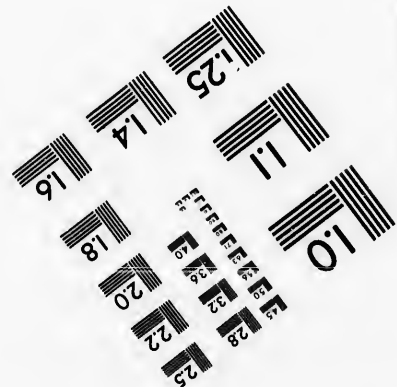
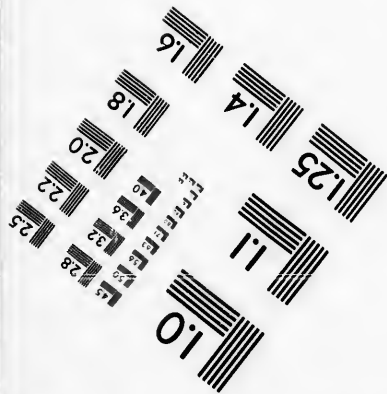
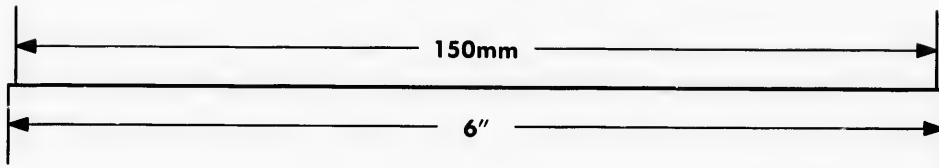
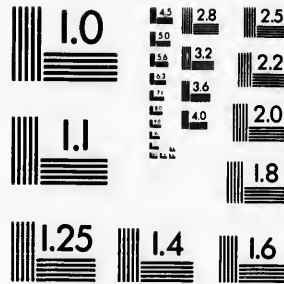
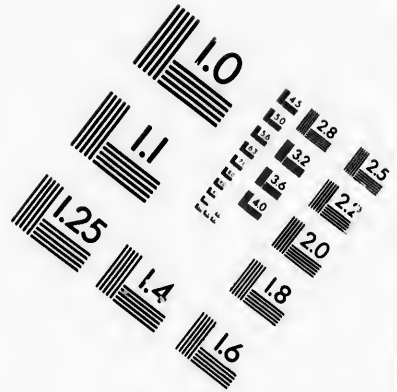
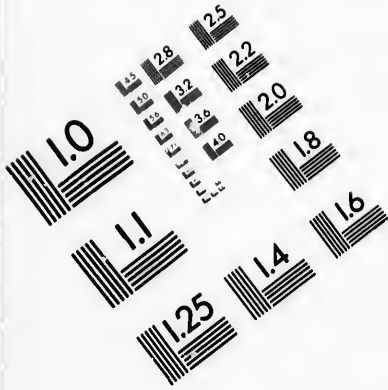


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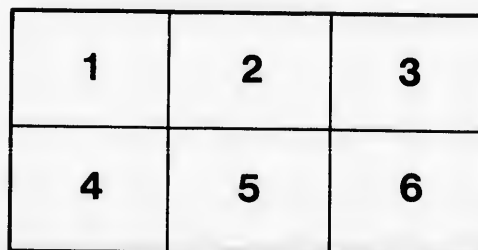
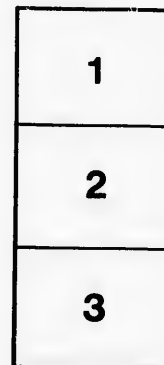
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# REPORT

ON THE

# FOREST WEALTH OF CANADA

BY

THE STATISTICIAN OF THE DEPARTMENT OF AGRICULTURE

PRINTED BY ORDER OF PARLIAMENT



OTTAWA

PRINTED BY S. E. DAWSON, PRINTER TO THE QUEEN'S MOST  
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1895

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APPENDIX TO THE REPORT OF THE MINISTER OF AGRICULTURE FOR 1894

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Hon. A.



STATISTICAL OFFICE,

DEPARTMENT OF AGRICULTURE,

OTTAWA, December, 1894.

SIR,—At your request I have prepared a report on the "Forest Wealth of Canada."

It includes :

1st. The report proper.

2nd. A number of appendices as per annexed list.

3rd. Statistical tables as per annexed list.

I have to state that the returns are not as complete as I would like them to be for the purpose of a complete investigation.

I have done the best I could with the limited resources at command.

Some statements which would have been of service I have been unable to obtain in time for use. Later on they may come in. If so they can form a supplementary report.

I have to record my indebtedness to Mr. E. J. Toker, to whom I intrusted the work of collecting the statistics I required.

I have the honour to be, sir,

Your obedient servant,

GEORGE JOHNSON,

*Statistician.*

Hon. A. R. ANGERS,

Minister of Agriculture,

Ottawa.

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# FOREST WEALTH OF CANADA.

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## FOREST WEALTH OF CANADA.

In accordance with directions I have endeavoured to gather statistics of the forest wealth of Canada.

The influence of forests on climate, on agricultural operations, on river fisheries, on water communications, on the health of the people and on the general trade and industries of a country is so far reaching that an examination of the value of our forests branches out in many directions, all of immense importance.\*

The important direct effects of forests are due to the products which they yield, the capital which they represent and the work which they provide.

The mechanical effect of forests makes itself felt chiefly in regard to the distribution of the rain water, the preservation of the soil on sloping ground, the binding of moving sand, and the prevention of avalanches. (*See Appendix P, for Humboldt's views.*)

In Canada, in the various industries depending for their existence upon the supply of wood there is an invested capital not far from 100 million dollars and an annual wage list of over thirty (30) million dollars with an output valued at close upon 110 million dollars. (*See Statistics, Table 1 e.*)

In addition, there are the railways which are dependent on the wood supply for railway ties† and dimension timber, and in whose freights the lumber carried figures as nearly one-fifth of the total freight carried; the canals, of whose freights the products of the forest constitute two-fifths of the total freight carried (*See Statistics, Table 2*); the mines which require wood for shoring purposes; the ships which, themselves chiefly made of wood, find in our exports‡ of the products of the forest the materials for the full cargo without which freight rates on goods carried must be higher—nearly one-quarter of the exports of home production being products of the forest; the leather industry which depends upon nature's supply of tannin secreted in the bark of trees; the lucifer match industries; those varied industries which depend in part upon wood, such as agricultural implements, edged tools, &c.; and the practically new industry of pulp making, which within ten years has sprung up into an industry with nearly three million dollars of invested capital and over one million dollars of annual output.

\*The New York State Forest Commission in January, 1894, report says: "On the preservation of our forests depend the water supply of our rivers and canals; the motive power of our great manufacturing interests; the priceless benefits offered by our forest sanitariums; the many delightful places of refuge from the summer heat of the cities, and the existence of our fish and game. But above all on their preservation depends that great factor in our political economy, the future timber supply." (*See Appendix A.*)

†Including sidings and double tracks we have about 18,500 miles of railway in Canada. At 3,000 ties to the mile the ties required number 55,770,000. Assuming the life of a tie to be seven (7) years, the number needed every year is about eight (8) million for renewals, and, allowing 300 miles for new roads every year, a million more for this purpose or about nine (9) million ties a year. Supposing that 50 cubic feet of ties can be obtained from an acre of forest, it will be seen that 3,340,000 acres will be required to supply the consumption of young and thrifty trees needed for the 18,500 miles, and, 530,000 acres for each year's demand.

‡Canada is the fourth largest exporter of products of the forest, being only exceeded by Sweden and Norway with a net export of \$37,135,000; by Austria with a net export of \$31,000,000 and by Russia with \$33,300,000. On a per head basis, Canada stands second, her net export in 1891 having been \$24,574,860, equal to \$5.08 per head against Sweden and Norway's \$5.50, Austria's 75 cents and Russia's 34 cents per head.

The value of forest products consumed per capita may be estimated approximately. The value of our forest products, calculated from the census returns of 1891, was \$80,071,415. For the fiscal year 1890-91 our imports of wood articles amounted to \$3,132,516, while for the same period our exports were \$27,207,547, leaving for consumption in Canada \$55,996,384 or a value of \$15.59 per head. With respect to the quantity used the census returns show an aggregate of 2,045,073,072 cubicfeet as the total cut of the year. About 30 per cent of this is exported, leaving 1,431,551,150' cubic feet for the annual home consumption. This is equal to 296.2 cubic feet per head of the population. B. E. Fernow,\* chief of the Forestry Division of the United States Department of Agriculture, estimates that the per capita consumption of the United States is about 350 cubic feet annually.

Whether we consider the capital invested, the labour employed, or the varied uses to which wood is put in enhancement of our comfort and convenience; or whether we consider the permanent interests of the timber trade, of the settlers in our new country, of the public revenue and of the country generally, we are forced to regard the forest as a precious heirloom to be deeply revered, properly used and, through careful maintenance, to be handed down to posterity improved and enriched.

Looked at from the most enlarged point of view the forests of Canada are her greatest heritage, because "the nations or states in which food, fuel, metal and timber may be produced at the highest relative rates of wages and at the lowest money-cost per unit of product will thereby be enabled to apply labour-saving machines to other branches of productive industry in the most effective manner."† The nation that would succeed in effecting this combination can do so only by maintaining its forests in their best possible condition, since of the four factors described the timber is the most easily exhausted. The nation which succeeds in this four-fold combination, must be, in the long run, at the head of all nations.

#### DIFFICULTIES IN THE WAY.

At the very outset of the inquiry great difficulties were encountered in the effort to secure trustworthy data. These difficulties were increased from the fact of the divided control and ownership.

The ownership of Canadian forests is for the most part vested in the Provincial Governments, including the provinces of Ontario, Quebec, New Brunswick, and British Columbia, which grant licenses to the lumbermen.

In the province of Manitoba and in the Territories and in the Railway Belt of British Columbia (40 miles wide by 500 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 licenses, the trees being sold with the land and not much timbered Crown lands 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.

\*Circular No. 10, U.S. Dept. of Agric. Div. of Forestry.

†Atkinson in "Forum." February, 1894.

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In the United States, notwithstanding the length of time during which attention has been directed to forestry, an exact census of forest area in existence has never been made. "The area covered with wood growth is less than 500,000,000 acres. If all the land area, not known to be treeless or in farms, were under forest, the acreage would not exceed 850,000,000, but the lower figure is probably more nearly correct." \*

The same statement may be made respecting Canada. From some persons there are affirmations that there is not more than ten years' supply.† From others there are declarations that the supply in our forests is sufficient to last 100 years, possibly 200 years.

The Assistant Commissioner of Crown lands of Ontario points out that "while the department could give the area of the unsold lands of the Crown, all of which are covered, to a greater or less extent, with various kinds of timber, as this is a wooded province, it is quite an impossibility to estimate the quantities of timber upon the ninety million acres representing that unsold area." ‡

#### DATA NEEDED.

The data needed for a thorough examination of this subject are:

1st. A statement of the wooded area of the Dominion, divided into, (a) That in the occupancy of private individuals, and (b) That in the control of the several governments.

2nd. Reports on the condition of the forest growth of sold and unsold areas by experts such as the surveyors in the employ of the Provincial and Dominion Governments, forest rangers and other persons employed in that work by the various large lumber firms. §

In the absence of data of the kind mentioned, I have endeavoured to shape inquiries so as to answer in the best possible way four questions:

1. What have we and what is it like as to size and varieties?
2. How fast is it going?
3. What means are used to replenish?
4. How long will the supply last?

This means, simply put, an examination into our forest area; into the destructive, the reproductive and the protective forces at work, and into the needs of the present time for the purpose of weakening the destructive and strengthening the protective and regenerating forces.

#### THE FOREST AREA OF CANADA.

There 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.

\* B. E. Fernow, Circular No. 10, Division of Forestry, United States Department of Agriculture.

† James Little in Forestry Convention, 1882, quoted by H. B. Small, "Canadian Forests."

‡ Letter to the Statistician.

§ An attempt has been made to cull from the reports of surveyors and others such casual statements as have been made on this subject by them. (See Appendix "B.")

Along these rivers population found its way to the different localities, impelled by various motives, some to settle on the land, some to explore and hunt, some to cut timber.

In 1642 Montreal was founded and a practical beginning made in settling the country. But the 2,000 settlers then in the region could do little to denude the land of its forest except by means of fire, the most potent instrument of destruction. For 250 years the axe and the torch have been making inroads upon this vast forest.

The census of 1891 shows that we have 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 300 million acres.

But allowing that one-half of the area is comparatively useless as forest area because of water and rock, we still have 150 million acres of forest area (see Table 4a). Under this assumption we have 45 per cent of the Eastern provinces still under forest.

Reference to "Statistics" Table 3, will show that Germany has 26 per cent of her area under forest and finds that forest area (somewhat over 34 million acres in extent) nearly sufficient to supply the wants of 50 million people, her net import of wood and forest products being but 43 cents per head, including woods and manufactures of wood not natural to the country; that Austria-Hungary with over 41 million people to supply and a forest area of 30 per cent of the whole area to provide the supply, is able to meet home demands and still to have a net export of over 31 million dollars; that Russia with an area in Europe of 1,341,122,560 acres, of which 37 per cent is forest area, can supply herself and have 33 million dollars of products of the forest for export.

Austria-Hungary with one acre of forest area per head of its population, manages to supply its own wants and to have a net export of 75 cents per head of its population.

Norway, with under 10 acres per head in forest area, supplies her own wants and has a net export of \$4.10 per head.

Sweden, with under 10 acres per head, supplies the wants of her own people and has a net export of \$6.00 per head.

The United States, with over 7 acres of forest area per head, supplies her own wants and has a net export of 13 cents per head.

Canada, with over 163 acres per head, supplies her own wants and has a net export of \$5.08 per head.

These figures indicate that in Eastern Canada the proportion of forest area is sufficient for all the purposes which suggest forest conservation in connection with agriculture, water supply, and sanitary considerations.

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We may therefore dismiss these points in relation to the forests of the four provinces. There are inequalities of condition, but as a whole this region is sufficiently clothed with forest to preserve to itself all the direct and indirect benefits of the forest in its relation to the cleared land and the inhabitants thereof.

The comparative figures already given seem to indicate that a *prima facie* case has been made out so strong in its general features as to throw the burden of proof upon those who deny the existence of a sufficient forest area in Canada to meet the requirements of the people and of their neighbours and others who seek to draw supplies from the abundant storehouse of Canada.

But area is one thing and *product per acre or per square mile* is another thing.

The question still remains, in what condition is our forest area for purposes of trade and commerce?

Many attempts have been made to answer this question. One of the earliest almost synchronizes with the date of the formation of our Canadian Confederation. It is a paper prepared by Hon. Jas. Skead of Ottawa, and read by him before the Detroit Convention in 1865.

Mr. Skead stated that the whole area available for producing pine, north of the St. Lawrence, was 287,711 square miles. He divided the area into several sub-divisions as under:

1st. The Saguenay territory with an area of 27,000 square miles.			
2nd. The City of Quebec	do	do	8,000 do
3rd. The St. Maurice	do	do	21,000 do
4th. The Bout de l'Isle	do	do	9,600 do
5th. The Valley of the Ottawa	do	do	87,761 do
6th. The Rideau River	do	do	2,350 do
7th. The Trent River	do	do	6,200 do
8th. The Georgian Bay	do	do	12,800 do
9th. The French and Pigeon Rivers	do	do	48,000 do
10th. The Saguenay to Blanc Sablon	do	do	65,000 do

11th. In addition to the above Mr. Skead allowed 24,000 square miles in the peninsula of Western Canada, now the Ontario peninsula.

It will be observed that Mr. Skead did not include in his list any timber region west of Nepigon River.

Of the districts he mentions, he says that (speaking in 1865) No. 1 is rich in white pine and red pine, spruce, birch and tamarack; No. 2 is moderately well wooded, producing white and red pine, birch, white cedar, spruce and tamarack; No. 3 contains large quantities of white, red and yellow pine, spruce, birch, maple, elm, ash and tamarack; No. 4 possesses a good deal of white and red pine, spruce, tamarack, and some ash; No. 5, he says, "is the principal site of the lumber trade and has been so since 1806, when the first raft left the mouth of the Gatineau." He states that in the fifty-nine years since that event (to 1865) "but little over 20,000 square miles have been denuded of merchantable lumber." "It possesses white and red pine, both of the largest and best on the continent. It also yields tamarack; spruce, ash, white oak, elm, birch, and all varieties of maple."

No. 6 he describes as furnishing white pine, and No. 7 as posses. of limited quantities of white and red pine, ash, oak, birch and tamarack. Of No. 8, he says it supplies a choice quality of red and white pine, some oak, elm, maple and birch. Of No. 9, he says it furnishes a quantity of white pine of small size but good quality, and a large quantity of other timber, as birch, maple, oak, elm, spruce, tamarack, ash and white cedar. No. 10 he describes as furnishing a large quantity of timber available for ship-building, and a quantity of the best description of birch, maple, oak, ash and elm. The 11th subdivision he describes as producing the finer hardwoods, such as oak, elm, black walnut, all the varieties of maple, chestnut, hickory, sycamore, basswood and ash.

In order not to burden too much the main body of this report I have placed in the appendix marked "C," extracts from Hon. Mr. Joly's report on our forests, made in 1877; Mr. James Little's statement in 1876; Mr. Stewart Thayne's evidence before a select standing committee of the Federal Parliament in 1878; Mr. A. T. Drummond's views in 1879, and Mr. Marler's statement before the American Forestry Congress held in Montreal in 1882; also extracts from the Hon. J. K. Ward's lecture in Montreal in 1883. These all contain important information.

In 1885, or twenty years after Mr. Skead had published his paper, the British Government procured, through the Governor General the Earl of Lansdowne, reports on the forests of Canada, the object being to obtain information on the reported proximate exhaustion of the forests of the Dominion.

The Lieutenant Governor of Prince Edward Island said in reply, "there are no forests of any extent in the province of Prince Edward Island, where they have disappeared under the axes of the settler and the lumberman."

The Lieutenant Governor of Nova Scotia forwarded two reports, one from Mr. James H. Austin and the other from Mr. W. A. Hendry. Mr. Austin said, "I find that in all probability all or nearly all the timber lands of this province will have been cut over for the first time by or perhaps before the expiration of six years from this date (July, 1884), but it does not follow that the supply will then be exhausted. It is found that by careful husbandry these trees which are too small for conversion into timber at the time of the first cutting, after fifteen or twenty years are of such size that a second cut nearly equal to the first can be obtained in many localities; consequently, if it were not for forest fires those lands which are carefully looked after would never become denuded of their timber." Mr. Austin stated that "the supply of pine and spruce is rapidly becoming exhausted; that there was a considerable quantity of hemlock timber, but that this was rapidly being destroyed for the bark; that the heavy birch had been largely converted into ton timber and exported, and that fires had rendered barren large tracts of country once covered with a stately growth of pine, spruce, &c."

Mr. Hendry dwelt upon the fire scourge and stated that in 1784 two-thirds of the province was burnt over within a fortnight and that every year during 45 years of his recollection fires had done more or less destruction. But such is the reproductive power of the land that, in his opinion, "there is no reason to anticipate any sudden or even defined period for the extermination of our forests, but that they are gradually being exhausted is true and it is proper to look this fact in the face."

On behalf of Ontario Mr. Phipps answered the inquiries sent by the British Government. He said that Ontario had 1,800 square miles known as timber limits: "There exist however, no data by which to form an exact idea of how long it would take at the present

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rate of consumption to exhaust the timber on these limits. Concerning the amount of timber lands possessed by the Government on which no license to cut has as yet been given, I would say that the timber limits sold last year (1883) extended as far north as 15 miles beyond Lake Nipissing. North of this point and extending east to Sturgeon River and west to Michipicoten River is a tract of country which there is reason to believe from the reports of those who have travelled across it, contains about 20,000 square miles of forest, possessing much valuable and merchantable timber."

Upon the general question Mr. Phipps said, "With regard to the duration of the timber supply of the Dominion of Canada no accurate calculation can be made as no data exist whereby to determine the amount of merchantable timber standing in the forest area. To obtain this would require surveys more extensive and costly than any which have been yet attempted. A general idea can be given by observing that altogether the area of timber lands in the Dominion of Canada is calculated to be about 280,000 square miles."

This estimate it will be observed is that made by Mr. Skead, who did not include the New Brunswick and the Nova Scotia forest area, the forest area in Quebec south of the St. Lawrence, the forest area in Ontario west of Lake Superior, nor that of British Columbia, to say nothing about the region intervening between Ontario and British Columbia.

#### QUEBEC.

The inquiry respecting the province of Quebec, was given to Mr. A. J. Russell (for 42 years Crown Timber Agent at Ottawa) to deal with. His report is full of information, as indeed would be naturally expected seeing that Mr. Russell was a singularly able man with exceptional opportunities.

Mr. Russell says that the territory in Quebec on the north side of the St. Lawrence "contains a forest region of upwards of 177,800 square miles in area; that by far the greatest portion of this area being fit for nothing else must remain a timber forest forever, increasing in value as timber becomes scarce elsewhere."

Going into detail, Mr. Russell says: "The first or gulf section of this vast forest region extending from the eastern boundary of the province westward to the 65th degree of longitude covers 32,000 square miles." "From the very little known of it owing to the interior waters being unsurveyed, it seems as yet comparatively valueless as a timber yielding country. As the timber of this territory is generally small and far from abundant and the rivers are obstructed with high falls and rapids and as even the ruggedness of the country will be an obstruction, lumbering operations on it will be expensive compared with the value of the timber when got out, but expensive river improvements will be much less necessary for the descent of saw-logs and railway ties than for square timber. Timber found is birch, fir and spruce."

The adjoining territory embraced between the line of longitude 65 degrees west and a north westerly line from the mouth of the River Manicouagan, with a frontage on the Gulf and River St. Lawrence of about 180 miles and a maximum depth, back from the mouth of the Manicouagan to the height of land at its source, of about 250 miles, is about 48,460 square miles in area. This region differs from the previously described district in having its rivers generally surveyed or explored. It has timber of a good

quality in greater abundance especially in the southern part, including even scattering pine of value.

Of the two regions, embracing together an area of 80,600 square miles, Mr. Russell says: "The general inferiority and, in parts, absence of timber is due to the poverty and shallowness and, in parts, the entire absence of soil, where successive fires have burned off the thin covering of vegetable matter from the rocks, and not to the coldness of the climate, which is really most suitable for the growth of spruce and fairly so for tamarack. From this vast region great quantities of wood can be taken out with profit for purposes for which such timber, though generally small, may be serviceable as the timber of the more valuable forests becomes scarce and high in price."

The third great portion of this northern forest region Mr. Russell describes as commencing at a north-westerly line from the mouth of the River Manicouagan and extending westward to the eastern watershed of the River Gatineau, including the River Saguenay, the St. Maurice and the lower Ottawa River territories.

This division contains an area of 81,128 square miles, and is distinctly different from Nos. 1 and 2. Lumbering operations have been successfully carried on for many years in various parts of it. In its forests pine of the best quality is, or, in some parts it may be said, has been more abundant, and these adjoin the rear of the older, or are associated with the advancing new, settlements of the province.

In the eastern part of this great central division the rivers Portneuf, the Sault aux Cochons and the Escoumains have yielded proportionately much more good timber, including some pine, than the territory on the east side of the River Manicouagan, though in parts denuded by old forest fires; though originally well wooded the future supply from them must be very small.

On the Betsiamites the timber is very small, and vast brulés are prevalent which cannot yield timber of value till reproduced in the remote future.

Included in this central division is the Saguenay region, covering about 24,000 of the total 81,128 square miles of area. Pine grows far north on the Saguenay owing to climate admitting. The settlements around Lake St. John have, however, created great demands on the forest supply, and in the opinion of Mr. Russell, given in 1882, "must soon destroy what remains of the best timber forest of the Saguenay. However, from the generally mountainous character and extensive area from which the many large branches of the Saguenay draw their waters there will always be, with proper care, a sufficient supply of spruce and larch and other woods, after its pine is almost or altogether cut away, to sustain a considerable export trade in lumber." The character of the timber of the Saguenay country may be understood from the following statement:—In 1856 and 1857 there were cut nearly twice as many pine logs as spruce. In the following 20 years the proportion of spruce logs gradually increased and more rapidly during 1878-82, in which there were very nearly thirteen times as many spruce logs as pine taken out, the annual cut of pine logs during the period of 1878-82 having fallen irregularly to about half what it was in the early years, indicating that the pine is becoming scarce, while the spruce continues abundant in the Saguenay country. From 1856 to 1881 the totals cut on Crown lands in the Saguenay district were: saw-logs, 1,164,844 of pine and 3,432,185 of spruce; of square timber, 343 pieces of white pine, 3,531 of red pine, and 4,095 of spruce and other kinds of wood.

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The average of these 26 years is 45,000 logs of pine and 132,000 pieces of spruce. In 1881, the pine amounted to 13,434 pieces and the spruce to 444,171 pieces. In 1891 the pine amounted to 34,099 logs and the spruce to 537,191 pieces. The proportion during the 26 years was 25 logs of pine to 75 logs of spruce. In 1881 the proportion was three logs of pine to 97 of spruce. In 1891 it was six logs of pine to 94 of spruce. While, therefore, there has been a great increase in the proportion of spruce to pine in 1891 as compared with the 26 years' period, the comparison of 1891 with 1881 shows a relatively larger proportion of pine logs cut. The figures show that over 20,500 more pine logs were cut in 1891 than in 1881, and indicate the greater rate at which the pine supply is diminishing.

The next subdivision of the central division of the northern forest region of the province is that of the St. Maurice. This has an area of 16,000 square miles drained by the St. Maurice and its tributaries, and a large area of waste land of the Crown on the River Batiscan. The St. Maurice territory, though it has no such extensive tract equal in fertility and climate behind its old settlements on the St. Lawrence as the Saguenay territory has at Lake St. John, surpassed the Saguenay originally in the value of its timber forests, owing to the greater proportion of pine in its middle and lower course and on the tributaries therein adjoining it.

The quantities of timber cut on Crown lands in the St. Maurice territory from 1856 to 1881, inclusively, have been: of square timber, white pine, 56,921 pieces, and red pine, 5,453 pieces (up to 1864; no square pine taken out since); of other woods, 9,257 pieces; of white pine saw-logs, 4,190,895 pieces; spruce saw-logs, 1,740,546 pieces. In the first fifteen years, the quantities were 2,110,527 pine saw-logs and 562,071 spruce, and in the last ten years, 2,080,368 pine and 1,178,475 spruce saw-logs. In 1881, the number of pine sawlogs was 114,371, and of spruce, 112,224. In 1891, the number of pine sawlogs was, 190,220, and of spruce, 320,765. It is evident, therefore, that the decade has added emphasis to Mr. Russell's remark in 1882 "that it is becoming more difficult to maintain the same superior production of pine as formerly over spruce," pine having increased in the ten years over 66 per cent and spruce nearly 190 per cent.

The fourth district of this central division is the Lower Ottawa territory or agency, including the vacant and waste lands of the Crown on the northern tributaries of the Lower Ottawa, from the boundary of the St. Maurice territory to the watershed dividing the valley of the Rivière du Lièvre from that of the Gatineau. It embraces the valleys of the River Assomption, the River du Nord, the Petite Nation, the Blanche and du Lièvre, with other smaller tributaries of the Ottawa, the total of the included areas being 11,256 square miles. The rivers mentioned lie entirely within the pine-growing zone, excepting the Rivière du Lièvre, the main branch of which, for forty miles in direct distance down from its source, is in the poplar, birch, spruce and tamarack region, which, sweeping over from Weymontateuch on the St. Maurice and the Manouan, intersects the du Lièvre at the head of Lake Magonangoos, and continues westward over to and across the east and west branches of the Gatineau, in the Upper Ottawa territory adjoining.

In this subdivision, the returns of timber on which dues accrued to the Crown from 1856 to 1881, inclusively, were, square white pine, 106,398 pieces; squared red pine, 943 pieces; other woods, principally birch, 38,459; white pine saw-logs, 5,735,931 pieces; spruce saw-logs, 383,354, or one of spruce to 15 of pine, nearly. Of the square white pine, 95,155 pieces were cut in the first fifteen years, and 10,300 in the following ten years to 1881,

inclusive. Of square red pine, 809 pieces in the fifteen year period, and 134 in the succeeding ten year period. Of other squared timber, 22,125 were cut in the fifteen year, and 16,334 in the ten year period. Of pine saw-logs, 3,374,896 in the fifteen, and 2,361,035 in the ten year period. This shows a decrease of about 10 per cent in the average annual cut of pine logs. In 1881, the cut of pine reported to the Crown Lands Department was 405,709 logs, and in 1891 it was 451,538. Of spruce saw-logs, 35,501 only were cut in the fifteen years and 347,853 in the ten years, showing an increase in the ten year period approximating to ten times that of the fifteen year period. The cut in 1881 was 125,389, and in 1891 it was 249,077.

It is noticeable that the total of pine saw-logs from the Lower Ottawa territory during the whole period is about one-fourth greater than that from the St. Maurice territory, though the latter has about double the area of the former.

The Upper Ottawa territory of the province of Quebec extends from the eastern watershed of the River Gatineau up to the head of Lake Temiscamingue and the line there established as the western boundary of the province, having an extreme breadth westward of 200 miles, and 200 miles in depth northward from the mouth to the source of the Gatineau. Its depth thence westward for nearly 200 miles is almost altogether unknown, and, till the position of the height of land dividing the Ottawa waters from those of the Hudson Bay is determined by survey throughout that distance, the area of the Upper Ottawa territory can only be imperfectly approximated at 29,523 square miles.

Of the northern tributaries of the Upper Ottawa, the entire courses of the Kippewa, Dumoine, Black River and Coulonge and three-quarters of that of the Gatineau, lie within the pine-growing zone and embrace by far the best pine-growing forests in the province, in extent, in size and in quality of the timber.

Mr. Russell points out that on a lot containing 197 acres, 17,383 pine saw-logs were proved to have been cut in four years, or about 88 logs to the acre. He refers to the prices obtained for timber berths as evidence that pine must at the date of his writing (1882) be abundant, and then goes on to say: "there are tracts, however, where hardwood predominates, with pine interspersed, which is of the best quality from the richness of the soil and not being crowded. But towards the northern limit of its growth where it is intermingled with poplar, birch and cypress, it diminishes in size and quality. The upper quarter of the course of the Gatineau lies within the broad zone of poplar, birch, cypress and tamarack country that extends towards the height of land. Mr. Russell supplies the following statistics:

*Total recorded product, Upper Ottawa Agency, from 1826 to 1881.*

Provinces.	Pieces.		
	Square Pine.	Other Woods.	Pine Saw-logs
Ontario .....	7,173,182	494,824	22,005,108
Quebec .....	3,955,166	209,338	19,507,159
Total .....	11,128,348	704,162	41,512,267



During fifty-six years an average of 199,600 pieces of square pine timber and of 741,300 pine saw-logs has been cut off the Upper Ottawa timber lands (both sides). During the fourteen years, 1867-81 (latter year included), the square white pine averaged 203,000 pieces and the pine saw-logs 2,500,000 in number a year.

Bringing the statistics down to the close of 1892 we have the following results; in the eleven years, 1882-92, the square white pine averaged 64,414 pieces and the pine saw-logs 3,807,800 in number a year.

The conclusion reached by Mr. Russell is as follows: "The valuable timber of our forests is being rapidly destroyed by the commercial demand for it, and by desolating fires, and we must now distinctly bear in mind that we have no new fields to fall back upon for the white pine which gives our trade its special value."

Mr. Russell refers to the region south of the St. Lawrence River in the following terms: "The area is about 34,200 superficial miles. Pine grows well in the Peninsula of Gaspé, including the county of Bonaventure, but owing to the general prevalence in many parts of a heavy growth of brown birch and maple and other hardwood trees, pine was originally less abundant, and is now scarce, much of it having been cut away, but large brown birch is abundant, and the growth of cedar in Gaspé is unequalled in size and quality. Excellent sound cedar is abundant, and brown birch is increasing in value now that walnut has become scarce."

"Westward the pine on the tributaries of the Restigouche has been cut away very much for square timber. The rivers falling into the St. Lawrence, though long lumbered upon for saw-logs, still yield a considerable proportion of pine."

In the whole of the part of the province south of the St. Lawrence the timber and saw-logs cut upon Crown lands, from 1856 to 1881, inclusive, are as follows:—Of square timber, 52,162 pieces of white pine, 3,828 pieces of red pine, and 102,788 pieces of all other woods. Of the 52,160 pieces of white pine, 44,530 pieces were cut during the first fifteen years of the period named, and 7,632 pieces in the succeeding ten years. Of the 102,788 pieces of other woods, 48,151 were cut in the first fifteen years, and 54,635 in the last ten years. Of saw-logs there were cut in the same twenty-five years 1,563,353 pieces of pine, and 6,326,346 pieces of spruce. Of the pine logs, 952,030 pieces were cut in the first fifteen years, and 611,323 pieces in the last ten years; of spruce saw-logs, 2,793,894 pieces in the first fifteen, and in the last ten years 3,532,452 pieces.

Put in tabular form the changes noted are as under:

		Pieces.
Square white pine, yearly average,	1856-71	3,000
do do do do do	1872-81	763
do do do do do	1882-91	153
Pine saw-logs yearly average,	1856-71	63,500
do do do do do	1872-81	61,132
do do do do do	1882-91	30,042
Spruce saw-logs yearly average,	1856-71	186,300
do do do do do	1872-81	353,245
do do do do do	1882-91	713,199

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ls.	Pine Saw-logs
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The Quebec Government has kindly supplied a map upon which is marked the area of the province, 15,200,525 acres. Of this, sold is 21,480,525; under license to cut timber is 32,076,160, and vacant lands, 75,443,840 acres. The map is coloured to show the areas in each county under license to cut timber.

## ONTARIO.

In 1893 a return was brought down by the Government of Ontario, showing the estimated quantity of pine timber now standing upon the Crown domain of the province.

With respect to the estimated quantity the return says: "No estimate has been made of the quantity of pine timber standing upon the whole Crown domain. There is a great stretch of territory lying north of the 48th parallel of latitude and the northern limit of Ontario and between 85 west longitude and the easterly limit of the disputed territory, in respect of which no estimate has been made at all, containing 89,000 square miles or thereabouts, much of which it is known is not pine bearing, but other portions are, and as to some other parts there is no information. What has been done is to take certain areas known to be pine bearing and apply a reasonable estimate to them as below:

	Square Miles.
West of the Ottawa River and north-west of the limits sold in 1872 between 80 and 85 west longitude, and extending north to the 48th parallel of latitude. ....	24,000
Between Ottawa Agency and sale of 1881 in the Nipissing District. ....	410
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	Feet.
To this area an average of one million feet B.M. to the mile was applied. ....	24,410,000,000
*Col. Dennis, late Deputy Minister of the Interior, estimated the timber in the disputed territory at. ....	26,000,000,000
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	50,410,000,000

There is now subject to license in Ontario about 20,000 square miles which has been estimated to contain half a million feet to the mile, equalling, 10,000,000,000

This gives a total on the territory estimated of 60,410,000,000 feet, exclusive of the territory of which no attempt at an estimate has been made as above stated.

\*See Mr. Burgess's letter on this estimate, page 15, following. (G.J.)

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	\$126,025,000
Add for duty on 10,000,000,000 feet, estimated on licensed lands at \$1 a thousand.....	10,000,000
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Making a total of.....	\$136,025,000

Upon this estimate the Assistant Commissioner of Crown Lands remarks:

"The estimate was made in 1887 by the officers of the Department of Crown Lands after consultation. The territory north of that sold in 1872 had been penetrated in a great many directions by surveyors, forest rangers, timber explorers, mining explorers and others who from time to time had stated to officers of the department and through the papers the localities in which they had seen pine timber to a sufficient extent to warrant the region estimated being classed as pine bearing, and a reasonable average was applied to that area, so as to give a rough estimate of the quantity of pine which it was expected would be there, subject of course to some variations and to decrease through destruction by fire. The estimate put upon the territory is not a high one, one million feet to the mile, which is about three average trees to the acre. It is not of course considered that all the territory is timbered, but the average put upon it is thought to be a reasonable one. The estimate of the disputed territory is that given by Mr. J. Stoughton Dennis, late Deputy Minister of the Interior, who no doubt based his opinion on what he had seen and heard from others who had been through portions of it, analogous data to that applied to the older parts of the province. The total estimate for the province leaves out of account 89,000 square miles, not because there is no timber upon it, for reports warrant the belief that at different points there is a good deal of timber, but because no such exploration or examination has been made by anybody as would warrant the formation of any opinion as to what it would produce.

"Since this estimate was made, there has become payable to the department for timber cut on territory under license, from 1887 to 1892 inclusive, four million and a quarter of dollars or thereabouts, the equivalent of 4,250,000,000 feet b.m. of timber, which would still leave on the licensed territory 5,750,000,000 feet b.m., but it is believed that this estimate is considerably below what the licensed area will produce, and the 10,000,000,000 feet b.m. estimated as on territory subject to license in 1887 was much below the quantity then on this territory. From the 26,000,000,000 feet b.m. estimated by Col. Dennis as being on the disputed territory, there must be deducted about 122,000,000 feet b.m. cut under authority of the department since 1884, and the additional quantity cut in that territory under authority of the Government of Canada as to which we have no satisfactory data.

"Some explorations and estimates have been made for the different sales, and some exploring, estimating and exploratory surveying have been done in the disputed territory since the sale of 1890 not affected by the sale, but no explorations of a general character have been made in that territory upon which an estimate could be founded. The general statement of Col. Dennis made prior to 1887 was, as before stated, incorporated with the partial and rough estimate made in 1887 and afterwards used in the House by the late and present Commissioners and Treasurer Ross.

"As to the quantities remaining on berths upon which operations have for many or few years been carried on, the department is not in possession of data to warrant a definite estimate as to particular berths. The changes caused by cutting and fire and those caused by growth from year to year would make it impossible for the department to express even an opinion beyond that already given."

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."

This brings down the information to a late date, so far as the two central provinces are concerned.

Respecting the province of British Columbia, it is difficult to procure information. The Dominion Government agent estimates the Douglas pine, cedar, spruce, Alaska pine, alder, maple, yew, and larch standing in the railway belt at 25,000,000,000, feet of a present value of \$25,000,000. Information supplied by Mr. R. E. Gosnell, as to the timber resources of British Columbia will be found in appendix "O."

#### NOTES UPON THE PREVIOUS EXCERPTS.

In addition to the remarks made *en passant* a few further remarks upon these several estimates may be in place.

Mr. Skead, in referring to the Ottawa valley, remarks that during fifty-nine years to 1865, "but little over 20,000 square miles had been denuded of merchantable timber." He also gave the area of the Ottawa valley region at 87,000 square miles. Mr. Russell says more recent surveys give the area at 60,080 square miles. Mr. Skead, from his practical acquaintance with the subject and from the means of information at his hand, would be likely to be accurate about the area cut over. It would thus appear that in 1865, one-third of the whole area of the Ottawa valley was denuded of its timber.

Upon Mr. Joly's estimate, given in Appendix C, I have to present that honourable gentleman's views, as stated in a letter dated 6th November, 1893. He says:—

"I am not in possession of any data by which to compare with an approach to exactitude the probable area of timber still left growing in the Province of Quebec with the Hon. Jas. Skead's estimate of 1865. The area may be nearly the same, as it could only have been reduced by the settlements made since then (which do not amount to much), but the proportion of valuable timber on these timber limits must be enormously reduced, and you can form an idea of the valuable first-class timber at present, as compared with 1865, by comparing the Cullers' Returns for these two periods."

With respect to the estimate brought down to the Ontario Legislature, I have to say that on sending to the Department of the Interior for the file of correspondence containing Colonel Dennis's estimate in order to verify the statement attributed to Colonel Dennis, I received the following letter from the Deputy Minister:—

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OTTAWA, 30th December, 1893.

DEAR MR. JOHNSON.—I duly received yours of the 22nd in regard to the estimate made by Colonel Dennis, in the autumn of 1878, with respect to the timber in the portion of Ontario then known as the Disputed Territory. I may say to you that the estimate in question, although signed by Colonel Dennis, was really made by myself, and that in writing it out from a little shorthand draft which I had made for myself, I committed the mistake which will be easily understood by shorthand writers of writing 26,000,000,000 feet instead of 2,000,000,000 feet. I should add that the letter containing the estimate in question was addressed to Mr. A. H. Dymond who was then preparing a pamphlet for the Ontario Government upon North-western Ontario, its boundaries, resources and communications. Colonel Dennis was in very poor health at the time, and did not examine the figures carefully, so that the mistake for the time being, passed unobserved. When the pamphlet was published, however, and an advance copy of it sent down, I immediately observed the blunder into which I had fallen, and on the 13th February, 1879, Colonel Dennis addressed to Mr. Dymond a letter explaining that although the quantity was correct in the notes which I had made, I had inadvertently stated it wrongly in writing the letter, and a strong appeal was made by him to Mr. Dymond to have the correction made in such a way that the public would not be misled. One week later Colonel Dennis wrote a letter to Mr. Dymond renewing this request, and pressing upon him the importance of it. Notwithstanding this, however, the Ontario Government would appear, no doubt inadvertently, to have continued the erroneous statement all through their returns and publications. I may mention to you that I consulted every person who would be likely to give reliable information on the subject, before making the estimate of 2,000,000,000 feet, including for instance, Mr. Hugh Sutherland, Mr. Simon J. Dawson, Mr. James Isbester, Mr. John Shields and Mr. Lindsey Russell, besides a number of surveyors and explorers who were more or less directly connected with the department at the time, and who had considerable opportunity of examining the timber resources of that section of the country. Nothing since has occurred to come within the range of my observation which would appear to me to justify any change in the figures, and I am quite certain that 26,000,000,000 is enormously in excess of the actual timber resources of that locality, and that 2,000,000,000 feet as then stated, would be a safe estimate to-day.

In a word, then, let me say that the estimate of 26,000,000,000 feet furnished to Mr. Dymond in 1878 was an erroneous one, the error was discovered immediately the printed pamphlet was placed in my hands, and the compiler was not only notified of the error and of what the figures ought to be, but was most earnestly requested to do what might be necessary to correct any misapprehension which the publication of the erroneous figures might have produced. I should add that this subject is at the present time engaging the attention of the Minister of the Interior, and will, in all probability, be brought to the notice of the Government of Ontario.

