lie close to commercial centres, and are being made use of; slate of the finest quality abounds, also building stone, whilst excellent clay, suitable for the highest grades of bricks is abundant. The phosphate industry, at present somewhat depressed will doubtless before long assume its accustomed prominence. But little has been done in the way of extracting the precious metals; however, this branch is receiving more attention than in the past, and we may expect to see judicious investments showing a good return on the outlay made.

FOREST AND STREAM.

To the sportsman, the Northern and Eastern portions of the Province, particularly, present a veritable paradise; the most desirable salmon and trout streams in the world are here to be found; the forests abound with the choicest of deer-stalking, whilst a profusion of feathered game is to be found very generally distributed.

COLONIZATION.

To intending settlers, the Provincial Government, offers the most advantageous terms; a large area of land in the Province is already surveyed and at the disposal of Colonists. (The "Settlers' Grant" is obtainable at all times from the Department of Colonization on application by writing to the Commissioner.)

Information concerning Land, Minerals, Fishing, and Hunting Privileges, AND the right to cut timber on vacant lands of the Crown, is obtainable by writing to the Hon. Commissioner of Crown Lands, Ottawa, P. O., Canada.

Memorandum of Provincial Area, &c.

Total area of the Province	142,031,400
Seigniorial grant lands, free grants, &c.	49,265,000
Vacant lands of the Crown	172,766,400

NEW BRUNSWICK AS A FIELD FOR IMMIGRANTS

THE Province of New Brunswick offers an inviting field for persons wishing to settle in a new country, where there is room for growth and development, without the hardship and isolation of pioneer life. The climate is very healthful, and the extremes of heat and cold, because of proximity to the seaboard, are less marked than in regions farther inland.

The general article on New Brunswick in this issue shows that a large portion of the province is as yet unsettled. For the individual or group of persons desiring to take up land and enter upon the pursuit of agriculture, the Government has made special provision, enabling such to secure free grants of land in lots of 100 acres for each person or family, subject only to conditions which would in any case be fully met by *bona fide* settlers. There are settlements, called "free grant" settlements, in various parts of the province, which were formed by immigrants from the British Islands, and in one case from Denmark, and which, within a comparatively few years, have established flourishing communities, where, formerly, the forest was unbroken. The settlements are all within a dozen miles or less of railway communication with all parts of the province, and are also within easy reach of neighbouring and more populous settlements. Hence the people are not in any sense debarred from the enjoyment of the refinements of modern life. Thus the parents make not only a home for themselves, but are able to give their children an education and a start in life in a country where there are almost unlimited possibilities of achievement to tempt the ambition of the younger generation. For new settlers just beginning, with no more than enough money to get fairly located on their own land, there is always an opportunity to get employment with older settlers, or with the lumbermen, when home work is not pressing, and the rate of wages is good. The lumbermen also afford a market for products of the farm. The new settler has the privilege of fishing in the streams, and the forest is a splendid hunting-ground.

For the farmer with a little capital there is always an opportunity to purchase a property in already settled districts, for in a comparatively new country there is always more or less movement of population. This movement is not caused by poverty or necessity, but is the result of a certain restlessness or ambition to tempt fortune in new fields, which is, in fact, inherent in the Anglo-Saxon race as developed on the American continent. There is, therefore, always a chance for a man with a little capital to buy a partially or even well cultivated farm in a settled community.

Nowhere is the thrifty farmer more independent than in New Brunswick. The soil is productive, yielding grain, vegetables, and all the hardier fruits. His fuel is at his door, in the hardwood timber that abounds. He has ready access to the markets. The province is peculiarly adapted to mixed farming and the development of the dairy industry. There are butter and cheese factories scattered through the province, and the Government supports a dairy school for a short season in each winter, where young farmers may learn by practical work as well as careful study under skilled professors, not only how to make cheese and butter, but also how to take care of live stock and the most suitable breeds of cattle to keep for dairy purposes. There are county agricultural societies, a provincial farmers' and dairy-men's association, whose annual meetings are of great value; there is a semi-monthly journal published solely in the interests of farmers; exhibitions of stock and produce are held in the various counties every year, with a grand interprovincial exhibition, industrial as well as agricultural, at St. John city, where the products of other provinces also appear. In every respect the agricultural community is active, intelligent, and progressive. The undulating surface of the province fits it admirably for sheep-raising, and the abundant and succulent grasses produce a very fine grade of mutton. Cattle-raising is a valuable industry near the marsh lands in Westmoreland county. This winter, for example, Mr. Joseph L. Black, of Sackville, whose lumber mills are illustrated in this issue, has fifty cattle in one of