Yours very truly,

(Sgd.) A. M. BURGESS.

From this explanation, it appears that the estimate submitted to the Ontario Legislature in 1893 is in excess of what it should be by 24,000 million feet in quantity and by \$60,000,000 in value.

## CONCLUSIONS FROM FOREGOING STATEMENTS.

Taking all these statements, the conclusions to be reached from them are:—

- 1st. That the first quality pine has nearly disappeared.
- 2nd. That of the second quality pine, there is a considerable supply.
- 3rd. That of other timber woods, there is a large supply.
- 4th. 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.

It would seem natural that pine of the first quality should have very greatly diminished, because while it, in common with other forest trees, is exposed to the woodman's axe, the settler's torch and to forest fires, it does not grow as rapidly as other woods. The destructive forces are vastly greater than the productive.

There are three ways to test the accuracy of the first conclusion.

- (a.) The size of the white pine as given in the cullers' returns.
- (b.) The size as given in the provincial returns as sworn to by the lumbermen and checked in the Crown Lands Department.
- (c.) The supply to the English market, where the best white pine is required.

(a.) An analysis of the cutters' returns of the Port of Quebec and other St. Lawrence ports gives the following result:—

Description.	Average cubic feet per piece.						
	1865.	1870.	1875.	1880.	1885.	1890.	1893.
Waney white pine.....	80	56	57	61	57	58	58
Square white pine.....	66	55	57	55	52	44	44
Square red pine.....	59	39	37	39	38	39	39

(See Statistics, Table 5, for details).

These figures show that in 1865 the average piece of waney white pine was 38 per cent larger than in 1893; that the average piece of square white pine was 50 per cent larger in 1865 than in 1893, and that the square red pine was over 51 per cent larger. A decrease in size during 28 years of 27 per cent and 33 per cent respectively indicates that, if size and quality go together, as far back as 25 years ago we had lost the first-class merchantable pine from our forests.

The figures also show a singular uniformity in size since 1870.

(b.) Taking the provincial returns, \* we find the following results:—

#### PINE SAW-LOGS.

Province.	Average size, board measure.						
	1887.	1888.	1889.	1890.	1891.	1892.	1893.
Ontario.....	122½	110	106½	103	96	94	98½
Quebec.....	138	135	137½	130	141	164	127½

It will be seen that the province of Ontario shows a yearly decrease in contents of the saw-logs until 1893 when there was a slight increase. The province of Quebec shows 1st. A general increase in contents, (until 1893, when there was a sudden decrease), and 2nd. A generally larger log than the province of Ontario.

I am assured that the figures "164" for 1892 are incorrect, and that the pine saw-logs of the Upper Ottawa district, which give the abnormally high measurement of 1892, did not in that year run higher than in former years. With respect to the second point, I am informed that in the province of Quebec, the scale used is Scribner's, while that used in Ontario was Doyle's, and that Scribner's gives fully 10 per cent more on an average. This would account to a considerable extent for the difference between the two provinces as shown in 1887, but not for the divergence shown in subsequent years.

\*Provincial Government returns in Crown Lands Reports.

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With respect to the abnormally large contents of the Quebec logs in 1892, I addressed the following letter to the Agent at Hull, of the Quebec Crown Lands :—

OTTAWA, January 3rd, 1894.

DEAR SIR,—In the report of the Crown Lands, 1892, published by the Quebec Government, it appears that the pine saw-logs reported from the Upper Ottawa averaged nearly 199 feet, and that the square white pine averaged 86 feet. In the previous year the average was, for logs, 141, and for square over 49, showing that the average of logs before 1892 ran below 150, and for square was about 50.

Can you give me any explanation of this great increase in size in 1892, both in logs and square, as compared with the previous experience?

An early reply will oblige.

Yours truly,

(Sgd.) GEORGE JOHNSON.

H. McGRADY, Esq., Quebec Crown Timber Agent, Hull, P.Q.

Mr. McGrady referred the letter to the Crown Lands Department at Quebec and both the Crown Timber Agent and the Assistant Commissioner agreed in the conclusion that there was an error in the return of 1892.

There is no doubt that there was an increase in the size of the pine logs in the Upper Ottawa Agency in 1892 and the meaning of it is that some fine pine had been discovered in the back part of the district and brought down. The very low figures for 1893 seem as doubtful as the very high figures for 1892.

(c.) Taking the Trade and Navigation Returns of Canada we find that in 1865 the total exports to all countries of white pine timber amounted to 606,300 tons, valued at \$2,963,534 or \$4.90 per ton. In 1893 the quantity of the same exported was 105,579 tons, valued at \$14 per ton.

Taking 1865 as a standard and testing the output of square white pine by the returns for later years, we find the following :—

EXPORT TO ALL COUNTRIES.

*White Pine Timber.*

	Tons.	Value.
1865 .....	606,300	\$2,963,534
1877-79 .....	282,250	2,737,194
1880-82 .....	227,705	2,335,604
1883-85 .....	219,379	2,771,776
1886-88 .....	138,329	1,609,295
1889-91 .....	157,245	2,260,517
1892 .....	123,994	1,645,711
1893 .....	105,789	1,481,155

Nearly 99 per cent of the whole going to Great Britain, as the following table shows :—

	Tons.	Value.	Value per Ton.
All countries, 1865.....	606,300	\$2,963,534	\$ 4 90
Great Britain, 1877-79, average	279,243	2,715,914	9 72
do 1880-82 do	220,731	2,304,937	10 43
do 1883-85 do	216,210	2,752,456	12 73
do 1886-88 do	137,894	1,604,621	11 64
do 1889-91 do	156,265	2,239,090	14 32
do 1892.....	123,820	1,644,031	13 27
do 1893.....	105,579	1,479,255	14 00

There has been a decrease in the quantity exported of over 82 per cent while the decrease in total value has been but little over 50 per cent.

It would appear that as a mercantile transaction the export of later years was as good as that of 1865, unless the cost of getting out the quantity in later years has been more than 32 per cent greater than that of 1865.

On the main point, however, under consideration, viz., the decreased size and consequent decreased quality of the white pine, there can no doubt, since the chief reasons for the decreased demand in the United Kingdom is the deterioration in quality, England's requirements being as great as ever, but the proportion going from Canada being less and less, the percentage for the years 1885-93 being 9.20 per cent against 21.91 for the years 1872-77 for hewn, and 23.14 per cent for 1885-93 for sawn wood, against 27.54 per cent for 1872-77. (See Statistics, Tables 6a and 6b.)

We come now to the other conclusions derived from the study of the statement of experts, as mentioned on page 15.

At the Forestry Convention held in Montreal in 1882, Mr. Marler, said to be an authority on matters connected with our forests, gave a calculation showing that the census cut of 1871 required an aggregate of 22,271,384 trees. He gave fifty trees to the acre, and showed that 445,428 acres were denuded each year of their trees.

Taking the same calculation, there were cut out of the forest area of the country in 1881 an aggregate of 30,578,922 trees and in 1891 an aggregate of 29,550,000 trees, requiring, respectively, 611,600 acres and 590,990 acres. In other words, taking these three returns as fairly averaging the cut of the intervening years, 16,480,000 acres (25,800 square miles) of forest area have been denuded during thirty years past to supply the demands, home and foreign, made upon our forests. This seems small compared with the whole area under forest. The basis of the calculation, fifty trees to the acre, giving, as it does, thirty feet all round for each tree, from which to procure light and air, and plant food from the soil, appears to be sufficient, since apple trees, requiring a large area in which to spread and secure sunlight for ripening their fruit, are each given 33 feet every direction in any well-planted orchard. Mr. Marler's calculation, based upon the cubic feet in a standard log, seems reasonable, and, if anything, to err through being too small, since the census returns of 1871 did not include fence poles, railway ties, telegraph poles, pulpwood, and hand-made shingles, all of which Mr. Marler passed over in his computation. Moreover, he allowed nothing for the destruction by fire and waste. These allowed for, it is evident that the

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area, over which the destructive forces have had full play, is very much greater than the 25,800 square miles required under Mr. Marler's calculation.

As has been shown already, the railways of this country have made a demand upon the forest for nearly 60,000,000 ties.

Mr. Joly endorses the view that more pine timber has been destroyed by fire than has been cut down and taken out by the lumbermen. Mr. Edwards says ten trees have been destroyed by fire to every one cut down by the lumberman. If these statements are any way near the mark, then not less than 258,000 square miles of the total in the four provinces east of the eastern boundary of Manitoba have been denuded of their timber growth.

But 258,000 square miles is close upon the total area of the forest, as given by Mr. Skead, who placed it at 287,000 square miles.

But, as before remarked, Mr. Skead did not include any area in the province of Ontario west of Nepigon River. Nor did he include the eastern Maritime Provinces. Allowing that the whole area, including lakes and rivers, is 500,000 square miles, these 258,000 square miles form the larger portion.

In the consideration of the force of these calculations a good deal depends upon the extent of the denudation of the forest and still more upon the degree of the afforesting processes which nature is constantly carrying on.

Mr. Marler (already quoted), in referring in 1882 to the belt of forest area to the south of the St. Lawrence in the province of Quebec, said: "Since twenty years, this great belt has been intersected by some dozen railways cutting up the land like a check-board, and by this means we must look forward, that by another ten years this belt will be entirely denuded of all kinds of timber."

From a study of the map, it seems that this very region is the best perhaps in all Canada to investigate, for the purpose, 1st, of seeing how far Mr. Marler's prophecy has been accomplished, 2nd, of ascertaining, to some extent at least, the reproductive powers at work.

The region in Quebec, south of the St. Lawrence, offers peculiar advantages for the study of the forest area. It is pierced by several rivers such as the Metapedia, Matane, Rimouski, Madeleine, Trois Pistoles, du Loup, Chaudière, Ouelle, du Sud, St. Francis, Yamaska, Richelieu, Chateauguay, etc. It is well intersected by railways passing through the region in every direction and connecting it with the great centres of Canada and the United States.

By dividing this region into three subdivisions, we may readily examine the process which is going on. These three subdivisions are: 1st. The region below Levis, consisting of the counties of Bonaventure, Gaspé, Rimouski, Temiscouata, Kamouraska, L'Islet, Montmagny and Bellechase. 2nd. The St. Lawrence River counties above, and including, Levis, consisting of Levis, Lotbinière, Nicolet, Yamaska, Richelieu, Verchères, Chambly, Laprairie, Beauharnois and Huntingdon. 3rd. The southern and border counties, consisting of Megantic, Beauce, Drummond and Arthabaska, Richmond and Wolfe, Compton, Sherbrooke, Stanstead, Bagot, St. Hyacinthe, Shefford, Brome, Missisquoi, Iberville, Rouville, St. Jean, Napierville, Chateauguay, Dorchester, and Soulanges and Vaudreuil.

The census returns for these counties show the following results:—

## CUT OF PINE.

For the whole region, 1891.....	10,509,289	cubic feet.
do do do 1881.....	8,958,886	do
do do do 1871.....	7,780,906	do

The increase in 1881 over 1871 was over 15 per cent, and in 1891 over 1881 it was over 17 per cent.

Further analysis shows that in the subdivisions the cut of pine was:—

## No. 1.

1891.....	5,727,354	cubic feet.
1881.....	1,272,573	do
1871.....	1,033,213	do

## No. 2.

1891.....	2,219,973	cubic feet.
1881.....	1,936,853	do
1871.....	3,387,459	do

## No. 3.

1891.....	2,561,962	cubic feet.
1881.....	5,749,460	do
1871.....	3,360,234	do

The details will be found in statistical table No. 7.

These returns indicate: 1st. That during twenty years in the first division the cut has rapidly increased so that it was in 1891 more than five times that of 1871. 2nd. That in the second subdivision the cut of 1891 is somewhat more than that of 1881, but about a third less than that of 1871. 3rd. That in the third subdivision the cut of 1891 is less than half that of 1881, while that of 1881 was 70 per cent more than that of 1871, and that of 1891 was nearly a quarter less than that of 1871.

In a general way these figures show that the decrease in the cut of pine would be very considerable during twenty years if it were not for the results in the Lower St. Lawrence division.\* But taking the two subdivisions above Levis we find that though the cut has decreased from 1871 to 1891 by about two million cubic feet, yet, that during the intermediate period, namely, in 1881, the cut was nearly one million more than in 1871. Allowing for errors the fact seems clearly established that in a region where the seigniorial grants were large in area and where the alienation of Crown lands has been extensive the growth of pine to a useful size has been considerable and has more than offset the destruction by fire.

This appears to be the general experience. No doubt there was a time when the axe and the torch were destroying the forest faster than it could be reproduced, but the

\* This conclusion is corroborated by the returns of the Crown Timber agents for a series of years. From 1856-71 the yearly average number of pieces of square pine was 3,000; of pine logs, 63,500; from 1872-81 it was square pine, 763, logs 61,132; from 1882-91 it was square pine, 153, logs 30,042.

[These are only adduced in evidence of the trend of affairs. They are not to be added to the census returns to show the total cut, as that would be duplication.]

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conclusion seems irresistible that the forces of protection and reproduction are now practically almost as powerful as the forces of destruction.

The great giants have largely disappeared. The ripe trees have been taken away like ripe fruit and for more than thirty years we have been depending more and more upon the newer growth, and finding more of it. Thus the returns of the province of Quebec show that from 1866 to 1878 the number of pine logs returned by the Crown Timber agents of the province was 18,752,274 with an average of 137 $\frac{3}{4}$  feet b.m., and from 1878 to 1890 the number was 27,965,278 logs with an average of 138 $\frac{1}{4}$  feet b.m.

That the quantity of useful pine in the country is constantly being replenished is seen in the returns for very old counties. Thus the Yorks of Ontario in 1871 produced 80,000 cubic feet of white pine; in 1881, 987,000 cubic feet, and in 1891, 562,000. The Durhams in 1871 produced 161,000 cubic feet; in 1881, 67,000, and in 1891, 111,000. The oldest counties, those upon the lake shore, thus seem able to keep up a constant supply suggesting reproduction on a much larger scale than many have thought possible.

The experience of woodsmen and other experts seems to point in the same direction.

Mr. Russell, already quoted in another connection, says in this regard: "On the southern tributaries of the Saguenay that interlace with those of the St. Maurice there is much good soil and where the trees fit to make saw-logs of have been cut away the small trees left if not destroyed by fire will soon be of useful size. This remark is applicable to all timber regions as I have had ample occasion to notice. In one case where no error could occur a small timber berth with well-marked outlines, which had been stripped of every tree fit to be a saw-log, under an able manager, was cut over by him again eight years afterwards when by the increased size of the small trees formerly left as unfit a greater number of saw-logs were made from them than were got from the first cut eight years before. On the Gatineau I passed through an extensive grove of young red pine trees of fine growth that had previously been three times completely cut over since the commencement of lumbering there."

Mr. R. W. Phipps said: "For many years statements have been made concerning the possible exhaustion of Canadian forests and very diverse opinions have been expressed on the subject by persons of apparently equal experience and knowledge. It appears to me when it has been stated that there is but five or there is but ten years' supply remaining this may be fairly understood to refer to the possibility of obtaining timber of the same sizes as we have heretofore cut. It is probable that over a great extent of this territory many of the largest trees have been taken out. But it should be remembered that the forest has great reproductive power, that young trees continually replace the old and that in twenty years time, trees now but of medium size will furnish excellent timber."

Mr. W. A. Hendry, of Nova Scotia, writes: "If active measures were adopted to put a stop to the ravages of forest fires and to prevent the felling of trees of a less size than a fixed number of inches diameter, I am sure that Nova Scotia will continue to be a timber producing and exporting country for all time to come, as our best timber lands can never be used for profitable agricultural purposes. As an instance of the marvellous productiveness of our forests, I would instance a small section of eight or ten square miles through which the Sackville River runs. Up to the year 1840 every house in Halifax was built of timber from that section and as every one knows it has produced an enormous amount of cordwood, house frames, boards, deals, wharf logs, shingles, &c., ever since. Within three years the writer has travelled through every part of the section referred to and it appears as far from exhaustion now as it did 40 years ago. The trees are not large, but they are tall and healthy; perhaps not many up to two feet in diameter."

Mr. Austin, of the same province, writes :—

"It is found that by careful husbanding, those trees which are too small for conversion into lumber at the time of the first cutting, after fifteen or twenty years supply a second cutting nearly equal to the first cut; consequently if it were not for forest fires those lands that are carefully looked after would never become denuded of their timber."

The census returns of Nova Scotia show that the quantity of pine, spruce, and other woods cut in 1870 amounted to 15,494,000 cubic feet; in 1880 to 27,745,000 cubic feet, and in 1890 to 46,408,000 cubic feet.

The exports from the province since 1877 by three year periods, have been (yearly average):

1877-79, yearly average.....	\$	939,571
1880-82, do do .....		1,291,381
1883-85, do do .....		1,483,311
1886-88, do do .....		1,504,866
1889-91, do do .....		1,739,981
1892.....		1,604,779
1893.....		1,823,960

Assuming that the home demand has increased with the population, it is evident that the fact of increase noted by the census returns is well supported by the trade returns. This could only be the case in a province like Nova Scotia on the hypothesis that the reproductiveness of the forest noted by Mr. Hendry has been an important factor.

Thus by the concurrent statistics of two regions—the southern Quebec and the Nova Scotian, similar in having been long settled and being well supplied with railways and waterways—supporting the views of the experts quoted, it would seem to be established that during the last twenty years the powers of production and protection have fairly held their own against the powers of destruction.

Since 1867, 76,692,700 pieces of pine, of which 72,236,200 were saw-logs, have been reported by the Crown Timber agencies as taken out of the forests of the Upper Ottawa district which includes the region from the water-shed of the Lièvre to the head waters of the Ottawa and all its tributaries.

Of these saw-logs 36,877,700 have been cut on the Quebec side and 35,358,500 on the Ontario side of this district.

This procession of logs has been moving steadily down the Upper Ottawa and its numerous streams since 1806, when the first boat-load was taken from the mouth of the Gatineau. Between 1826 and 1867, 6,315,000 logs and 7,480,000 pieces of square pine were floated away.

In all those years settlers were hewing out for themselves homes by destroying the forest.

The area drained by the Upper Ottawa and its tributaries is stated to be about 30,000 square miles.

Thus during eighty-five years these 30,000 square miles—the very heart of the pine producing area of Canada—have been supplying pine at a rapidly accelerating rate. For

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forty years 1826-67 an annual average of 354,000 pieces; for fifteen years, 1867-81, an annual average of 2,590,000 pieces; for ten years, 1882-91, an annual average of 3,785,000.

At a sale of timber limits in Ottawa on the 24th January, 1894, one parcel on the Coulonge River, 235 square miles, sold for \$1.40 an acre, lakes and streams included. Besides this amount the purchasers have to pay the annual ground rent of \$3.00 a square mile and the timber dues of 26 cents on each standard pine log of 200 feet board measurement.

About the same time, the newspapers announced the sale of 205 square miles of timber limits on the Ontario side of Lake Temiscamingue, at the rate of \$2.32 per acre.

It is evident, therefore, that notwithstanding all the millions of pieces which have been taken out as above described, pine must still be abundant to yield a profit on such purchases besides the cost of manufacturing it into lumber.

Further corroboration of the value of the timber limits is found in the fact that the lumbermen are holding on to the timber limits.

#### PROTECTION OF FORESTS.

Means have been employed to check the destructive, and to assist the reproductive, forces.

#### QUEBEC.

In the province of Quebec, the Legislature, by an Act passed in 1883, and by another passed in 1889, has divided the province into twenty-one fire districts within which the commissioner has the power to employ the necessary number of men to act in the suppression of any forest fires. A sum of \$5,000 is annually set apart by the Government for that purpose, and the licentiates who are also interested in the preservation of their timber are obliged to contribute a similar amount to cover the expenses incurred in connection therewith. As an additional preservative of the forests the regulations of 1888 prohibit the licentiates from cutting pine trees measuring less than 12 inches and trees of any other kind less than 9 inches on the stump. Lastly, as an incentive to the planting and cultivation of forest trees the Legislature of Quebec in 1882 provided for the bonusing of any one planting one acre with forest trees with a land order entitling him to public lands, which may be opened for sale, to the extent of \$12 for each acre planted. In respect to the latter, Hon. Mr. Joly in a recent letter intimates that the tree planting has not been as successful as he at the time thought it was likely to be, though there is now an appreciable interest taken in tree planting which increases year by year.

Recently a large tract of land in the Saguenay region has been set apart by the legislature for a park under the name of the Laurentides Park.

#### ONTARIO.

Various measures have been adopted by the Government of Ontario to protect the forest wealth of the province from destruction, especially by fire.

In 1878 the "Fire Act" (chap. 23) was passed. It empowers the Lieutenant Governor in Council to proclaim fire districts, within which, from April 1st to November 1st, no fires may be lighted in or near the woods except for clearing land, cooking, obtaining warmth, or for some industrial purpose, and then only with the precautions laid down.

For clearing land fires must be started, managed and cared for with every reasonable care and precaution to prevent them spreading to the forest. For fires for cooking, obtaining warmth, or for any industrial purpose, selection must be made of a spot with the smallest quantity of inflammable matter, which must be removed for a radius of ten feet; care must be taken to prevent the fire spreading, and to extinguish it before leaving. If a match, tobacco ash, gunwadding, &c., is dropped, the fire from it must be completely extinguished before leaving the spot. Those in charge of lumbering, surveying, or other camping parties are to read and explain the Act to those under them. Railway engines must have approved means of guarding against fires from their ashpans and smoke-stacks, and the engine-driver in charge must see to this. The penalty is a fine up to \$50, with three months' imprisonment in default, and for railway companies a penalty of \$100. Crown land agents, wood and forest agents, free grant agents, and bush rangers are specially charged to enforce the Act.

In the same year fire district No. 1 was proclaimed under this Act, having for its southern boundary Lake Huron, Georgian Bay, and the irregular line from Midland Bay to the Ottawa River at the southerly limit of the licensed forests; for its western boundary, the Ottawa River and the dividing line between Ontario and Quebec; for its northern boundary, that of the province; and for its eastern boundary, "Salters line" and its production, being a few miles east of meridian 84, near Bruce Mines, north of St. Joseph Island.

In 1886 fire district No. 2 was proclaimed to consist of all of Ontario west of No. 1. Thus all of the province is included in these fire districts, and is subject to the Fire Act, except the old settled districts southward of the licensed timber limits.

In the previous year, 1885, a new step of great importance had been taken, namely, the appointment of fire rangers. These men were appointed for the protection of limits, where the license holder would agree to pay half the expense. They were to be nominated by the limit owners, subject to the veto of the department, and would be under their supervision and direction as well as that of the government timber agents and rangers. Their duties were to inform settlers and others concerned as to the Fire Act, and enforce its observance, to suppress fires, engaging assistance when necessary for this purpose, and to inform both the department and the limit owner of the damage done. They were employed from the beginning of May to the end of September.

The success and popularity of this system may be seen by its growth from year to year. In 1885 thirty-seven fire rangers were employed at a cost of under \$4,000, half of which was paid by the licensees. In 1886 there were forty-five fire rangers at a joint cost of \$10,000, besides a number of the lumbermen's forest rangers having authority given them to enforce the Act. In 1887 there were fifty-five fire rangers and a joint expenditure of \$15,000, much help having to be hired to fight fires. In 1888 the joint cost was \$18,000, there being seventy rangers who fought dangerous fires. In 1889 there were seventy-five rangers, the expenditure being \$15,000, and there being little fire. In 1890 there were eighty-three rangers at a cost of \$17,000, with no fires. In 1891 there were ninety-eight rangers on the limits of thirty-seven lumbermen including the largest limit holders. The season was dry and there were bad fires, but the rangers reported their extent, so that the lumbermen could cut the killed trees before they were bored and the government could dispose of the burnt timber on the unlicensed Crown lands.

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The cost was \$20,000. In 1892 there was little fire and the joint cost of government and lumbermen was \$18,000.

Arbor Day, suggested by the Forestry Associations, has been accepted by the Minister of Education, who allows a holiday to the public school children on that day to plant trees. The planting is not extensive, but there is the advantage that the rising generation may learn the lesson that trees are friends to be fostered and not enemies to be destroyed.

In the sale of timber limits in 1890 a provident condition was made in the terms of sale, that the saw-logs must not be removed but must be manufactured into lumber in the locality, thus effectually preventing the stripping of our forests for the benefits of others only. This precedent was abandoned in the sale of 1892.

An important step is the setting apart of a forest reservation and national park of eighteen townships on the Nipissing district called the Algonquin Park. Two-thirds of it was already under license and the remaining third was sold at the limits sale of 1892, so that it will not have the advantage of being a reserved forest under state management. Only the pine was sold to the lumbermen, other trees being excepted, as was the case with all the limits sold that year.

## NEW BRUNSWICK.

An Act to prevent the destruction of forests by fire was passed in New Brunswick in 1885. It is framed after the Ontario "Fire Act" of 1878, and indeed the chief enacting clauses are identical. The principal differences are as follows: The period for restriction in the use of fire is from May 1st to December 1st; the radius to be cleared round fires for cooking, &c., is five instead of ten feet; persons starting fires on lands not their own or allowing them to spread to lands not their own shall in case of negligence be liable to penalties; railway companies shall keep section men to watch for and extinguish fires, and when passing through woods shall clear away combustibles to the edge of the wood; the penalties are from \$20 to \$200, and for railway companies from \$50 to \$200; Supervisors of roads, commissioners of highways, county councillors and constables are in case of forest fires to order out men to stop the progress of the fire, the penalty for refusing being \$5 to \$20; Crown land agents, free grants commissioners, Labour Act commissioners, lumber scalers, fishery wardens and deputy crown land surveyors are to enforce the provisions of the Act.

A condition of the lumbering license is that no pine or spruce tree shall be cut which will not make a log at least eighteen feet in length and ten inches at the small end.

The N. B. Crown Lands Department report for 1888 says: "The subject of the protection of our forest areas from destruction by fires is being continually forced upon our notice. These great areas are being further penetrated year by year by lines of railroad, by highways, by pioneers and settlers and by sportsmen and hunters, and the risk from the careless or accidental firing of the forests is continually on the increase. In other wood-producing countries, such as Sweden, Norway, Russia, and some of the United States, stringent laws and regulations are in force for the prevention of such fires, and for the prevention of waste in cutting, and large sums of money are appropriated for the enforcement of these laws and for the carrying out of an efficient protective service.

"Our chief source of local revenue is in our timber lands and their destruction would necessarily entail direct taxation for a part of the ordinary current expenses of the country, but with proper care and guardianship these timber limits will continue to produce for an indefinite period as large, if not a larger, revenue than now.

"In view of these facts it would seem that this subject merits more consideration than it has received in the past and we could gather useful lessons from the experience of other countries. A moderate expenditure for guardianship during the season when fires are most prevalent, would, I am satisfied, be a great practical advantage. Something should also be done to check the wanton and careless destruction of young and rapidly growing timber trees by woodsmen in carrying on lumber operations.

"In both these latter respects we might learn much from the foresters of the neighbouring state of Maine."

The commission appointed to consider the administration of the Crown timber lands of New Brunswick, in their report dated March 2nd, 1892, made the following recommendation :—

"The practice largely prevailing in connection with the hemlock industry of permitting the operators to remove the bark only, leaving the remainder of the tree to rot when felled, is, we believe, a very pernicious one. Although this wood is not now valuable in some sections of the province in comparison with spruce, pine and cedar, it is not unreasonable to anticipate that it will in the near future become so. Hemlock logs left in the woods are great feeders of forest fires, and we are creditably informed that bark operations are a faithful source of such fires, which in some cases have destroyed valuable tracts of government timber. Another objectionable feature of this business is the great waste of young spruce trees, which are cut for bedding, or skidding the hemlock, and also broken in felling it. These, if allowed to grow, would eventually make saw-logs. Very stringent regulations should be made to prevent bark operators from cutting or destroying spruce or other merchantable wood, and in cases where such wood is destroyed or used, each tree should be rated as a saw-log, and so paid for."\*

The commissioners also make the following recommendations :—

"We recommend that surveys and explorations be made where most needed, by competent judges of timber upon land, so that the Government may know approximately the quantity of lumber owned by the province, where it most needs cutting, and what, if any lands should be allowed to rest in order that the trees may mature."

"We beg to express our conviction that positive injury has been done to the lumbering interests of the province, to its reputation as a good agricultural country, as well as to the people directly concerned, by permitting settlers to locate on lands which were well timbered, but unfit for settlement or agricultural purposes. We hope this practice will in future be avoided, and the valuable timber areas of the province thus reserved for their legitimate purposes."

#### NOVA SCOTIA.

Chapter 65 of the Revised Statutes of Nova Scotia (Fifth Series, 1884) is similar to the Fire Act of New Brunswick. The penalties are from \$20 to \$400, and in the case of railway companies \$100 for each offence. In addition to the penalties, persons starting fires on the lands of others, or allowing them to spread from their own are liable to double damages to the Crown or private persons affected.

\*The recommendations of the commission have had good effect. By the new form of license issued in 1893 the operator is prohibited from cutting spruce or pine for skidding, bedding, or other similar use, any trees so cut to be charged stumpage as merchantable logs. By another clause no spruce or pine may be cut "even for piling" under 18 feet long and 10 inches diameter at small end, under penalty of double stumpage and forfeiture of license. By a further clause the regulations against holding limits for speculative purposes without working them, are made more stringent.



## BRITISH COLUMBIA.

The Statutes of British Columbia, 1890, contain a short Act, the "Bush Fire Act," to protect its forests.

## PRINCE EDWARD ISLAND.

There is a law in Prince Edward Island restricting the careless use of fires endangering woods.

## THE FEDERAL AUTHORITIES AND THE FOREST.

The relation sustained by the federal authorities to the forest is, for the most part, indirect rather than direct. (For forest reserves of the Dominion *see* appendix Q.) The Federal Government, for instance, has charge of the fisheries and seeks to maintain in efficiency the river fisheries. In so doing, it comes in contact with the hard fact that the efforts of the Department of Marine and Fisheries are rendered more or less abortive by the adverse conditions created and intensified year by year through the denudation of the forest.

The Department of Agriculture has the same interest in the question, because of the intimate connection between the forest and the farm.

The Department of Railways and Canals has a deep interest in the question because, if the innumerable streams feeding the great reservoir of Lake Ontario are reduced in volume, that reservoir will lose its head and the pressure will be less upon the river carrying away its surplus. Hence a smaller volume of water in the great watercourse, and hence a diminished supply, which will be felt in the canals by the reduction of the depth on the sills (*see* appendix F).

But the chief immediate relation of the federal authorities to the forest is caused by their control over the export and import trade of the country. This refers especially to the four eastern provinces and to British Columbia, in all of which the control of the forests is vested in the Provincial Governments, with the exception of the railway belt in British Columbia, the timber on which would not exceed in value the wood exports of the country in a single year. About one-fourth of the total exports of the country is products of the forest.

It becomes necessary, therefore, to examine the trade returns more closely than has been done, to the present point, in this inquiry.

The Parliament of Canada has, from the first, legislated in respect to the forest in the only way it could, namely, by imposing an export duty, by way of restraint on production. Chapter 44, schedule F, Acts of 1886, provided for the levy of duties on export of shingle bolts and stave bolts, spruce logs and pine logs, \$1 per M. feet b.m., and on oak logs, \$2 per M. feet b.m.

By chapter 35, Acts of 1875, the duties on exports of stave bolts and oak logs were abolished.

In Acts, 1886, chapter 37, and in chapter 33, Revised Statutes, Canada, section 6 (both assented to 2nd June, 1886), the duty on exported pine logs was increased to \$2,

and on shingle bolts, to \$1.50, power being given to the Governor in Council to remove the duty altogether or to increase it on pine logs to \$3 per M. feet, in case public exigencies required a change in either direction.

During the fiscal years ended the 30th June, 1887 and 1888, the duty on exported pine logs remained at \$2 per M. During the fiscal year ended 30th June, 1889, the duty on exported pine logs was raised to \$3, from the 13th November, 1888. During the fiscal year 1890, the duty was \$2, and during the fiscal year 1891, it was \$2, till the 13th October, 1890, when the export duty was abolished. It has not since been re-imposed.

In the United States, the import duties were, in 1874 :—

1. For timber hewn or sawed, or used on wharf building, or for spars..... 20 p.c.
2. Timber sided and squared..... 1 cent per cubic ft.
3. Sawed boards, planks, deals, and other lumber of hemlock, whitewood, sycamore and basswood..... \$1.00 per M. b.m.
4. All other varieties of sawed lumber..... \$2.00 per M. b.m.
5. Planed or finished lumber 50c. per M. for each side planed or finished, in addition to other rates.
6. Planed on one side, tongued and grooved (additional)..... \$1.00 per M.
7. Planed on two sides, tongued and grooved (additional)..... \$1.50 per M.
8. Logs and round timber (unmanufactured) and ship timber, free
9. Shingle bolts, stave bolts and heading bolts, free.
10. Woods, poplar or others for the manufacture of paper, free.

The Act of 1883 made no changes excepting that a duty of ten per cent was imposed on pulp of wood.

In 1890 the United States McKinley Tariff (so called) provided that timber, hewn and sawn, should pay an import duty of 10 per cent; lumber sided or squared,  $\frac{1}{2}$  cent per cubic foot. Nos. 3, 4, 5, 6, 7, 8, 9 and 10 remained the same, except that white pine, which by the Act of 1893 had a duty of \$2 per thousand, was admitted at \$1. This Act contained a proviso as follows: "Provided that in case any foreign country shall impose an export duty upon pine, spruce, elm, or other logs or upon stave bolts, shingle wood, or heading blocks exported to the United States from such country, then the duty upon the sawn lumber shall remain the same as fixed by the law in force previous to the passage of this Act" of 1890.

The effect of this proviso was, that when the United States tariff went into force 6th October, 1890, the Canadian Government repealed the export duty by proclamation dated 11th October 1890, and the United States import duty on white pine boards became \$1 instead of remaining at the old duty of \$2.

The duty on spruce boards remained as before though the Canadian Government had taken off the export duty on spruce logs. Subsequently, the United States appraisers ruled that the Douglas pine of British Columbia was a spruce lumber and therefore subject to a duty of \$2 instead of the duty of \$1 as white pine.

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Wood pulp was subjected by the tariff of 1890 to duties of import varying from \$2.50 per ton to \$7—an increase from 10 per cent ad valorem. This particular phase of the question will be discussed later on.\*

The Canadian export duty on logs, etc., was doubtless imposed, primarily, with the object of limiting demand so as to give the forests additional chance of recuperation.

Analysis of the export duty shows that since 1868 the total yield has been \$521,211, of which \$70,299 was obtained prior to 1871, in which year the amounts were separated so that they can be apportioned. This leaves \$450,911, and this amount was obtained as follows:—

Shingle bolts.....	\$ 43,034
Stave bolts.....	6,912
Oak logs.....	8,565
Spruce logs.....	185,734
Pine logs.....	206,666
Total.....	\$ 450,911

\* Since the above was written the United States tariff has been modified. The rates of the tariff of 1894 are as under:—

DUTIABLE—WOOD AND MANUFACTURES OF.

- 179. Osier or willow, prepared for basket-maker's use, twenty per cent ad valorem; manufactures of osier or willow, twenty-five per cent ad valorem; chair cane, or reeds, wrought or manufactured from rattans or reeds, ten per cent ad valorem.
- 180. Casks and barrels, empty, sugar-box shoofs, and packing boxes and packing box shoofs, of wood, not specially provided for in this Act, twenty-five per cent ad valorem.
- 180½. Tooth-picks of vegetable substance, thirty-five per cent ad valorem.
- 181. House or cabinet furniture, of wood, wholly or partially finished, manufactures of wood, or of which wood is the component material of chief value, not specially provided for in this Act, twenty-five per cent ad valorem.

FREE—WOOD.

- 672. Logs, and round unmanufactured timber not specially enumerated or provided for in this Act.
- 673. Firewood, handle bolts, heading bolts, stave bolts, and shingle bolts, hop poles, fence posts, railway ties, ship timber, and ship planking, not specially provided for in this Act.
- 674. Timber, hewn and sawed, and timber used for spars and in building wharfs.
- 675. Timber, squared or sided.
- 676. Sawed boards, planks, deals, and other lumber, rough or dressed, except boards, plank, deals and other lumber of cedar, lignum-vitæ, lancewood, ebony, box, granadilla, mahogany, rosewood, satinwood, and all other cabinet woods.
- 677. Pine clapboards.
- 678. Spruce clapboards.
- 679. Hubs for wheels, posts, last blocks, wagon blocks, oar blocks, gun blocks, heading, and all like blocks and sticks, rough, hewn or sawed only.
- 680. Laths.
- 681. Pickets and palings.
- 682. Shingles.
- 683. Staves of wood of all kinds, wood unmanufactured; Provided, That all of the articles mentioned in paragraphs six hundred and seventy-two to six hundred and eighty-three, inclusive, when imported from any country which lays an export duty or imposes discriminating stumpage dues on any of them, shall be subject to the duties existing prior to the passage of this Act.
- 684. Woods namely, cedar, lignum-vitæ, lancewood, ebony, box, granadilla, mahogany, rosewood, satinwood, and all forms of cabinet woods, in the log, rough or hewn; bamboo and rattan unmanufactured; briar root or briar wood, and similar wood unmanufactured, or not further manufactured than cut into blocks suitable for the articles into which they are intended to be converted; bamboo, reeds, and sticks of partridge, hair wood, pimento, orange, myrtle, and other woods, not otherwise specially provided for in this Act, in the rough, or not further manufactured than cut into lengths suitable for sticks for umbrellas, parasols, sunshades, whips, or walking canes; and Indian malacca joints, not further manufactured than cut into suitable lengths for the manufactures into which they are intended to be converted.

PULP.

- 303. Mechanically ground wood pulp and chemical wood pulp unbleached or bleached, ten per cent ad valorem.

To obtain this sum there were exported 30,769 cords of shingle and stave bolts, and 350,479 M. feet b.m. of saw-logs.

Of the cords, 6,911 were stave bolts, and the remainder shingle bolts. Of the M. feet, 210,200 were spruce, 4,283 oak, and the remainder pine logs.

The first point of inquiry is, whether this export duty acted in restraint of the business, and the second is whether it had any influence upon the price obtained.

The Trade and Navigation Returns show the following exports of pine logs during recent years :—

Year ended 30th June, 1884.....	M. Feet.	Duty.
do do 1885.....	974	\$2 per M. feet.
do do 1886.....	380	2 do
do do 1887.....	2,869	2 do
do do 1888.....	6,350	2 do
do do 1889.....	468	2 do
do do 1890.....	10,839	4½ mos. 2, remainder \$3.
do do 1891.....	32,144	2
do do 1892.....	36,699	3½ mos. 2, when repealed.
do do 1893.....	73,963	No duty.
do do 1894.....	127,084	do

The above table shows that from 1884 to 1888 (both years included) the amount exported was only 200 M. feet more than the amount exported in the one year 1889, that in 1889 the export took a sudden jump; that in 1890, notwithstanding the export duty, the amount exported was nearly three times that of 1889; that in 1891 the repeal of the duty only caused an increase of 4,500 M. feet and that since the duty was repealed the export of the first full year without the duty was more than double that of 1890 and that of the second full year was nearly four times that of 1890.

These figures seem to indicate that foreign demand for pine logs began in the fiscal year 1889, in spite of the export duty imposed, and that this demand has continued at an annually accelerated rate. The fact of the increase in 1889 when for eight months the duty was \$3, and of the still further increase in 1890 when the duty was \$2, and the sudden and large increase over the figures from 1884 to 1888 preclude the admissibility of the argument that the increase has been owing to the removal of the export duty.

The conclusion would appear a legitimate one that the increased demand of recent years is not owing to the removal of the export duty but would have gone on even if that duty had been retained. Thus, from a forestry point of view the export duty was an unavailing effort of protection for our forests, while from the point of view of the financial effect upon the Federal exchequer the removal of the duty has resulted in the loss of about \$100,000 a year.

It might be that this sudden expansion of the trade was caused by a decrease either in the price of the log or of the freight rates. Returns from the railways show that the freight rates on lumber have remained practically the same. The sworn returns of the lumbermen to the Customs authorities show that the prices of pine logs have undergone very little change, the average price having been in 1886, \$8.52; 1887, \$7.75; 1888, \$8.25; 1889, \$8.70; 1890, \$8.14; 1891, \$8.54; 1892, \$8.81, and 1893,

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\$8.32. During the period 1881-92 (twelve years) the average price was \$8.30 per M. feet, and in 1893 it was \$8.32. Spruce logs in twelve years averaged \$5.07 and in 1893 were \$5.84.

Neither is the expansion caused by a change from one form of wood export to another. No pine deals were exported to the United States (according to the trade returns) in 1893, '92 or '91. In 1890 there was a small export of 42 standard hundred; in 1889, of 106 standard; in 1888, of 12 standard; in 1887, of 519 standard; in 1886, of 288 standard. It is evident, therefore, that the sudden expansion is not due to a change from one class of wood products to another.

Examination shows that an immensely preponderating proportion of this export of pine logs is from Ontario. Out of 280,729 feet pine logs exported in the period 1889-93, 279,373 M. were from Ontario.

Further examination shows that these exports are chiefly from the Georgian Bay district to the east coast of Michigan.

The following is an extract from the Ontario Crown Lands report for 1893:—

"The quantity of logs exported to the United States in the round to be sawn up there was larger than in the previous year, but it did not attain anything like the proportions which were stated by those who assumed to be, but were not, acquainted with the facts. The total output for the province of saw-logs and round timber for the year was 742,491,791 feet. Of this quantity 210,682,802 feet were exported in the log to the United States, and, in addition, 24,250,000 feet b.m. of the previous season's cut was exported this year, making the total export of logs for the year 1893 cut on the licensed lands of the Crown 234,932,802 feet. This does not include about 10,000,000 feet, b.m. cut on Dominion lands (Indian reserves), all of which was exported in the log, to be sawn in the United States. It will, therefore, be seen that the export from Ontario to the United States will not be more than 50 per cent of the estimates which have appeared from time to time in the public press as the conjectures of some and the confirmed opinions of others. The department has taken every pains to ascertain the exact quantities which were exported, and the figures here given are believed to be accurate."

Mr. Hardy here says the quantity of logs exported to the United States in the round for the calendar year was 244,932,802 feet b.m., made up as follows:—

From year's cut.....	210,682,802	feet b.m.
do previous year's cut.....	24,250,000	do
do Indian reserves (about).....	10,000,000	do

Total export in calendar year 1893. 244,932,802 do

This does not include logs cut on private property and exported.

The amount thus given by the Ontario Crown Lands Department greatly exceeds the log export from Ontario as reported in the Canadian Trade and Navigation Returns, which is as follows for the fiscal year 1892-93:—

Pine saw-logs.....	125,837,000	feet b. m.
Elm do.....	33,615,000	do
Hemlock saw-logs.....	224,000	do
Oak do.....	1,347,000	do
All other do.....	4,054,000	do

Total Ontario export fiscal year 1892-93. 165,077,000 do

It thus appears that there is a difference between the amount of saw-logs exported from Ontario to the United States, as reported by the Crown Lands Department for the calendar year 1893, and the Trade and Navigation Returns of logs exported to all countries for the fiscal year 1892-93, of 79,855,802 feet b.m.

This difference must arise from one of two causes: either the export of saw-logs must have increased greatly during the season of navigation of 1893 over that of 1892; or else the Customs officials failed to secure a full return of the saw-logs rafted to the United States. An exact comparison could be made if the Customs Department returned the amount of the export for the navigable season of 1893.

A statement by the Department of Customs (*see* statistical table 17), with the names of exporters from the Georgian Bay, makes the export of logs 143,788,158 feet for the fiscal year 1893; it was 57,840,978 feet for 1892. This does not seem to agree with the Trade and Navigation Returns, which give an export of only 125,837,000 of pine for the whole of Ontario.

The cut of saw-logs for 1893, according to the Ontario Crown Lands report, was as follows:—

Pine saw-logs.....	718,215,271	feet b.m.
Other do .....	8,095,124	do
Total .....	726,310,395	do

The proportion exported, being 210,682,802 feet b.m., is 29 per cent, with the possibility of a further proportion being exported later, as occurred in 1893.

On the coast of Michigan there are centres of milling industry, chiefly situated in Saginaw Bay, which opens its mouth just across the lake from the Georgian Bay region, within convenient distance for rafting purposes. Men interested in the saw-mill industry in Saginaw City, Tawas, Bay City, and other places in this bay, purchased timber limits in the Georgian Bay region, and since 1890, cut and rafted the logs across Lake Huron to Saginaw Bay, thus adding one other source of supply to those they already possessed.

It has been urged that they are compelled to obtain these logs or close their mills, and that if Canada should put an export duty on these logs the results would be, 1st, to preserve our interests in the Georgian Bay region from depletion, and, 2nd, \* to compel the lumbermen of Saginaw Bay to bring pressure upon the United States Government for the purpose of obtaining a tariff, on wood and products, more satisfactory to Canada.

Nobody can object on public grounds to the Saginaw Bay lumbermen or anybody else purchasing limits and cutting logs provided the limitations as to the size of the log cut are such as to ensure the speedy reproduction of the forest. It is not fair to ask the present generation to forego their chance to make money out of the forest in order that coming generations may make the money. The present generation ought to be determined to hand down the precious heritage of the forest, not only in as good a condition as they found it, but improved in every respect. They ought also to have their fair share in the good to be derived from the presence of the forest. The two things can be

\* This argument has been set aside by the march of events, the present United States tariff being greatly modified.

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done and done simultaneously. Nature's enormous reproductive powers, aided to but a comparatively small degree by us, will take care that the forest is replenished.

It is important, however, to understand the exact amount of dependence the Saginaw Bay lumbermen have upon Georgian Bay logs. This can best be done by showing the proportion which the Georgian Bay logs bear to the total supply required by the Saginaw Bay lumbermen.

Taking the latest returns to be had it is found that in 1892 the city of Saginaw and Tawas City required 793,184,159 feet of saw logs.\* These were supplied as follows:—

	Feet.
Rafted out of streams in Michigan .....	234,114,329
do from Georgian Bay .....	184,500,000
do do upper lake points in Michigan.....	63,500,000
Hauled by rail.....	311,069,830
Total.....	793,184,159

It will be seen that this one bay, which by no means includes all the saw-mills of the state, but which takes all the exported product of the Georgian Bay region, obtains less than one-quarter of its needed supply from Canada.

In the face of this fact it can hardly be successfully affirmed that the pine-growing group of states, Michigan, Wisconsin, and Minnesota, have become exhausted. Yet that is the contention of those who advocate the imposition of an export duty on logs in order to preserve our forests from speedy depletion.

According to the census of 1890 the saw-mill products of Michigan were valued at nearly \$116,000,000, or \$115,000,000 more than the value of the exported saw-logs from the Georgian Bay region in 1892.

From the forestry side of this question the arguments adduced seem not to be bottomed on facts, appear indeed to be controverted by the facts.

There still remains the question, who shall do the sawing of these logs? Shall it be done on the Michigan side or on the Canadian side of Lake Huron? An export duty of \$2 or \$3 would no more prevent Michigan saw-mill owners sawing the logs in the future than it did in 1889 and 1890, when the sudden expansion began. To be effective in the prevention of this business the export duty would have to be raised. If it were possible, by greatly increasing the export duty, to render it unprofitable for the Saginaw Bay lumbermen to tow their rafts across the lake they would have to turn to other quarters for their supply. The pine growing region of the three states already referred to would be searched more closely, and it must be remembered that the Southern States have not less than 207,000,000 acres, or more than one-half their whole area under forest. We would be deprived of a market for our logs and our manufacturers of lumber would not saw a single log more.\*

\* Unless it happened that the higher export duty imposed compelled Michigan lumbermen to turn to Southern pine, while still maintaining their saw-mills in Michigan. The cost of transporting the Southern pine might raise the price of lumber generally. This would have a good effect upon Canadian lumber mills, the product of which would be sought even at the increased price, provided no counteracting influence was created by an increased import tariff by the United States.

The circumstances of the Georgian Bay region are so exceptional that they must be dealt with by themselves and by the only authority that can deal best with them—the Government of Ontario. It can deal with the question by adopting an enlightened policy which shall comprehend a vigorous assistance of the powers of reproduction by insisting upon no trees being felled under a fixed diameter, by strict attention to fires, and by enlarged plans of afforestation based upon the study of the measures adopted by France and Germany. Possibly it may also be able to make part of the contract under which the standing timber is disposed of by the Crown, that logs shall be sawn on this side of the lake. But this latter measure is of doubtful expediency.

It seems a fair conclusion that the lumber trade is of such a character that export duties, imposed or repealed, have little, if any, effect upon prices, and, therefore, little effect by way of restraint of volume of trade.

Some help might be given the Provincial Government by the Federal authorities in other ways. For instance, the towing of logs is a menace to shipping as much in a shallow lake like Lake Huron, as it is on the ocean, the danger of rafts breaking up being even greater on Lake Huron than on the high seas.

It was recently stated in the London (Eng.) correspondence of the *New York Times*, that efforts were being made to induce Canada to prohibit the export of rafts from the ocean coast, on the ground that ocean transport was endangered by the partly submerged logs floating about. The same danger exists in Lake Huron. Through that lake goes a large quantity of shipping. The Suez Canal is considered one of the great world-commerce paths. The "Soo" Canal has a larger number of vessels going through it than the Suez; the figures for 1892 being, "Soo" 12,580, Suez, 3,559.

Again, complaints have been made that the chafing of the logs while being towed knocks off the bark and the fibre next it, and that this refuse not only destroys the nets, but is rapidly depleting the whitefish and salmon-trout fisheries in Lake Huron.

In the balancing of disadvantages it might be found more conducive to the prosperity of Canada to forbid towing altogether.

#### WOOD PULP AND PULP WOOD.

The manufacture of wood pulp and the export, not only of pulp, but of wood for making it, have attained large proportions, and the industry has become of great importance. First practised in Germany in 1846, it was adopted considerably later in Canada. The census of 1891 gives a product of 261,155 cords of pulpwood, which can not be compared with the cut in previous decades, as there was no record of pulpwood in the census returns of 1881 or 1871. There is comparatively little pulpwood cut on licensed Crown lands, a large proportion being obtained from private property, and some wood being probably used for this purpose which is not so classified.

There has been a great increase in the number of pulp mills in the Dominion. They are not mentioned in the census of 1871, but the census returns of 1881 and 1891 show a rapid growth:—

	No.	Capital invested.	Number employees.	Wages.	Raw material.	Products.
1881.....	5	\$ 92,000	68	\$ 15,720	\$ 9,400	\$ 63,000
1891.....	24	2,900,907	1,025	202,009	469,845	1,057,810

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The growth in other countries has also been rapid. Professor Schlich, in his "Manual of Forestry, 1884," estimated that the annual consumption in Germany of wood for pulp was 40,000,000 cubic feet. The United States Consular Report, 1887, says that in Norway, the export of wood pulp rose from 8,540 tons in 1875, to 26,055 tons in 1880, and 90,781 tons in 1885. Of Sweden, the United States Consular Report, 1891, says: "The production of wood pulp has increased very rapidly of late years. It is made chiefly from spruce. The great proportion of the wood pulp is consumed at home, yet, in 1885, 16,000 tons were exported, and in 1889, the export had increased to more than 52,000 tons."

The New York Forest Commission, in its report for 1891, says: "In the last eight years the amount of timber used by the pulp mills has increased 500 per cent. In the year just past, 1891, the timber cut for wood pulp in the great forest of northern New York, was equal to one-third the amount cut by the lumbermen."

The exports from Canada, both of wood pulp and pulpwood, have also made rapid strides. They are not mentioned in the Trade and Navigation Returns till 1890, but from that year onward they are recorded as follows:—

	Wood pulp, value.	Pulpwood, value.
1890 .....	\$ 80,005	\$168,180
1891 .....	188,198	280,619
1892 .....	219,458	335,303
1893 .....	386,092	455,893

There has risen a demand for an export duty on pulpwood, both to protect our forests and to keep the industry in Canada, instead of sending the raw material out of the country to be manufactured. Such an export duty has been tried elsewhere, but without much success. The United States Consular Report for 1890, says of Norway: "The forests have lately suffered the loss of many young trees, cut down either for exportation or for pulp manufacture at domestic mills. The so-called cellulose wood, prepared from small trees and cut very short, to escape the export duty on wood, is now in great demand in foreign markets."

It is obvious that, to be effective, the export duties must cover the wood suitable for making pulp, of any form and of the smallest dimensions, even down to chips, otherwise the wood may be so cut as to evade the duty.

It must also be remembered that the woods used for making pulp reproduce themselves more readily and more rapidly than the pine forests, and they grow over far greater areas.

GEO. JOHNSON,  
*Statistician.*

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## APPENDIX "A."

## FOREST COMMISSION, STATE OF NEW YORK.

*(Telegram, 24th January, 1894.)*

ALBANY, N. Y., 24th January, 1894.

The new State Forest Commission to-day submitted a special report to the Legislature strongly favouring the issue of \$3,000,000 in bonds to purchase lands for the State park within the Adirondack and Catskill forests. The commission says: "On the preservation of our forests depends the water supply of our rivers and canals, the motive power of great manufacturing interests, the priceless benefits offered by our forest sanitariums, the many delightful places of refuge from the summer heat of cities, and the existence of our fish and game. But, above all, on their preservation depends that great factor in our political economy, our future timber supply."

The great forest of Northern New York covers an area of 3,583,502 acres. The Adirondack park or proposed reservation includes 2,807,760 acres, classified as follows: Primeval forest, 1,575,483 acres; lumbered forest, 1,027,955 acres; denuded, 50,050 acres; burned, 13,430 acres; waste, 13,526 acres; water, 57,104 acres; wild meadows, 495 acres; improved, 64,717 acres. The difference in area—781,043 acres—between the entire forest and that of the proposed reservation represents scattered or isolated tracts of woodland which could not be well included in the park lines.

The State owns 731,459 acres in the Adirondack forest, of which 551,093 acres are situated within the limits of the reservation. By the sale of the outlying lands and timber rights, and reinvestment of the proceeds in the interior, it is expected that the State ownership within the park can soon be increased to 900,000 acres or more. It is not proposed to buy improved lands, hotel property, nor water fronts and high-priced property held for summer residents, nor is it proposed at this time to purchase lands owned by private clubs. The commission thinks that eventually the State should purchase 1,200,000 acres, of which 677,955 acres is lumbered forest and 522,045 acres primeval forest.

It is recommended that the State acquire by purchase 100,000 acres in the Catskill region.

The bill which the commission submits, authorizes the State Controller to issue \$3,000,000 in bonds bearing interest at a rate not exceeding four per cent, one-twentieth of the bonds to be paid each year after issue. The bonds would be sold by the Controller as fast as needed at not less than par, and the proceeds would be devoted mainly to purchasing lands for the State park.

## AMERICAN FORESTRY ASSOCIATION.

*(Telegram, March 7th, 1894.)*

ALBANY, N. Y., March 7th. The American Forestry Association met at Albany, N. Y. on Tuesday. Governor Flower, in the course of an address of welcome, said, among other things:—

"Long before there were any forest commissions in the various states, the men of your association, acting from purely disinterested motives, held annual conventions in the large cities of the United States and Canada, and aroused thereby the attention of the people to the necessity of forest preservation. As a result of the early labours in this direction many of our states have now established forest commissions; the Federal Government has become interested in the work, and throughout our entire land the celebration of an Arbor day is the occasion of implanting in the minds of thousands of school children the first principles of forestry.

"It is eminently proper that the forest associations represented in this congress meet in Albany, for it was in the Empire state that the ideas which those associations promulgated were first planted and first bore fruit. Of the 44 states of the Union, New York was the first to establish a department of forestry and provide liberal appropria-

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tions needed for carrying on its work. The state of New York was also the first to assume control over its public lands and to place them under a definite system of management—one which will not only insure forest preservation, but will at the same time furnish a perpetual supply of lumber and a constant source of revenue to the state.

"New York is so fortunate in its natural and topographical advantages, that we have unusually large areas of timbered wilderness which has thus far been spared from destruction. In the Adirondack region alone, we have about 3,700,000 acres of wooded area, and in the Catskill region is another large tract. New York is also particularly well supplied in respect to watercourses and lakes, which depend very largely for their supply upon the vast tracts of wooded land. Because of our forests we are shielded from the long periods of drought such as are characteristic of the treeless states of the West. In 1885, steps were taken towards the establishment of the Adirondack park.

"Most of the lands in the Adirondacks available for the purpose of a forest preserve are now owned by private individuals or associations, who retain them, not for the purpose of lumbering, but for the present, at least, as places of recreation and sport. It has been thought that those holdings might be turned into a State preserve, and the object of forest preservation attained by an arrangement between the State and the holders. If forest preservation in this state is at stake, our people could certainly afford to be taxed many millions of dollars rather than to suffer the disastrous effect of forest denudation.

"Following the ideas and suggestions which have been promulgated by the forests experts belonging to your associations, we intend then that our forests shall not only protect our water supply, and thereby our agriculture and commercial interests, and furnish summer homes and sanitariums for our people, but that they shall at the same time yield a revenue which shall pay the cost of maintenance and a handsome sum beside. Our commission has already this year sold stumpage rights which will yield the State upwards of \$50,000. This is more than the entire cost of the department.

"This matter of selling timber rights has been misstated, and the impression has gained ground in some localities that the State permits the cutting of all trees over twelve inches in diameter. In reply it should be stated that none of the hard woods, which, by the way, represent 60 per cent of the forest, can be cut under the present law.

"All those who argue that cutting for revenue is inconsistent with the preservation of our forests, I would refer to the successful operation of this system in Europe, and I would also call attention to the fact that the New York State Forest Commission is selling to-day timber rights on thousands of acres which have been cut over by the lumbermen in some cases three times—lands which, owing to the natural tendency of the spruce to reproduce itself, now offer another desirable crop of timber."

"Following Governor Fowler, came the Hon. J. Sterling Morton, Secretary of Agriculture of the United States. He is a large man with a pleasant face, but has a weak voice. He demonstrated that he is familiar with the science of forest preservation, and spoke very interestingly. He attributed the denudation of the forest to the ignorance of the axeman and the hunter, the one who has indiscriminately cut down trees, and the other who has started fires that have devastated vast tracts. He argued that the people should be taught forestry as a sick man is taught health. He also said that the observance of Arbor day on the plains has been forced upon the people in order that the inhabitants of those districts may find some shelter. All but five states have now adopted this day as one in which to recognize the duty of planting trees. 'The man who seeks to reproduce trees is a benefactor to his race,' said the speaker. There are in the United States 466,000,000 acres of wooded land, while in Russia there are 426,000,000 acres. The consumption of wood for all purposes in the United States takes the timber from 25,000 acres a year.

"Prof. B. E. Fernow, chief of the Forestry Bureau at Washington, said that the white pine of Michigan had been cut so recklessly that it would be five years before any more could be cut in those forests. Something like \$40,000,000 had been expended in forest preservation in this country, and four times that amount will be required before the forest can be restored to a state that will warrant free cutting. In all our forests there are upwards of 425 kinds of wood, but only about 50 are in the market.

## APPENDIX "B."

## DIGEST OF REPORTS—ONTARIO.

## PROVINCIAL SURVEYORS' REPORTS, CROWN LANDS REPORT, 1885.

Bleazard Township, Nipissing District. N.W. Lake Nipissing. Well timbered with spruce, tamarack, birch, balsam, poplar, cedar, maple, in order named. A few scattered pine through northerly part, inferior quality, mostly scrubby. "May be a million feet." Extensive brulé.

Lorain Township, Nipissing District. On Lake Temiscamingue. S.W. part, valuable white pine timber limit. S.E. and N.E. burnt, but still large amount of good red and white pine. N.W. part balsam, cedar, spruce, tamarack, white birch, poplar, etc.

Olrig Township, Nipissing District. Near Mattawan. Maple, birch, balsam, etc. The pine mostly cut.

Bower Township, Nipissing District. Algonquin Park. N.E. corner partly burnt. N.W. corner stripped of pine; the rest much large good pine with some hardwood.

Clara Township, Nipissing District. Near Algonquin Park. Much brulé, and long lumbered, little timber left. A few pine of poor quality in south three concessions.

Cameron Township, Nipissing District. East of Algonquin Park. Brulé 30 years old; was good pine and a few patches left. Second growth dense. Pitch pine, poplar, white birch, etc.

Trill Township, Nipissing District. Spanish River. In W. and N.W. fine hardwood bush. Concession 4, 5 and 6 considerable pine but much of it scrubby. S. part, birch, maple, spruce, balsam, tamarack and scrubby pine. Considerable black birch, and birdseye maple. A scattering of good pine throughout the township.

Levack Township, Nipissing District. Near Spanish River. Part pine and tamarack; (shown on his plan) the pine of good quality, large, straight and sound. Part mixed timber, pine, spruce, tamarack, balsam, poplar, birch and maple. Part brulé, small pitch pine and poplar.

Cartier Township, Nipissing District. Spanish River. Pine scattered in brulé, and in green districts of centre and S.E. In N., especially N.W., large red and white pine numerous. Brulé grown with pitch pine, poplar, birch and cherry.

Freswick Township, Nipissing District. Algonquin Park. Pine never very much and now lumbered. E. and S. burnt; the rest on high ground, maple, beech and birch, in swamps, tamarack, spruce and cedar.

Cascaden Township, Algoma District. Vermillion River. Greater part brulé, with usual second growth. S.E. part green birch, poplar, spruce, balsam and maple. A few good pine but too scattered to be of much commercial value.

Dowling Township, Algoma District. Vermillion River. Very little pine. Birch, poplar, balsam, spruce, tamarack, maple, cedar, ash and ironwood in order named. Con. 6 old brulé grown with balsam, birch, poplar, hazel and alder.

Baldwin Township, Algoma District. Spanish River. S. portion much burnt, pine lumbered and burnt; much swamp. N. and W. some pine of good quality with maple and other hardwoods.

Nairne Township, Algoma District. Spanish River. Brulé with usual second growth, was a pine forest. Small Norway pine on flat in centre.

Gould Township, Algoma District. Mississauga River. A few scattered pine in hardwood in greater part of township. Numerous small swamps with cedar, spruce, balsam and birch.

North Algona Township, Renfrew County. Principally brulé. Pine cut or burnt, the little left being scattered and inferior. Small patches of hardwood and small swamps with tamarack and cedar.

Fraser Township, Renfrew County. The pine lunned and burnt.

O'Connor Township, Thunder Bay District. Thickly timbered, the S. three concessions jack pine and poplar, the north birch with occasional spruce, tamarack and cedar. Much burnt land, with dense second growth. A few good-sized pine on W. boundary and W. part of N. boundary.

Gillies Township, Thunder Bay District. Burnt seventy years ago, second growth poplar, birch, spruce, tamarack and jack pine. There are poplar, spruce, and tamarack, 10 to 12 inches diameter, and tall. The jack pine is up to 12 inches diameter, fit for ties, building and some for lumber. Of white pine there are a few of moderate size on Con. 3.

Lybster Township, Thunder Bay District. Same as last, but timber (second growth) smaller.

PROVINCIAL SURVEYORS' REPORTS—CROWN LANDS REPORT, 1886.

Head Township, Renfrew County. E. of Algonquin Park. Pine mostly cut or burnt, some hardwood. Brulé with usual second growth.

Maria Township, Renfrew County. E. of Algonquin Park. Chiefly brulé with second growth.

Broder Township, Nipissing District. Near Sudbury. Mostly burnt—small second growth. A few inferior pine on Concessions 2 and 3, lots 6 and 7, and Concessions 1 and 2, lot 12. Some spruce, tamarack, &c.

Deacon Township, Nipissing District. Algonquin Park. Half, a large amount of valuable pine with hardwood. Half, brulé with second growth.

Dill Township, Nipissing District. Near Sudbury. S.E., mixed timber with good number of red and white pine. N. and W., brulé.

French Township, Nipissing District. Jocko River. S. part in timber berth 233, most pine cut. N. part, scattered pine of good quality. On hills, maple, black birch, balsam, cedar with a few hemlock, ironwood, elm and oak; lowlands spruce, tamarack, cedar, birch, a few ash and elm. N. E. quarter burnt a hundred years ago—scattered stunted timber.

Ermatinger Township, Algoma District. S.W. half, not burnt, chiefly birch, maple, pine (red, white and pitch), spruce and balsam. N.E. half, burnt, but still quite a quantity of green pine standing.

Grassette Township, Algoma District. Mississauga River. Timber scrubby; small balsam, tamarack, cedar, spruce, hemlock and pine; small tracts of hard maple and birch. N. W. portion a few good pines much scattered.

Montgomery Township, Algoma District. Mississauga River. Well timbered. A large belt of good pine on west end of Lake Chiblow and westward three quarters of a mile; west of this more scattered. Around south end of Lake Bernard and a quarter of a mile back, some pine of a fairly good quality. Swamps at intervals with cedar, tamarack, spruce, &c.

Morgan Township, Algoma District. Vermillion River. Excellent pine in large quantities, above medium size, straight and sound. Other timber, balsam, spruce, birch, maple, cedar, tamarack. S. E. and N. E. corners have small patches of brulé, with poplar, birch, spruce, &c.

Otter Township, Algoma District. Mississauga River. N. W. part, brulé with poplar, white birch, &c., and occasional clumps of green hardwood. S. and S. E. parts not burnt, larger timber, maple, black birch, cedar, spruce and pine. The pine has been culled for board timber; some is unsound but some fit for saw-logs.

Base and Meridian Lines, Thunder Bay District. Near Pic Reserve and White River. Ran east 36 miles along Canadian Pacific Railway crossing five times and never distant  $2\frac{1}{2}$  miles. At 18 miles ran north 12 miles, and at 24 miles ran north 6 miles to White Lake. Timber, balsam, spruce, tamarack, white birch, a few Norway pines and poplar.

Conmee Township, Thunder Bay District. Kaministiquia River. N.W. and part of north, brulé with small second growth. The rest has large poplar, birch and

spruce, with occasional white pines too few and scattered to be worth more than passing notice.

Marks Township, Thunder Bay District. Kaminstiquia River. Burnt 150 years ago. White and yellow birch, spruce, poplar, jack pine, tamarack and balsam thickly grown. The spruce, tamarack and poplar are large. There is an occasional white pine.

North of Rainy Lake and River. Bolger's exploration. Rainy River fertile belt, Lake of Woods to Fort Francis, 60 miles by 15 miles; the timber is chiefly poplar of large size, cedar large enough for telegraph poles and shingle bolts, spruce, tamarack and balsam. Some groves of pine, "but it cannot be called a pine country." There is red and white pine round the N. W. Bay of Rainy Lake and on waters thence to S. E. corner of Lake of the Woods. Between these waters and the North Bay of Rainy Lake there is a considerable quantity of pine but not large, thick groves. N. of Rainy Lake to 49°, eastward to Sand Island River, and on the Seine to Sturgeon Falls there is considerable scattered pine throughout. Fine groves of red and white pine near the Seine, other timber, jack pine, poplar and tamarack.

PROVINCIAL SURVEYORS' REPORTS—CROWN LANDS REPORT, 1887.

Lumsden Township, Algoma District. Vermillion River. Swamp, rock and brûlé. "The timber is of very little importance, but in a small section of the eastern part of the township I found a few scattered pine of fair quality."

Foster Township, Algoma District. Vermillion River. Well timbered throughout, white and red pine of medium size and fair quality. Small patches burnt in N. E. and N. W. corners.

Hyman Township, Algoma District. Spanish River. Timber chiefly pine, spruce, balsam, cedar and birch. Considerable good marketable pine. South of Spanish River rocky, timber burnt, second growth poplar, birch and pine, with patches of good pine.

Edgar Township, Nipissing District. Petawawa River. N. of Petawawa, rocky and timber burnt, except a limited portion towards the W. boundary. South more level; fires left little green timber; second growth poplar and birch.

Anglin Township, Nipissing District. Near Algonquin Park. Fire destroyed all valuable timber except some patches; second growth poplar, cherry, &c. S. of Lake Lavielle stony hardwood land with some good pine. On the whole very little timber of any value left in township.

White Township, Nipissing District. Petawawa River. S. and E. parts almost destitute of timber, sandy plain covered with jack pine, small poplar, whitewood, &c. N. and N. W. parts rough and broken with small poplar, birch, alder, willow, &c. A patch of good land at junction of White Partridge River and Lavielle Creek, west side of river to south boundary, and extends half a mile back, green mixed bush, pine, birch and balsam. Tamarack and spruce in swamps up to 12 inches. Most of the township was burnt twenty years ago.

Garson Township, Nipissing District. N. W. of Lake Nipissing. Red and white pine abundant, also spruce, balsam, tamarack, cedar, maple and birch. Small areas of brûlé at S.E. and S.W. corners.

Dymond Township, Nipissing District. N. of Lake Temiscamingue. Timber throughout township small, chiefly spruce, tamarack, poplar, whitewood, cedar and balsam, with some black birch, elm and soft maple. Northerly part burnt many years ago, and now very little merchantable timber.

Harley Township, Nipissing District. N. of Lake Temiscamingue. Greater part of S.W. quarter, spruce and tamarack swamp. S.E. quarter chiefly spruce and tamarack, with cedar where wet. N.E. corner, spruce, cedar and tamarack swamps. Rest of N. half, higher with poplar and some scattered pine, but not enough for requirements of a settled township.

Brethour Township, Nipissing District. N. of Lake Temiscamingue. Timber chiefly spruce, balsam, tamarack with scattered birch, cedar and poplar along the creeks. Very few pine. N. W. corner brûlé with small second growth.

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Bucke Township, Nipissing District. N. of Lake Temiscamingue. Good cedar along Lake Temiscamingue; rest chiefly poplar, whitewood, tamarack, spruce and balsam.

Hilliard Township, Nipissing District. N. of Lake Temiscamingue. S.W. part and part of W. portion a plateau with dense growth of large timber, white pine, birch, poplar, tamarack, spruce and cedar. E. of Blanche River second growth of no commercial value. W. of Blanche River heavily timbered with large and valuable spruce, tamarack, cedar, poplar and white pine.

Harris Township, Nipissing District. N. of Lake Temiscamingue. Timbered with spruce, tamarack, birch, balsam, large cedar and some hard maple, red and white pine.

Casey Township, Nipissing District. N. of Lake Temiscamingue. Mostly spruce and tamarack swamp.

PROVINCIAL SURVEYORS' REPORTS—CROWN LANDS REPORT, 1888.

Hess Township, Algoma District. Spanish River. Greater portion well timbered with good white pine.

Monterief Township, Algoma District. Spanish River. Belt of good pine three miles square in centre and W. of township. Much burnt, with second growth spruce, balsam, pitch pine and white birch.

Algoma and Nipissing boundary. Base and meridian lines. On meridian line 18 miles northward from N. E. angle of Lumsden Township; 1st mile fair old bush, then brûlé to 8th mile, chiefly pitch pine, birch and poplar; less than a mile, old bush, then brûlé to 14th mile, then old bush to 18th mile, birch, spruce, pine, poplar, maple and cedar. The second brûlé is well grown up. Pine is found on large lake at 1st mile, E. of 3rd mile, W. of 4th mile, in green bush 8th and 9th miles, E. and W. of 13th mile, N. of 14th mile. On base line 42 miles westward from district boundary, mostly brûlé, some old timber chiefly pitch pine, spruce, tamarack, birch, poplar, and some maple. Pine on first and second miles and northward, on 8th, 9th and 10th miles, a few on 14th mile, more numerous on 18th, 19th, and 20th miles and northward. Southward on Onaping Lake, a large quantity of good pine. Was told at N. end of Onaping Lake country nearly all covered with pine. From 21st to 42nd mile pine all through in large bunches distant from each other. On Pogunasing Lake and lakes crossed to westward, pine in large quantities along the shores and some distance northward.

Chamberlain Township, Nipissing District. N. of Lake Temiscamingue. Brûlé with small poplar, birch, alder and cherry. Very little timber of any value left.

Kerns Township, Nipissing District. N. of Lake Temiscamingue. Well covered with timber, chiefly tamarack, spruce, balsam, balm of gilead, cedar and poplar. Some white pine on Con. 2 and 3, lots 9, 10 and 11.

Bronson Township, Nipissing District. On Petawawa River. Much brûlé with usual second growth; small pine in patches where protected by lakes, &c.

Dickson Township, Nipissing District. Algonquin Park. E. of Lake Lavielle and Lake Clear, part burnt in strips, part good hardwood with good red and white pine. S. and W. of Lake Clear, good hardwood with some pine. W. and N. parts of township burnt with usual second growth, but some good pine on shores of lakes. Much lumbering, but much valuable timber left.

Armstrong Township, Nipissing District. N. of Lake Temiscamingue. Well timbered, chiefly with tamarack and spruce on high as well as low land, good for lumber. Very few pine and hardly any hardwood.

Ingram Township, Nipissing District. N. of Lake Temiscamingue. Poplar, willow, small tamarack, spruce and balsam, with islands of fair-sized spruce and tamarack throughout. A good grove of pine in the N. E. corner. Looking northward and eastward from hill on the north boundary, a large tract of pine could be seen in the unsurveyed country and appeared very valuable.

Marter Township, Nipissing District. N. of Lake Temiscamingue. Brûlé with usual second growth of no market value. Some relics of pine, once plentiful.

Hudson Township, Nipissing District. N. of Lake Temiscamingue. Timber second growth 75 years old, the most valuable being the cypress or pitch pine, 6 to 18 inches diameter, tall and thick. Some remains of the old forest.

Blythe Township, Nipissing District. N. of Lake Nipissing. Timber generally good except on some low lands, where small spruce and tamarack. On uplands, pine, spruce, birch and maple, except 4,000 acres brûlé. Good pine in greater part of township.

Stewart Township, Nipissing District. N. of Lake Nipissing. Pine of good size and quality except brûlé in north. Little hardwood.

Evanturel Township, Nipissing District. N. of Lake Temiscamingue. No good timber; small second growth. Some cedar swamps.

Fitzgerald Township, Nipissing District. Next Algonquin Park. On eastern boundary 6,000 acres good hardwood. In S. W. corner a block of white pine. The rest brûlé with usual second growth.

Thunder Bay and Rainy River District boundary. Base line N. W. angle of Strange Township to Agnes Lake, Hunter's Island. S. from this, meridian line between Thunder Bay and Rainy River District. Some good-sized pine near Waykwahbinonahm Lake, also near Bitchu Lake and on Hunter's Island. Indians said more good pine south of base line. Burnt land, second growth pitch pine, birch and poplar. On unburnt part pitch pine, birch and poplar of good size, fit for mining or fuel purposes. Some good groves of spruce and tamarack.

Lakes west of Arrow Lake, Thunder Bay District. From and including Rose Lake westerly to Gunflint Lake, well timbered with spruce, poplar, birch and balsam. Occasional red and white pine in small belts or scattered, the red more common than the white—useful but not enough to make the land valuable for it alone. Eastern part of Gunflint Lake, westerly and northerly brûlé with poplar, birch and jack pine, as far as Island Portage or Granite River. From this a belt of spruce, poplar and birch, with some red pine 12 to 16 inches, to Seiganagah Lake and along its S. and E. shores. N. shore brûlé to two miles from outlet; S. E. part and some islands, considerable pine from 12 to 20 inches, mostly red. From two miles E. of outlet to Seiganagah Lake considerable red pine with spruce, poplar and birch. Again brûlé on Seiganagouse Lake S., S. E. and E.; small second growth. About two miles from E. end, spruce, poplar, birch and jack pine, with increasing proportion of red pine. W. of Angle Lake a belt of red pine. From Seiganagah Lake westward only occasional brûlé with considerable red pine of good size, especially near Big Rock Lake. 210 miles were run.

#### PROVINCIAL SURVEYORS' REPORTS, CROWN LANDS REPORT, 1889.

Dack Township, Nipissing District. N. of Lake Temiscamingue. Half of township brûlé with poplar, spruce, tamarack, balsam, willow and birch. In green bush tamarack, spruce, balsam, balm of gilead and birch, with a few white pine from 6 to 24 inches.

Robillard Township, Nipissing District. N. of Lake Temiscamingue. Timber, spruce, balsam, tamarack, cedar, birch and pitch pine. Merchantable white pine in southern portion and along Blanche River. A large tract of brûlé across the whole N. portion.

Savard Township, Nipissing District. N. of Lake Temiscamingue. Con. 1, 2 and 3, balsam, spruce, tamarack, poplar, balm of gilead, all large. The rest brûlé, poplar and birch on highlands and tamarack and spruce on lowlands.

Henwood Township, Nipissing District. N. of Lake Temiscamingue. Timber chiefly spruce, tamarack, white birch, whitewood and pine. Rocky ridges in south with pitch pine of no commercial value. East, centre and north, scattered white, red and pitch pine of good quality. Will be the centre of a limit of considerable value.

Notman Township, Nipissing District. N. of Lake Nipissing. Timber, balsam, spruce, tamarack, hemlock, cedar, birch, hard maple and pine. Pine scattered over the whole township of good merchantable quality.

Osborne Township, Nipissing District. N. of Lake Nipissing. Westerly side and south-east corner green. Birch, balsam, tamarack, spruce, with a few scattered pine.

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N. W. corner tamarack and spruce swamp, not large trees. The rest brûlé with small poplar and cherry.

Hammell Township, Nipissing District. N. of Lake Nipissing. Considerable white pine round most of many lakes and scattered over township, the largest and best in S. E. portion. Blocks of maple and birch almost exclusively. Flats of spruce, tamarack and cedar.

Niven Township, Nipissing District. Adjoins Algonquin Park. S. W. corner (about 4,000 acres) dense growth of white and red pine, average 16 inches, not best quality. Rest old brûlé, burnt again bare. In S. E. broken hills on which is springing up a thrifty growth of young pine, white and red.

Beauchamp Township, Nipissing District. N. of Lake Temiscamingue. S. E. part broken by creeks. Balsam, birch, spruce, tamarack and cedar. Lots 1 and 2, Con. 2 and 3, a few pine. S. W. part large pitch pine flat. N. E. part brûlé, rocky. Along west boundary, a mile or two miles to eastward a strip of very good pine land.

Marquis Township, Nipissing District. N. of Lake Temiscamingue. Heavy growth of large poplar, spruce, tamarack, birch and balsam, the poplar the largest seen. White pine and cedar scattered in the vicinity of the Blanche River, only enough to be valuable to settlers. Brûlé across S. portion extending north-westerly, also N. W. corner; small pitch pine.

Bryce Township, Nipissing District. N. of Lake Temiscamingue. Brûlé covered with scrub pine, poplar, birch, balsam and tamarack. A few small cedar swamps. White pine throughout the township, not of much commercial value.

Pacaud Township, Nipissing Township. N. of Lake Temiscamingue. Brûlé. All valuable timber gone; second growth balsam, spruce, pitch pine, tamarack, birch and poplar, twenty years old.

Craig Township, Algoma District. Spanish River. Largely brûlé. A small area of green timber west of Spanish River; a few excellent pine, with balsam, spruce and birch. Along Spanish River to west for one mile good pine, burnt and being lumbered.

Scoble Township, Thunder Bay District. Pigeon River. Mostly brûlé. A few clumps of pine, chiefly Norway. Some clumps of spruce, tamarack and cedar, useful for ties and piles for mines. N. part thick growth of poplar, birch and some spruce suitable for cordwood and pulp.

#### PROVINCIAL SURVEYORS' REPORTS—CROWN LANDS REPORT, 1890.

Shakespeare Township, Algoma District. Spanish River. Mostly covered with valuable timber, chiefly pine, balsam, spruce, tamarack, cedar, birch and maple. Pine most abundant. Parts of S. E. and S. W. corners burnt over.

Totten Township, Algoma District. Spanish River. Belt on creek  $\frac{1}{2}$  to  $1\frac{1}{2}$  miles wide timbered with pitch pine, spruce and tamarack. N. E. corner brûlé, 3,500 acres. Rest well timbered with good white pine, birch, spruce, cedar, maple, &c. Pine fairly abundant, especially lots 5 and 6, Con. 3, and lots 7 and 8, Con. 4 and 5.

Barron Township, Nipissing District. E. of Algonquin Park. Brûlé except small patches of hardwood. Pine timber been good, but lumbering for years has removed all larger timber.

Guthrie Township, Nipissing District. E. of Algonquin Park. S. W.  $\frac{1}{2}$  high; white pine, hemlock, birch, maple, beech, cedar and balsam, healthy growth. N. W.  $\frac{1}{2}$  and E.  $\frac{1}{2}$  brûlé. Usual second growth.

Appelby Township, Nipissing District. W. of Lake Nipissing. Larger part brûlé. Second growth poplar, birch, willow and alder. A fair quantity of pine along the Veuve River, also oak, soft maple and ash.

Blaine Township, Nipissing District. N. of Lake Temiscamingue. N.  $\frac{1}{2}$ , greater part timbered with tamarack, spruce, balsam, cedar, poplar, up to 24 inches, but most small. The rest brûlé 25 years old. Second growth tamarack, spruce, balsam, pitch pine and poplar.

Charlton Township, Nipissing District. N. of Lake Nipissing. Half old brûlé, second growth poplar, birch and spruce, with maple in a few places. The rest spruce,

balsam, birch, tamarack, a little maple and white pine, small and scrubby, except in E. portion. Large pine on lots 1, 2 and 3, Con. 2, 3 and 4.

Cleland Township, Nipissing District. Wahnapiatae River. A large quantity of valuable pine still uncut in the township, also a heavy growth of spruce, birch, tamarack, poplar, balsam and pitch pine. Brulé across the N. W. corner and N. to railway.

Garrow Township, Nipissing District. On Temiscamingue Road. Well timbered. On the highlands, balsam and pine, on the lowlands, spruce, tamarack and cedar. Considerable areas of red and white pine. Brulé in N. W. corner. Small second growth poplar and birch.

Gladman Township, Nipissing District. N. of Lake Nipissing. Thickly wooded throughout with hard and soft wood, only a small strip of brulé three-quarters of a square mile in the N. W. corner. A few large pine at the north and east. Spruce and tamarack swamps across the township north-westerly. Good pine was seen north of the township.

Hawley Township, Nipissing District. N. of Lake Nipissing. Red and white pine, balsam, spruce, tamarack and birch. Very large pine in N.W. corner, the remainder poor. Brulé with second growth poplar, birch, tamarack, spruce and jack pine.

Lockhart Township, Nipissing District. N. of Lake Nipissing. No brulé. The higher portion, the central part of Con. 1, 2 and 3, chiefly maple, birch and balsam; other parts spruce, tamarack, cedar, red and white pine, and pitch pine, a few ash, elm and ironwood.

Lyman Township, Nipissing District. N. of Lake Nipissing. Good pine, principally white, scattered over the greater part of the township. Spruce, tamarack, balsam, cedar, poplar, white and black birch, and maple in order named. A third of the township westerly brulé, second growth poplar, cherry and birch.

Sharpe Township, Nipissing District. N. of Lake Temiscamingue. Timber, poplar, white birch, spruce, tamarack, balsam, pine, cedar, &c. A few scattering white and red pines. Two-thirds of the township brulé, 25 years old. Tamarack fit for piles and ties, spruce, poplar and birch of good size and a little cedar.

Boundary between Rainy Lake and Thunder Bay Districts. Northward on boundary, 120 miles from Sewell's base line; at 12th mile east 4 miles to Moss Township; at 30th mile, west 12 miles to Magnetic Lake. Mostly brulé, 7 to 70 years old, with small second growth birch, poplar, cherry, spruce, pitch pine, &c. Considerable tamarack, and pitch pine fit for ties, especially north of the C.P.R. along English River. A few groves of white pine, but none of any consequence north of the Seine River. More or less pine through the country south of, and around Crooked Pine Lake, and a considerable number of scattering trees in places south of Windigoostigwan Lake.

#### PROVINCIAL SURVEYORS' REPORTS—CROWN LANDS REPORT, 1891.

Porter Township, Algoma District. N. of Sault Ste. Marie branch. The whole township, (except brulé, 1,000 acres), well timbered with pine, cedar, spruce, maple, birch, hemlock, &c. The pine of good quality, except on rocky lands in the N.W. part, where short and scrubby.