his barns, and with them had in the autumn 4,000 bushels of turnips, raised to form part of their winter rations. Fodder corn grows readily in the province, and while New Brunswick does not equal the west as a place for the production of beef cattle, yet cattle-raising for the local market is an important item in the farmer's economy. He can raise horses, cattle, sheep, hogs, and poultry, and practically all the food they require. Wheat-flour is so cheap that it does not pay him to cultivate that grain, but he can raise oats, buckwheat, rye, barley, and flax, and the province always has a surplus of hay for export. Potatoes, turnips, beets, carrots, parsnips, cabbage, celery, and other vegetables yield large returns. Apples, plums, strawberries, raspberries, currants, gooseberries, and other fruits are a source of profit in their season. Wild berries are very plentiful in the season.

Passing from the agricultural wealth of the province, it is to be noted that it has great wealth in coast fisheries, where oysters, lobsters, salmon, cod, mackerel, herring, halibut, haddock, hake, pollock, shad, alwives, and other fish are plentiful in their season, and give employment to a considerable population. Some of the best sporting rivers in the world for salmon and trout angling are in New Brunswick.

The timber wealth of the province is sufficiently set forth in this book. It has mineral resources of great value in lime, gypsum, granite, coal, manganese, and doubtless others that are yet awaiting development.

As for manufactures, the cities of St. John, Moncton, and Fredericton, and the towns of St. Stephen, Woodstock, Marysville, Chatham, and others, have important manufacturing industries. There are five cotton mills in the province. Wood working factories, rolling mills, machine shops, boiler and engine works, nail factories, saw factories, foundries, boot and shoe factories, woollen mills, tanneries, brass works, confectionary and biscuit works, pork-packing establishments, and many minor industries, are operated to a greater or less extent, and, considering the total population, furnish employment to quite a large proportion of artisans, who, in turn, consume the farmers' products.

The province has probably more miles of railway in proportion to the population than any other country. This fact, together with its large extent of seaboard, affords admirable facilities for trade and intercommunication. It has already been pointed out that St. John has, this winter, steamship communication direct with London, Liverpool, Glasgow, Dublin, Belfast, and Aberdeen; with also occasional sailings to and from continental ports. There is also a steamship line to the West Indies and Demerara, and one to Boston, while there is close connection by rail with all parts of Canada and the United States. Thus the province is in close touch with the world.

As to educational advantages, New Brunswick has an admirable system of free public schools, culminating in the University of New Brunswick, and including a normal school where teachers are trained. The province devotes a large portion of its revenue to educational purposes, and the schools are supported by taxation on the whole people. Every child has, therefore, the opportunity to secure at least common school education, and the standard of the schools is always high. They are under the control of a Board of Education, a chief superintendent, and a staff of capable inspectors. The Methodist Church has at Sackville a splendid college and university, richly endowed, for the education of children of both sexes, and many of other than Methodists go there to complete their course. The Roman Catholics have a fine college at Memramcook, and there are academic and other private schools; while in Nova Scotia, within easy reach, the Church of England, Presbyterian, and Baptist Churches have each a university of their own.

All the great Christian bodies are well represented in New Brunswick, and churches are found in every little settlement as well as in the villages and towns. The moral and religious tone of the people is of a high standard.

Information regarding New Brunswick can be secured from the Agent-General for the province, Mr. C. A. Duff Miller, London, or from the office of the Surveyor-General, Fredericton, New Brunswick.

THE WOOD INDUSTRIES OF CANADA.