Township outlines on C.P.R. from Pogamasing to Woman River, Algoma District. The greater part brulé. Pine, to an extent worth mentioning, only near Ramsay Station and at Cat Lake, where a considerable quantity of fair size. Near Woman River, some rather small pine.

Fell Township, Nipissing District. N. of Lake Nipissing. S. E. part of N. W. corner brulé. Timber mixed, only medium; some good tamarack and spruce, considerable white birch and poplar; the pine mostly small.

Clancy Township, Nipissing District. Near Algonquin Park. Still a large quantity of white and red pine of commercial value, though long lumbered. The N. part swampy, the rest heavily timbered with mixed wood, black birch, beech, ironwood, hemlock, maple, &c.

Bastado Township, Nipissing District. N. of Lake Nipissing. A great deal of pine has been taken out and a large quantity still remains. A considerable quantity of good

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spruce ; good cedar in the swamps ; other timber, white and black birch, balsam and tamarack. Brulé in Con. 3, 4, 5 and 6, with usual second growth.

Gorham Township, Thunder Bay District. Brulé, except a small portion of the N. E. corner and other small scattered patches. Timber small, birch, poplar, balsam, spruce, cedar and tamarack.

Ware Township, Thunder Bay District. Three-fourths brulé, second growth small pitch pine, poplar, birch, alder, hazel, with patches of prairie ; green timber spruce, tamarack, cedar, balsam, birch, poplar and pitch pine. No white pine.

Dorion Township, Thunder Bay District. Brulé, second growth poplar, birch, tamarack, spruce, pitch pine, &c., of small marketable value.

Carpenter Township, Rainy River District. Swamps, with small spruce and tamarack, through a large portion of the township. The rest poplar, spruce, balsam of gilead, tamarack, birch and balsam. Considerable pine of good quality in small patches scattered throughout the township.

Dobie Township, Rainy River District. A portion consists of spruce swamps, the rest poplar, balsam of gilead, spruce, tamarack and balsam.

Base Lines along Seine River, Rainy River District. From the 30th mile on the Thunder Bay boundary 60 miles westward. Mostly brulé, 70 or 80 years old, second growth white birch, poplar, spruce and pitch pine. Some cedar, tamarack and spruce, but not abundant. Principal pine along Seine River from Steep Rock Lake to Sturgeon Falls, fair size, chiefly white ; a little pine along the Atikokan, and in places along second and third meridian lines.

PROVINCIAL SURVEYORS' REPORTS—CROWN LANDS REPORT, 1892.

Scadding Township, Nipissing District. N. W. of Lake Nipissing. Well timbered where not burnt. Brulé, with second growth birch, red pine and poplar. In the S. half the pine is mostly cut, but in the N. half, especially in the E. portion, there is a large amount of valuable pine.

Street Township, Nipissing District. N. W. of Lake Nipissing. The west half well timbered with white and red pine, spruce, birch, maple, jack pine, balsam and poplar. The east half brulé ; second growth ten or fifteen years old, poplar, birch and jack pine. The greater part of the good pine is on lots 8 to 11, Con. 5, and lots 7 to 11, Con. 6.

MacLennan Township, Nipissing District. N.W. of Lake Nipissing. Timber, pine, balsam, spruce, cedar, birch and tamarack. The pine of fair quality is in considerable abundance.

Falconbridge Township, Nipissing District. N.W. of Lake Nipissing. Timber, pine, cedar, balsam, spruce, tamarack and birch. Pine of good quality has been long lumbered ; a fine belt, towards the north and west of the township, is still left.

McLaren Township, Nipissing District. N. of Lake Nipissing. Timber chiefly pine, spruce, tamarack, cedar, birch, poplar, balsam, of fair size and good. Small patches of good pine in the N.E. and S.W., the balance small and scrubby.

Master Township, Nipissing District. Near Algonquin Park. Hemlock, tamarack, spruce, maple, beech, basswood, ironwood, &c. A large area of brulé with poplar, birch, &c. The pine is nearly all removed, having been long lumbered.

Thistle Township, Nipissing District. N. of Lake Nipissing. Timber mixed, pine, spruce, tamarack, cedar, balsam, poplar, white birch, some black birch and sugar maple. A little brulé, a small part of the S.W. corner and along the west boundary. A great deal of good tamarack, spruce and cedar in township.

Vernon Township, Algoma District. Spanish River. Timber, spruce, birch, balsam, white pine and cedar, with some maple. Brulé five lots in the N.W. angle. Belts of good pine of large size run through west part, the rest being small and scrubby. In the eastern portion a thick growth of small white pine.

Bigelow Township, Algoma District. Spanish River. Half brulé, second growth pitch pine, poplar and birch. Only marketable pine in vicinity of E. and S. boundaries.

Dunlop Township, Algoma District. Spanish River. The whole well timbered with tamarack, spruce, birch, balsam, cedar and maple. The pine has been largely lumbered, but some remaining in Con. 5 and 6.

Gough Township, Algoma District. Spanish River. Timber little burnt, only a strip along the south boundary. White spruce, tamarack, cedar and hemlock in large quantities good for ties, &c. The pine is partly cut, but a great deal remains of good quality.

Spohn Township, Rainy River District. On the Lake of the Woods. Largely covered with spruce and tamarack swamps, also cedar. On the higher parts chiefly poplar, balm of gilead, spruce, birch and tamarack. There was considerable pine, but it has been cut, what remains being hollow, stunted and punkey.

Township Outlines, Algoma District. From Woman River to Windermere station. "The timber is that common to this whole northern country, viz.: spruce, tamarack, banksian pine, white birch, balsam, poplar, cedar, &c." Much brulé, with second growth. Much good spruce, banksian pine and tamarack, fit for ties between Woman River and Chapeau. The surveyor says, "We saw not more than two score trees of red or white pine in the whole survey."

Sturgeon Falls to Rainy Lake. Base Outlines. Rainy Lake District. Considerable brulé along the line run, and in the whole country in the vicinity of 49°; second growth white birch, poplar, spruce, tamarack and pitch pine from seven to thirty years old. Considerable spruce, tamarack, cedar and poplar of good size. East of Rainy Lake, rocky and swampy. Along 49° to First Correction line, rocky. South of this, good level land timbered with poplar, spruce, cedar, tamarack, &c.

Lakes in Thunder Bay District. Exploratory survey. Some good pine to S. and E. of Northern Light Rock on Northern Light Lake, extending as far south as main shore north of Eagle Island; the rest around the lake, brulé with small second growth. On the islands, especially Eagle Island, good pine, enough with the mainland for a good limit. On the N.E. shore of Sandy Lake a little good pine, other timber small. North of this some good spruce and tamarack. On Waykwobionan Lake, at E. end and on islands, a small amount of pine; at Sandy Creek good pine in small quantities, also at Shebandowan Lake and Green Water Lake. Round Kashabowie Lake the timber drowned and killed by a dam, and back from shore brulé with small second growth. On islands in the lake a little good pine but not enough for a limit.

#### PROVINCIAL SURVEYORS' REPORTS—CROWN LANDS REPORTS, 1893.

McCrosen Township, Rainy River District. On Lake of the Woods. The timber consists principally of tamarack, spruce, poplar and cedar; a few scattered red and white pine occur, but not in any quantity.

Pratt Township, Rainy River District. Near Lake of the Woods. This township is mostly swamps. The timber is mostly tamarack and spruce in the swamps; on the high lands, poplar, tamarack, spruce, birch, balsam, balm of gilead, and in the very wet swamp lands the timber is chiefly stunted tamarack and spruce. White pine, in small quantities, is met with in some places, but not in sufficient quantities for a timber berth.

Capreol Township, Nipissing District. On Wahnapiet Lake. The south half chiefly low and swampy. The timber is chiefly pine, spruce, tamarack, cedar, birch, hard maple and balsam. A large amount of good, fairly large pine was seen throughout the township; in the swamps, the spruce, tamarack and cedar is of a fair size and good, and also the birch and hard maple found on the ridges. The balance of the timber is small and scrubby.

Crerar Township, Nipissing District. On Sturgeon River. Lumbering operations have been carried on in the township for many years, and what timber remains, with the exception of that on the tract of land between the Sturgeon River and the Tamagangue River, is of little value.

Davis Township, Nipissing District. Near Sturgeon River. Nearly all the township has been burned over in recent years. That part, however, in the north-east corner,

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except along the lake shore, is green bush, as is also a part along the north boundary, for some distance west of the lake. Where burnt over there is an undergrowth of birch, poplar and jack pine on the high land, and alder, cedar and spruce on the low land. The green bush consists of mixed timber, being pine from 15 to 30 inches, birch, white-wood, spruce and tamarack in places, but there is very little marketable timber.

Gibbons Township, Nipissing District. On Sturgeon River. Nearly one-half of the township has been burnt over. Of the remainder, nearly all the pine has been taken off by the lumbermen, spruce, balsam, birch, cedar and tamarack being the remaining timbers, with an occasional maple on the higher lands, and elm along the streams.

Loughrin Township, Nipissing District. Near Sturgeon River. Brulé, dating back about twenty years, covers the entire township, and there is, consequently, no large timber of value. The second growth timber is dense, and consists of jack pine, poplar, spruce, birch and tamarack, amongst which, in some places, numerous dead white pine trees are found.

Norman Township, Nipissing District. On Wahnapiatae Lake. The northern part of the township, from the fourth concession northward, is well timbered, with white and red pine of medium size. The south part is covered with a scrubby growth of spruce, balsam, pitch pine and birch, and some scattered white and red pine of medium size.

Stratton Township, Nipissing District. On Petawawa River. Nearly all this district has been extensively lumbered over for many years, yet there remains a considerable quantity of average and smaller pine trees, scattered over the country, suitable for commercial use, besides an almost inexhaustible quantity of other marketable woods, basswood, maple, spruce, tamarack, &c. There are large areas of brulé or burnt land, frequently covered with a dense growth of young poplar, white birch, willow, cherry, balsam, &c., causing progress through them to be very slow and often difficult.

Tennyson Township, Algoma District. North of Spanish River. The township has been very valuable as a timber limit, but the greater portion of the pine has been cut. The township is very heavily timbered, with the exception of that portion burnt over, and shown on the timber map. Pine, tamarack, spruce, balsam and cedar are the chief timbers, with maple, birch, poplar and hemlock scattered through them.

Township outlines, Algoma District, along Canadian Pacific Railway, from Windermere to Brimmer Station. The timber is that common to the whole of this district, viz., spruce, white birch, tamarack, poplar, balsam, cedar, pitch pine, and occasionally Norway and white pine. The only extent of the last two varieties met with was in townships Nos. 46 and 47, where there appears to be a considerable extent of both red and white pine. I understood from a party who had explored that part of the country that the quality and quantity of the timber improved very much as he went north, and that for twenty miles in that direction considerable pine of both varieties was met with.

Booth Township, Thunder Bay District. On Nipigon River. The face of three-fifths of the township is covered with small mixed scrubby timber, with larch and poplar prevailing. There is a skirting of green bush along the southern and western boundaries, consisting of spruce, tamarac, balsam, birch and poplar, with some sections of very fine spruce timber. Only an occasional white pine was noticed.

Purdum Township, Thunder Bay District. On Nipigon River. The surface of a large portion of the area surveyed is brulé. Still there are some small sections of very good spruce, tamarack, and cedar. Only an occasional white pine was seen.

Rainy River District, base and meridian lines, from near Seine River; north, fifty-four miles on fifth meridian line, to Taché Station, Canadian Pacific Railway; base line, eighteen miles east and thirty miles west, near north end of meridian line. Large tracts of the country have been burnt at various times, but timber of fair size, in tracts of considerable area, is often met with. There is not much pine timber along the lines of survey beyond that which has already been surveyed into limits. The swamps and flat land generally contain spruce, tamarack, and sometimes cedar. Pitch or banksian pine of fair size, fit for railway ties, was sometimes met with. The brulé is generally covered with young poplar, white birch, pitch pine, spruce, cherry, &c., and is often almost impenetrable.

## REPORTS OF ONTARIO STIPENDIARY MAGISTRATES.

BORRON'S REPORT on Basin of Hudson's Bay, 1880. Sessional Papers, Part IV, No. 22.  
 "The territory is naturally divided into three tolerably well defined belts or zones."

(Ont. N. of Height of Land.)

1st. The plateau on the Height of Land remarkable for its lakes." (He thinks it averages 50 or 60 miles in width.)

2nd. The intermediate belt or "steppes," remarkable for its rapids and falls.

3rd. The flat or level country extending from the coast of James' Bay southerly to where the "steppes" of the second or intermediate belt begin." (Width 50 or 60 miles at E. boundary to 200 on W. boundary, at St. Martin's Falls.)

By the Abbittibi and Moose (Missinaibi or N. Branch). "Timber. The character of the timber begins to change before the Height of Land is reached, other trees taking to some extent the place of pine. There is a falling off also in the size of the timber generally. This is most sudden and therefore most conspicuous a little above the uppermost of the "Fifteen carrying places" or portages about fifteen miles from the N.E. extremity of Lake Temiscamingue. At the lower end of this last portage I observed oak trees eight to ten feet in circumference, and on the portage below this I noticed white pine six to eight feet and red pine five to six feet in circumference. The rock is gneiss, the soil alluvial, and although containing many boulders, seemingly a rich soil. A few miles from this portage, at the outlet of a lake called Mijizowaga, the canoe route leaves the main Ottawa River, which comes from this lake, and our course was northward through a chain of narrow lakes to the Height of Land. The unfavourable change in the nature and size of the timber which thereafter takes place is attributable, I think, rather to some alteration in the soil than in the climate itself. The soil often changes greatly in a few miles, the climate rarely does so. I am satisfied that there are very large areas of country both on the Height of Land and the Ottawa and its tributaries, where from fire or having been cut or both, hardly a pine tree can now be seen, yet capable, so far as soil and climate are concerned, of growing good pine, were these in the meantime not crowded cut by other trees, such as aspen, poplar and birch, which are perhaps a little better adapted to a soil recently burnt over or which by their more rapid growth succeed in first getting possession of the ground. The areas which on this side of the Height of Land are either adapted to or in course of adaptation to the growth of pine, and fitted for little else, are in the aggregate so extensive, that although there may be little or no pine in this territory, I am under no apprehension that one of Canada's foremost industries will perish for want of material. Spruce under the name of "fir" is used almost entirely at Moose Factory and other posts in this territory for house building and other purposes. It is tolerably abundant both on the banks of the Abbittibi and Moose, not in forests or groves, but scattered through the woods. There is some pine about Lake Abbittibi and also Missinaibi Lake, but it did not appear to be large or in any great quantity. Poplar, aspen, birch, balsam, cedar, tamarack and spruce are the principal forest trees I saw in this territory, and while there is, I believe, amply enough for a numerous population, it is not in the meantime, so far as I am a judge, an inviting field for the lumberman. Under the head of "Climate and Timber," Dr. Bell in his Geological Report for 1877-8, page 25 C, remarks as follows: "The original timber along the lower stretch of Moose River has been mostly burnt within the last fifty or sixty years, but whenever old spruces have escaped they are of a larger growth than those seen on any other part of the route from Michipicoten. In regard to the distribution of the timber, it is a curious fact that small white elms appear below the Long Portage of the Missinaibi branch of the Moose, after having been last seen on the lower parts of the Michipicoten River, near Lake Superior. The northern limit of the white cedar is just south of Rupert's House. At Great Whale River the white birch exists only as a large shrub. The poplars disappear between Fort George and this river. The tamarack is found nearly as far north as the spruce, which is last seen on the coast near the

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northern part of Richmond Gulf. The latter tree is, however, said to extend much farther north at a distance back from the sea." It will be observed that the points named by Dr. Bell are all, with the exception of Rupert's House, a long way north of Moose Factory. The tamarack I saw on the lower stretches of the Moose and Abbittibi River were rarely more than one foot in diameter and far from numerous. The spruce, which as remarked before is the wood chiefly used for boards and scantling, is a good serviceable wood, and I saw trees of it upwards of six feet in circumference. The poplar at Moose Factory is not often more than from four to five feet in circumference. Among the shrubs the willow, the alder and dogwood are most conspicuous." (Pages 27-8.)

Mr. Borron says of the Abbittibi, "The country for a considerable distance below Lake Abbittibi, is seemingly very flat, the banks of the river are so low indeed and so densely wooded with rather stunted and unhealthy looking timber that little can be seen of it." He thinks, "it abounds in marshes and swamps." (Page 17.)

He says of the Moose (Missinaibi branch): "The timber from Moose Factory to the commencement of the plateau of the Height of Land, which I take to be above the upper end of Green Hill Portage, consists principally of aspen, poplar, spruce, balsam, birch, tamarack and cedar. The mountain ash was plentiful the whole way." (Page 19.)

LYON'S REPORT of Lands in Rainy River District, from Hunter's Island, north, to Lake Joseph, westward, 1889. (Sessional Papers, Part IV., No. 22.)

"The whole of the country is covered with timber with the exception of spots where it has been burnt. The timber is chiefly poplar, spruce, oak, elm, basswood, cedar, white pine, red pine, jack pine, tamarack and birch. In some sections the timber is small but usually straight and thrifty. The pine is of medium size and generally sound. Three timber limits bordering on the Lake of the Woods and Rainy Lake have been sold by the Dominion Government. These are estimated to contain 600,000,000 feet of lumber." (Page 44.)

"Pine timber in considerable quantities is to be found in this territory in addition to the timber included in the limits referred to, and is generally situated on the borders of the lakes and streams where it can be readily removed and floated to the point desired to be manufactured. I will not attempt to name the quantity of pine and other timber fit for lumber, but have no hesitation in saying that the quantity is very considerable."

LYON'S REPORT, 1880. (Sessional Papers, Part IV., No. 44.)

"The Government of Minnesota are surveying the country to the south of Rainy Lake and will before long survey the lands on the south shore of Rainy River. When these lands are placed in the market and settled it will be a decided advantage to settlers on the Canadian side of the river. There are large quantities of pine and other valuable timber on Rainy Lake and the American rivers emptying into Rainy River, which must find an outlet by Lake of the Woods and the Canadian Pacific Railway." (Page 56.)

E. P. LORRON'S REPORT on North and West parts of Ontario, 1880. (Sessional Papers, 1881, No. 44.)

"Those who have read the preceding narratives of my explorations this season cannot fail to have perceived that the fertile appearance of the land on the immediate banks of the rivers is very delusive and misleading. Over and over again it must have been noticed that on going inland at those points where on the banks of the rivers the soil and timber presented the most promising appearance, we found that the ground became wetter and wetter, that sphagnum moss covered the surface to a greater and greater depth and that generally in less than half a mile we came to where peat had been formed; that as these peat mosses increased in depth, first the poplar aspen and birch

would give place to spruce, or to what is called in this country juniper, and tamarack; and secondly these last would diminish in size until they were little more than mere shrubs, thinly scattered over the wide spreading surface. Nor were these trees healthy wherever the peat had attained to any considerable thickness. On the contrary they were not only stunted but scrubby and frequently dead. The expeditions I made from Moose Factory, first up the Jag-a-wa River into the heart of the region lying between the Moose and Albany Rivers, and secondly up the Abbitibi River to New Post, through the region lying on the eastern side of Moose River, as well as my explorations along the coast of James' Bay, are conclusive, I think, as to the vast extent of these peat mosses, if not their almost universal prevalence in the flat belt of the country bordering on the southern extremity of James' Bay." (Page vii, 2.)

Mr. Borron, speaking of the land further south, "the belt remarkable for its rapids and falls," as being more adapted for cultivation, says:—

"I am inclined to think, however, that even in this belt there is no inconsiderable quantity of land overspread with swamps and peat mosses, more particularly on the east side of the Abbitibi, in which direction I should not be surprised to find that the peat mosses extended almost unbroken from Hannah Bay on the coast to near Lake Abbitibi."

"I do not know of any part in the Dominion, or indeed in any part of the world where the peat mosses or bogs are nearly so extensive as they appear to be in this basin of the Hudson's Bay. I am strongly of the opinion that not less than ten thousand square miles of the territory belonging to Ontario on the north side of the Height of Land is overlaid by beds of peat the thickness or depth of which often exceeds six feet and will probably be found to be twenty feet or more in many places. Nor is this by any means all, for I have little doubt that there are immense areas also covered with peat on each side of the territory awarded to us." (Page xi.)

By Michipicoten River to Missinaibi River.

Missinaibi River.—Mr. Borron does not mention pine except "a few red pine at Brunswick Lake." Spruce, tamarack, birch, poplar, &c., often mentioned on banks.

Jag-a-wa River.—Country between Moose and Albany Rivers. On banks, poplar, aspen, spruce. On each side sphagnum peat spreading as far as seen from highest trees.

Lower Moose River.—Same timbered banks with peat at back.

Abbitibi River.—Same timbered banks but before he went one quarter of a mile nothing but peat, as far as New Post.

Rupert River, &c.—Same peat moss.

Abbitibi River above Long Portage.—Timber better but still peat at back.

Lake Abbitibi.—A few red pine near outlet.

By Lake Temiscamingue and Montreal River to Lake Tamagaming.

Tamagaming Lake and River.—Good pine, white and red, but much burnt. Back by Lake Nipissing, &c.

BORRON'S EXPLORATIONS of Hudson's Bay Basin, 1881. (Sessional Papers, No. 53, 1882.)

*Timber.*—In his general report Mr. Borron says:—

"In what has been called, the level clay country, which embraces all of the first plain or plateau and most of the second, the forest is restricted in a great measure to the narrow belt of good soil reported as extending along the margins of the rivers and streams and to the banks of the lakes. The alluvial bottoms on the rivers, and islands both in the rivers and lakes, are generally well clothed with timber. This timber consists of spruce, aspen, poplar, tamarack and white birch chiefly. Of these the spruce is the most valuable, being that which is fittest for sawing into boards and scantling and employed for these purposes by all the Hudson Bay Co.'s posts on James Bay under the name of 'fir.' The largest trees are about seven feet in circumference, but in clearness or freedom from knots, &c., it compares unfavourably with our white or red pine. It is and always will be of great importance and value to the inhabitants of the territory, and although offering no inducements to the lumbermen at present, may yet take its place in the market when the country is opened up and other wood becomes scarce and

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dear. On the upper or southern margin of the second plateau and also on that which constitutes the height of land itself there has at one time been a large quantity of both red and white pine, and at New Flying Post I saw fine pine of both varieties, as also good spruce and tamarack. I measured some of the larger trees and found them to be as follows, about three feet from the ground: White pine, eight feet; red pine, seven feet; spruce, six feet and tamarack six feet in circumference.\* On my subsequent trip from Flying Post to Matawagamingue I saw a few white pine trees (survivors of the ancient forest), two of which measured ten and eleven feet respectively in circumference. The amount of pine left by the fires in the neighbourhood of Flying Post I was unable to ascertain, but am satisfied that the quantity is greater and quality better than anywhere else that I have yet seen on the north side of the height of land. But whatever it may be it bears a very small proportion to the forests of pine which have been, temporarily at least, destroyed by fire.

"The quantity of aspen and poplar in this territory is very great, and may, in view of the employment of the pulp of this wood for the manufacture of paper, become extremely valuable. The tamarack too, though much less in quantity (unless we include the diminutive ones found growing on the muskegs) will also be of some value whenever the country is opened up. Tamarack of the size suitable for telegraph poles is very common, and more rarely such as would make railway ties were met with. The largest trees of this kind rarely exceeded six feet in circumference.

"The other woods are of such a nature or are found in such limited quantities or are so scattered as to be of no apparent value with the exception of the white cedar and white birch, more or less of both of which are found from the height of land to within a few miles of James' Bay, and both are of the greatest value to the natives as affording them the best possible materials whereof to build their canoes. There is a variety of pine found very generally on poor sandy or rocky ground, all over the territory, more particularly in the upper or southern portion. It rarely attains a large size, has a scrubby rough bark, few branches, and those near the top; it yields a good deal of resinous gum, and the wood is yellowish and used for nothing that I know of except fuel, for which it answers tolerably well when dry. I have called it in my narrative sometimes pitch pine and at others rough barked pine."

*Sphagnum Peat.*—In other parts of his report Mr. Borron expresses his opinion that the peat mosses overspread not only the lower plateau but also "by far the greater part of the belt of the plateau," between the long portages and the height of land, even extending over and beyond it.

From Missinaibi, across to Flying Post, on branch of Matagami (140 miles).

On the portage route between these two branches Mr. Borron describes the belt of various trees and sphagnum peat behind them with red pine in one spot. Near Flying white and red pine in clumps.

From Flying Post eastward to Matawagamingue, on Matagami (85 miles). Some good timber—still occasional pine.

Down Matagami.—Some pine at starting, then usual timber on banks with peat inland, and this on second plateau above long portage.

Up Albany River.—Poor timber on banks; peat inland. At Chepy River, an Indian said all muskeg to Moose River.

#### DOMINION SURVEYORS' REPORTS—DEPARTMENT OF INTERIOR REPORT, 1885.

Mr. Fawcett's exploration from Rat Portage along Winnipeg River to English River and up this to Albany River. Timber—poplar, scrub pine, some spruce, &c. At Grassy Narrows some fine pine; the first valuable timber he had seen. On both sides of the river near Lac Seul considerable good pine, like Norway pine. On the banks of the lake, spruce and tamarack. No white pine seen north of the height of land.

\* I was informed by Mr. Thomas Moore, the officer in charge of that post, that some sugar maple and black birch trees might be seen growing a few miles from the post, and that he had noticed and measured a white pine that was two fathoms or twelve feet in circumference.

## DOMINION SURVEYORS' REPORTS—DEPARTMENT OF INTERIOR REPORT, 1890.

Mr. Ogilvie's exploration from the Ottawa River to Hudson's Bay. No pine beyond Abbittibi; timber scarce.

## REPORTS OF GEOLOGICAL SURVEY, 1886. VOL. 2.

Mr. Bell's exploration of Attawapishkat River and Albany River—Lonely Lake to James' Bay. Round Lake St. Joseph the timber greatly destroyed by forest fires from 100 years old to the present time; second growth either aspens or white birch with a few spruce, or wholly banksian pine. Part of the main shore and on many islands not burned there is good timber, viz., white and black spruce, tamarack, aspen, white birch, banksian pine, poplar, balsam, white cedar, &c., in the order named. On Lake Lansdowne, where not burnt, some good spruce and tamarack. On Attawapishkat River, spruce, &c., getting smaller towards the north. On Albany River, spruce, tamarack, banksian pine and cedar, some good but much burnt, with bogs away from river banks. No white pine.

## REPORTS OF GEOLOGICAL SURVEY, 1887-8. VOL. 3, II H.

Mr. Ingall's report on Thunder Bay Mining district from 81° to 91° and back from the shore. "The whole region consists for the greater part of a great rocky area covered with bush mostly very dense, while extensive swampy areas are frequent. In places considerable stretches are covered with useful timber, such as maple and pine, but for the greater part the bush is useless except for local demands, such as would arise from mining operations." "The bush which covers the whole district consists mostly of poplar and birch in the lower lands with some intermixed pine, &c., while balsam, spruce and tamarack preponderate in the swampy parts."

## REPORTS OF GEOLOGICAL SURVEY, 1887-8. VOL. 3, I F.

Exploration of Rainy Lake region. "It cannot be called a pine country though there is some in spots." Prevailing timber, spruce, cedar, tamarack, balsam and hardwoods.

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## PROVINCIAL SURVEYORS' REPORTS—CROWN LANDS REPORT, 1887.

Radnor Township and Seigniori of Cap de la Madeleine, Champlain County. Little pine, but spruce, cedar, &c.

Rivers Towachiche, aux Eaux Mortes, &c., Portneuf County. Little pine in two spots. Merchantable spruce, &c.

Musquarro and Kegashka Rivers, Saguenay County. Timber not merchantable size. Lakes and rivers between Batiscan and Metabetchouan, Quebec County. Pine very scarce; white and black spruce.

Rivers Moise and Croche, Quebec County. Good spruce; pine not mentioned.

Rivers Upikauba, aux Ecorces, &c., Chicoutimi County. Merchantable spruce.

River Metabetchouan, Quebec County. Little merchantable timber; no pine.

Between Cedar Lake and Lake St. John, Chicoutimi County. A little spruce, no pine, much brûlé.

Marlow Township, part near River Chaudière, Beauce County. Pine removed; some spruce remains.

Risborough Township, Beauce County. Same as above.

Baskatongue Township, Ottawa County. Little merchantable timber.

Pope Township, Devil's Mountain, Ottawa County. No merchantable pine; some mixed wood.

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other timber.

McGill Township, Ottawa County. No pine, some mixed wood.  
River du Diable, Montcalm County. No pine; good mixed wood.

PROVINCIAL SURVEYORS' REPORTS.—CROWN LANDS REPORT, 1888.

Fabre Township, Pontiac County. Two-thirds burnt; pine gone.  
Guigues Township, Pontiac County. Half burnt; some pine left in northern part.  
Boisclerc Township, Pontiac County. Western half burnt. Eastern half well timbered, pine being cut.  
Bear River and tributaries, Ottawa County. Much pine cut, considerable left, also spruce.  
Hincks Township, Ottawa County. Chiefly hardwood; pine exhausted.  
Kiamika Township, Ottawa County. Mixed timber; some pine.  
Batiscan Seigniory, Champlain County. Some spruce, balsam, maple and birch.  
River St. Anne, North branch, Portneuf County. Chiefly spruce, fair in parts.  
River Metabetchouan, Chicoutimi County. No merchantable timber.  
Dallas and Taillon Townships, Chicoutimi County. Chiefly spruce; some red pine; white pine cut.  
Kenogane Township, Chicoutimi County. Chiefly spruce and tamarack; some young pine.  
Ferland Township, Chicoutimi County. Spruce, birch and poplar.  
River St. Marguerite, Saguenay County. Good spruce of merchantable size.  
River à la Truite, Saguenay County. Good merchantable timber, chiefly spruce.  
River Manitou. Some good spruce.  
Tessier Township, Rimouski County. Cleared of merchantable pine and spruce.  
Tourelle Township, Gaspé County. Small spruce, balsam and birch.  
Rivers Mont Louis, Anse Pleureuse, Pierre and Claude, Gaspé County. Merchantable spruce, balsam and birch in parts.  
Port Daniel Township, Bonaventure County. Some spruce, balsam, birch, &c. A little pine to the north.  
Coleraine Township, Megantic County. Spruce, balsam, birch, &c., mostly small.

PROVINCIAL SURVEYORS' REPORTS.—CROWN LANDS REPORT, 1889.

Dallas and Dolbeau Townships, Chicoutimi County. Some merchantable spruce, balsam, &c. A little pine.  
River Shipshaw, Saguenay County. Some spruce and birch, the best cut.  
Rivers Peribonka, Epinettes and Betsiamites, Saguenay County. Spruce and a little pine on Peribonka, little value.  
Rivers Croche and Bostonais, Portneuf County. Spruce and birch, a little pine.  
Little Batiscan and Blanche Rivers, Portneuf County. Small spruce, balsam and birch.  
River Talayarde, Portneuf County. Small balsam, birch, and a little spruce.  
Rivers aux Rats, Bellavance and du Milieu, Champlain County. Some fine pine in places; good spruce and hardwood.  
Campbell Township (part), Ottawa County. Hemlock, cedar, hardwood. Little pine or spruce.  
Moreau and Campbell Townships, Ottawa County. Pine mostly cut, in some spots "some second growth pine which will soon make excellent timber." Good hardwood, spruce, balsam, &c.  
Blake Township, Ottawa County. Very fine pine, good spruce, hardwood, &c.  
Hincks Township, Ottawa County. Mixed timber, fine pine, spruce, hardwood, &c.  
Northfield Township, Ottawa County. Good pine and other timber.  
Guiges and Fabre Townships, Pontiac County. Pine cut or burnt. Some spruce and hardwood left.  
Gaultier Township, Berthier County. Spruce, birch, cedar, &c.  
Gagnon Township, Chicoutimi County. A large quantity of merchantable pine and other timber.

Tourelle Township, Gaspé County. A little merchantable spruce, with balsam and birch.

Little Mecatina River, Labrador. Upper part, well timbered with fair spruce, balsam, tamarack and birch.

PROVINCIAL SURVEYORS' REPORTS—CROWN LANDS REPORT, 1890.

River and Lake Manouan and River Peribonka, Saguenay County. No trees fit for lumber on Manouan; "black fir" on Peribonka.

River Goynish, Saguenay County. No merchantable timber.

Cap Chat Township, Gaspé County. Cedar, fir and birch, some of good size.

Rivers St. Anne and Tourilli, Quebec County. Good merchantable spruce, birch, balsam, &c.; no pine.

River St. Paul or Esquimaux, Labrador. On banks, small spruce, fir, birch, tamarack, for spars or fuel. Moss inland.

PROVINCIAL SURVEYORS' REPORTS—CROWN LANDS REPORT, 1891.

River Nabesipi, Saguenay County. Small spruce, balsam, &c. No commercial value. Rivers aux Rochers and Moise, Saguenay County. Merchantable spruce, in small quantities in coulées.

Rivers Goynish and Nabesipi, Saguenay County. No wood fit for commerce.

Melherbe Township, County Lake St. John. Good spruce, birch and fir. Only a few pine.

River Casapsal, Matane County. No timber for lumbering, but small quantities of good spruce, cedar, balsam and birch.

Hamilton River, Labrador. The upper part of the river and its tributaries wooded.

PROVINCIAL SURVEYORS' REPORTS—CROWN LANDS REPORT, 1892.

Crespel Township, County of Lake St. John. Spruce, balsam and birch. "Rivers à la Perche, d'Épinette Rouge and aux Rat Musques cross the township, and it is on the sides of these rivers that we find the greatest quantity of merchantable timber."

A second report says there is also pine near the lakes.

Chavigny Township, Portneuf County. Pine mostly cut, but a little left. Good spruce, maple, &c.

Marmier Township, Portneuf County. Abundance of merchantable spruce and birch. Only a little pine.

Alton Township, Portneuf County. Merchantable timber, spruce, hemlock, birch, beech and maple, the hardwood predominating. Spruce cut and destroyed, and hemlock cut for bark and left to rot. No good pine seen; "not in its element."

River aux Tonnerre, Saguenay County. No merchantable timber.

River Magpie, Saguenay County. Eight miles from mouth good and large merchantable spruce.

PROVINCIAL SURVEYORS' REPORTS—CROWN LANDS REPORT, 1893.

River Jupitagon, Saguenay County. Balsam and spruce are the only kinds of timber that one meets with; the trees are about ten inches in diameter.

Lauré and Trudel Townships, in Quebec and Champlain Counties. The principal kinds of woods are fir, spruce, bouleau and birch. They exist in several places in large quantities, sufficient to be utilized as merchantable timber. Mention is also made of a maple sugary on a mountain near the River Jeannotte, as a remarkable fact, on account of there being no maple in any other part of this district.

River Chaloupe, Saguenay County. Balsam, spruce and bouleau, of moderate size, are the only woods that are found on the shores of this river. On the upper part, the wood, chiefly balsam and spruce, is small and only good for fuel.

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Rivers aux Pins and Adam, Saguenay County. The firm of Price Bros. & Co. make use of these two rivers to transport their logs to the River St. Lawrence.

River Petite Cascapédia, Bonaventure County. "On the East branch, at a short distance from the Forks, and also on the stream called Samarague, I noticed rich spruce groves and very fine pineries. I might have thought myself in the country surrounding the St. Maurice."

Rivers Odili and Consapsigan, tributaries of the St. Maurice. On the Odili, the timber, white spruce, tamarack and bouleau, which is composed of young trees growing on the ashes of an old brûlé, is small and of little value. On the River Consapsigan or Jonglerie, the timber, of middling size, is chiefly bouleau, white spruce, tamarack and poplar. There is no cedar.

River St. Paul or des Esquimaux, Saguenay County. There is very little wood on the banks of this river, and it is stunted wood.

River au Bouleau, Saguenay County. The timber, a great part of which is spruce, measures from twelve to twenty inches in diameter.

River Mingan, Saguenay County. There is no merchantable timber along this river. From its mouth, up to a distance of twenty miles, one meets only burnt wood and marshy land; from thence, up to its head, one meets balsam, spruce and bouleau of an inferior quality. Another report says that fire has destroyed all the wood.

Rivers Grande and Petite Bostonnais, and other tributaries of the St. Maurice. On the Petite Bostonnais, lumber camps have been made all over. The young growth of timber consists of pine, spruce and bouleau. On the Grande Bostonnais, the merchantable timber has been cut; the spruce, the bouleau, and a small quantity of pine grow very thick. The streams and Lakes à Dchène and à Shay, offer for timber nearly the same advantages.

Between the River Valin and Lake Moncouche, Chicoutimi County, spruce is in abundance, but the largest trees have been cut down to make saw-logs; the other kinds of timber are fir and bouleau; there are a few pine trees.

Rivers à l'Eau Dorée, à la Truite and Nipissis, Saguenay County. Along the upper section of Rivière à l'Eau Dorée, and also along Rivière à la Truite and the lower section of the River Nipissis, there are large quantities of spruce, fir and bouleau. In the upper section of the Nipissis the wood is more rare and smaller.

Rivers Odili and Consapsigan, Lake Clair and des Iles, tributaries of St. Maurice. On the Consapsigan for 25 miles up, the timber, where the fire has not passed, consists of bouleau, rock pine, fir and black spruce of little value, except for firewood. On the Odili, partly burnt, with groves of greenwood of poor growth. On the River Croche grow bouleau, spruce, fir, birch and elm. Around Lac des Iles, wooded with black spruce and fir. On the discharge of Lac de l'Equerre the timber is fir, spruce, bouleau and birch, with a few cedar trees on the banks of the St. Maurice.

Rivers Etamamion and Darby, Saguenay County. A great part is burnt, leaving only rocks to view. Wood is, however, found at certain places, but this wood is small, consisting of sapin, bouleau and white spruce.

Tom Creek, Bastien Creek, &c., Champlain County. There is a good deal of merchantable wood which has been cut down on a large scale by an American company. Part is burnt with small second growth.

River Pebelognang, tributary of Vermillion River. On the Vermillion near discharge the banks are elevated and rocky, covered with spruce, balsam, bouleau and young rock pine. On Pebelognang the timber is chiefly bouleau, white spruce, red spruce, black spruce, balsam, rock pine and some white pines here and there, with cedar on banks of Lake Sleigh. The country on the S.W. branch of the river and around Lakes Sleigh, Dorval, à Baude and Wekanmekonke is well wooded, containing a good quantity of merchantable wood, such as pine and spruce. Apart from that, fire has made its ravages in several places on the banks of the river some years ago, destroying a large quantity of merchantable timber. The ground is partly covered with a young growth of rock pine and bouleau.

River Du Pin, Bellechasse County. The ranges N.E. and S.W. of the River Du Pin bear maple, birch, bouleau, spruce, cedar and fir; the best spruce and finest cedar have been cut. On the ranges N.E. and S.W. of the village reserve there is very little timber.

River French, tributary of St. Maurice, Champlain County. The kinds of timber which predominate are red pine or cypress, spruce, fir and bouleau. Near the mouth of the French, the spruce is large enough to be advantageously worked; the pine, however, has already been cut down.

Base line, from River Grande Peribonca to River Mistassibi, N. of Lake St. John. As to the merchantable timber which remains now in that district, it is very rare; however, between the Petite Peribonca and the Mistassibi, I met a little spruce and some pine; if one may judge by the section where Mr. J. B. Scott is now working, this region would be advantageous enough for the timber trade.

Bras du Nord of River Ste. Anne, and tributaries, Portneuf County. The timber is all of small dimension and of no merchantable value except as cordwood, with the exception, however, of the silver birch (bouleau) which forms a considerable part of the forest there in some places, the timber being valuable to cabinet-makers. The only variety of the different timber consists in spruce (black and white), fir and silver birch, with a few red and yellow birch occasionally. In some places the spruce, which is all small, is of greater quantity than other kinds of timber, while in other places it is the fir or the silver birch which predominate, the last mentioned timber occupying a much smaller extent of country than the other two kinds.

Bay Lake, Upper Ottawa, Pontiac County. There is an abundance of white pine, red pine and spruce.

#### GEOLOGICAL SURVEY REPORTS, 1885. VOL. 1.

Mr. Low's exploration of Lake Mistassini, &c. On the Betsiamites or Bersimis River, for forty-five miles up the hills, well wooded with white and black spruce. Bad forest fires. Second growth poplar, white birch, banksian pine and spruce; not large. On Lake Pimpuakin, the shores and hills covered with a fair growth of spruce and birch. Portaged to Manouan River and Lake; small spruce and birch, about half burnt. On Peribonca River, larger spruce, where not burnt. To the height of land, on foot, chiefly swampy, with small black spruce and larch. By the Temiscamie to the Mistassini. On the higher ground at the south end, white spruce, poplar and birch; in the swamps, black spruce and tamarack; on brulé, banksian pine; on Rupert River, small spruce, birch, tamarack, banksian pine, &c. Crossed to Martin branch of Rupert River; the same small timber. Below Lake Memiskow, the timber better to Rupert House.

#### MANITOBA AND THE TERRITORIES.

##### FROM THE GEOLOGICAL SURVEY REPORTS, 1886.

Northern Alberta, &c.—Mr. Tyrrell explored the country between 51° and 54° N. latitude, and 110° to 115° 15' W. longitude, an area of 45,000 square miles. The country prairie and partly wooded for the greater part; the area of forest small, viz., the Beaver Hills, and the district stretching south-west from Edmonton, south of the Saskatchewan and west of Pigeon and Battle lakes; there are also small patches in the half wooded area. The forest area is along the western edge of this district with the Beaver Hills as an outlier. On the high sandy ridges spruce and jack pine, between them marshes with small spruce and larch.

Lake Winnipeg to Hudson Bay.—Messrs. Low and J. M. Macoun explored the Berens River, finding small and rough timber: black spruce, banksian pine, tamarack, &c. Round Favourable Lake better timber, white and black spruce, &c., and the same on Sandy and Severn lakes. Down the Severn River similar timber but smaller.

##### GEOLOGICAL SURVEY REPORTS, 1887-8.

Yukon District, &c.—The Douglas fir, the Engelmann spruce, the hemlock (*Tsuga Mertensiana*) and the gigantic red cedar are not found in the valleys of the Stikeen, the Liard and the Upper Yukon. White and black spruce and the banksian pine are widely

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distributed. The banksian pine is characteristic of the Mackenzie Valley. On the coast north of  $54^{\circ}$  there is small and less merchantable timber. The red cedar stops at the mouth of the Stikene and the yellow cedar barely reaches Sitka. Black and white spruce are found throughout the Yukon district in the valleys and on the lowlands; fair to good, suited for construction. On the Stikene River the flats near the mouth have good spruce and cottonwood. Around Dease Lake the country is wooded but there is little fit for lumber. On Francis Lake there is some good spruce, white and black. On the Upper Liard and its tributaries the timber is mostly small.

Duck and Riding Mountains.—The Duck and Riding Mountains and the country between them and Lakes Winnipegosis and Dauphin have coniferous forest on the summits and the northern and eastern flanks of the mountains. There are belts of hardwood timber on the rivers and scattered groves.

## GEOLOGICAL SURVEY REPORTS, 1888-9.

Yukon and Mackenzie Basins.—Mr. McConnell, who explored in this region, says: "The whole country between the Peace and the Athabasca north of the Loon, an area of about 25,000 square miles, is generally forested, mainly with spruce and poplar, and is everywhere characterized by an abundance of lakes and of muskegs and marshes." The Liard valley is wooded with small trees, white spruce, banksian pine and poplar. On the Nelson River (its tributary) for 100 miles up to Fort Nelson the country is well forested, it is said the best grade of timber in the Mackenzie valley. On the Slave River are level plains with extensive forests of white spruce, banksian pine, larch and poplar. From Fort Providence to Lake Bietcho, where it is not muskeg, the country is well wooded with white spruce and banksian pine. On the Mackenzie River from Liard River to the Blackwater River there are spruce forests with lakes and muskegs. To Bear River and Fort Good Hope the spruce is smaller. Near Bear River is a tree-covered plain. To Peel River there are groves of spruce, some of them large.

Porcupine and Pasquia Hills.—Mr. Tyrrell, surveying this country, says: "Portions of the wide plains or valley lying between the Porcupine and Pasquia Mountains are now thickly wooded with large spruce, which if protected from destruction by forest fires, will furnish Manitoba with an abundant supply of timber."

## DEPARTMENT OF INTERIOR SURVEYS, 1877.

Third Principal Meridian.—From Fishing to Quill Lake the country was well supplied with wood, some of it merchantable. There was some fair sized timber till the third mile south of the Canadian Pacific Railway, on the rising ground with large poplar. Wood and ponds alternating continued for 27 miles. On the third meridian at the eleventh base line groves of timber abound. From the Touchwood Hills to Carleton there are 24 miles of hilly country, heavily timbered; afterwards little wood except at the Saskatchewan River. From Carleton House to Prince Albert little timber until reaching a heavy belt of spruce and poplar across the neck of land between the north and south branches. Thence to Prince Albert, a fair supply of wood. From Prince Albert to the Indian settlement 104 miles, little timber. To Fort à la Corne, 39 miles, well wooded; thence to Big Hill, 60 miles, with some poplar groves.

## DEPARTMENT OF INTERIOR SURVEYS, 1878.

Nelson River.—There is small spruce, tamarack and banksian pine fit for railway ties, &c., and these extend to beyond the Churchill River.

## DEPARTMENT OF INTERIOR SURVEYS, 1881.

Lake Winnipegosis.—Prof. Macoun, exploring the country around Lake Winnipegosis and its neighbourhood found large quantities of good timber, spruce, poplar, &c.

## DEPARTMENT OF INTERIOR SURVEYS, 1882.

Porcupine Mountain.—In Prof. Macoun's account of his survey of this district, he says: "Valuable spruce and poplar forests are found around every point of Porcupine Mountain." There are also other descriptions of timber.

## DEPARTMENT OF INTERIOR SURVEYS, 1886.

Lake Winnipeg.—In Mr. Wilkin's exploratory survey around Lake Winnipeg, he says it is "not much of a lumbering district." He found some spruce.

## DEPARTMENT OF INTERIOR SURVEYS, 1892.

Edmonton District.—Mr. Hubbell and other surveyors re-marking the corners of the old surveys in the Edmonton district, found much of the country thickly timbered with poplar interspersed with spruce fit for building purposes, and some for the manufacture of lumber. Good timber, principally spruce, grew in many of the townships adjoining the Saskatchewan and Sturgeon rivers, and easterly from the Egg lakes. Surveyors on the other townships mention places where "a plentiful supply of firewood and building timber can be had," "prairie with willow and poplar bluffs," "well wooded with spruce swamps," "a considerable quantity of timber," &c.

Prince Albert District.—In the Melfort, formerly Stony Creek District, Mr. Ogilvie found willow and poplar, not fit for lumbering, but for fencing and building logs. In Township 43, range 20, west of second meridian, the south half was heavily wooded. Township 43, ranges 16 and 17, had scattered bluffs of small scrubby spruce, the largest area in one block being not more than 240 acres, with 6,000 feet of lumber per acre. There would be about 400 acres in all, with two and a quarter millions of poor lumber. There was said to be good timber in the townships to the north of those surveyed, but much burnt. There was much poplar at the head of Melfort Creek. North of Muskeg Lake there was a lot of good spruce timber, but a small area. Surveyor Belanger found in Township 44, range 17, along the southern boundary, a belt two miles wide of fine poplar with groves of spruce. In some of the other townships there was poplar and scrubby pine.

Peace River and Tributaries.—Mr. Ogilvie in his exploration found in the Athabasca Valley, from the mouth of the Pembina to Fort McMurray, much spruce and some poplar that would make fair lumber. It would be smaller than that used in the eastern provinces, but as good as that in use in the Territories. From Fort McMurray to the lake there was much merchantable spruce, but the stream runs the wrong way, to the northward from the settlements. The timber above Athabasca Landing and Lesser Slave Lake and River, could, he says, be floated to the Landing, whence there would be only 96 miles to carry it to Edmonton. Much of the spruce there was being burnt. On Great Slave Lake and the Lower Peace River, he found much valuable timber, but this also is on Arctic waters, and so, too, with the timber on Great Slave Lake and the Mackenzie River. The timber in the valley of the Liard and the East branch was very large. From the Mackenzie up to the forks of the East branch and the Sicanie Chief River, 150 miles by the stream, there were many and large extents of spruce better than he had seen before in the country. The cottonwood and balsam poplar were also very large. At Fort Nelson was an extensive flat covered with these trees and with spruce. Between Sicanie Chief and Peace rivers, on his track across, he found only fencing timber until nearing the Peace River, where there was larger spruce, poplar and banksian pine. On the Peace River, between the St. John and Smoky rivers, there was some good timber in the bottoms but only enough for a local demand. On the uplands, on both sides, the timber was only fit for fencing. On the road between the Peace River Crossing and the Lesser Slave Lake, the country was covered with bush, but not with much timber fit for lumber, and he supposed it to be a fair sample of the whole district. Around Lesser Slave Lake a large quantity of lumber could be got. He quotes Count de Sainsville as saying of the country around the delta of the Mackenzie that there was no timber of useful size near the coast. On the Cariboo Hill, there was small spruce extending 35

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miles north and south, and 20 miles east and west. North of Great Slave Lake to Back and Big Fish rivers and Beachy Lake, is the barren land, with no merchantable timber.

## DEPARTMENT OF INTERIOR SURVEYS, 1893.

**Red Deer River, Northern Alberta.**—The country comprising Townships 37 and 38, ranges 23 and 24, is rather rough, rolling and hilly, and a great part of it is covered with thick poplar and willow. Considerable quantities of spruce are to be found in clumps, along the Red Deer River, which enters Township 38, range 24, near the south-west corner of the townships and pursues a sinuous course a little north of east and enters the western boundary of Township 38, range 23, near the south west corner of section 7. Large areas of good white poplar are to be found along the eastern boundary of Townships 37 and 38 in range 23.

**Edmonton District, Alberta.**—The eastern boundary of Townships 53 and 54, range 13, runs for nearly 12 miles through dense timber, chiefly poplar and willow varying in size from 2 to 14 inches in diameter. Much of the timber would make good fencing and in some places it would yield fair building logs. The northern part of Township 54 is more open, with bluffs of small poplar and willow. Township 56, range 13, is thickly covered with poplar, spruce and willow, amply large for building and fencing purposes; there is also a considerable amount of burnt timber. Township 55 is more open with bluffs of poplar and willow scrub, the latter predominating. Township 56, range 12, is generally open country with some small poplar clumps and willow scrub. Township 55 has a little more timber, principally clumps of small second growth poplar and willow, with thick willow scrub. Township 53 is covered with thick poplar and willow, the former varying in size from 3 to 13 inches in diameter. Township 54 is more open with occasional poplar bluffs and willow scrub. Township 56, range 20, is covered with thick heavy poplar, spruce and jack pine, sufficiently large for the manufacture of lumber or for building logs. Township 56, range 21, is covered with heavy spruce and poplar and much windfall. Township 55, range 21, is generally covered with clumps of poplar and willow as well as some spruce. In Township 46, range 25, the parts lying north and west of Bigstone Creek are thickly wooded with poplar, willow and a few bluffs of spruce.

**Among Foothills of Rocky Mountains, Southern Alberta.**—In Townships 21 and 20, ranges 3 and 4, a considerable amount of brush and some large trees are to be found. In Townships 32 and 33, ranges 5 and 6, there is a good deal of birch and willow scrub in the Red Deer River bottom.

**Saskatchewan District from Quill Lakes, north to Pasquia Hills and from Nut Hills west to Humbolt.**—The greater portion of the territory was more or less covered with timber and scrub. On 10th base line from Range 8 to 21, the country is described as partly prairie and partly wooded, sometimes with scrub often dense and sometimes with fair timber, spruce, poplar, &c., generally enough for settlers, but not for lumbering operations. On 11th base line from Range 23 eastward to Range 17, the country is described as more hilly, and more wooded, with heavier timber, but with rolling prairie interspersed. This line traverses the Pasquia Hills.

**Touchwood Hill District, Saskatchewan.**—The subdivision of a number of townships from the northern slope of the Touchwood Hills to the Quill Lakes and Fishing Lake. Townships 32 to 34, ranges 11 to 15, showed a rolling prairie country, interspersed with woodland, sometimes scrub but often fair useful timber, chiefly poplar.

**Prince Albert District, Saskatchewan.**—In the subdivision of some townships near the forks of the Saskatchewan and on Waterhen Lake, the country is described as prairie land with clumps of scrub and some bluffs of good poplar.

**South-east Saskatchewan and North-east Assiniboia.**—In outline and correction surveys of some townships between Beaver and Nut Hill, the Quill Lakes and the Assiniboia River, the country was mostly prairie, interspersed with woodlands mostly scrub but with some good spruce and poplar.

**Townships 21 and 22, range 15, west of the principal meridian.**—In Township 22, the available timber is not so abundant as in that to the south of it; but there is on most sections, especially adjoining the streams, some good sized poplar with a

sprinkling of tamarack and spruce, enough for all settlers' purposes. The red willow, which makes excellent firewood, is also abundant. Township 21 consists of stretches of open land interspersed with bluffs or belts of timber. This is generally poplar, often of size suitable for building, with some large spruce and tamarack, though not enough for lumbering. Much fallen timber resulting from fires is met with, which, with what is standing, makes fuel abundant. A large proportion of the timber, which covers some one-third of the surface of this district, is good sized poplar fit for building, with some large tamarack and spruce, though not in sufficient quantities nor suitably placed for lumbering.

## BRITISH COLUMBIA.

## DEPARTMENT OF INTERIOR SURVEYS, 1885.

The Railway Belt.—Mr. Higginson, reporting on the railway belt in British Columbia, 40 miles wide and 500 miles long from the summit of the Rocky Mountains to the Pacific coast, estimated the timber at 3,000,000,000 feet b.m. Douglas pine, spruce, hemlock and cedar were all good, but the cedar often hollow. The timber existed principally in the valleys, along the lake and on the slopes, extending from the creeks and rivers, the largest being nearest the coast on the north arm of Burrard Inlet, the Pitt, Stave, Lilloet and Harrison rivers and lakes. In the east the largest body of timber in one place was on the eastward slope of the Selkirk Mountains along the Columbia River.

## DEPARTMENT OF INTERIOR SURVEYS, 1892.

The Railway Belt.—Mr. Drewry reported that along the Illecillewaet and Incomappleax rivers there was considerable valuable timber, that on the former river being under license and consisting of fir, spruce, hemlock and cedar. On the Incomappleax River, from Battle Creek down there was a large quantity of large cedar with a smaller quantity of scattered pine (*P. ponderosa*).

## DEPARTMENT OF INTERIOR SURVEYS, 1893.

Kamloops and New Westminster Districts, Railway Belt.—The surveyed portion of Township 4, range 30, west of the 6th meridian is flat and heavily timbered. The mountains to the left of the Salmon River valley, are sparsely wooded and thickly covered with grass; the mountains to the right are heavily wooded and with little or no grass. The land surveyed in part of Townships 4 and 5, range 27, west of the 6th meridian, is heavily timbered. Townships 3 and 4, range 5, west of the 7th meridian, are wet and heavily timbered. The land surveyed in Township 20, range 10, west of the 6th meridian, is fairly timbered with fir, cedar and spruce, which is now being utilized for ties and other purposes. In Townships 20 and 21, range 9, west of 6th meridian, from the mouth of Canoe Creek at Shuswap Lake, for two miles up the creek, the land is heavily timbered with cedar, fir and tamarack of splendid quality and enormous size.

## REPORTS OF THE GEOLOGICAL SURVEY, 1885, VOL. 1.

Rocky Mountains, Southern.—Mr. Dawson surveying between 49° (the International Boundary) and 51° 30' a district 50 miles wide and 200 miles long, found the commonest timber to be black pine and Engelmann spruce with Douglas fir in the lower valleys. In the Flathead valley was black pine and poplar, and the same on Mist Creek. In the Kootenay valley there were Douglas fir, spruce, &c. In the Elk River valley was much good spruce. There was good timber in the Vermillion valley.

## REPORTS OF THE GEOLOGICAL SURVEY, 1886, VOL. 2.

Northern Vancouver Island.—Mr. Dawson reported that Texada Island was generally wooded, but not densely, with very fair timber in the valleys; bare, rocky hillsides were frequent. In the vicinity of Hardy Bay, southward from Beaver Harbour, were

considerable low land, quantities coast. On lines and the level in with an ab inner shore extremity the whole scrub pine

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considerable tracts of low level land, heavily timbered. On Quotsino Sound, were tracts of low land, wide valleys and low rounded hills, with good timber in very considerable quantities; on the upper part of the sound there was Douglas fir, but not on the outer coast. On the coast of British Columbia and Vancouver Island, also; the actual shore lines and on the rocky and mountainous tracks the timber was somewhat inferior; in the level inland regions and in the sheltered valleys were great quantities of fine trees, with an almost unlimited amount of timber. The Douglas fir was abundant on the inner shores of Vancouver Island and the adjacent mainland, but not on the northern extremity of the island or the west coast. The yellow cypress was further north. Over the whole area there were western hemlock, western cedar, Menzies' spruce, western scrub pine and yew.

REPORTS OF GEOLOGICAL SURVEY, 1886-7, VOL. 3, PART 2.

Rocky Mountain Ranges.—Mr. Dawson reported of the Rocky Mountains proper:—

"Some of the valleys penetrating this range on the east are lightly timbered, or in part prairie-like in character, but as a rule, the mountains are thickly wooded wherever sufficient soil exists for the support of trees, and owing to the greater rainfall on the western slopes of the range, the forests are there often very dense." The valley between this and the next range he described as 700 miles long. Of the Gold Range, under various names he reported: "The forests of the Pursell, Selkirk and Columbia ranges are dense and tangled and even less perfectly explored than the corresponding portion of the Rocky Mountains." On the great interior plateau, he found, in the southern portion, much open country, but he said, to the north, with increasing moisture it becomes generally forested. Of the Coast Range, a continuation of the United States Cascades, he reported:—"The mountains as a rule are densely forested and extremely rugged, the flora of their seaward slopes being that characteristic of the west coast, and co-ordinate with great humidity, while on the north-eastern flanks, the forest resembles that of the inland ranges.

REPORTS OF THE GEOLOGICAL SURVEY, 1888-9, VOL. IV.

West Kootenay District.—The timber line is about 7,000 feet, the woods being open and park-like above 5,000 feet, the rocky or exposed slopes above this level, as well as many broad mountain tops, being almost destitute of trees. Elsewhere the country is generally wooded, and in the lower and more sheltered valleys there is much good timber. The Columbia valley as well as the slopes of the mountains are well wooded with spruce, cedar, cottonwood, &c. In the Kootenay valley and on its slopes is some good timber.

NEW BRUNSWICK.

REPORTS OF THE GEOLOGICAL SURVEY, 1885, VOL. I.

Northern District. On the Silurian deposits, on the high, dry land, were found white spruce, balsam, fir, white and red pine, &c.; on the swampy ground, white and black spruce, &c.; on the hardwood ridges, birch, maple and beech, with a few spruce. In the crystalline belt, hemlock, spruce, white and red pine were common; hardwood ridges were rare. Along the Bay of Fundy, little timber was left.

REPORTS OF THE GEOLOGICAL SURVEY, 1886, VOL. II.

Northern New Brunswick and S.E. Quebec.—Mr. Chalmers found on the drier parts of the Silurian upland, white spruce, black birch, rock maple, white and yellow birch, with some red and white pine; on the lower ground and swamps, cedar, larch and the spruces; on the river banks and intervalles, elms, spruce, cedar, &c., with some red pine. The region drained by the Upper Restigouche and its tributaries has a heavy growth of spruce, birch, maple, &c. On the carboniferous formation in addition to these, hemlock is found.

Part of Northumberland, Victoria and Restigouche.—On the pre Cambrian area there is a thick growth of black spruce. The white and red pine are exhausted.

REPORTS OF GEOLOGICAL SURVEY, 1886-7, VOL. 3, PART II.

Lake Temiscouata.—Messrs. Bailey and McInnes, in their account of their survey, say: "The whole of the country east of Lake Temiscouata and much of that west of it is still in forest and is the seat of important lumbering operations.

N.E. District.—Mr. Chalmers in his survey found hemlock, black and white spruce, birch, maple, beach, poplar, white and red pine, &c., on the high ground, and cedar, larch, ash, elm, &c., in the swamps. The country was much burnt by the great Miramichi fire of 1825, and there is a second growth of poplar, &c., but there is red pine and black spruce on the sand and gravel, and white spruce on the dry river banks, with a growth of 12 to 15 inches since the fire.

REPORTS OF THE GEOLOGICAL SURVEY, 1888-9, VOL. IV.

Southern portion.—Mr. Chalmers, in his survey, found that Charlotte County, St. John's County, and the parts of King's and Queen's counties south-west of the St. John River, were mostly occupied by the original forest, spruce, pine, hemlock, cedar, &c. In St. John's County, hardly any forest, except the east part of St. Martin parish—black spruce, pine, &c., and this extends into Albert County, as far as Shepody River. In King's County, the hilly tract south-east of the Intercolonial Railway, there is nearly the same forest, but more maple. In King's and Westmoreland counties, west of the Intercolonial, there is the same timber, but thinned out. On the carboniferous area in Queen's, Westmoreland, and Sudbury counties there is black spruce, hemlock and cedar. In the northern part of Queen's, King's and Sudbury counties there is the original forest growth, except where burnt.

COMMISSION ON NEW BRUNSWICK CROWN TIMBER LANDS, 1892.

Renous and Dungarvon Rivers.—"The timber covering a large tract of land on the upper waters of these rivers, is virgin timber, to a large extent, and it has reached an age in which it is not only gaining nothing, but deteriorating. It should, therefore, be cut and marketed. If that were done, it would relieve other tracts which are now over-cut, and give time for the young growth upon them to mature."

Upper Restigouche.—"We have ascertained from the testimony before us that there is an unsurveyed tract of 1,800,000 acres in the Upper Restigouche district, which is believed to be well spruced and a fine cedar country."

North Shore.—"The cedar supply of Maine is now very inadequate to the growing demand of the United States market. As we have in this province, and especially on the North Shore, the best cedar areas of the country, we believe that its value should be more fully recognized than it now is."

NOVA SCOTIA.

REPORTS OF THE GEOLOGICAL SURVEY, 1886, VOL. 2.

Antigonish, Guysborough and Pictou Counties.—On Isaac Harbour River, there is good hardwood between the upper part and Lawlor's Lake and towards Country Harbour and westward, with barren tracts of granite. A large quantity of ton timber is shipped to England, chiefly from Guysboro' Harbour, but the woods of the greater portion, of the country are small and barely supply the local demand for lumber. Pine is exported square and in logs, as well as oak, tamarack, birch and maple.

Guysborough and Halifax Counties.—Extensive fires have destroyed the forests along the shore, and in many places, far inland. A large dense forest, affording good ship timber, is still found on the head waters of the rivers New Harbour, Isaac Harbour, Indian, Liscomb, Ecum Secum, Moses, Quoddy, Salmon and Sweet Harbour, and lumbering is still carried on extensively on Sheet Harbour, Moses and Liscomb rivers.

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## APPENDIX "C."

## STATEMENTS OF EXPERTS ON FOREST AREA.

In 1887 Hon. Mr. Joly made a report to the Hon. Minister of Agriculture, Ottawa, on the Forests of Canada.

A few extracts from his report will suffice to show his views of the extent of our forests.

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. That 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 the 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, principally in the east, 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 head-waters 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 300 miles higher up the Ottawa, as the river runs, on Lake Temiscamingue 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 Bostonnais 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, which we shall consider later, 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."

In 1876 Mr. James Little prepared a pamphlet on 'the timber supply question. He considered that "British Columbia had a good supply of a description of pine which differs considerably from our white pine, with other commercial wood; but whether much or little, it is so far away that it would be much cheaper to freight supplies from the north of Europe than from that province. It may be utilized to some extent when there is a railway to move it to the Saskatchewan Valley. North-east of the Rocky Mountains there is some timber on the rivers of the wild north land which discharge into the ocean, but it is also too far away to be of any account to us here in the east."

"Next comes the province of Manitoba without any supply of timber except what little may be found on the Canadian portion of the Red River, around the Lake of the Woods and other patches of but small account in a country almost all prairie."

"Next comes the rocky barren district north of Lake Superior and bounding the province of Ottawa on its north-west extremity. This province, the province of Ontario, was not long since a magnificent forest country, probably unsurpassed on the face of the globe in its wealth of timber, and especially that of the best description of white pine in which it abounded. That section drained by the streams which empty Lakes Huron, St. Clair and Erie was exceedingly rich in the commercial woods of pine, oak, walnut, ash, elm and white wood. They are now all but gone; hardly any can now be seen west of the northern railway which runs from Toronto to Collingwood on Georgian Bay.

"The Muskoka country on Georgian Bay, which was only a few years ago opened up to settlement, is undergoing the same rapid process of denudation incident to all new timber settlements. The hardwood timber is being burnt up to make way for the plough and the pine is fast disappearing under the stroke of the axe for the insatiable saw-mill. That section, with all the streams emptying into Georgian Bay up to Sault Ste. Marie, does not hold as much pine as is got out in a single season in Michigan alone. In fact it would be a wise measure, if it could be enforced, to compel the whole province west of the water-shed of the Ottawa to preserve the little timber now remaining for its own use.

"We now reach the valley of the Ottawa which is the only pine timber we have worth giving a moment's consideration to in discussing the question of supply, and yet, from the information I have obtained on the subject from those whose lives have been mostly spent in the territory, I have every reason to conclude that at the rate of consumption going on a single decade will be sufficient time to totally exhaust its resources.

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"In five and the Prairie woods of the l vanished, and the products o supplies for ou away our timb they can be fo

"The valley of the St. Lawrence from Montreal to the Gulf never had a great amount of pine timber on it. The St. Maurice held more than the whole territory beside, and that river has been undergoing a course of depletion for so many years that I feel safe in saying it would not now afford enough to supply the whole consumption of the State of New York for a single year.

"I would now offer a few remarks regarding our spruce supply, a description of wood which ranks next to that of pine in the amount of consumption, and enters into competition with the lower grades of that product to a very considerable extent. The supply of this timber this side of British Columbia is confined chiefly to the valley of the St. Lawrence below Montreal, the Eastern Townships, Nova Scotia and New Brunswick. The Eastern Townships have been run over to a large extent for both local consumption and foreign demand. Every stream in it has been ransacked for the saw-mills in the interior, on the river, and at Quebec, and there is not now much left convenient to the floating streams, and especially in the St. Francis district, outside the lands held in fee by private parties. On the north shore of the St. Lawrence the spruce is exhausted for many miles back and is now all held under license from the Government of the province, as is also the whole region below Quebec, hardly a stream of which but has extensive mills on it, and from all appearance this description of timber will be as short-lived in this province as the white pine.

"Nova Scotia is also making rapid progress in ridding her soil of its wood encumbrance, and with regard to New Brunswick, which manufactures more spruce deals than are shipped at Quebec of both pine and spruce, and appears determined to get rid of her timber at any sacrifice, she cannot, if the press of that province informs us correctly on the subject, have any great supply now left. The *St. John Telegraph*, the leading paper of the province, gives us an idea of the state of matters there. It says that, 'the increasing scarcity of the timber adjacent to the sea and the navigable rivers has, within a few years, become a subject of great moment to the inhabitants of the province. Until recently, some of our people have been accustomed to look upon our pine and spruce trees as an encumbrance to the land and unworthy the cost of protection. The public, however, think differently now, since they find that one-half of the best timbered lands have been destroyed, while nine-tenths of the remainder have been worked on so much that they have been largely deprived of their most valuable soft woods.' And yet we find in the face of this condition of the timber resources of the province, after having stripped it of its immense amount of most valuable pine timber, they are slaughtering away at what is left of their spruce and throwing it on the English markets at auction, to such an extent as not to realize for it more than it should now be worth standing in the forest.

"An article in a recent issue of the *London Timber Trades Journal*, mentions a sale of 300 acres of timber, grown by the Earl of Cawdor on the mountains of Scotland, which brought £16,000 sterling, about \$80,000, and that after it had undergone repeated thinnings, which realized large additional sums, and I will venture to say that there are not 300 acres of the timber which the lumbermen of New Brunswick are now recklessly throwing away, but what would be worth as much in five years time, if left untouched.

"In five years, neither pine timber, nor pine or spruce deals, except it be some of the best clear pine, which is indispensable for many purposes to the people of Britain, and for which they will have to pay excessive prices, will be shipped from the port of Quebec.

"In five years, lumber will be higher on this side of the Atlantic, with the above exception, than it is now or will then be in Great Britain.

"In five years, I look for lumber to be shipped from the Ottawa to supply Michigan and the Prairie States of the West, and in a dozen of years from now the commercial woods of the United States and Canada, this side of the Pacific Slope, will have totally vanished, and instead of running abroad to find markets on which to force and sacrifice the products of our forests, we will be running abroad to see where we can purchase supplies for our home consumption, and the shipping, which is now engaged in carrying away our timber and lumber, will be required to freight supplies to us from wherever they can be found."

The Select Standing Committee on Immigration and Colonization of the Federal Parliament of Canada, in 1878, heard some evidence on the "Timber Interests." Mr. Stewart Thayne, in answer to the question put by Mr. Trow, Chairman—"Can you form an estimate of how long the present supply of timber is likely to last, supposing the present consumption, exportation and waste continue?" said: "I should not like to commit myself to a definite opinion upon such a subject; 1st. Because I cannot find any data sufficiently reliable to guide me to a safe conclusion on so important a matter. 2nd. Any calculation that would ignore the quantity of young timber standing in the woods, but which may become available in the course of twenty or thirty years, would rest on an unsound basis; and 3rd. Because there are so many sections of timber-producing land in these provinces, which though not extensive when considered separately, still form in the aggregate no mean source of supply, and which though now 'lost' or, would soon be opened up provided a profitable demand should spring up. Having made this statement to show why I decline to draw any hard and fast line as to the extent of the supply, I feel bound to say that every test I have applied to ascertain the quantity of merchantable timber actually standing in any section of the country has convinced me that the resources available are much smaller than public opinion supposes them, particularly of those woods adapted to the export trade."

Mr. A. T. Drummond, in 1879, discussed the distribution and preservation of Canadian timber trees in the report of the Montreal Horticultural Society for that year. Respecting the pines, he said: "The white and red pines are, however, the trees in which centre perhaps the most interest. Pitch pine is of mere local occurrence, and the banksian pine, though abundant in the Lake Superior region eastward to the Lower St. Lawrence, and of merchantable size, according to Professor Robert Bell, along the southern branch of the Albany River, is in the more accessible sections only a scrubby tree. In the Province of Quebec, south of the St. Lawrence, little pine is now left, though thirty years ago large lumbering operations were carried on in the country lying south of Quebec, and east of Sherbrooke. In the Ontario peninsula as well, pine is now scarce, and even what there is of it is of small size. Large as this territory is in which the white and red pine are found, the extensive sections of the country now left quite destitute of pine warn us that these forests are not co-extensive with our annual requisitions on them. At the present time the St. Lawrence and the Ottawa valleys furnish the largest part of the pine lumber. Very nearly as much is annually cut on the St. Lawrence and its tributaries below Montreal as in the Ottawa Valley, but contrary to the general impression, and to the customs returns, very nearly two-thirds of the square timber and the lumber manufactured on the Upper Ottawa is, as Mr. A. J. Russell has pointed out to me, from the Ontario forests. Some conception of the abundance of these trees in these valleys, and also of the enormous requisitions annually made by lumbermen upon our pine forests, is shown by the fact already referred to, that during the years 1870-71 and 1872 the average number of logs banked upon the small streams tributary to the St. Lawrence and Ottawa was over 5,250,000 annually."

In 1882 the American Forestry Congress was held in the city of Montreal. Mr. G. L. Marler, a high authority, read a paper on "The Denudation of our Forests."

He said: "The province of Quebec is the principal territory from whence the mercantile lumber is drawn. There are two large belts of timber lands in the province, one on the south side of the St. Lawrence; the other and the greater on the north side.

"The first extends from Gaspé, on the Bay des Chaleur, which divides it from New Brunswick, thence along the high lands on the boundary line until it strikes the head-water of the Connecticut River, thence along the line of 45th degree north latitude to the St. Lawrence, by which it is bounded in front. This belt consists of about 30,000 square miles.

"The other extends from below the Saguenay to the Ottawa, and thence 200 miles north of the St. Lawrence, and consists of about 120,000 square miles.

"Until a few years back these great belts of timber land were reached only by streams running through them, and could only be devastated by the lumbermen a few miles each side of these rivers, leaving large spaces untouched by the woodman's axe. But since twenty years this great belt (the southern) has been intersected by some

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dozen railways cutting up the land like a checker-board, and by this means we must look forward that by another ten years this belt will be entirely denuded of all kinds of timber.

"The northern belt is now passing through the same phase as the sister belt. The rivers on the north shore are not so numerous as on the south side of the St. Lawrence, but they are of greater magnitude, and extend further into the interior. Like the other belt this one is also being cut across by railways."

The following are extracts from a lecture delivered in Montreal by Mr. J. K. Ward, on 10th December, 1883:—

"It is estimated from statistics derived from Government returns and other sources that I have access to, as well as having some personal knowledge of the business, that there is manufactured annually in the Dominion, east of the Rocky Mountains, lumber and timber approximating to 2,600,000,000 feet, board measure, composed of hewn timber and sawn lumber, railway ties, cedar, round and flatted timber. \* \* \*

"I have divided the whole product of the provinces about as follows:—

"Ontario furnishes 4,474,000 pieces, equal to 2,600,000 standard pine logs of 200 feet each, producing 520,000,000 feet of lumber; 6,790,000 cubic feet of white and red pine or 81,000,000 feet b.m.; dimension lumber, 23,000,000 feet b.m.; hardwood, cedar, &c., equal to 5,000,000 feet, making in the aggregate 635,500,000 feet b.m. paying to the Provincial Government for timber dues \$501,000, and ground rents \$46,000, with 18,000 square miles under license.

"Quebec has under license 48,500 square miles, producing 2,500,000 pine logs, equal to 386,000,000 feet b.m. and 1,308,000 spruce logs producing 106,000,000 feet b.m.; white and red pine timber, 3,110,000 cubic feet, equal to 37,320,000 feet b.m.; hardwood, 51,000 cubic feet, or 611,000 feet b.m.; railroad ties 143,000 pieces, 32 feet each, making 4,576,000 feet b.m.; cedar equal to 4,500,000 feet; pine and spruce round timber 5,760,000 feet b.m.; tamarack, 175,000 feet B.M.; hemlock, 34,000 feet; cordwood equal to 5,000,000 feet, making in all 549,976,000 feet, giving a gross revenue of \$68,596 to the Province.

"New Brunswick, cut on Government lands, equal to 160,000,000 feet of all classes, principally spruce, the pine in this province, once so famed, being almost exhausted. There being a large extent of private lands in this province, I think it is safe to estimate that there is not less than 500,000,000 feet of lumber and timber produced, considerably more than three-fourths of which is exported; the balance being for home use. The extent of territory is 17,500,000 acres, 10 millions of which is granted and located, leaving 7½ millions still vacant, giving to the province a revenue of \$152,000 for timber dues, ground rent, &c.

"Nova Scotia is estimated to produce about 250,000,000 feet, of which about \$1,500,000 worth is exported, this province furnishing a large quantity of birch and maple.

"Manitoba and North-west Territories produce, say, 75,000,000 feet.

"These figures give us a total of 2,010,476,000 feet.

"The difference between this total and 2,600,000,000 is made up by the products of private lands, principally in New Brunswick and Eastern Townships of Quebec, and including also the output of scores, if not hundreds, of small mills scattered through the country, known only in their own localities. Of the total there is about three-fifths exported, realizing \$24,000,000.

"As to the extent of territory on which these lumbering operations are carried on, there are in the three provinces of Quebec, Ontario and New Brunswick 75,500 square miles under license, besides about 7,000 square miles owned by private parties in these three provinces and Nova Scotia, the whole being equal to 52,800,000 acres. This however is not all the timbered territory from which we have to draw our future supplies. The older provinces of the Dominion embrace an area of about 360,000 square miles, which after deducting the territory under license, leaves an area of 270,000 square miles or 180,000,000 acres. Only a small proportion comparatively of this is occupied for agricultural purposes, thus leaving a very large extent of territory on which no doubt there are vast quantities of timber, not only for export but for home purposes. I have no doubt whatever but that more than half of the whole of this territory is unfit for

settlement and will remain for ages as bushland. This bushland in a sanitary point of view will be useful in attracting the rains, holding back the water in its natural beds, so preventing sudden rises and falls in the rivers, which often cause much damage by overflowing lands, as well as loss by excessive drought, so that many streams that once afforded good water powers are now useless as such.

"In coming back to the question of the extent of timbered territory from which we are to draw our future supplies of merchantable lumber, you can hardly meet with two lumbermen who will correspond in their opinions. It is extremely problematical as to the average quantity of lumber which a given area will yield. I have seen five, ten or even twenty thousand feet come off an acre, and have heard of as much as fifty thousand; but this I consider as very rare. It has been estimated that our timber territory in Ontario and Quebec would yield from one to two thousand feet per acre, which I consider not an unreasonable estimate. It would therefore be fair to adopt the medium estimate of fifteen hundred feet per acre, which would give, at the present rate of production, a thirty-seven years' supply. This in addition to a very large extent of territory not under license, would, it is reasonable to suppose, yield enough to make fifty years' supply, as stated in my paper read before the Forestry Congress. This calculation refers exclusively to pine, spruce and hardwoods, in which our country abounds, that heretofore have been comparatively neglected, and will as pine grows scarce, become more used for finishing purposes. As years pass by and the timber increasing in size, the territory cut over by the lumbermen, who in the past took nothing but the choicest, will be found to contain a large quantity of material that will be considered valuable.

"As to providing against loss by forest fires, we may reasonably hope that they will be less frequent than in the past, and that the natural increase in size, will, as some argue, make up for the loss occasioned by them. It may seem strange that to produce the annual output of wood goods, supposing the average yield per acre is 1,500 feet, it requires 1,700,000 acres to be gone over, or equal to an area sixteen times that of the Island of Montreal.

"Before closing this part of the subject, I would refer to that portion of my paper referred to, in which I remarked that to the uninitiated travelling through the woods he would hardly know that the shantymen had been there, except for seeing an occasional stump, a few chips, or the top of a tree. This may require a little explanation. In my experience of nearly forty years' lumbering it has been my fortune to work mostly in what is called a hardwood country, where the best pine is usually found in very scattered quantities. But where in a few cases I have worked in what is known as a green country, where pine mostly prevails, it has generally proved so faulty that but a small proportion of the whole was considered merchantable, so that the country, to a casual observer, looking from a distance, appears to be covered with timber."

The Honourable  
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## APPENDIX "D."

## FOREST PRESERVATION.

ROCKLAND, ONT., 14th February, 1894.

The Honourable  
The Commissioner of Crown Lands,  
Quebec.

SIR,—I have had several interviews with the Assistant Commissioner relative to the preservation of the forests of the province of Quebec, and have also made two or three attempts to have an interview with yourself on the same subject, but without success. The last time I sought an interview with you was two weeks ago when in Quebec, but unhappily, I found you were ill and confined to your house. I had, however, a long interview with Mr. Taché, and he finally requested me to address you, putting my ideas in writing, which I shall now endeavour to do.

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 lumberman this district of country was immensely rich in pine, and to a lesser extent in spruce, cedar, hemlock and other woods. For the last sixty years or more, and perhaps more particularly for the past thirty or forty 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 to 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 under-sized 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 very 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 lesser 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 lesser of all the dangers and one that cannot be very well 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 organization 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 possible dangers surrounding the several situations to be so guarded. The whole grand system of organization 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 organizations dealing with this district separately, or whether there should be one organization 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 organization 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

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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 it 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 lumbermen 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 had 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 license holders, and they are two evils which in the best and truest interest of the province require immediate and most efficient remedy.

Finally, let me say that I am sorry to have troubled you with this long letter. My only excuse is that I am thoroughly in earnest in this matter, and desire to lay my views before you as fully as correspondence will permit. 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. I cannot think that any written or verbal statement can fully impress the importance of this matter upon you. Nothing would be so useful as to see the real conditions with your own eyes, and I will make this proposition. If you will come with me for a few days, and make a short tour of the Gatineau district, I will take you round comfortably, and I will give you a practical illustration of the truth of every word I have stated. Such a trip would be most useful to yourself, and of the greatest possible value to the province. Mr. Andrew Thompson of Quebec, I think, would consent to join us if you will make the trip.

Again apologizing for this very long letter,

I have the honour to be, sir,

Your obedient servant,

(Sgd.) W. C. EDWARDS.

## APPENDIX "E."

### FISHERIES AND FOREST.

OTTAWA, 27th January, 1894.

GEO. JOHNSON, Esq., Statistician, &c.

DEAR SIR,—Your letter to hand of the 11th instant, asking information on the question, "What influence has the denudation of the forest upon river fisheries?" You draw my attention to a conversation we had of a passing character on this subject, on which we both agreed, that the effect of the denudation of the forests produced injurious influence upon river fisheries.

On this subject I am fully confirmed in my belief, after many years of observation and experience, that the cutting away of the forests is not only injurious, but also brings about the extermination of many descriptions of fish, especially those of the higher order, such as belong to the salmon family.

Many rivers and streams that were teeming with fish of the salmon and trout species when the country was in its primeval state, or at the time of the first settlement of the country, have now become almost depleted of these better kinds, brought about by the effects of clearing off the forests and bringing the land under cultivation for cereal and farming purposes generally.

The causes for this loss of fish-life are many. The cutting down of the forests and opening up of the country generally decreases the rainfall, which in a large measure becomes absorbed into the cleared and arable lands, thus reducing the volume of water which originally fed the streams. The cutting away of the forests also gives increased strength to the sun's rays upon this reduced flow of water, causing a much higher

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temperature to what it was when in the normal state; thus making the streams unsuitable, and unhealthy for the trout and other fish at first indigenous to them, and these streams are now partially replaced with several species of the lower order, such as catfish, sunfish, perch, pike and others of a kindred nature, the better kinds of fish by this higher temperature of water having been driven from their natural habitat, they cannot exist in it.

Again, the clearing away of the forests, while it may be generally advancing agricultural pursuits, nevertheless acts in the reverse way with the fish cultural products; the refuse and other foul matter, from barnyards and turnpike roads, together with the sewage and drainage and noxious matter from saw-mills and manufactories, all leading into these streams, make them as it were public drains instead of the channels of pure liquid water which they were before this transition of the forests took place. All these injurious results combined, produced from the cutting away of the forests, have in many cases and in many particular localities so changed the streams from their original standard as to make them quite unsuitable for the habitation of the more valuable kinds of fish, and in many cases have brought about a total extermination of fish-life, (from their once numerous abodes) originally provided by nature for man's food and comfort.

There are many other evil results in addition to those mentioned. All these with the so-called onward march of progress to supply the sordid wants of men irrespective of consequences for the future, have brought about this sad state of things, and raised a problem which will be found very difficult to solve.

I am, yours respectfully,

(Sgd.) SAM. WILMOT,  
*General Supt. F. C.*

## APPENDIX "F."

### LOWERING OF LAKE ONTARIO.

An interesting paper was read at the Canadian Institute on Saturday evening, 10th February, 1894, by Mr. Kivas Tully, C.E., on "The Fluctuations of Lake Ontario," being a continuation of a former paper read at the Canadian Institute on the 22nd March, 1879, making a total period of forty years. As the survey of the great lakes has been completed by the United States, Mr. Tully was enabled to give accurate information as to the watershed, water surface and levels of the lakes, which could only be considered approximate in the former paper, though procured from the best authorities. The great decrease of nearly three inches in the average rain and snowfalls in the last fifteen years, as compared with the previous twenty-five years, was ascribed to the destruction of the forests, without much attempt to replace them by planting trees. The decrease in the average snowfall is corroborated by the decrease of more than three inches in the mean average level of Lake Ontario, for the last fifteen years. These decreases were substantiated by the records of the Meteorological Observatory for the past fifty years, which show a diminution of 2.602 inches, the figures being 36.940 inches as the mean of seventeen years in 1858, and 34.338 inches mean of fifty years in 1891. These facts deserve the serious consideration of the whole community, particularly the farming portion, as a diminution of rainfall means a decrease in the fertilising of the soil.—(*Toronto Empire*, 13th February, 1894.)