THE RATHBUN COMPANY

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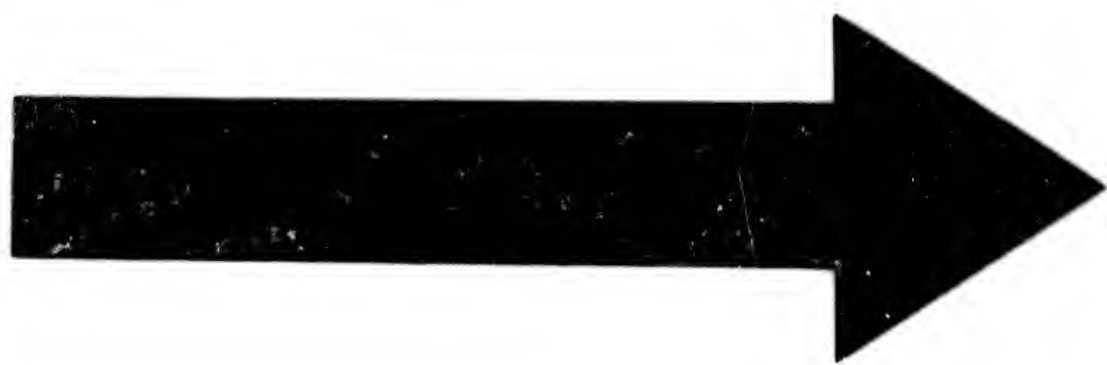
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AND AT

**107, BATH STREET, GLASGOW.**





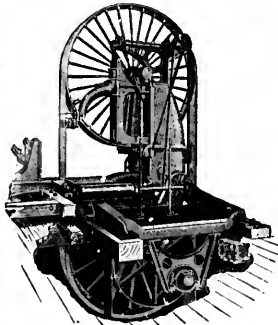


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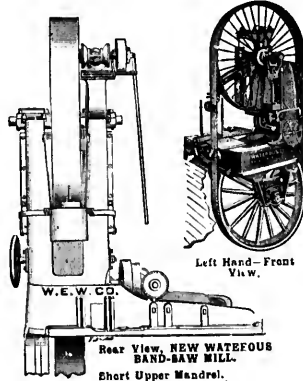
10

# Lumber Machinery

## The Most Modern

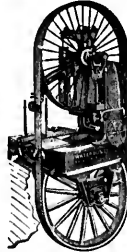


Right Hand-Front View.  
**NEW WATEROUS BAND-SAW MILL.**  
It surpasses all others in many points.

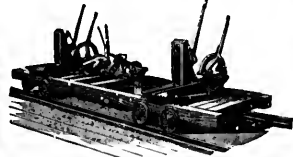


W.E.W.CO.  
Rear View, NEW WATEROUS  
BAND-SAW MILL.  
Short Upper Mandrel.  
Whisk Centrally Hung.  
Lower Wheel Inside Frame.

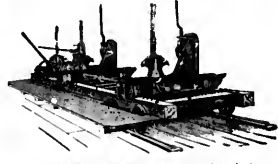
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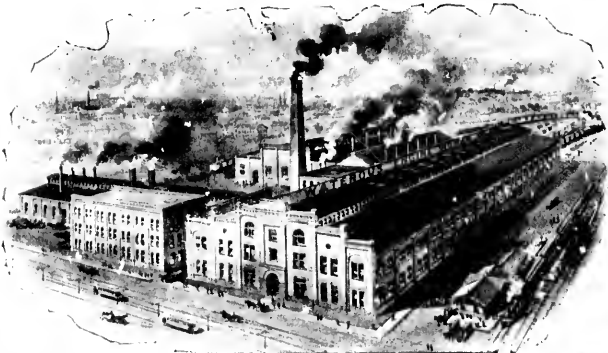
Left Hand-Front  
View.



Muleback 2 Block Log Carriage.



Unbreakable Steel Girder Log Carriage.



ESTABLISHED

**1844**

INCORPORATED

**1874**

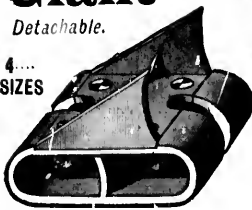
NEW WORKS OCCUPIED

**1896**

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A Most Satisfactory and Durable Chain for Log  
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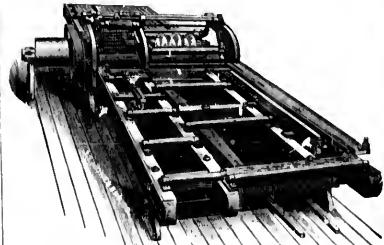
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TOOTH

LUMBER

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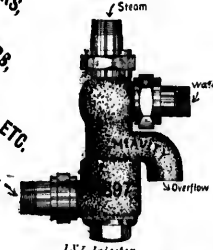
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