## APPENDIX "G."

## UNITED STATES CONSUMPTION OF WOOD.

(From Bulletin No. 10, Forestry Division, United States Department of Agriculture.)

According to estimates based upon census and other figures, the United States use 22,000,000,000 cubic feet of wood annually. Of this enormous amount (about 350 cubic feet per capita), over 4,000,000,000 cubic feet of the best timber are made into lumber (between 30,000,000,000 and 40,000,000,000 feet board measure). Railroad construction requires about 500,000,000 cubic feet, and fencing takes an equal amount; but by far the largest consumption is for firewood. An uncertain amount is burned up every year in forest fires which rage over the western mountain country especially, and which swell the total consumption, probably, to beyond 25,000,000,000 cubic feet annually. During the last three decades an increase of about thirty per cent in consumption, for each decade, is indicated. The area covered with wood growth is less than 500,000,000 acres. If all the land area not known to be treeless or in farms, were under forest, the acreage would not exceed 850,000,000 acres, but the lower figure is, probably, more nearly correct.

From the careful statistics of the German Government and from the records of private forests, we know that the annual growth of wood per acre and year, does not average more than fifty-five cubic feet, though, under favourable conditions, it may rise to double that amount with some species. In this yield are included branches and smaller dimensions, down to three inches diameter, which are not used in the United States. If we refer only to the production of such sizes as are used in the United States, their timber at the age of 125 years would be found to have grown at least not more than thirty-five cubic feet per acre annually. The present acreage of the United States, therefore, even if well stocked and well managed, could not produce the annual consumption. But we know that much of it is badly stocked, occupied with poor timber and not cared for. The United States are, therefore, consuming much more than the area reproduces, probably double this amount, and with every year the disproportion grows. Were we to assume that 10,000 feet board measure is now standing on every acre of the whole forest area—an extravagant estimate even with the enormous stumpage of the Pacific coast forests—the area of the United States could not supply their needs for much more than over 100 years, the time it takes to produce a good sized saw-log. Most of the timber now being cut is over 200 years old. The probabilities are that the end will be visible much sooner. For the white pine, the end—speaking relatively, not absolutely—is now in sight, and the same is true for walnut, yellow poplar and ash.

B. E. FERNOW,  
*Division of Forestry.*

## APPENDIX "H."

## EUROPEAN FORESTS.

The table\* of the areas of European forests has been prepared from the latest available information, chiefly from returns obtained, expressly for this report, by the Foreign Secretary, Lord Rosebery, from the British representatives in the different countries.

In Germany, France and Austria, their example being followed by Switzerland, Italy, Roumania and others countries, the public forests, and to a great extent those belonging to private owners, are cultivated as carefully and scientifically as a well managed farm. Only the annual crop is consumed, the forest not being destroyed but maintained in perpetuity. To utilize the yearly growth and equalize the supply the most approved plan is to divide the forest into compartments, each with trees of ages differing

\* See Statistical Table 3a.

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from the others, so that in succession they are ready to be cut. At the time of felling, some standard trees are left to seed and to shelter the young seedlings, which thus take their place in the rotation, any gaps being filled by planting if necessary. The general plan thus briefly sketched is of course subject to modification from various causes, duly considered by the trained forest officers. Another plan, called *jardinage*, is to select each year and cut a certain number of the mature trees in a forest of all ages, taking care not to injure the growing timber, and that young trees, seeded or planted shall fill the place of those cut. Some such method must be adopted at first even when the division into compartments is aimed at ultimately. About twenty-five per cent of the area of the country thus treated as cultivated woodland is able to supply the wants of the dense population of European countries while conserving the forests. In France, Germany, Austria, Italy, Switzerland and some other countries, even private owners are not allowed to cut their forests without the sanction of the authorities, nor without replanting, especially on the sources of streams, on hills where the soil is liable to be washed away, or in places where protection is needed against avalanches, &c.

In some other European countries such as Norway, Sweden, and till lately northern Russia, such cultivation and conservation of the forests is not at all or little practised, the forest being depleted for local use and for exportation as on this continent.

In view of the statement often heard that our pine forests could not be thus treated so as to maintain them undestroyed, it is interesting and instructive to note the proportion of coniferous forests in European countries where scientific forestry is successfully practised.

PROPORTION OF CONIFEROUS FOREST.

COUNTRY.	Coniferous.	Deciduous.
	per cent.	per cent.
Austria.....	72	28
Hungary.....	22	78
Belgium.....	33	67
France.....	33	67
German Empire.....	67	33
Holland.....	40	60
Italy.....	31	69

The forest statistics of some of the subdivisions of the Austrian and German Empires show this large proportion of coniferous trees even more forcibly. Bohemia has 82 per cent pine, 12 per cent mixed, and 6 per cent hardwood. Prussia has 67 per cent coniferous; Saxony, 86 per cent; Hesse, 39 per cent, and Wurtemberg, 58 per cent, with 9 per cent of mixed forest. The skilled foresters of Europe find no more difficulty in preserving and perpetuating these coniferous forests (largely pine), while obtaining a yearly supply from them, than in the case of hardwood forests.

The table of forest areas in other parts of the world shows that some of the British colonies and dependencies are paying attention to the preservation and reproduction of their forests. In India such a system has long been established and conducted with great success by an able staff of forest officers, who had at first to obtain their training at the forestry schools of France and Germany, but such an institution is now in existence in England. In Australasia and South Africa the Governments have also recognized, as will be seen, the necessity for the conservation and extension of their forests.

## GERMANY.

Germany stands in the first rank of the countries practicing scientific forestry. The administration and methods differ somewhat in the various States composing the Empire, but the Kingdom of Prussia may be taken as indicative of the general practice. The principles on which the management of the State forest rests is thus stated by Donner, the Oberland fürstmeister or Chief of the Forest Service:—

"The fundamental rules for the management of State forest are these : first, to keep rigidly within the bounds of conservative treatment ; and second, to attain, consistently with such treatment the greatest output of most useful products in the shortest time.

"The State believes itself bound, in the administration of its forests, to keep in view the common good of the people, and that as well with respect to the lasting satisfaction of the demand for timber and other forest produce, as to the numerous other purposes which the forest serves. It holds fast the duty to treat the Government woodlands as a trust held for the nation as a whole, to the end that it may enjoy for the present the highest satisfaction of its needs for forest produce and the protection which the forest gives, and for all future time, at least an equal share of equal blessings.

"The forest is a trust handed down from former times, whose value lies not only in its immediate production of wood, but also essentially in the benefit to agriculture of its immediate influence on climate, weather, protection in various ways, the conservation of the soil, &c. The forest has significance not only for the present, nor for its owner alone ; it has significance as well for the future and for the whole of the people."

Another authority says of Prussia :—

"It has therefore steadily refused to deliver its forests to more or less speedy destruction by allowing them to pass into the hands of shorter lived and less provident owners. Even in the times of greatest financial difficulty, when Prussia was overrun and nearly annihilated by the French, the idea of selling the State forests was never seriously entertained."

The organization of the Prussian Forest Service is as follows : It is under the Ministry of Agriculture, State Lands and Forests, having for its immediate head the Oberland fürstmeister or Chief of the Forest Service. In the central office is the Bureau of Forest Surveys and Working Plans, which is charged with the formation of ranges, each under the charge of an executive officer, their subdivision into blocks, and a further division into compartments ; with the surveying and estimating of the forests and the timber ; the determination of the yield that may properly be utilized ; and the construction of the working plans revised at intervals of five and ten years.

Over each of the thirty five divisions there is a council to control the forest business within its sphere, the Oberfürstmeister and Fürstmeister being members. They inspect the 680 Oberförsters, who are charged with the actual management.

The training of the forest officers is as follows : After graduating from a gymnasium, there is a year of practical work under an Oberförster, then two years at a forest school, followed by a year of jurisprudence and political economy at a university. The examination, if successful, is followed by two years of travel and work. Five months of this must be spent in the practical administration of a range under an Oberförster, four months in the preparation of working plans, and six months in discharge of all the duties of an ordinary forest guard. Then follows the final examination, which having passed, he becomes a forest assessor, in due time to become an Oberförster, with the control of a range of some 10,000 acres.

Subordinate to these officers and under their direction are the various grades of forest guards who do the actual work of protection, planting, felling, &c., and who are also thoroughly trained and tested.

In the other portions of the Empire the State forests are under much the same system. There is more difference as to the next class of forest property, that of the municipalities and other public bodies. In all, however, improvident and wasteful methods in the treatment of these forests is absolutely prevented, and they are under the control of the State forest officers.

Even private forest owners are subject to the intervention of the State, dangerous deforestation being prevented, especially in the case of what are termed "protection forests." Where the owner is unwilling to suffer these restrictions the State will buy him out.

GRAND DUCHY OF HESSE.

Date.	Country.	Per cent.	Forest lands, acres.	State or Crown, acres.	Communal, &c., acres.	Private, acres.
1887.....	Hesse, G. D.	32	612,663	170,895	234,599	207,169

There i forests.

Private High on Coniferous f

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Country

Prussia.....  
 Bavaria.....  
 Wurtemberg..  
 Saxony.....  
 Baden.....  
 City of Zurich.

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\*E. B. Ferno †Increased t

There is a thoroughly organized forest staff, supervising private as well as public forests.

Private forests cannot be uprooted without ministerial approval.

High or regular forests are 86½ per cent. low and medium growth 13½ per cent. Coniferous forest, 39 per cent.—U. S. Con. Rep., Vol. 25, 1888, page 1.

\*REVENUE AND EXPENDITURE OF STATE FORESTS.

Countries.	Forest Area.	Total Expenditure.	REVENUE.		EXPENDITURE PER ACRE.						
			Gross.	Net.	Total.	Percent of gross revenue.	Adminis- tration & protection	Marking crops.	Cultiva- tion.	Roads.	Net Revenue per acre.
Prussia.....	6,000,000	8,000,000	14,900,000	6,000,000	1.33	58	0.48	0.30	0.14	0.06	0.96
Bavaria.....	2,300,000	3,150,000	5,880,000	2,730,000	1.37	53	0.64	0.37	0.11	0.11	1.19
Wurtemberg.....	470,000	1,025,000	2,260,000	1,235,000	2.17	45	0.87	0.92	0.22	0.33	2.63
Saxony.....	415,000	1,040,000	2,750,000	1,710,500	2.50	37	0.65	0.81	0.11	0.21	4.11
Baden.....	235,000	404,000	1,000,000	686,000	1.54	40	0.22	0.83	0.15	0.12	2.00
City of Zurich.....	2,750	14,000	26,000	12,000	5.00	54	1.14	2.10	0.16	1.14	4.40

FRANCE.

For centuries the necessity for preserving the forests has been felt in France, and important forest laws were passed in 1569. The present Forest Code dates from 1827, having been little changed.

The forest administration is under the Minister of Agriculture, who is also president of the Forest Council, which includes the Director of Forests and the three administrators of the different bureaus. Under them are thirty-six conservators, who are the higher inspecting and controlling officers; 225 inspectors in charge of divisions; 242 assistant inspectors, the executive officers personally directing the work in their cantonments, and 328 *gardes généraux*, with similar duties. Besides these are about 3,500 forest guards of various grades.

The training for the forest service is far less protracted than in Germany, taking only a third or fourth of the time, while the efficiency of the staff is unquestionable. There is only one higher forestry school, that at Nancy, through which all the candidates must pass, having two years of study there. There is also a professional school at the *Domaine des Barres* for forest guards.

The woodlands of the communes and public institutions, amounting to 4,715,124½ acres, are under the control of the forest administration. These bodies may make no clearing in their forests without an express permit from the president. Communal forests can never be divided among the inhabitants. A quarter of the woodland area must always be placed in reserve when these public bodies possess at least seven and three-quarter acres of forest. If chosen by these bodies, the forest guards must be approved and commissioned by the forest administration, which also controls the fellings, sales, &c., the expense of this management being met by a fixed tax.

Private owners are not exempt from control. They may not root up or clear their woodlands without notifying the forest service four months in advance, when the clearing may be forbidden if the forest is deemed necessary on any of the following grounds: To maintain the soil upon mountains or slopes; to defend the soil against erosion and flooding by rivers, streams or torrents; to ensure the existence of springs and water-courses; to protect the dunes and seashore against the erosion of the sea and the encroachment of moving sands; for purposes of military defence; for the public health.

\*E. B. Fernow, U.S. For. Div. Bulletin No. 5.

†Increased to 4,738,464. See French Forestry Report, 1894.

A proprietor clearing his forest without permission is subject to a heavy fine and may be forced, in addition, to replant the area which he has cleared.

Under this provident system the forests of France have, of late years, increased rather than decreased. Over 350,000 acres have been reafforested in connection with the extensive engineering works to control the torrents in the Alps, Pyrenees and Cevennes. The plantation of the dunes and landes has also been carried on systematically on an extensive scale, transforming into a source of profit what was once a cause of danger and destruction.

Even with such scientific forestry, France does not draw from its forests sufficient timber for the wants of the country. This is shown plainly by the following quotation from the description of the French forests by Major Bailey, an expert in forestry, whose account is endorsed by the authorities of the French forest administration. He says:—

“Of the 21,500,000 loads of wood produced, about 4,000,000 loads were timber and the rest firewood. The latter sufficed for the national requirements, but the former was far from doing so; for the imports of wood of this class exceeded the exports by 2,062,432 loads, valued at £6,408,000, that is to say, that it was less than two-thirds of the amount required. The question of foreign timber supply is, therefore, a very important one, even for France, which has seventeen per cent of its area under forest.”

—Major F. Bailey, R.E. Vol. XI. Trans. Scot. Agric. Soc.

The French Forest Administration in its report of 1892 (contained in the report of the Department of Agriculture) gives a full statistical and descriptive account of the forests in its charge at the beginning of 1893.

The areas under the control of the forest service were as follows:—

	Acres.
Forests of the public domain.....	2,691,156
Forests of the communes and public institutions.....	4,738,464
Total under forest service.....	7,429,620

This is estimated at 5·6 per cent or about an eighteenth part of the total area of France, the forests and woodlands of private proprietors, amounting to more than 16,000,000 acres, not being included.

It is remarked in the report that:

“Although designated, according to custom, by the name of forests, the properties which compose the domain controlled by the forest agents are not entirely wooded. They comprise, besides the forests properly so-called, considerable stretches of land scarcely occupied, or even bare, sandhills, naked rocks, &c. There have accordingly been set aside the areas occupied by re-afforestation, the litoral zones of the region of the *dunes* or sandhills, the bare lands or pastures, the shelter zones of the high mountain regions and the tracts specially maintained for hunting and shooting.”

The following is the result of this classification:—

Class.	Total areas.	Forests properly so-called.	Unproductive area.	Percentage unproductive.
	Acres.	Acres.	Acres.	
State forests.....	2,691,156	2,206,175	484,981	18·0
Forests of communes and institutions.....	4,738,464	4,565,358	173,106	3·6
Total.....	7,429,620	6,771,533	658,087	8·8

\* *Sarbage* is the ground, the ashes practised in the A  
† *Forestage* is the the whole of a mountain slopes w

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"It will be remarked that the proportion of unproductive area is five times greater in the State forests than those of the communes and public institutions; eighteen per cent of the one and 3.6 per cent of the other. This fact is easily explained.

"Properties belonging to the communes and public institutions are not placed under the control of the forest service unless they form forests capable of regular utilization or are composed of land convertible into woodland with relative ease. When some unproductive portions are included it is from the necessity of withdrawing these tracts by an effective supervision from causes of degradation which might have serious consequences for the existence of the forests, for the security of dwellings and of neighbouring cultivated lands.

"The State, on the contrary, while it is a proprietor of productive forests, has also to consider public utility. Charged with the duty of arresting the invading sandhills and of remedying the disasters arising from the deforestation of the mountains, the State holds and even acquires each year tracts of land, which not only bring in no return, but are a cause of expenditure because of the cost of their superintendence and of the works designed to render them accessible, to hinder their degradation and to cover them with vegetation.

"But if these tracts make no return to the State, considered as investments, on the other hand they are of an incalculable benefit to the State as representing the interests of the community, since they protect villages, roads, railways and cultivated lands against invasion by sands, avalanches or torrents. The damage done by torrents may be reckoned by millions, and we may also estimate by millions the profit derived by the country from unproductive forests, which prevent the formation of new torrents or have removed those which recently worked their ravages."

There follows a table giving the areas in the 87 departments of the forests under the control of the forest service, distinguishing those of the State from those of the communes and public institutions, the productive from the unproductive.

Taking the whole of these forests the 27 departments having more than 98,840 acres each (40,000 hectares) are grouped on the south and east frontiers, bordering on the Pyrenees and Alps, forming the great forest region of the north-east and covering the Island of Corsica. These 27 departments contain 72 per cent of the total area under the forest administration.

Appended to this report of the French Forestry administration there are 20 maps showing very clearly by the depth of colour the distribution of the public forest in the different departments; these comprise the total areas, the unproductive areas, the State forests, the forests of the communes and public institutions, productive and unproductive areas, coppice, coppice under standards, coppice under conversion, high forests, quantity and value of production, and production of oak and coniferous woods.

From these maps, especially that showing the unproductive area of the state domain under the forestry service, it may be seen that land of this description is chiefly in the departments bordering on the Alps and Pyrenees and on the southern part of the west shore. This is owing to the large tracts that are under process of reforestation, on the mountains to control the torrents and on the *landes* and *dunes* to fix the sand.

In passing on to consider the methods of treatment of the forests, the unproductive areas are excluded, only the productive forests and woodlands being included.

The productive State forests are divided as follows:—

	Acres.	Per c.
Coppice, coppice * <i>sarté</i> , coppice † <i>furté</i> .....	55,798	2.5
Coppice under standards.....	645,017	29.2
Coppice in process of conversion.....	368,811	16.8
High forest.....	1,136,549	51.5
<b>Total.....</b>	<b>2,206,175</b>	<b>100</b>

\**Sartage* is the treatment where the chips, twigs, &c., from cutting the copsewood are burnt on the ground, the ashes manuring the soil for a cereal crop between the stools the following year; it is chiefly practised in the Ardennes.

†*Furtage* is the selection of the coppice shoots for cutting at a certain size at intervals, instead of clearing the whole of a certain area; it is practised chiefly in the valley of the Seine for fuel, and in coppices on mountain slopes where total denudation would be hazardous.

As coppice produces chiefly firewood, with decreasing demand the State has aimed at reducing the proportion of its domain thus treated, so that it amounts at present to only 2.5 per cent. Part of this consist of the woods of hohn-oak in the departments of Vaucluse and Var, that tree producing firewood, charcoal and tan bark, but not being suitable for the growth of timber.

The coppice under standards with its production of timber and small wood, is found especially remunerative near the large towns and coal mines, where the periods of cutting are extended so that the copsewood affords a large proportion of mine props, &c. It amounts to 29.2 per cent.

The coppice in process of conversion into high forest amounts to 16.8 per cent,

The high forests occupy more than half of the productive area of the State forests, 51.5 per cent. At the head are the fir and beech forests of the Vosges, the pine forests of Corsica, the beech forests of the Lower Seine, the oak forests of Allier, and the maritime pine forests of Gironde and the Landes, the latter being of recent creation to bind the shifting sands.

The productive forests and woodlands of the communes and public institutions are divided as follows :—

	Ares.	Per c.
Coppice, coppice <i>sarté</i> , coppice <i>sureté</i> . . . . .	672,222	14.7
Coppice under standards . . . . .	2,429,586	53.2
Coppice in process of conversion . . . . .	45,338	1.0
High forest . . . . .	1,418,211	31.1
Total . . . . .	4,565,358	100

The report remarks : "The proportion of the forests of the communes and public institutions subject to treatment as simple coppice (14.7 per cent) seems high enough as compared with that of 2.5 per cent in the State forests. But one must not lose sight of the fact, that when it is a question of regulating the treatment of a communal forest the administration is bound to give great weight to local wants, and that in the cold mountain regions where transportation is very difficult a hardwood coppice placing within reach of the commune a fuel of good quality, may often render more service than a coniferous forest the produce of which, of little value as fuel, would not sell as timber for want of a market.

"Coppice under standards occupies 53.2 per cent of the area of the forests of the communes and public institutions. It is the system preferred by the proprietors, who hesitate to invest a considerable capital in their forest domains and who yet wish to improve the yield by the production of a certain quantity of timber, principally oak. The temperate regions of plains and hills are particularly fitted for coppice under standards. These conditions are met with in the north-west of France where the communal forest property is very extensive; it is easy, therefore, to understand the important place occupied by the coppice under standards in the forests of the communes and public institutions.

"The coppices in process of conversion into high forests occupy only one per cent of the total area of the forest of the communes and public institutions. There is nothing astonishing in this. The communes and public establishments generally wish to realize the whole of their forest revenues as soon as they are available; their financial situation, the daily wants which burden them, make this a necessity. But they know that a coppice cannot be converted into high forest without augmenting considerably the capital in timber left standing, which necessarily exacts, during a period more or less prolonged, an accumulation of savings in the shape of standing timber. These savings can only be made by a diminution of revenue. Nor are all the conversions in progress in the communal forests the result of an aim methodically pursued. A good number of them are the consequence of circumstances created neither by the administration nor the communes. Thus in the Pyrenees, the Alps and the central forest, certain coppices, which remained unworked for want of markets and became too old to push fresh shoots, have grown into high forests and later will be renewed by sowing.

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"The high forests of the communes and public institutions, 51.1 per cent, are principally to be found in the mountainous departments of the east and south and in Corsica. These forests are principally coniferous, more or less mixed with beech. The communes own very little oak forest, the communal forests of this wood being oftentimes treated as coppice under standards.

The production in quantity for the year 1892 was as follows:—

From the State forests:

Wood.....	96,135,860 cubic feet.
Cork.....	257,497 lbs.
Tanbark.....	31,237,859 do
Resin.....	4,170,662 do
Total value \$5,047,645.	

From the forests of communes and public institutions:

Wood.....	102,439,938 cubic feet.
Cork.....	673,285 lbs.
Tanbark.....	51,051,702 do
Resin.....	1,806,229 do
Total value \$6,377,704.	

From all the forests under control of the forest administration:

Wood.....	265,575,798 cubic feet.
Cork.....	930,782 lbs.
Tanbark.....	82,289,561 do
Resin.....	5,976,891 do
Total value \$11,425,349.	

The average yearly produce per acre, calculated on the productive forest area only is as follows:—

Quantity (wood) per acre:

State forests.....	43.58 cubic feet.
Forests of communes and public institutions.....	37.11 do

Value per acre:

State forests.....	\$ 2.29
Forests of communes and public institutions.....	1.40

There is a marked superiority in the returns from the State forests. The products which they furnish are at the same time greater in quantity and of better quality.

The quantity of material produced has varied with the system of treatment as is shown in the following table:—

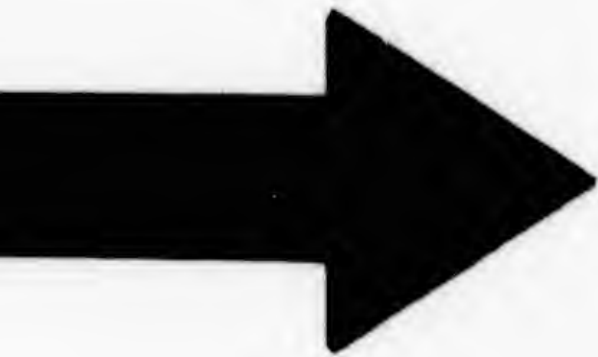
PRODUCE BY THE ACRE IN CUBIC FEET.

	Coppice.	Coppice under standards.	Coppice under conversion.	High forests.
State forests.....	13.68	48.90	41.07	42.85
Forests of communes and public institutions.....	17.87	49.01	23.52	26.28

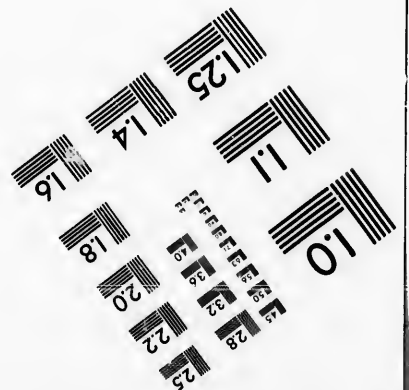
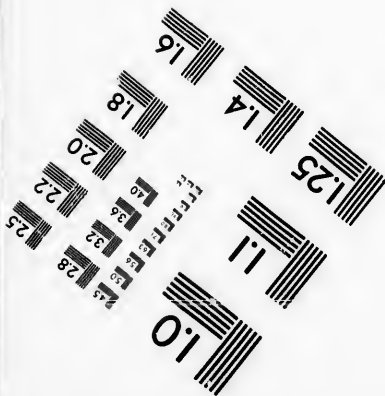
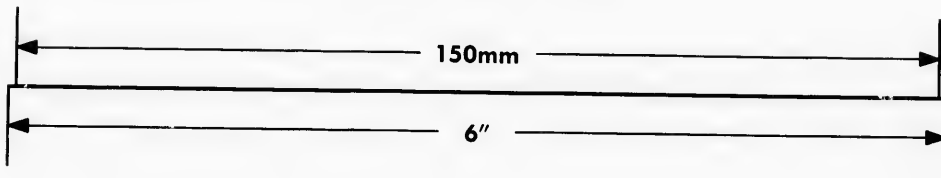
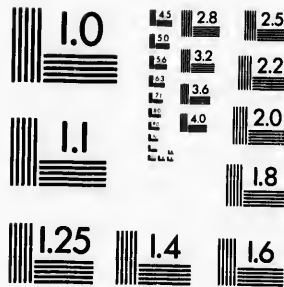
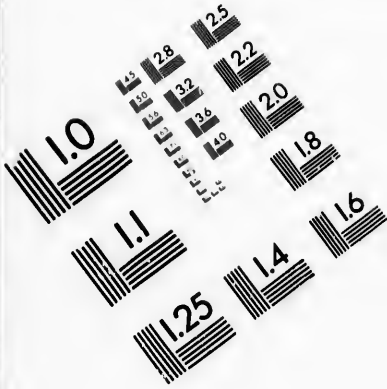
The production from the coppices is evidently greater in the forests of the communes and public institutions than in the State forests. This arises from the State having retained as coppice only the poorest of the forests.







# IMAGE EVALUATION TEST TARGET (MT-3)



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As to the coppices under standards the production is nearly equal in the two classes.

In the case of coppice in process of conversion the return is much larger in the State forests. The groves which the State has resolved to convert into high forest have been chosen from the best of the forests, those from which they calculated to obtain choice timber.

The high forests of the State have a product far exceeding that of the high forests of the communes and public institutions.

Of the products of the forest under the control of the forest administration, 81·3 per cent are hardwood and 18·7 per cent coniferous wood. The timber is 23·1 per cent, (oak 7·04, other hardwood 2·1 and coniferous wood 13·6); poles and props 1·03 per cent and firewood 75·6 per cent. (70·9 hardwood and 4·7 coniferous).

#### AUSTRIA.

"The paternal government of Austria prescribes the most stringent laws regarding the culture and preservation of the forests belonging to the imperial domain, to municipalities or to private individuals. According to our ideas these restrictions are rather autocratic; but they serve their purpose and the Austrian woodlands are renowned for the good and exemplary care taken in their preservation. The latest statistics place the productive land of the empire at 28,406,532 hectares; of these 9,227,061 hectares are forest lands, of which 1,381,433 are hard woods, 6,587,853 pine woods and 1,257,775 brushwood. The forests cover about the fourth part of the empire and are of great value. Their cultivation and preservation and the administration of the laws with reference thereto are entrusted to the ministry of agriculture, the provincial president and district captains. Their subordinates must all pass an examination. \* \* \*

"A forest register is kept and maps are drawn of each district, which specify the number of acres covered by forest, its condition, age and state of growth. The expenditures for government forests are 3,546,240 florins; revenues, 3,951,650 florins; showing a profit of 405,410 florins. The government forests contain 952,689·96 hectares, municipal 1,297,238·21, private 6,977,133·03. The largest private owners are: the Emperor, 35,000 hectares, Imperial family, 25,000, Archduke Albrecht, 115,000, Prince Johann Lichtenstein, 136,103, Prince J. A. Schwarzenberg, 110,718, Count Schönborn, 124,563, Prince of Saxe Cobourg, 74,181, Baron von Sina, 60,000, Prince Esterhazy, 85,000."—U. S. Con. Rep. No. 131, 1891.

#### SWITZERLAND.

"There is a federal bureau of forestry, known as the third division of the department of Commerce and Agriculture, that assumes direct management of the federal forest districts (mountains or Alps) and the forests outside of this district are under the control of the respective cantonal governments. The federal forest inspector is vested with the power to see to the enforcement of the forest police laws and regulations both of the Confederation and the cantons. In all the cantons with the exception of Basle Land, Basle City and Geneva, there is a chief forester under whom the entire administration is placed. In addition to him nearly every large city and commune have special skilled and educated foresters for the more careful attention to their local forests. All, however, are subject to the orders and the immediate direction of the cantonal chief forester, as he is subject to the authority of the federal department of forestry.

"The destruction of forests is well safeguarded by the federal law of March, 1876, and previous to its enactment most of the cantons had rigid state laws against any dangerous clearing of the forests. As a rule any person, commune or corporation wishing to make a clearing must obtain the consent of the forest director, or if the proposed clearing is included in whole or part within the federal forest district, the assent of the proper government officials is required. As a condition to the granting of the permission, the parties must either replant the clearing with shoots or pay a sum sufficient to have it done."—U. S. Cons. Rep. No. 74, Feb. 1887, pages 428-9.

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The Swiss Confederation has the right of supervision over the police of the forests and of framing regulations for their maintenance. The entire forest area of Switzerland is 828,770 hectares in extent. The district over which the federal supervision extends lies to the south and east of a tolerably straight line from the eastern end of the lake of Geneva to the northern end of the lake of Constance. It comprises about 452,326 hectares, and the federal forest laws apply to all cantonal, communal and municipal forest within this area, those belonging to private persons being exempt, except when from their position they are necessary for protection against climatic influences. In 1876 it was enacted that this forest area should never be reduced; servitudes over it, such as rights of way, gathering firewood, &c., should be bought up; public forests should be surveyed, and new woods planted where required, subventions for the purpose being sanctioned. There have been bought up (1881-91) 2,057 servitudes, costing 726,938 francs; up to the end of 1891 the cadastration of 93,380 hectares of forest had been executed and in the year 1891, 700,000,000 trees were planted. Subventions are also granted to the free forest districts, comprising 3,827 sq. kilometres of forest. In most cantons forest administration is conducted by a department under a member of the government, assisted by a chief forester, but in some by a committee chosen directly by the people.—Statesman's Year-Book, 1893, page 1006.

## RUSSIA.

About 50 years ago, in consequence of the attention that had been drawn to the depletion of the woodlands in Russia, steps were taken for the organization of the Crown forests. It was not, however, till 20 years later that the present organization was established, and considering the vast field to be covered, it is not surprising that forestry is comparatively in its infancy in the Russian empire, and that much of the forest land is not yet subject to its influence. On the staff, there are 350 forest and field surveyors, whose duty it is to make plans for exploiting the forests of which they have determined the boundaries and made the necessary subdivisions. These plans are revised after a lapse of ten years, and they are carried out, and the practical work done by a large staff of local forest officers. The great forests of the north have, however, not yet been subjected even to this preliminary process of surveying. It is in the other parts of the empire, where the forests are more accessible, and their maintenance more immediately urgent, that the forest staff have already done much good work. Their efforts have not been restricted merely to conservation, for on the steppes, the Russian prairies, extensive planting has been undertaken; the plantations already amounting to 130 square miles, while additions of about three square miles are being made each year. Much successful work is also being done in binding shifting sands by planting suitable trees.

While the Crown forests are thus being cared for, those of corporations and private owners are not exempt from control. In 1888 a law was passed for the protection of forest lands. By this law throughout European Russia forests may be declared "preserved woodlands" on the following grounds:—that they serve as preventives against the formation of dry sand tracts and their encroachment along sea-shores or the banks of navigable rivers, canals and artificial reservoirs; that they protect from sand drifts, towns, villages, cultivated land roads, &c.; that they protect the banks of navigable rivers, canals and spring sources from landslides, overflows or injury by the breaking up and passing of the ice; that growing on hills, steep places or declines, they serve to check land or rock slides, avalanches and sudden freshets; and all forests that protect the springs and sources of rivers, and their tributaries. These preserved forests may not be converted into arable land, and even felling may not be practised without official sanction. The scheme of administration of these forests must be approved by the local forest committee, so that there may be constant renewal to replace the cutting. If serious outlay is required the owners may transfer the forests to the government at their estimated value, having a right of redemption for ten years on paying the expenses and interest.

Even forests not comprised in these preserved woodlands, though in the hands of corporations or private owners, are subject to regulations. They may not be cleared

without good grounds being shown; wholesale cuttings that would exhaust the stock of timber and prevent the natural re-growth are forbidden; and the pasturage of cattle is prohibited in young forest. To facilitate these restrictions the owners have to submit plans for cutting to the forest committee for approval, and in case of infraction they have to replant the illegal clearings, or if this is neglected the work is done by the committee at the owner's expense.

In each government there is such a committee for the protection of forests, under the presidency of the Governor General and composed of the representatives of the local administration, the justices of the peace, the county council and forest owners. They have power to declare what shall be classed as "preserved forests," and to sanction the plans of the owners of unreserved forests. In preserved forests these plans are made at the expense of the government, in unreserved forests at the expense of the owners. In each province the government maintains an inspector-instructor, whose duty it is to advise those who apply to him in forest matters, and as far as possible to superintend on the spot all forest work. The government also has established nurseries from which private owners can obtain young trees and seeds at a low price. The owners are allowed to employ as managers of their forests the trained officials, who still rank in the forest corps, and medals and prizes are given yearly to forest owners for excellency in forest culture and management.

Adequate provision is made for instruction. There is at St. Petersburg a Forest Institute in which theoretical training is given, supplemented by practical studies on the ground in the summer, the staff comprising sixteen professors and seven assistants. At New Alexandria in the Vistula provinces there is another Forest Institute, and there are chairs of forestry in a number of colleges and schools. Besides this there are thirteen lower forest schools, where the instruction is largely by practical work in the forests, the trained pupil joining the government forest corps or being employed by private owners.

Forest societies have been formed by private enterprise at St. Petersburg, Moscow and Riga, and are doing much to spread a sound knowledge of forestry.

#### SWEDEN.

"Sweden's lumber export consists chiefly of sawed stuff, four-fifths being deals, battens and boards. The remainder is principally squared timber, usually hewn spruce logs, used for piling; yards, booms and masts, and pit props. For 1881-5, the exports of unmanufactured lumber averaged \$25,864,000 annually. There were also manufactures of wood to an annual value of about \$4,500,000. The production of wood pulp has increased very rapidly of late years. It is made chiefly from spruce. The greater proportion of the wood pulp is consumed at home, yet, in 1885, 16,000 tons were exported, and in 1889, the export had increased to more than 52,000 tons.

"More than one quarter of the entire wooden area of Sweden, or 14,300,000 acres, belongs to the Crown. This is valued at \$13,588,000, nearly \$1 an acre, and in 1888, yielded a net income of \$335,000. These royal timber preserves are managed with scrupulous care. All Sweden is divided into forest districts, and these, in turn, into *revir*. Each district is under the supervision of a chief forest inspector, and each *revir* is guarded by a forest ranger and a number of under-keepers. Only trees marked by them are permitted to be felled. The Crown forests are managed, in fact, on the principle that the increase alone may be cut, and that the forest itself—the capital stock, so to speak—shall stand forever on all Crown lands unsuitable for cultivation. Furthermore, the Government has entered upon an extensive and practical system of planting forests upon desolate and uncultivated areas. These excellent official measures have also had a marked effect upon the owners of the private forests, especially upon the larger proprietors, many of whom are now managing their timber lands as permanent sources of income. It is my judgment, therefore, that the vast forests of Sweden will be preserved and maintained, substantially, as they stand to-day, and that Sweden's lumber export—her greatest source of income—will be kept up and kept good throughout an indefinite future."—U.S. Cons. Rep. No. 125, 1891—pages 227-8.

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NORWAY.

The French Consul at Christiania, gives the following information on the forests of Norway:—

"The forests\* cover a territory of 19,752,393 maal, or 4,803,216 acres, divided as follows:—

	Wooded.	Unproductive.	Total.
State .....	7,748,967	9,895,738	17,644,705
Districts and communes.	1,762,348	345,840	2,107,688
Total .....	9,511,315	10,241,578	19,752,393

"The average value of a hectare (2.47 acres) of forest is 43 crowns (about \$11.60)."  
—U.S. Cons. Rep., Vol. 26, 1888, page 241.

"The forest wealth of Norway has, for a long time, been steadily declining. The forests owned by the State and communities are estimated to cover an area of 1,000,000 hectares, or 2,500,000 acres. Since 1866, the Government has bought about 37,000 hectares of woodland in different sections of the country, but the aggregate forest land of Norway is supposed to have diminished in an equal ratio, by the destruction of private woods. The value of public and communal forests is estimated at \$4,000,000, and they occupy only twelve and a half per cent of the aggregate forest ground of the country, which may be computed at nearly 8,000,000 hectares or 20,000,000 acres. In Sweden, the public forests amount to sixteen per cent; in Bavaria, fifty-one per cent; in Baden, seventy per cent; in Prussia, sixty-eight per cent, and in France, thirty-five and a half per cent of the total forest land."—U.S. Cons. Rep. Vol. 122, 1890, page 394.

"A royal commission was appointed in 1874 to examine the condition of private forests and the general wood supply of the country, and their report was quite alarming. It was estimated that the five southern 'stifts' or provinces of Norway, which together, embrace about 17,000,000 acres, consumed in 1875, 401,000,000 cubic feet of wood, while the reproduction did not exceed 293,000,000 cubic feet, which gave a year's deficit of 108,000,000 cubic feet. Forty years earlier forest statistics recorded a fair surplus of production over consumption, and in 1855 there was nearly a balance. The committee stated that the yearly loss, already so large, must increase for every year, and the Government has no longer any means to arrest the destruction of the forests. Extensive purchases of private forests by the Government were recommended, although the committee did not expect great results from the adoption of this measure alone. The spread of knowledge of rational forestry can have but a limited influence, although the Government has now established a few forest schools in different parts of the country. The only means of protection now left would be a law restricting the disposal of forest property by the private owners and forbidding the destruction of young forest trees. Such a law already exists in France, Italy, Germany and Switzerland, and to a certain extent in Sweden. Its adoption here, was, in fact proposed in 1882 by the Government, but since then no further steps were taken in the matter, public sentiment being much opposed to the restrictions projected. The legislature finally took the matter in hand last year, and there are now many who urge immediate adoption of measures for preserving at least a part of the forests which still form an important factor of the national wealth and the principal resource of a large tract of the country. The forests have lately suffered the loss of many young trees of small dimensions, cut down either for exportation, or for pulp manufacture at the domestic mills. The so-called cellulose wood, prepared from small trees, and cut very short to escape the export duty on wood, is at present in good demand in foreign markets."—U. S. Cons. Rep. No. 122, 1890, page 394.

"Great Britain now takes about two-thirds of the exports of Norwegian wood, viz., nearly 1,200,000 cubic feet per annum." \* \* \* "Australia had in 1889, declined by a third from 1888, but the Cape of Good Hope and Port Natal had in the meantime doubled their consumption of the Norwegian article, sold at good prices.—U. S. Cons. Rep. No. 122, 1890, page 395.

\*Public and not private forest, apparently.

## EXPORTS OF PRODUCTS OF FORESTRY AND WOOD INDUSTRY.

	Kroner.
1866-70 average.....	31,040,000
1871-75 do .....	44,950,000
1876-80 do .....	38,800,000
1881-85 do .....	42,860,000
1881 year.....	44,910,000
1882 do .....	45,890,000
1883 do .....	43,800,000
1884 do .....	49,520,000
1885 do .....	39,160,000

"Of the value above given of the Norwegian forestry products exported in 1885, 31,236,000 kroner belong to timber properly speaking, 5,664,000 kroner to wood pulp, and 1,802,000 kroner to matches.

## EXPORTS OF TIMBER DURING THE TEN YEARS, 1876-85.

	Planned timber. Reg. ton.	Sawed timber. Reg. ton.	Hewn timber. Reg. ton.	Round timber. Reg. ton.	Staves Reg. ton.	Firewood Reg. tons.	Totals Reg. tons.
1876.....	144,199	340,594	134,572	240,846	29,854	42,589	932,651
1877.....	158,279	314,186	191,479	197,292	28,151	31,121	830,598
1878.....	162,198	219,193	97,846	195,429	27,016	35,332	737,014
1879.....	164,770	176,893	102,134	207,417	26,148	29,496	706,858
1880.....	193,654	245,548	165,628	290,739	30,161	29,576	895,206
1881.....	227,088	228,951	80,016	280,429	34,405	31,102	881,991
1882.....	334,044	268,484	66,485	278,520	34,526	36,750	918,809
1883.....	247,667	244,150	66,165	303,007	43,977	40,190	945,156
1884.....	238,954	243,920	69,356	307,826	39,969	39,206	939,231
1885.....	245,936	236,011	59,441	242,666	33,928	42,405	860,387

"The quantity of the exported timber was smaller in 1885 than in any of the previous five years, and was less by 49,000 register tons than the average exports for the years 1881-85, but 40,000 register tons larger than the quantity for the years 1876-80. The exports of sawed and planed timber have during the last years generally been somewhat over 480,000 register tons, after having reached 592,500 tons in 1882, the largest quantity exported since 1873 and 1874, when it arose to 570,000 and 550,000 register tons respectively. Of planed timber a somewhat larger average quantity was exported during the last years than of sawed timber, while in 1877 the proportion was one-third of planed to two-thirds of sawed timber. The exports of hewn timber, *i. e.*, beams, &c., have steadily declined, and amounted in 1885 to not much more than one-half the average exports of the years 1876-80, and to one-third of the average exports of 1871-75. Also the shipping of mining timber and pit props was smaller than in the years immediately preceding.—U. S. Cons. Rep. Vol. 22, 1887, page 777.

"The export of wood pulp rose from 8,540 tons in 1875, to 26,055 tons in 1880, and 90,781 tons in 1885.—*Ibid.*, page 778.

## FORESTS OF BRITISH COLONIES AND DEPENDENCIES.

## INDIA.

Forestry in India is a comparatively modern institution. In former times no doubt considerable areas were scrupulously protected in many parts of the country, but wherever this was the case, the forests were kept as game preserves for the pleasure of kings, princes and great nobles. The idea of conserving forests in order to maintain an uninterrupted supply of forest produce useful and even necessary for the people; the idea of maintaining a proportion of the country under forests on account of the indirect

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benefits conferred on the Empire at large by the very existence of forests, was never thought of by former governments. Even during the earliest times of British sway, the economic value of forests was not recognized, and they were considered more in the light of impediments to the increase of cultivation and consequently to the general prosperity of the empire than otherwise. This period has passed away and the necessity for the maintenance and conservative treatment of forests as a mainstay of agriculture is now almost universally recognized, while forestry conservancy is regarded as a duty of the State.

Naturally incalculable harm was done by the inconsiderate destruction of the forest, especially in the more populated districts, where the demand for new land was greatest and where the forests were often already less than the state of the country demanded. Large areas, though not immediately destroyed, were alienated by settlements and grants, and were thereby withdrawn from further active interference on the part of government. Security to life and property enabled the peasants and herdsmen to graze their cattle far from their homes and unprotected, and at the same time such cattle increased in value. Herds naturally increased, and additional grazing areas being required, these were cleared by fires, thereby opening the way to future famines and distress. Railways soon spread over the country and forest growth disappeared with an incredible rapidity within the reach of their influence, partly on account of the direct demands made on them for construction works—demands which were frequently supplied in a wasteful and reckless manner; partly on account of the increased impetus given to cultivation.

It was only when failures to meet local demands for public works were brought to notice that the value of the forests was gradually brought to light, and it came to be understood that a question of such general magnitude and importance could only be efficiently grappled with by a special organization. It was thus that the forest department came into existence.

As a matter of course, it rested with the government to show the lead, and the first step in the new direction was naturally to ascertain the extent of the forest property still remaining in the possession of the State and to what extent such property was burdened by rights. The Oriental governments, from which the British government inherited its forest property, never recognized the accrual of any prescriptive right; but on the other hand anybody was accustomed, without let or hindrance, to get what he wanted from the forest, to graze his cattle where he liked and to clear jungle growth for cultivation wherever he listed. This state of things, it is self-evident, did not permit of systematic forest management and it became clear that a forest law and a forest settlement were urgently required. It was necessary that the forest law should define the forests in which the right of the State was still absolute; forests which were the property of the State but which were burdened with legal rights, prescriptive or granted; and forests the property of individuals or communities, but in which the State had rights over all or certain kinds of growing trees.

The first Indian Forest Act was passed in 1865, after several local rules and Acts had been introduced and had been in force for a longer or shorter time.

The Act of 1865 was found in actual practice to be wanting in many important respects and was replaced by the Act of 1878. Even in this new Act, however, faults were at once recognized, and separate Acts were passed for Burmah and Madras in 1881 and 1882 respectively.

All three Acts provide for the formation of government reserves and the settlement of rights within them; also for the constitution of village forests. They contain forest police rules, necessary for the protection of government forests and forest produce. The Indian Forest Act contains in addition, provisions for the creation of protected forests. All three Acts provide for the control over forests not belonging to the State if such control appears necessary for the public weal, or if the treatment which such forests have received from their owners injuriously affects the public welfare or safety.

The controlling staff numbers about 170 officers, of whom 50 per cent have received a scientific training in forestry, and were appointed in England by Her Majesty's Secretary of State. Most of these officers were trained in France, and some in Germany.

Totals  
Reg. tons.

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830,508  
737,014  
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In 1885 a forestry school was established in England at Cooper's Hill, near Windsor, with a course of three years, three months of the last year being spent in an excursion to the best European forests. There is also a forest school in India for native assistants.

By fire protection, the regulation of grazing and the general protection of the forests, ample reproduction is, after a shorter or longer period as a rule, ensured in the more valuable forests of India.

The results are seen in the following statement:—

Quinquennial Periods.	Revenue.	Expenditure.	Surplus.
	Rupees.	Rupees.	Rupees.
1864 5 to 1868 9, annual average.....	37,38,189	23,81,732	13,56,457
1874 5 to 1878 9 do do .....	66,55,913	45,76,372	20,79,541
1884 5 .....	1,01,02,420	68,27,373	32,75,047

Dr. Schlick prophesied five years ago, that in twenty-five years the net surplus will be four times the present amount, if the Government of India perseveres in its forest policy as developed in the past.

#### NEW SOUTH WALES.

"The forest area of New South Wales would probably not exceed 30,000 square miles out of a total area of 310,938 square miles. \* \* The country east of the great dividing range is estimated to contain 50,000 square miles, one-fourth of which probably consists of forests."

"There are 47 varieties of the *Eucalyptus* in New South Wales. \* \* The best known of these is the celebrated blue-gum, *Eucalyptus globulus*. This tree grows to a greater height than any other in the world, and sometimes rises to 200 feet before sending out a branch. It reaches a greater height, however, in Victoria and Tasmania than in New South Wales. The highest ever felled in the latter colony was 360 feet, while in Victoria one was felled (at Healsville, 37 miles from Melbourne) measuring 480 feet (14 feet higher than the Strasberg Cathedral). The circumference of this giant of the forest was 100 feet. In Tasmania these trees not unfrequently attain a height of 400 feet."

"There are about 100 different varieties of the acacia in New South Wales." Their bark is used for tanning, and the wood of some species for cabinet work.

Pine trees of various kinds exist, but are scarce and inaccessible.

"With the exception of the Government reserves which include about 5,400,000 acres, all forests or Crown land in New South Wales are common property except for grazing purposes. The Government reserves are, however, of a temporary character, and are reduced from time to time partly because upon careful examination they are found to contain little or no timber, and partly because the Government yields to the pressure brought upon it to put the land up for sale. The Government also controls large areas of unreserved timber lands, but when once sold it has nothing to do with the timber upon them."

"Rights to cut and remove timber from blocks within State forests are sold by auction or by tender at an upset price of £10 (\$48.66) per block of 640 acres per annum, for the term of one year only, unless circumstances should justify the Government in special cases in extending the term to three years, and then in addition to block rental, a royalty will be imposed."

There are also licenses to cut timber from Crown lands at 5s. (\$1.20) for ordinary timber, and 10s. (\$2.40) for cedar. Firewood may be freely cut for use, not sale.

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A forest conservatory bureau is attached to the Department of Mines, the field staff consisting of one inspector, 28 forest rangers, and ten assistants. They have not had a scientific training as in India.

The licenses impose restrictions as to the size of trees to be cut. Trees may not be felled within a chain and a half of a navigable river.

Some planting, but not much, has been done.

The imports are large, being as follows for 1885-6:—

DRESSED.

—	1885.		1886.	
	Sup. feet.	£	Sup. feet.	£
United Kingdom .....	3,522,771	159,840	6,404,523	314,760
New Zealand .....	5,304,866	218,245	5,376,615	198,945
Australia (rest) .....	1,005,899	74,025	1,216,237	81,450
Norway .....	5,423,341	218,600	5,762,179	267,675
United States .....	3,436,799	178,325	4,479,598	187,350
Canada (B.C.) .....	767,319	30,165	113,577	4,000
Other countries .....	3,850	2,295	208,143	10,585
Total .....	19,464,845	882,065	23,561,175	1,007,765

UNDRESSED.

—	1885.		1886.	
	Sup. feet.	£	Sup. feet.	£
United Kingdom .....	1,732,186	61,580	1,519,040	58,225
New Zealand .....	10,537,974	287,880	8,465,633	229,385
Australia (rest) .....	3,261,291	141,615	1,659,728	98,305
Norway .....	783,595	27,975	1,039,042	31,620
Sweden .....	477,314	23,850	513,004	21,000
United States .....	19,728,436	581,140	25,761,156	686,395
Canada (B.C.) .....	9,485,774	272,675	1,808,416	49,000
Other countries .....	172,209	9,989	281,576	9,295
Total .....	46,180,779	1,409,695	41,043,618	1,164,535

U.S. Consular Reports, Vol. 23, 1887.

The following table will show some of the articles New South Wales imported in 1892 and the portion of each she obtained from the United States and from Canada:—

Articles.	Canada.	United States.
	£	£
Dressed timber .....	50,000	46,000
Rough timber .....	46,000	537,500
Doors .....		71,300
Shooks and staves .....		650
Laths .....	1,775	12,475
Shingles .....		5,090

U.S. Cons. Rep. No. 155, 1893, Page 410.

## VICTORIA.

Many years ago attention was called to the wastefulness and improvidence of the dealings with the forest of Victoria, as of other parts of Australia. The timber was not only being diminished by clearings for settlement, by ordinary home consumption and by fires, but immense numbers of standing trees were killed owing to the practice of stripping from them large sheets of bark to cover, perhaps, a mere temporary hut.

In 1876 an Act was passed called the State Forest Act, which provided, first, for the appointment of local forest boards, which were to have the care of reserves and other Crown lands; secondly, for the appointment of foresters by local forest boards; and thirdly, by the promulgation by the Governor in Council of regulations prescribing the duties of these boards. In 1884 this Act was superseded by a new one, which deals with the formation of State forests and timber reserves and their management, and with the management and disposal of timber and other forest produce, not included in the State forests and timber reserves.

The forests generally are worked under the license system, regulated by the rules made under this Act. There are licenses for felling, splitting, clearing undergrowth, the erection of saw-mills, grazing, the removal of bark, &c.

The results of this measure were not equal to the anticipations, the causes assigned for this failure being the bad license system, the ill-arranged classification of State forests, timber reserves and Crown lands, the absence of professional foresters to direct operations, and the neglect to reserve the best natural forests.

## SOUTH AUSTRALIA.

"The planting of forest trees and the conservation of woods and forests very properly receive a large amount of attention in South Australia. The colony is beginning to feel the benefit of it, as a considerable quantity of timber for railway sleepers has been cut during this year, giving a revenue of £2,660 in excess of expenditure, exclusive of special votes. Since the organization of the department ten years ago, £59,043 has been received by it for timber sold, land rented for grazing, &c., and £58,216 has been expended as permanent improvements upon the forest reserves. From the commencement the total net profit made by the department has been £827. The work is very progressive and every year shows considerable advance beyond the previous one. The revenue of the past year was £8,123, or £1,606 in excess of any former year. No less than 165,324 acres in various parts of the colony are forest reserves, and of this 6,685 acres are inclosed for planting. The present total value of the permanent improvements effected by the department is estimated at £150,000 for an expenditure of £58,206 spread over ten years, and more than the whole of which has been repaid by the sales of timber, rents for grazing, &c."—U.S. Cons. Rep., Vol. 23, 1887, p. 741.

## CAPE COLONY.

"In 1880 the question of forest management was brought before the colonial parliament. It was pointed out that the persons in charge had received no special training for the work which had in consequence suffered severely, and a salary for a trained forest officer was voted by parliament. The services of Count de Vasselot, of the French School Forest at Nancy was secured, and he proceeded early in 1881 to organize the present forest department. Count de Vasselot adopted the method of dividing the forests into blocks and subdividing them again into sections. Felling now proceeds regularly in biennial sections, so that the regrowth in the first section cut may develop into mature trees by the time the working of the last section is finished, and there will thus be no occasion at any time to close the entire forest from fellings. The period for the revolution of fellings has been fixed for forty years."—U. S. Cons. Rep., Vol. 24, 1887, p. 360.

"To illustrate the method now used in the colony for the management and conservation of forests, a description of that used in the Knysna, the most extensive and valu-

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able in the colony, will only be necessary. The total forest area of the Knysna is approximately 100,000 acres, of which about three-quarters have been considerably exhausted by reckless and indiscriminate felling. The forest staff at this forest consists of one conservator, three officers of the higher grade and six forest rangers or guards. The work of each officer of the higher grade extends over an area varying, according to circumstances, from 10,000 to 30,000 acres. The timber, or high forest is surveyed by him. He determines the boundaries of series or blocks, and draws up working plans for the formation of sections. All working schemes are submitted to the superintendent of woods and forests, and after their approval the lines are opened, sections surveyed, and trees available for felling counted and stamped with an official mark. The rangers or guards are employed in riding about and reporting infractions of forestry laws. In addition thirteen foresters are employed and distributed over the different forests. Their duties consist in planting and transplanting trees." \* \* \* "Each forester is expected to raise at least 40,000 young trees annually." \* \* \* "There were six foresters in the King William Town forests in 1885, who during that year had 138,080 plants in the nursery, and transplanted into the forest 63,885 young trees." —U. S. Cons. Rep. Vol. 21, 1887, p. 360.

"Over a million plants are now flourishing at Government nurseries." \* \* \* "At the plantation Tokai on the Table Mountain Range, plants have been raised from 150 species of extratropical trees. It is proposed to reforest the whole of the Table Mountain slopes, and in two seasons over 1,000 acres have been planted. Plants are distributed throughout the colony from these nurseries at a nominal rate." U. S. Cons. Rep. Vol. 24, 1887, p. 360-1.

The forestry staff at present consists of one superintendent, three conservators, four assistant conservators, and the necessary staff of forest guards.

## OTHER FORESTS.

### JAPAN.

That Japan is not neglecting the preservation of its forests may be seen from the following account by Heinrich Semler:

"Japan, whose total area includes in round numbers 94,900,000 acres possesses forests of 28,700,000 acres in extent. This people furnishes a shining example in the matter of forestry. Even the old feudal lords were penetrated with the value of the woodlands as they showed by the enactment of vigorous protective laws. When in the recent civil war the Government of the Mikado destroyed the feudal system it declared the forests, as far as they had belonged to the feudal lords, to be the property of the State, and promulgated a forest law which was valid for the whole Kingdom. Accordingly the forests of Japan are about equally divided between the State and private owners. The former manages its woodlands, through a forest service with headquarters at Tokio, where is also the forest school. Founded within the last ten years (from 1888), the school has an average attendance of about 150 and has quite recently been under the charge of Dr. Mayr, whose work on *The Forests of North America* has made his name familiar to the advocates of forestry in the United States. Only a part of the pupils expect to enter the Government service.

"The forest service does not rest satisfied with the present proportion of woodland, but busies itself actively with planting, in connection with which the introduction of foreign species has been attempted.

"There is a notable export of wood from Japan to China, and on the other hand an import from North America to Japan; which last, however, the Japanese soon expect to be able to do without."

### COSTA RICA.

"It is forbidden to cut wood from the national forest without permission of the executive.

"It is forbidden to destroy such trees as exist along the highways, and such trees as may be utilized without destroying them.

"The owners of lands traversed by running streams, on the banks of which the trees have been destroyed, are obliged by law to plant trees along the margins of said streams for the distance of not less than 10 metres on each side of the whole extent of such streams contained in their properties.

"Persons infringing on the above provisions are liable to a fine of not less than \$25 and not more than \$100."—U. S. Cons. Rep. No. 119, 1890, p. 613.

#### ARGENTINE REPUBLIC.

"The timber of the country is all in the far interior or along the upper rivers, where exist in their primitive condition thousands of leagues of the most magnificent hardwoods to be found anywhere in the world. Laws have been passed by the Argentine Congress for their protection against a vast army of trespassers who make their living by appropriating to themselves all that they can cut and float out of the country. The custom-house returns for this reason, show but a small portion of the timber which leaves the River Plate for foreign ports. The shipments reported to the customs house last year amounted to only \$339,020, against \$394,848 in 1884." U. S. Cons. Rep., Vol. 23, 1887, p. 311.

The value of the imports of "lumber and woodenware" was much greater, amounting to \$5,906,805, of which \$4,219,611 was pine lumber.—*Ibid*, page 327.

#### VENEZUELA.

"Fustic and other woods continue to be shipped in large quantities, and vessels from Europe and the United States are constantly employed in this trade. During the past year the United States received from Maracaibo, fustic, cedar and boxwood of the respective values of \$37,734.19, \$8,484.85 and \$8,878.85."—U. S. Cons. Rep., Vol. 23, 1887, p. 545.

#### SIAM.

"Teak is the most valuable timber of the country. It is utilized in immense quantities throughout the east for house building. For ship building it is without an equal; it is largely exported to China and Europe for that purpose, and for resisting the ravages of the white ants and the effects of the weather it is unsurpassed by any other wood. It grows in the northern part of Siam and Burmah at an altitude of 1,200 to 1,500 feet above the sea, and reaches its greatest perfection in about 120 years. Ten or fifteen years make a good sized tree that can be cut down, where quality of wood is not an object. It is generally believed that the forests will become exhausted before many years, there being no law to prevent the indiscriminate felling of timber, nor compulsory planting of new trees. The teak district is from 100 to 150 miles in width, the forests being in charge of the governors of the provinces in which they are situated. They are generally leased for ten years and it behooves the lessee to fell and remove the greatest number of logs possible, he paying a royalty to the governor of \$1.80 a log." U. S. Con. Rep., Vol. 26, 1888, p. 553.

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## APPENDIX "I."

## TREES OF CANADA.

Canada has always been regarded as a land of forests; which was certainly true of old Canada, the Maritime Provinces, Quebec and Ontario, and the term is still applicable, though settlement and lumbering have made and are still making great inroads upon our woodland. The North-west Territories also, though having vast prairies, have their great northern forest, and British Columbia is emphatically a forest country.

The tree of greatest importance commercially is the white pine, perhaps the best of all soft woods, which adds so largely to our exports, and is the most valuable element in the forests of Ontario and Quebec, New Brunswick and Nova Scotia. The spruce too, especially in the Maritime Provinces and Quebec, contributes largely to our foreign commerce, also augmented by considerable quantities of hemlock, tamarack, cedar and a variety of hardwoods. In British Columbia the huge Douglas fir provides large and increasing amounts of timber and lumber for exportation.

A more detailed account of our timber trees is given under the head of each province.

## ONTARIO.

The great timber tree of Ontario, the main object of our gigantic lumbering operations, is the white or Weymouth pine (*P. strobus*) which besides a large home consumption is imported in enormous quantities by the United Kingdom and the United States, supplying as it does an unrivalled wood for the inside finishing of houses and other purposes. Either in dense pineries or mingled with other trees, it pervades the great valleys of the Ottawa and its tributaries, the Trent River and the streams running into the Georgian Bay and Lake Huron, and in this great pine district much timber still remains though lumbering and forest fires have diminished it seriously. South of this district there used also to be much pine, but the settlement of this portion of the province, has left nothing that could be called pine forests, though many scattered trees and even groves remain, and still afford a considerable supply for local use, as the census returns show. Northward the height of land forms the limit of the already dwindling pine forests, only a small quantity being found beyond it at a few points. Eastward the white pine is a scarce tree to the north of Lake Superior, but still further eastward is again found scattered and in groves, but with nothing like the great central pine forest, on the waters of Rainy Lake, Lake of the Woods and their affluents, even extending a short distance into the south-east corner of Manitoba.

The red or Norway pine (*P. resinosa*), less valuable for lumber, but in demand for building timber and masts and spars, occupies much the same region as its congener, and is commonly associated with it, though in much smaller quantity. Towards the northern limit it becomes more numerous in relation to the white pine, and this is still more the case towards the eastern line, the pine of the Rainy River district being chiefly of the red species.

The other pine found in Ontario, the scrub or banksian pine (*P. banksiana*), extends further to the northward and eastward than the white or red pine. Though sometimes attaining a size making it of some local use, its inferior quality renders it unsuitable for export, and it only needs mention because reports of pine being seen sometimes refer to this tree, but give a delusive idea of valuable white pine forests where they are not in existence.

Good spruce abounds in Ontario and its use is growing, but the prevalence of pine in the lumbering districts causes it to be neglected at present as a matter of commerce. Its increasing use for the manufacture of wood pulp, largely for export, threatens

serious inroads upon this valuable tree. Hemlock is in the same danger from the use of its bark for tanning extract; this tree, as well as tamarack, cedar and balsam fir, are plentiful, and are used locally, but as yet are not much exported.

The hardwoods are of great variety and abundance and are much used both at home and abroad for different purposes. Those of the greatest commercial importance, are: oak, elm, maple, beech, birch, butternut, hickory, basswood, cherry, &c. There are still valuable hardwood forests, though much has been wasted by clearing for agriculture and burning.

Extending into the south-west peninsula of Ontario, was a group of valuable trees, which have become scarce and in some cases almost extinct, such as the black walnut, the tulip tree or whitewood, the plane tree or buttonwood, the chestnut, some of the hickories, the coffee tree, &c.

The following is a list of the trees of the province with their botanical, English and French names:—

## ONTARIO.

BOTANICAL NAME.	ENGLISH NAME.	FRENCH NAME.
<i>Abies balsamea.</i>	Balsam fir.	Sapin blanc.
<i>Acer dasycarpum.</i>	Silver maple.	Érable blanche.
do <i>nigrum.</i>	Black maple.	do noir.
do <i>Pennsylvanicum.</i>	Striped maple.	do jaspé.
do <i>rubrum.</i>	Red or soft maple.	do rouge.
do <i>saccharinum.</i>	Sugar or rock maple.	do à sucre.
do <i>spicatum.</i>	Mountain maple.	do bâtarde.
<i>Alnus incana.</i>	Alder.	Aune.
<i>Asimina triloba.</i>	Papaw.	Papayer.
<i>Amelanchier Canadensis.</i>	June berry.	Alisier.
<i>Betula lenta.</i>	Black birch.	Bouleau noir.
do <i>lutea.</i>	Yellow birch.	do élançé.
do <i>papyrifera.</i>	Canoe birch.	do à papier, ou à canot.
<i>Carpinus Caroliniana.</i>	Hornbeam.	Charme.
<i>Carya alba.</i>	Shell-bark hickory.	Noyer tendre.
do <i>amara.</i>	Bitter hickory.	do dur.
do <i>microcarpa.</i>	Small fruit hickory.	Petite noix.
do <i>porcina.</i>	Pignut hickory.	Noyer brun.
do <i>tomentosa.</i>	White heart hickory.	Noix blanche.
<i>Castanea Americana.</i>	Chestnut.	Chataignier.
<i>Celtis occidentalis.</i>	Sugar berry.	Mabouillier.
<i>Cornus Florida.</i>	Dogwood.	Cornouillier.
<i>Crataegus coccinea.</i>	White thorn.	Aubépine.
do <i>crus-galli.</i>	Cockspur thorn.	do
do <i>tomentosa.</i>	Black thorn.	Épine noire.
<i>Fagus ferruginea.</i>	Beech.	Hêtre.
<i>Fraxinus Americana.</i>	White ash.	Frêne blanc.
do <i>pubescens.</i>	Red ash.	do rouge.
do <i>sambucifolia.</i>	Black ash.	do noir.
do <i>quadrangulata.</i>	Blue ash.	do bleu.
do <i>viridis.</i>	Green ash.	do vert.
<i>Gymnocladus Canadensis.</i>	Coffee tree.	Chicot.
<i>Juglans cinerea.</i>	Butternut.	Noyer tendre.
do <i>nigra.</i>	Black walnut.	do noir.
<i>Juniperus virginiana.</i>	Red cedar.	Cèdre rouge.
<i>Larix Americana.</i>	Tamarack or larch.	Épinette rouge.
<i>Liriodendron tulipifera.</i>	Tulip tree.	Tulipier.
<i>Morus rubra.</i>	Mulberry.	Mûrier rouge.
<i>Negundo aceroides.</i>	Ash-leaved maple.	Érable à Giguères.
<i>Nyssa multiflora.</i>	Tupelo.	Tupelos.
<i>Ostrya Virginica.</i>	Ironwood.	Bois de fer.
<i>Picea alba.</i>	White spruce.	Petite épinette.
do <i>nigra.</i>	Black spruce.	Grosse épinette.
<i>Pinus Banksiana.</i>	Banksian or scrub pine.	Pin gris ou cyprès.
do <i>resinosa.</i>	Red or Norway pine.	Pin rouge.
* do <i>rigida.</i>	Pitch pine.	Pin à poix.
do <i>strobus.</i>	White or Weymouth pine.	Pin blanc.
<i>Prus Americana.</i>	Mountain ash.	Cormier.
do <i>coronaria.</i>	Wild crab tree.	Pommier.

\* On Thousand Islands only.

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BOTANICAL NAME.	ENGLISH NAME.	FRENCH NAME.
<i>Platanus occidentalis.</i>	Plane or buttonwood.	Platane de Virginie.
<i>Populus balsamifera.</i>	Balsam poplar.	Baumier.
do <i>grandidentata.</i>	Large-toothed poplar.	Peuplier.
do <i>monilifera.</i>	Cottonwood.	Liard.
do <i>tremuloides.</i>	Aspen.	Tremble.
<i>Prunus Americana.</i>	Wild plum.	Prunellier.
do <i>Pennsylvanica.</i>	Red cherry.	Cerisier rouge.
do <i>serotina.</i>	Black cherry.	do noir.
<i>Quercus alba.</i>	White oak.	Chêne blanc.
do <i>bicolor.</i>	Blue oak.	do bleu.
do <i>coccinea.</i>	Scarlet oak.	do écarlette.
do <i>macrocarpa.</i>	Burr oak.	do à gros fruits.
do <i>palustris.</i>	Pin oak.	do de marais.
do <i>prinoides.</i>	Yellow chestnut oak.	do jaune.
do <i>prinus.</i>	Chestnut oak.	do jaune.
do <i>rubra.</i>	Red oak or black oak.	do rouge.
do <i>tinctoria.</i>	Yellow oak.	do noir.
<i>Rhus typhina.</i>	Sumach.	Sumac
<i>Salix nigra.</i>	Black willow.	Saule noir.
<i>Sassafras officinale.</i>	Sassafras.	Sassafras.
<i>Thuja occidentalis.</i>	White cedar or arbor vitæ.	Cèdre blanc.
<i>Tilia Americana.</i>	Basswood.	Bois blanc.
do <i>pubescens.</i>	do	do
<i>Tsuga Canadensis.</i>	Hemlock.	Pruche.
<i>Ulmus Americana.</i>	White elm.	Orme blanc.
do <i>fulva.</i>	Red or slippery elm.	do rouge.
do <i>racemosa.</i>	Rock elm.	do des rochers.

## QUEBEC.

As in Ontario the white pine (*P. strobus*) is the most important tree from a commercial point of view. The Ottawa seems to be the centre of the rich pine forests of Canada, and they are as productive on the left bank of the river and on its tributaries on that side as in the Ontario portion of the great valley. The valley of the St. Maurice and its tributaries has also valuable pine forests, but in both these valleys the lumbermen have stripped large districts of the pine of any marketable size, though much still remains. Up the Saguenay and around Lake St. John there was a limited quantity of white pine, which has almost disappeared, and further eastward and northward the banksian pine is the only representative of the family. On the south side of the St. Lawrence, though largely settled and almost wholly private property, some scattered remnants of the old pine forests must still remain, and are being brought to market, as shown by the census returns. As in other provinces, the red pine is found and worked with the white.

The spruce forests of Quebec are also very rich and extensive, and are being more and more exploited every year, adding a constantly growing proportion to the exports. The spruce extends much further eastward than the pine, and beyond the St. Maurice valley and south of the St. Lawrence is the most important timber tree. There is also a large and growing output of tamarack, hemlock and cedar, which are abundant, but again it must be noted that much hemlock is being cut and wasted for its bark. The hardwoods, and especially the birch and maple, also supply a large quantity of valuable timber.

A list of the trees of the province is appended :—

## QUEBEC.

BOTANICAL NAME.	ENGLISH NAME.	FRENCH NAME.
<i>Abies balsamea.</i>	Balsam fir.	Sapin blanc.
<i>Acer dasycarpum.</i>	Silver maple.	Erable blanche.
do <i>Pennsylvanicum.</i>	Striped maple.	do jaspé.
do <i>rubrum.</i>	Red or soft maple.	do rouge.
do <i>saccharinum.</i>	Sugar or rock maple.	do à sucre.
do <i>spicatum.</i>	Mountain maple.	do bitarde.
<i>Alnus incana.</i>	Alder.	Aune.
<i>Amelanchier Canadensis.</i>	June berry.	Alisier.
<i>Betula lenta.</i>	Black birch.	Bouleau noir.
do <i>lutea.</i>	Yellow birch.	do élané.
do <i>papyrifera.</i>	Cane birch.	do à papier, ou à canot.
do <i>populifolia.</i>	Poplar-leaved birch.	do rouge.
<i>Carpinus Caroliniana.</i>	Hornbeam.	Charme.
<i>Carya alba.</i>	Shell-bark hickory.	Noyer tendre.
do <i>amara.</i>	Bitter hickory.	do dur.
<i>Celtis occidentalis.</i>	Sugar berry.	Maccoullier.
<i>Crataegus coccinea.</i>	White thorn.	Aubépine.
<i>Fagus ferruginea.</i>	Beech.	Hêtre.
<i>Fraxinus Americana.</i>	White ash.	Frêne blanc.
do <i>pubescens.</i>	Red ash.	do rouge.
do <i>sambucifolia.</i>	Black ash.	do noir.
<i>Juglans cinerea.</i>	Butternut.	Noyer tendre.
<i>Juniperus Virginiana.</i>	Red cedar.	Cèdre rouge.
<i>Larix Americana.</i>	Tamarack or larch.	Epinette rouge.
<i>Ostrya Virginica.</i>	Ironwood.	Bois de fer.
<i>Picea alba.</i>	White spruce.	Petite épinette.
do <i>nigra.</i>	Black spruce.	Grosse do.
<i>Pinus Banksiana.</i>	Banksian or scrub pine.	Pin gris ou cyprès.
do <i>resinosa.</i>	Red or Norway pine.	Pin rouge.
do <i>strobus.</i>	White or Weymouth pine.	Pin blanc.
<i>Pirus Americana.</i>	Mountain ash.	Cornier.
<i>Populus balsamifera.</i>	Balsam poplar.	Baumier.
do <i>grandidentata.</i>	Large-toothed poplar.	Peuplier.
do <i>monilifera.</i>	Cottonwood.	Liard.
do <i>tremuloides.</i>	Aspen.	Tremble.
<i>Prunus Americana.</i>	Wild plum.	Prunellier.
do <i>Pennsylvanica.</i>	Red cherry.	Cerisier rouge.
do <i>serotina.</i>	Black cherry.	do noir.
<i>Quercus alba.</i>	White oak.	Chêne blanc.
do <i>macrocarpa.</i>	Burr oak.	do à gros fruits.
do <i>rubra.</i>	Red or black oak.	do rouge.
<i>Salix nigra.</i>	Black willow.	Saule noir.
<i>Thuja occidentalis.</i>	White cedar or arbor vitae.	Cèdre blanc.
<i>Tilia Americana.</i>	Basswood.	Bois blanc.
<i>Tsuga Canadensis.</i>	Hemlock.	Pruche.
<i>Ulmus Americana.</i>	White elm.	Orme blanc.
do <i>fulva.</i>	Red or slippery elm.	do rouge.
do <i>racemosa.</i>	Rock elm.	do des rochers.

## NEW BRUNSWICK.

At one time New Brunswick had rich forests of white and red pine, like Ontario and Quebec, but though trees and even groves of pine are scattered through the woodlands, the supply is sensibly diminished. Pine lumber is still largely exported, but in far greater quantities is that now supplied by the spruce, which is not only abundant in the province, but also of good size and excellent quality. The white cedar or *arbor vitæ* also grows in great profusion, and is largely cut, as are also the hemlock, the larch or *laematalæ*, the balsam and a variety of the fine hardwoods which also flourish in the province.

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*Abies balsam*  
*Acer Pennsylvanicum*  
do *rubrum*  
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do *spicatum*  
*Amelanchier Canadensis*  
*Betula lenta*  
do *lutea*  
do *nigra*  
do *papyrifera*  
do *populifolia*  
*Fagus ferruginea*  
*Fraxinus Americana*  
do *pubescens*  
do *sambucifolia*  
*Juglans cinerea*  
*Larix Americana*  
*Ostrya Virginica*  
*Picea alba*  
do *nigra*  
*Pinus Banksiana*  
do *resinosa*  
do *strobus*  
*Pirus Americana*  
*Populus balsamifera*  
do *grandidentata*  
do *monilifera*  
do *tremuloides*  
*Prunus Americana*  
do *Pennsylvanica*  
do *serotina*  
*Quercus alba*  
do *macrocarpa*  
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*Salix nigra*  
*Thuja occidentalis*  
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The following is a list of the trees :—

## NEW BRUNSWICK.

BOTANICAL NAME.	ENGLISH NAME.	FRENCH NAME.
<i>Abies balsamea.</i>	Balsam fir.	Sapin blanc.
<i>Acer Pennsylvanicum.</i>	Striped maple.	Érable jaspé.
do <i>rubrum.</i>	Red maple.	do rouge.
do <i>saccharinum.</i>	Sugar maple.	do à sucre.
do <i>spicatum.</i>	Mountain maple.	do bitarde.
<i>Amelanchier Canadensis.</i>	June berry.	Alisier.
<i>Betula lenta.</i>	Black birch.	Bouleau noir
do <i>lutea.</i>	Yellow birch.	do élané.
do <i>nigra.</i>	Red birch.	do rouge.
do <i>papyrifera.</i>	Canoe birch.	do à canot.
do <i>populifolia.</i>	Poplar-leaved birch.	do rouge.
<i>Fagus ferruginea.</i>	Beech.	Hêtre.
<i>Fraxinus Americana.</i>	White ash.	Frêne blanc.
do <i>pubescens.</i>	Red ash.	do rouge.
do <i>sambucifolia.</i>	Black ash.	do noir.
<i>Juglans cinerea.</i>	Butternut.	Noyer tendre.
<i>Larix Americana.</i>	Hackmatac or larch.	Epinette rouge.
<i>Ostrya Virginica.</i>	Iron wood.	Bois de fer.
<i>Picea alba.</i>	White spruce.	Petite epinette.
do <i>nigra.</i>	Black spruce.	Grosse epinette.
<i>Pinus Banksiana.</i>	Banksian or scrub pine.	Pin gris, ou cyprès.
do <i>resinosa.</i>	Red or Norfolk pine.	Pin rouge.
do <i>strobus.</i>	White or Weymouth pine.	Pin blanc.
<i>Pirus Americana.</i>	Mountain ash.	Cormier.
<i>Populus balsamifera.</i>	Balsam poplar.	Baumier.
do <i>grandidentata.</i>	Large-toothed poplar.	Peuplier.
do <i>monilifera.</i>	Cotton wood.	Liard.
do <i>tremuloides.</i>	Aspen.	Tremble.
<i>Prunus serotina.</i>	Black cherry.	Cerisier noir.
<i>Quercus macrocarpa.</i>	Burr oak.	Chêne à gros fruits.
do <i>rubra.</i>	Red or black oak.	do rouge.
<i>Salix nigra.</i>	Black willow.	Saule noir.
<i>Thuja occidentalis.</i>	White cedar.	Cèdre blanc.
<i>Tilia Americana.</i>	Bass wood.	Bois blanc.
<i>Tsuga Canadensis.</i>	Hemlock.	Pruche.
<i>Ulmus Americana.</i>	White elm.	Orme blanc.

## NOVA SCOTIA.

The destruction of the pine has advanced even further in Nova Scotia than in the other provinces, and what remains is almost wholly on private property. Its place both for home use and for export, is filled in a great measure by the spruce, which is abundant and good. Hackmatac and hemlock are also being largely used, and balsam is coming more into notice. Unlike the adjoining province, Nova Scotia has no white cedar, which is absent, or only represented by a few rare trees near the Bay of Fundy. Several species of hardwood grow abundantly, and are utilized both for local needs and foreign commerce.

The following is the list of trees :—

## NOVA SCOTIA.

BOTANICAL NAME.	ENGLISH NAME.	FRENCH NAME.
<i>Abies balsamea</i> .	Balsam fir.	Sapin blanc.
<i>Acer Pennsylvanicum</i> .	Striped maple.	Érable jaspé.
do <i>rubrum</i> .	Red maple.	do rouge.
do <i>saccharinum</i> .	Sugar maple.	do à sucre.
do <i>spicatum</i> .	Mountain maple.	do bâtarde.
<i>Amelanchier Canadensis</i> .	June berry.	Alisier.
<i>Betula lenta</i> .	Black birch.	Bouleau noir.
do <i>lutea</i> .	Yellow birch.	do clancé.
do <i>parryifera</i> .	Canoe birch.	do à caout.
do <i>populifolia</i> .	Lamp-leaved birch.	do rouge.
<i>Fagus ferruginea</i> .	Beech.	Hêtre.
<i>Fraxinus Americana</i> .	White ash.	Frêne blanc.
do <i>pubescens</i> .	Red ash.	do rouge.
do <i>sambucifolia</i> .	Black ash.	do noir.
<i>Juglans cinerea</i> .	Butternut.	Noyer tendre.
<i>Larix Americana</i> .	Tamarack or larch.	Épinette rouge.
<i>Ostrya Virginica</i> .	Iron wood.	Bois de fer.
<i>Picea alba</i> .	White spruce.	Petite épinette.
do <i>nigra</i> .	Black spruce.	Grosse épinette.
<i>Pinus banksiana</i> .	Banksian or scrub pine.	Pin gris or cyprès.
do <i>resinosa</i> .	Red or Norway pine.	Pin rouge.
do <i>strobus</i> .	White or Weymouth pine.	Pin blanc.
<i>Pinus Americana</i> .	Mountain ash.	Cornier.
<i>Populus balsamifera</i> .	Balsam poplar.	Baumier.
do <i>grandidentata</i> .	Large-toothed poplar.	Peuplier.
do <i>monilifera</i> .	Cotton wood.	Liard.
do <i>tremuloides</i> .	Aspen.	Tremble.
<i>Prunus serotina</i> .	Black cherry.	Cerisier noir.
<i>Quercus macrocarpa</i> .	Burr oak.	Chêne à gros fruits.
do <i>rubra</i> .	Red or black oak.	do rouge.
<i>Salix nigra</i> .	Black willow.	Saule noir.
* <i>Thuja occidentalis</i> .	White cedar.	Cèdre blanc.
<i>Tilia Americana</i> .	Bass wood.	Bois blanc.
<i>Tsuga Canadensis</i> .	Hemlock.	Pruche.
<i>Ulmus Americana</i> .	White elm.	Orme blanc.

\* Only along Bay of Fundy.—Rare.

## PRINCE EDWARD ISLAND.

A great part of this island was once thickly wooded, but at present it produces no more timber and lumber than it requires. The extent of Crown lands remaining unalienated is small and it is not first class forest. Some pine still exists and with the other coniferous trees and some excellent hardwood of various kinds, supplies the local demand. The white cedar, if indigenous, is very rare.

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The following is the list of trees :—

PRINCE EDWARD ISLAND.

BOTANICAL NAME.	ENGLISH NAME.	FRENCH NAME.
<i>Abies balsamea.</i>	Balsam fir.	Sapin blanc.
<i>Acer Pennsylvanicum.</i>	Striped maple	Erable jaspé.
do <i>rubrum.</i>	Red maple.	do rouge.
do <i>saccharinum.</i>	Sugar maple.	do à sucre.
do <i>spicatum.</i>	Mountain maple.	do bâtarde.
<i>Betula lenta.</i>	Black birch.	Bouleau noir.
do <i>lutea.</i>	Yellow birch.	do clancé.
do <i>papyrifera.</i>	Canoe Birch.	do à canot.
do <i>populifolia.</i>	Poplar-leaved birch.	do rouge.
<i>Fagus ferruginea.</i>	Beech.	Hêtre.
<i>Fraxinus Americana.</i>	White ash.	Frêne blanc.
do <i>sambucifolia.</i>	Black ash.	do noir.
<i>Larix Ameriçna.</i>	Larch.	Epinette rouge.
<i>Ostrya Virginica.</i>	Iron wood.	Bois de fer.
<i>Picea alba.</i>	White spruce.	Petite épinette.
do <i>nigra.</i>	Black spruce.	Grosse épinette.
<i>Pinus strobus.</i>	White pine.	Pin blanc.
<i>Pinus Americana.</i>	Mountain ash.	Cornier.
<i>Populus balsamifera.</i>	Balsam poplar.	Baumier.
do <i>grandidentata.</i>	Large-toothed poplar.	Peuplier.
do <i>tremuloides.</i>	Aspen.	Tremble.
<i>Salix nigra.</i>	Black willow.	Saule noir.
<i>Tilia Americana.</i>	Bass wood.	Bois blanc.
<i>Tsuga Canadensis.</i>	Hemlock.	Frûche.
<i>Ulmus Americana.</i>	White elm.	Orme blanc.

MANITOBA AND THE TERRITORIES.

The great western region, of Canada, from Lake of the Woods to the Rocky Mountains, and from the international boundary to the Arctic Ocean, contains a vast extent of prairie, but it is by no means destitute of forest and woodland. Even the prairie districts are not altogether treeless, for the rivers and streams are fringed with poplars of large size and good timber, with other trees, and the ridges and hills are timbered with spruce, black pine (cyprès) poplars, &c. These trees supply the local saw-mills, and are used by the people in the districts now being settled, supplemented however, by lumber brought into the country from east and west.

North of the prairie region is a great forest largely composed of spruce, of the same species as those in eastern Canada, but often attaining a greater size and superior quality. The balsam fir, the Banksian pine, the poplars and other trees also contribute their quota to this great northern forest, which having a trend northwestward, at the Mackenzie River almost reaches the Arctic Ocean. As the waters run northerly and there are no railways, this forest has not yet been utilized to supply the settlers on the southward.

On the east side Manitoba touches the forest region of eastern Canada, and includes some of its peculiar trees. Thus the white and red pine, the white cedar, the basswood, the maples and other trees of Ontario and Quebec, extend sparingly into the extreme southwest corner of Manitoba till their line of limit turns to the south.

On the west side, on the other hand, the territories bordering on the Rocky Mountains whose summits form the dividing line, have some of the trees of the British Columbian interior, such as the Douglas fir, the mountain pine, the spruces, &c. These are being utilized by the lumbermen and afford a welcome supply to the dwellers on the adjacent prairies.

Again in the western part of Manitoba and extending more or less into the adjacent territories, is a little group of trees found neither to the eastward, westward or northward. These are the ash-leaved maple (*Negundo aceroides*) and the green ash, while the burr oak reappears here after a wide interval, and they are of great value to the district in which they grow. The ash-leaved maple is also one of the favourite trees with settlers on the prairies who are being wise enough to make plantations for the shelter of their homes and their crops.

The following is the list of trees:—

MANITOBA AND NORTH-WEST TERRITORIES.

BOTANICAL NAME.	ENGLISH NAME.	FRENCH NAME.
<i>Abies balsamea.</i>	Balsam fir.	Sapin blanc.
do <i>subalpina.</i>	Alpine balsam fir.	do des monts.
<i>Acer spicatum.</i>	Mountain maple.	Erable bâtarde.
<i>Betula papyrifera.</i>	Canoe birch.	Bouleau à canot.
<i>Fraxinus pubescens.</i>	Red ash.	Frêne rouge.
do <i>viridis.</i>	Green ash.	do vert.
<i>Larix Americana.</i>	Larch or tamarack.	Épinette rouge.
do <i>Lyallii.</i>	Mountain larch.	do des monts.
<i>Negundo aceroides.</i>	Ash-leaved maple.	Erable à giguières.
<i>Picea alba.</i>	White spruce.	Petite épinette.
do <i>Engelmannii.</i>	Western black spruce.	Épinette noir.
do <i>nigra.</i>	Black spruce.	Grosse épinette.
<i>Pinus albicaulis.</i>	White bark pine.	Pin blanc.
do <i>Banksiana.</i>	Banksian pine.	Pin gris ou cyprès.
do <i>flexilis.</i>	Mountain white pine.	Pin blanc.
do <i>Murrayana.</i>	Black pine or cypress.	Cyprès.
do <i>resinosa.</i>	Red pine.	Pin rouge.
do <i>strobus.</i>	White pine.	Pin blanc.
<i>Pirus Americana.</i>	Mountain ash.	Cormier.
<i>Populus angustifolia.</i>	Black cottonwood.	Liard noir.
do <i>balsamifera.</i>	Balsam poplar.	Baumier.
do <i>monilifera.</i>	Cottonwood.	Liard.
do <i>tremuloides.</i>	Aspen.	Tremble.
do <i>trichocarpa.</i>	Black cottonwood.	Liard.
<i>Pseudotsuga Douglasii.</i>	Douglas fir.	Pin d'Oregon.
<i>Quercus macrocarpa.</i>	Burr oak.	Chêne à gros fruits.
<i>Salix flavescens.</i>	Willow.	Saule.
do <i>nigra.</i>	Black willow.	do noir.
<i>Thuya occidentales.</i>	White cedar.	Cèdre blanc.
<i>Tilia Americana.</i>	Basswood.	Bois blanc.
<i>Ulmus Americana.</i>	White elm.	Orme blanc.

BRITISH COLUMBIA.

Of all the provinces and territories of Canada, British Columbia is, as a whole, the most densely wooded with valuable timber of great variety. It does not possess the king of Canadian trees, the unrivalled white pine (*P. strobus*), but, in other respects, it surpasses the rest of the Dominion. The Douglas fir is the most important timber tree, growing abundantly and to an enormous size on Vancouver Island on the mainland shore, and in places extending inland, even as we have seen, to the eastern slope of the Rockies. This is the main object of the lumbermen, and besides the domestic use, is exported in great quantities, being widely known in commerce as "Oregon pine." It makes strong and large building timber, admirable masts, and good, if rather coarse, lumber. The gigantic cedar also growing along the sea-coast, is much used, especially for shingles. The yellow cypress, another sea-coast tree extending farther north, is also of large size and its wood is of fine grain. The white mountain pine is also largely

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used, where accessible, being the nearest substitute for our white pine (*P. strobus*), though its lumber is not so good, and the same may be said of the western yellow pine, another inland tree. The spruces are especially valuable, abundant and widely disseminated. The spruce of Eastern Canada, which crosses the continent from ocean to ocean, extends northward to the boundary of the province, and in its far western habitat, is even larger and better than in the east. The western black or Engelmann's spruce, an inland tree, is even superior in size and quality, as is also the Sitka spruce of the coast. There are various other valuable coniferous trees. The poplars, in some places, are gigantic. The hardwoods are well represented, among them by an oak and some maples peculiar to this coast. The climate seems so well suited to tree growth that even those that are little better than shrubs elsewhere, become of importance and value, as the red alder, the dogwood, the arbutus, the crab apple, &c.

The following is the list of trees :—

## BRITISH COLUMBIA.

BOTANICAL NAME.	ENGLISH NAME.	FRENCH NAME.
<i>Abies amabilis</i> .	White fir.	Sapin blanc.
do <i>grandis</i> .	Western white fir.	Gros sapin.
do <i>subalpina</i> .	Mountain balsam.	Sapin des monts.
<i>Acer macrophyllum</i> .	Large-leaved maple.	Érable.
do <i>circinatum</i> .	Vine maple.	do
<i>Alnus rubra</i> .	Red alder.	Aune rouge.
<i>Arbutus Menziesii</i> .	Arbutus.	Arbute.
<i>Betula occidentalis</i> .	Western birch.	Bouleau.
do <i>papyrifera</i> .	Canoe birch.	do à canot.
<i>Cornus Nuttallii</i> .	Western dogw. od.	Cornouillier.
<i>Juniperus Virginiana</i> .	Red cedar.	Cèdre rouge.
<i>Larix Americana</i> .	American larch.	Épinette rouge.
do <i>Lyallii</i> .	Mountain larch.	do des monts.
do <i>occidentalis</i> .	Western larch.	do rouge.
<i>Picea alba</i> .	White spruce.	Petite épinette.
do <i>Engelmannii</i> .	Western black spruce.	Épinette noir.
do <i>nigra</i> .	Black spruce.	Grosse épinette.
do <i>Sitchensis</i> .	Western white spruce.	Épinette blanche.
<i>Pinus albicaulis</i> .	White bark pine.	Pin blanc.
do <i>contorta</i> .	Scrub pine.	Cyprés.
do <i>monticola</i> .	White mountain pine.	Pin blanc.
do <i>Murrayana</i> .	Black pine.	Cyprés.
do <i>ponderosa</i> .	Yellow pine.	Pin jaune ou rouge.
<i>Pirus rivularis</i> .	Western crab apple.	Fommier.
<i>Populus balsamifera</i> .	Balsam poplar.	Baumier.
do <i>monilifera</i> .	Cottonwood.	Liard.
do <i>tremuloides</i> .	Aspen.	Tremble.
do <i>trichocarpa</i> .	Cottonwood.	Liard.
<i>Prunus emarginata</i> .	Cherry.	Cerisier.
do <i>mollis</i> .	do	do
<i>Pseudotsuga Douglasii</i> .	Douglas fir.	Pin d'Oregon.
<i>Quercus Garryana</i> .	Western white oak.	Chêne.
<i>Salix lanceifolia</i> .	Lance-leaved willow.	Saule.
do <i>lasianдра</i> .	Willow.	do
<i>Taxus brevifolia</i> .	Western yew.	If.
<i>Thuja gigantea</i> .	Giant cedar.	Grand cèdre.
do <i>excelsa</i> .	Yellow cypress or cedar.	Cèdre jaune.
<i>Tsuga Mertensiana</i> .	Western hemlock.	Pruche.
do <i>Pattoniana</i> .	Alpine hemlock.	do

## DOMINION OF CANADA.

The following is a list of the indigenous trees of Canada with their botanical and English names and the provinces in which they are found.

Some foreign trees are so thoroughly acclimatized and so widespread that they might almost be included in the list. The most noteworthy of these exotic trees are :

ACCLIMATIZED TREES.

BOTANICAL NAME.	ENGLISH NAME.	FRENCH NAME.
<i>Abies excelsa.</i>	Norway spruce.	Epinette de Norvège.
<i>Jesculus hippocastanea.</i>	Horse chestnut.	Marronnier.
<i>Populus alba.</i>	White poplar.	Peuplier argenté.
do <i>pyramidalis.</i>	Lombardy poplar	do de lombardie.
<i>Robinia pseudoacacia.</i>	Locust tree.	Acacia.
<i>Salix alba.</i>	White willow.	Saule blanc.

and others might be added to the list.

In this connection it may be noticed that the ash-leaved maple or box elder (*Negundo aceroides*), of Manitoba and the Territories, is being largely planted in the other provinces, while plantations of some of the forest trees of Eastern Canada are being made on the prairies.

The list of Canadian trees has been made as complete as possible, but probably there are additions yet to be made from British Columbia, and the habitat of various species may be extended to other provinces than those named.

I am indebted to Prof. John Macoun, of the Geological Survey, for the careful revision given by him to these lists.

TREES OF CANADA.

Botanical Name.	English Name.	Distribution.
<i>Abies amabilis</i> . . . . .	White fir . . . . .	British Columbia.
do <i>balsamea</i> . . . . .	Balsam fir . . . . .	All the provinces, except British Columbia.
do <i>grandis</i> . . . . .	Western white fir . . . . .	British Columbia.
do <i>subalpina</i> . . . . .	Mountain balsam . . . . .	do and Territories.
<i>Acer circinatum</i> . . . . .	Vine maple . . . . .	do
do <i>dasycarpum</i> . . . . .	Silver maple . . . . .	Ontario and Quebec.
do <i>nigrum</i> . . . . .	Black maple . . . . .	Ontario.
do <i>macrophyllum</i> . . . . .	Large-leaved maple . . . . .	British Columbia.
do <i>Pennsylvanicum</i> . . . . .	Striped maple . . . . .	Ont., Que., New Brunswick, Nova Scotia, P.E. Island.
do <i>rubrum</i> . . . . .	Red or soft maple . . . . .	do do do do
do <i>saccharinum</i> . . . . .	Sugar or rock maple . . . . .	do do do do
do <i>spicatum</i> . . . . .	Mountain maple . . . . .	Ont., Que., N. Brunswick, N. S., P.E.I., Man. & Ter.
<i>Alnus incana</i> . . . . .	Alder . . . . .	Ontario and Quebec.
do <i>rubra</i> . . . . .	Red alder . . . . .	British Columbia.
<i>Amelanchier Canadensis</i> . . . . .	June berry . . . . .	Ontario, Quebec, New Brunswick and Nova Scotia.
<i>Arbutus Menziesii</i> . . . . .	Arbutus . . . . .	British Columbia.
<i>Aspinna triloba</i> . . . . .	Papaw . . . . .	Ontario.
<i>Betula lenta</i> . . . . .	Black birch . . . . .	Ont., Que., New Brunswick, Nova Scotia, P.E. Island.
do <i>lutea</i> . . . . .	Yellow birch . . . . .	Ont., Que., N. Brunswick, N.S., P.E.I., & N.W. Ter.
do <i>occidentalis</i> . . . . .	Western birch . . . . .	British Columbia.
do <i>papyrifera</i> . . . . .	Canoe birch . . . . .	All the provinces.
do <i>populifolia</i> . . . . .	Poplar-leaved birch . . . . .	Que., New Brunswick, Nova Scotia and P.E. Island.
<i>Carpinus Caroliniana</i> . . . . .	Hornbeam . . . . .	Ontario and Quebec.
<i>Carya alba</i> . . . . .	Shell bark hickory . . . . .	do
do <i>amara</i> . . . . .	Bitter hickory . . . . .	do
do <i>microcarpa</i> . . . . .	Small fruit hickory . . . . .	Ontario.
do <i>porcina</i> . . . . .	Pignut hickory . . . . .	do and Quebec.
do <i>tomentosa</i> . . . . .	White heart hickory . . . . .	do
<i>Castanea Americana</i> . . . . .	Chestnut . . . . .	do and Quebec.
<i>Celtis occidentalis</i> . . . . .	Sugar berry . . . . .	do and Quebec.
<i>Cornus Florida</i> . . . . .	Dogwood . . . . .	do
do <i>Nuttallii</i> . . . . .	Western dogwood . . . . .	do
<i>Crataegus coccinea</i> . . . . .	White thorn . . . . .	do and Quebec.
do <i>crus-galli</i> . . . . .	Cockspur thorn . . . . .	do
do <i>tomentosa</i> . . . . .	Black thorn . . . . .	do
<i>Fagus ferruginea</i> . . . . .	Beech . . . . .	Ont., Que., N. Brunswick, Nova Scotia & P.E. Island.
<i>Fraxinus Americana</i> . . . . .	White ash . . . . .	do do do do
do <i>pubescens</i> . . . . .	Red ash . . . . .	do do do do
do <i>sambucifolia</i> . . . . .	Black ash . . . . .	do do do do
do <i>quadrangulata</i> . . . . .	Blue ash . . . . .	Ontario.
do <i>viridis</i> . . . . .	Green ash . . . . .	do Manitoba and Territories.

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Taxus brevifolia  
Thuya excelsa .  
do gigantea .  
do occidenta  
Tilia Americana  
do pubescens  
Tsuga Canadens  
do Mertensia  
do Pattoniar  
Ulmus Americ  
do fulva . . .  
do racemosa



TREES OF CANADA—*Concluded.*

Botanical Name.	English Name.	Distribution.
<i>Gymnocladus Canadensis</i>	Coffee tree	Ontario.
<i>Juglans cinerea</i>	Butternut	do Quebec, New Brunswick and Nova Scotia.
do <i>nigra</i>	Black walnut	do do do and British Columbia.
<i>Juniperus Virginiana</i>	Red cedar	All the provinces.
<i>Larix Americana</i>	Tamarack or larch	British Columbia and Territories.
do <i>Lyallii</i>	Mountain larch	do
do <i>occidentalis</i>	Western larch	Ontario.
<i>Liriodendron tulipifera</i>	Tulip tree	do
<i>Morus rubra</i>	Mulberry	do
<i>Negundo aceroides</i>	Ash-leaved maple	do Manitoba and Territories.
<i>Nissa multiflora</i>	Tupelo	Ontario.
<i>Ostrya Virginica</i>	Iron wood	Ont., Que., N. Brunswick, Nova Scotia & P.E. Island.
<i>Picea alba</i>	White spruce	All the provinces.
do <i>Engelmannii</i>	Engelmann's black spruce	British Columbia and Manitoba.
do <i>nigra</i>	Black spruce	All the provinces.
do <i>Sitchensis</i>	Western white spruce	British Columbia.
<i>Pinus albiculis</i>	White bark pine	do and Territories.
do <i>Banksiana</i>	Banksian or scrub pine	Ont., Que., N. Brunswick, Nova Scotia & Man. & Ter.
do <i>contorta</i>	Scrub pine	British Columbia.
do <i>flexilis</i>	Rocky Mountain pine	Territories.
do <i>monticola</i>	White do	British Columbia.
do <i>Murrayana</i>	Black pine or cypress	do
do <i>ponderosa</i>	Yellow pine	do Manitoba and Territories.
do <i>resinosa</i>	Red or Norway pine	Ont., Que., N. Brunswick, N. S. (Man. S.W. corner.)
do <i>rigida</i>	Pitch pine	Ontario.
do <i>strobus</i>	White or Weymouth pine	Ont., Que., N.B., N.S., P.E.I., (Man. S.W. corner.)
<i>Pinus Americana</i>	Mountain ash	do do do do and Manitoba.
do <i>coronaria</i>	Crab apple	Ontario.
do <i>rivularis</i>	Western crab apple	British Columbia.
<i>Platanus occidentalis</i>	Plane or button wood	Ontario.
<i>Populus angustifolia</i>	Black cotton wood	Territories.
do <i>balsamifera</i>	Balsam poplar	All the provinces.
do <i>grandidentata</i>	Large-toothed poplar	Ont., Que., N. Brunswick, Nova Scotia & P.E. Island.
do <i>monilifera</i>	Cotton wood	All the provinces, except Prince Edward Island.
do <i>tremuloides</i>	Aspen	do
do <i>trichocarpa</i>	Cotton wood	British Columbia, Manitoba and Territories.
<i>Prunus Americana</i>	Wild plum	Ontario and Quebec.
do <i>emarginata</i>	Western cherry	British Columbia.
do <i>mollis</i>	Cherry	do
do <i>Pennsylvanica</i>	Red cherry	Ontario and Quebec.
do <i>serotina</i>	Black cherry	Ontario, Quebec, N. Brunswick and Nova Scotia.
<i>Pseudotsuga Douglasii</i>	Douglas fir	British Columbia and Territories.
<i>Quercus alba</i>	White oak	Ontario and Quebec.
do <i>bicolor</i>	Blue oak	do
do <i>coccinea</i>	Scarlet oak	do
do <i>Garryana</i>	Western white oak	British Columbia.
do <i>macrocarpa</i>	Burr oak	Ont., Que., N. Brunswick, Nova Scotia, Man. & Ter.
do <i>palustris</i>	Pin oak	Ontario.
do <i>prinoides</i>	Yellow chestnut oak	do
do <i>prinus</i>	Chestnut oak	do
do <i>rubra</i>	Red or black oak	do Quebec, New Brunswick, and Nova Scotia.
do <i>tinctoria</i>	Yellow oak	Ontario.
<i>Rhus typhina</i>	Sumach	do Que., N. B., N. S. and P.E.I.
<i>Salix flavescens</i>	Willow	Manitoba and Territories.
do <i>lanifolia</i>	Lance-leaved willow	British Columbia.
do <i>hastata</i>	do	do
do <i>nigra</i>	Black willow	Ont., Que., N. Brunswick, Nova Scotia, P.E.I. & Man.
<i>Sassafras officinale</i>	Sassafras	Ontario.
<i>Taxus brevifolia</i>	Western Yew	British Columbia.
<i>Thuja excelsa</i>	Yellow cypress or cedar	do
do <i>gigantea</i>	Giant cypress	do
do <i>occidentalis</i>	White cedar or arbor vita	Ont., Que., N. Brunswick, Nova Scotia and Man.
<i>Tilia Americana</i>	Bass wood	Ont., Que., N. Brunswick, N.S., P.E.I. and Man.
do <i>pubescens</i>	do	Ontario.
<i>Tsuga Canadensis</i>	Hemlock	Ont., Que., N. Brunswick, Nova Scotia & P.E. Island.
do <i>Mertensiana</i>	Western hemlock	British Columbia.
do <i>Pattoniana</i>	Alpine hemlock	do
<i>Ulmus Americana</i>	White elm	Ont., Que., N. Brunswick, N.S., P.E.I. Man. and Ter.
do <i>fulva</i>	Red or slippery elm	Ontario and Quebec.
do <i>racemosa</i>	Rock elm	do

## APPENDIX "J."

## WOODS IN CANADA—STRENGTH, WEIGHT, &amp;c.

Authoritative experiments to determine the strength, weight, &c., of our woods have not been made in Canada.

Mr. Sargent, in charge of the forestry branch of the United States census of 1880, caused investigations to be made by Mr. Sharples of the woods of North America (excluding Mexico), and the following tables are compiled from the data thus given for the species found in Canada.

In most cases the specimens were taken from the butt end of the tree, free from sap or knots; they may be regarded as representing the best wood that could be obtained from the tree. The value for construction was obtained by experiments made with the United States testing machine at Watertown arsenal.

The specimens used for specific gravity determinations were made 100 millimeters long and about 35 millimeters square and were dried at 100° centigrade till they ceased to lose weight.

The relative fuel values were obtained by deducting the percentage of ash from the specific gravity and were founded on the hypothesis that the real value of the combustible material in all woods is the same.\*

The specimens tested for the purpose of determining the strength of the wood produced by the different trees were cut, with a few exceptions, before March, 1881, and were slowly and carefully seasoned.

Those used in determining the resistance to transverse strain were made 4 centimeters square, and long enough to give the necessary bearing upon the supports. Hydraulic pressure was applied by means of an iron rod 12 millimeters in radius acting midway between the supports.

The specimens tested by longitudinal compression were 4 centimeters square and 32 centimeters (8 diameters) long. They were placed between the platforms of the machine and pressure was gradually applied till they failed. The figures given represent the number of kilograms required to cause failure.

The specimens tested under pressure applied perpendicularly to the fibres were 4 centimeters square and 16 centimeters long. They were placed upon the platform of the machine and indented with an iron punch 4 centimeters square on its face, covering the entire width of the specimen, and one quarter of its length in the centre.

In the following table the coefficient of elasticity is derived from the second deflection, the measurements being taken in millimeters and the weight in kilograms.

The ultimate transverse strength is the force applied to the middle of the stick required to break a stick 4 centimeters square and one meter between the supports.

In the compression tests the surface exposed to pressure was 4 centimeters square. To give the pressure on a square centimeter these results must be divided by 16.

\*The United States census report remarks: "In burning wood, however, various circumstances affect its value; few fire-places are constructed to fully utilize the fuel value of resinous woods, and carbon escapes unconsumed in the form of smoke. Pine, therefore, which although capable of yielding more heat than oak or hickory, may in practice yield considerably less, the pine losing both carbon and hydrogen in the form of smoke, while hickory or oak, burning with a smokeless flame, is practically entirely consumed. The ash in a wood, being non-combustible, influences its fuel value in proportion to the amount. The state of dryness of the wood also has much influence upon its fuel value, though in a less degree than is generally supposed."

Abies amal
do balsa
do granu
do subal
Acer circin
do dasye
do nigru
do macro
do Penns
do rubru
do sacch
do spicat
Alnus incar
do rubr
Amelanchie
Arbutus Me
Asimina tri
Betula lent
do lutea
do occid
do papu
do popul
Carpinus Ca
Carya alba
do amar
a do micro
do porci
do tomer
Castanea As
Celtis occid
Cornus Flori
do Nutt
Crataegus co
do cr
do tu
Fagus ferrug
Fraxinus Am
do pu
do sar
do qu
do Vir
Gymnocladu
Juglans cimen
do nigra
Juniperus Vir
Larix Americ
b do Lyalli
do occiden
Liriodendron
Morus rubra
Negundo ace
c Nissa multif
Ostrya Virgin
Picea alba

a Carya  
tests from the

b. Larix  
In British Co

c. Nissa

WOODS OF CANADA.

TABLE of Averages, Specific Gravity, Fuel Value and Strength.—(Compiled from U. S. Census Returns, 1880.)

Botanical Name.	English Name.	Specific gravity.	Approximate relative fuel value.	Coefficient of elasticity kilograms on millimeters.	Ultimate transverse strength in kilograms.	Ultimate resistance to longitudinal crushing in kilograms.	Resistance to indentation to 1/27 millimeters in kilograms.
<i>Abies amabilis</i> .....	White fir.....	0.4298	49.18	1,260	338	7,480	1,029
do <i>balsamea</i> .....	Balsam fir.....	0.3819	38.02	819	220	5,851	1,292
do <i>grandis</i> .....	Western white fir.....	0.3515	35.08	958	211	6,255	810
do <i>subalpina</i> .....	Mountain balsam.....	0.3476	34.61	762	202	4,824	1,015
<i>Acer circinatum</i> .....	Vine maple.....	0.6660	66.34	1,718	327	7,349	3,265
do <i>dasycarpum</i> .....	Silver do.....	0.5289	52.52	1,110	435	7,711	2,899
do <i>nigrum</i> .....	Black do.....	0.6915	68.66	1,027	410	8,803	4,149
do <i>macrophyllum</i> .....	Large-leaved maple.....	0.4909	48.83	780	292	6,100	2,597
do <i>Pennsylvanicum</i> .....	Striped do.....	0.5299	.....	.....	.....	.....	.....
do <i>rubrum</i> .....	Soft or red do.....	0.6178	61.65	943	346	7,492	2,795
do <i>saccharinum</i> .....	Sugar or rock do.....	0.6912	68.75	1,465	490	9,507	4,019
do <i>spicatum</i> .....	Mountain do.....	0.5330	.....	.....	.....	.....	.....
<i>Alnus incana</i> .....	Black alder.....	0.4697	.....	.....	.....	.....	.....
do <i>rubra</i> .....	Red do.....	0.4812	47.93	1,060	346	6,644	1,870
<i>Amelanchier Canadensis</i> .....	June berry.....	0.7838	77.95	1,197	483	10,712	4,483
<i>Arbutus Menziesii</i> .....	Arbutus.....	0.7052	70.24	838	387	8,034	3,322
<i>Asimina triloba</i> .....	Pawpaw.....	0.3660	39.61	482	167	3,895	1,098
<i>Betula lenta</i> .....	Black birch.....	0.7617	75.97	1,432	519	9,907	3,615
do <i>occidentalis</i> .....	Yellow do.....	0.6553	65.34	1,618	533	9,907	2,581
do <i>parafrifera</i> .....	Western do.....	0.6030	60.12	924	344	6,260	2,459
do <i>populifolia</i> .....	Cane do.....	0.5955	59.40	1,306	454	7,781	2,083
<i>Carpinus Caroliniana</i> .....	Poplar-leaved birch.....	0.5760	57.43	730	332	5,564	2,073
<i>Carya alba</i> .....	Hemlock.....	0.7286	72.26	1,149	490	7,969	3,405
do <i>anara</i> .....	Shell-bark hickory.....	0.8372	83.11	1,390	512	10,107	4,344
do <i>microcarpa</i> .....	Bitter do.....	0.7552	74.74	1,039	470	8,357	3,878
do <i>porcina</i> .....	Small fruit do.....	.....	.....	.....	.....	.....	.....
do <i>tomentosa</i> .....	Pignut do.....	0.8217	81.36	1,014	466	9,232	4,822
<i>Castanea Americana</i> .....	White heart do.....	0.8218	81.29	1,150	482	9,485	4,429
do <i>occidentalis</i> .....	Chestnut.....	0.4504	44.95	856	297	6,106	1,698
<i>Celtis occidentalis</i> .....	Sugar berry.....	0.7287	72.08	685	337	6,739	3,472
<i>Cornus Florida</i> .....	Dogwood.....	0.8163	80.98	821	386	8,553	4,875
do <i>Nuttallii</i> .....	Western dogwood.....	0.7481	74.44	1,031	423	10,603	3,883
<i>Crataegus coccinea</i> .....	White thorn.....	0.8618	.....	.....	.....	.....	.....
do <i>crus-galli</i> .....	Cockspar do.....	0.7194	71.55	664	279	6,884	3,368
do <i>tomentosa</i> .....	Black do.....	0.7633	75.96	732	303	7,117	3,944
<i>Fagus ferruginea</i> .....	Beach.....	0.6883	68.48	1,210	490	7,530	3,145
<i>Fraxinus Americana</i> .....	White ash.....	0.6543	65.16	1,015	367	7,535	2,745
do <i>pubescens</i> .....	Red do.....	0.6251	62.35	812	371	6,960	3,272
do <i>sambucifolia</i> .....	Black do.....	0.6318	62.72	822	345	6,766	3,106
do <i>quadrangulata</i> .....	Blue do.....	0.7184	74.50	774	346	7,980	3,322
do <i>viridis</i> .....	Green do.....	0.7117	70.71	903	382	7,711	3,521
<i>Gymnocladus Canadensis</i> .....	Coffee tree.....	0.6934	68.88	1,048	329	6,406	2,560
<i>Juglans cinerea</i> .....	Butternut.....	0.4086	40.66	812	255	6,270	1,488
do <i>nigra</i> .....	Black walnut.....	0.6115	60.91	1,092	365	9,178	3,140
<i>Juniperus Virginiana</i> .....	Red cedar.....	0.4926	49.11	670	316	6,750	2,376
<i>Larix Americana</i> .....	Tamarack.....	0.6236	62.16	1,261	384	8,763	1,675
do <i>Lyallii</i> .....	Mountain larch.....	.....	.....	.....	.....	.....	.....
do <i>occidentalis</i> .....	Western larch.....	0.7407	74.00	1,658	524	11,023	2,395
<i>Liriodendron tulipifera</i> .....	Tulip tree.....	0.4230	42.20	926	280	5,955	1,296
<i>Morus rubra</i> .....	Red mulberry.....	0.5898	58.56	824	331	6,721	2,805
<i>Negundo aceroides</i> .....	Ash-leaved maple.....	0.4328	42.82	582	226	5,151	1,781
<i>Nyssa multiflora</i> .....	Tupelo.....	0.6353	63.66	818	360	7,497	3,131
<i>Ostrya Virginica</i> .....	Ironwood.....	0.8284	82.42	1,373	484	8,669	3,696
<i>Picea alba</i> .....	White spruce.....	0.4051	40.38	1,023	319	5,489	1,117

a. *Carya microcarpa* is treated by Sargent as a variety of *Carya alba*, and was not distinguished in the tests from that species, which see above.

b. *Larix Lyallii*, called "a rare and local species of the Northern Rocky Mountains," was not tested. In British Columbia it is more plentiful.

c. *Nyssa multiflora* is included by Sargent in *N. sylvatica*, a species which embraces various forms.

## WOODS OF CANADA—Continued.

TABLE of Averages, Specific Gravity, Fuel Value and Strength.—(Compiled from U. S. Census Returns, 1880.)

Botanical Name.	English Name.	Specific gravity.	Approximate relative fuel value.	Coefficient of elasticity in kilograms on millimeters.	Ultimate transverse strength in kilograms.	Ultimate resistance to longitudinal crushing in kilograms.	Resistance to indentation in 1.27 millimeters in kilograms.
<i>Picea Engelmanni</i> .....	Engelmann's spruce	0.3449	38.38	808	245	4,271	1,217
do <i>maria</i> .....	Black spruce	0.4584	45.71	1,100	318	6,520	1,249
do <i>Sitchensis</i> .....	Western white spruce	0.4287	42.80	960	277	5,653	1,160
<i>Pinus albiculis</i> .....	White bark pine	0.4165	41.54	512	249	5,206	1,716
do <i>Banksiana</i> .....	Banksian or scrub pine	0.4761	47.50	942	278	6,329	1,609
do <i>contorta</i> .....	Scrub pine	0.5815	58.04	1,585	423	9,808	2,382
do <i>flexilis</i> .....	Rocky Mountain pine	0.4358	43.42	676	266	5,591	1,727
do <i>monticola</i> .....	White mountain pine	0.3908	38.99	350	260	5,319	1,071
do <i>Murrayana</i> .....	Black pine or cypress	0.4646	46.33	771	241	5,328	1,379
do <i>ponderosa</i> .....	Yellow pine	0.4715	46.99	887	307	6,037	1,719
do <i>resinosa</i> .....	Red or Norway pine	0.4854	48.41	1,132	341	7,274	1,353
do <i>rigida</i> .....	Pitch pine	0.5151	51.39	1,314	314	5,687	2,123
do <i>strobus</i> .....	White or Weymouth pine	0.3854	38.47	851	297	6,219	1,194
<i>Pirus coronaria</i> .....	Crab apple	0.7048	70.11	642	207	6,706	3,099
do <i>maria</i> .....	Western crab apple	0.8316	.....	.....	.....	.....	.....
<i>Platanus occidentalis</i> .....	Plane or buttonwood	0.5678	56.52	864	271	7,297	2,645
<i>Populus angustifolia</i> .....	Black cottonwood	0.3912	38.81	438	171	4,332	1,225
do <i>balsamifera</i> .....	Balsam poplar	0.3635	36.11	857	235	5,129	1,292
do <i>grandidentata</i> .....	Large-tooth poplar	0.4632	46.11	963	308	5,727	904
do <i>monilifera</i> .....	Cottonwood	0.3839	38.53	994	328	5,651	1,327
do <i>tremuloides</i> .....	Aspen	0.4032	40.11	814	259	5,285	1,281
do <i>trichocarpa</i> .....	Cottonwood	0.3814	37.66	1,117	284	6,243	1,018
<i>Prunus Americana</i> .....	Wild plum	0.7215	72.02	827	369	9,419	3,405
do <i>mollis</i> .....	Western cherry	0.4562	44.93	861	290	7,597	1,280
do <i>Pennsylvanica</i> .....	Red cherry	0.5023	.....	.....	.....	.....	.....
do <i>serotina</i> .....	Black cherry	0.5822	58.14	852	354	8,746	3,239
<i>Pseudotsuga Douglasii</i> .....	Douglas fir	0.5157	51.53	1,283	376	8,289	1,698
<i>Quercus bicolor</i> .....	Blue oak	0.7470	74.39	971	386	8,183	3,388
do <i>coccinea</i> .....	Scarlet oak	0.7662	76.18	906	388	7,859	3,534
do <i>Garryana</i> .....	Western white oak	0.7405	73.91	1,685	450	8,074	3,224
do <i>macrocarpa</i> .....	Burr oak	0.7453	74.24	811	375	7,957	3,846
do <i>palustris</i> .....	Pin oak	0.6938	68.82	929	419	7,843	3,730
do <i>prinoides</i> .....	Yellow chestnut oak	0.8605	86.09	1,123	465	7,862	3,040
do <i>prinus</i> .....	Chestnut oak	0.7499	74.42	1,125	528	9,204	4,224
do <i>rubra</i> .....	Red or black oak	0.6540	65.28	1,273	440	8,615	3,686
do <i>tinetoria</i> .....	Yellow oak	0.7045	70.16	1,034	444	8,172	2,825
<i>Rhus typhina</i> .....	Sumach	0.4357	.....	.....	.....	.....	.....
<i>Salix flavescens</i> .....	Black willow	0.4989	49.91	1,262	388	7,484	2,019
do <i>laucifolia</i> .....	Lance leaved willow	0.4517	45.73	305	200	4,581	1,311
do <i>lasiandra</i> .....	Willow	0.4756	.....	.....	.....	.....	.....
do <i>nigra</i> .....	Black willow	0.4456	.....	.....	.....	.....	.....
<i>Sassafras officinale</i> .....	Sassafras	0.5042	50.38	519	257	6,110	2,144
<i>Taxus brevifolia</i> .....	Western yew	0.6391	63.78	761	460	7,734	4,293
do <i>Thuya excelsa</i> .....	Yellow cypress	0.4782	47.66	1,029	342	7,281	1,618
do <i>gigantea</i> .....	Giant cypress or cedar	0.3796	37.90	1,034	319	7,197	1,114
do <i>occidentalis</i> .....	White cedar or arbor vitae	0.3114	31.53	533	219	4,003	957
<i>Tilia Americana</i> .....	Basewood	0.4525	45.00	840	252	5,768	1,044
do <i>pubescens</i> .....	Downy basewood	0.4074	40.47	811	239	6,487	950
<i>Tsuga Canadensis</i> .....	Hemlock	0.4239	42.20	900	307	6,142	1,314
do <i>Mertensiana</i> .....	Western hemlock	0.5183	51.61	1,375	388	8,747	1,622
do <i>Pantoniana</i> .....	Alpine hemlock	0.4251	44.35	775	307	6,074	1,664
<i>Ulmus Americana</i> .....	White elm	0.4584	64.54	747	364	7,191	2,970
do <i>fulva</i> .....	Red or slippery elm	0.4956	69.77	953	371	8,628	2,389
do <i>racemosa</i> .....	Rock elm	0.7263	72.26	1,066	455	9,474	3,281

d. *Prunus mollis* is given by Sargent as a variety of *P. emarginata*, the wood of the latter not having been collected for testing.

e. In Sargent's lists *Thuya excelsa* appears as *Chamaecyparis Nutkaensis*.

It will be heavier than "belong to the regions."

The 24 h

1. *Crataegus*
2. *Quercus*
3. *Carya alba*
4. *Pirus riv*
5. *Ostrya V*
6. *Carya to*
7. do po
8. *Cornus F*
9. *Amelanch*
10. *Quercus l*
11. *Crataegus*
12. *Betula len*
13. *Carya am*
14. *Quercus p*
15. *Cornus N*
16. *Cornus A*
17. do C
18. do U
19. do C
20. *Larix occi*
21. *Celtis occ*
22. *Carpinus*
23. *Ulmus rac*
24. *Prunus Ar*

The 12 lig

1. *Thuya occi*
2. *Picea Eng*
3. *Abies sub*
4. do gran
5. *Populus hu*
6. *Thuya giga*
7. *Populus tri*
8. *Abies bals*
9. *Pinus stro*
10. *Populus mo*
11. *Pinus mont*
12. *Populus an*

The 24 woo

1. *Betula lutea*
2. *Quercus prin*
3. *Larix occide*
4. *Betula lenta*
5. *Carya alba*
6. *Acer saccha*
7. *Pagus ferru*
8. *Carpinus Vir*
9. *Ostrya Carya*
10. *Amelanchier*
11. *Carya tomer*
12. *Carya amara*
13. *Carya porcin*
14. *Quercus palif*
15. *Taxus brevif*
16. *Ulmus racem*
17. *Betula papyr*
18. *Quercus coc*
19. do tinc
20. do prin
21. *Acer dasycar*
22. *Cornus Nutka*
23. *Pinus contort*
24. *Quercus rubra*

It will be seen that there is no tree in Canada of which the wood when dry is heavier than water. In the United States, Mr. Sargent says, the only heavier woods "belong to the semi-tropical region of Florida or to the arid Mexican and interior Pacific regions."

The 24 heaviest woods in Canada are as follows, in order:—

Resistance to indentation by 1/2" millimeter in kilograms.	
1	1,217
20	1,240
53	1,160
66	1,710
29	1,609
18	2,382
01	1,727
39	1,071
28	1,379
57	1,719
4	1,353
57	2,123
9	1,194
6	3,099
7	2,645
2	1,225
6	1,202
1	994
1	1,327
5	1,281
3	1,018
9	3,405
7	1,280
6	3,269
9	1,608
3	3,388
0	3,534
4	3,224
7	3,846
3	3,730
2	3,040
4	4,224
5	3,686
2	2,825
2	3,243
4	.....
1	2,619
1	1,311
1	.....
4	2,144
1	4,223
1	1,618
1	1,114
3	957
8	1,044
1	950
2	1,314
1	1,622
4	1,661
8	2,970
1	2,399
1	3,281

The 12 lightest woods are as follows, in order of lightness:—

1	Thuya occidentalis.	White cedar.
2	Picea Engelmanni.	Engelmanns' spruce.
3	Abies subulpin.	Mountain balsam.
4	do grandis.	Western white fir.
5	Populus balsamifera.	Balsam poplar.
6	Thuya gigantea.	Giant cedar or cypress.
7	Populus trichocarpa.	Western cottonwood.
8	Abies balsamea.	Balsam fir.
9	Pinus strobus.	White pine.
10	Populus monilifera.	Cottonwood.
11	Pinus monticola.	White mountain pine.
12	Populus angustifolia.	Black cottonwood.

The 24 woods with the greatest transverse strength are as follows:—

1	Betula lutea.	Yellow birch.
2	Quercus prinoides.	do chestnut oak.
3	Larix occidentalis.	Western larch.
4	Betula lenta.	Black birch.
5	Carya alba.	Shell bark hickory.
6	Acer saccharinum.	Sugar maple.
7	Fagus ferruginea.	Beech.
8	Carpinus Caroliniana.	Hornbeam.
9	Ostrya Virginica.	Ironwood.
10	Amelanchier Canadensis.	June berry.
11	Carya tomentosa.	White heart hickory.
12	Carya amara.	Bitter hickory.
13	Carya porcina.	Pignut hickory.
14	Quercus palustris.	Pin oak.
15	Taxus brevifolia.	Western yew.
16	Ulmus racemosa.	Rock elm.
17	Betula papyrifera.	Canoe birch.
18	Quercus coccinea.	Scarlet oak.
19	do tinctoria.	Yellow oak.
20	do prinus.	Chestnut oak.
21	Acer dasycarpum.	Silver maple.
22	Cornus Nuttallii.	Western dogwood.
23	Pinus contorta.	Scrub pine.
24	Quercus rubra.	Red or black oak.

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The 24 woods with the greatest elasticity are as follows:—

- |                                     |                      |
|-------------------------------------|----------------------|
| 1. <i>Larix occidentalis</i> .      | Western larch.       |
| 2. <i>Betula lutea</i> .            | Yellow birch.        |
| 3. <i>Pinus contorta</i> .          | Scrub pine.          |
| 4. <i>Acer saccharinum</i> .        | Sugar maple.         |
| 5. <i>Betula lenta</i> .            | Black birch.         |
| 6. <i>Carya alba</i> .              | Shell bark hickory.  |
| 7. <i>Tsuga Mertensiana</i> .       | Western hemlock.     |
| 8. <i>Ostrya Virginica</i> .        | Ironwood.            |
| 9. <i>Betula papyrifera</i> .       | Canoe birch.         |
| 10. <i>Pseudotsuga Douglasii</i> .  | Douglas fir.         |
| 11. <i>Salix flavescens</i> .       | Black willow.        |
| 12. <i>Larix Americana</i> .        | Tamarack.            |
| 13. <i>Abies amabilis</i> .         | White fir.           |
| 14. <i>Quercus prinus</i> .         | Chestnut oak.        |
| 15. <i>Fagus ferruginea</i> .       | Beech.               |
| 16. <i>Amelanchier Canadensis</i> . | June berry.          |
| 17. <i>Carya tomentosa</i> .        | White heart hickory. |
| 18. <i>Carpinus Caroliniana</i> .   | Hornbeam.            |
| 19. <i>Quercus rubra</i> .          | Red oak.             |
| 20. <i>Pinus resinosa</i> .         | Red pine.            |
| 21. <i>Quercus prinoides</i> .      | Yellow chestnut oak. |
| 22. do <i>palustris</i> .           | Pin oak.             |
| 23. <i>Populus trichocarpa</i> .    | Western cottonwood.  |
| 24. <i>Acer dasycarpum</i> .        | Silver maple.        |

The 24 woods with the greatest resistance to longitudinal crushing are as follows:—

- |                                    |                      |
|------------------------------------|----------------------|
| 1. <i>Larix occidentalis</i> .     | Western larch.       |
| 2. <i>Amelanchier Canadensis</i> . | June berry.          |
| 3. <i>Carya alba</i> .             | Shell bark hickory.  |
| 4. <i>Acer saccharinum</i> .       | Sugar maple.         |
| 5. <i>Betula lenta</i> .           | Black birch.         |
| 6. do <i>lutea</i> .               | Yellow birch.        |
| 7. <i>Carya tomentosa</i> .        | White heart hickory. |
| 8. <i>Ulmus racemosa</i> .         | Rock elm.            |
| 9. <i>Prunus Americana</i> .       | Wild plum.           |
| 10. <i>Carya porcina</i> .         | Pignut hickory.      |
| 11. <i>Quercus prinoides</i> .     | Yellow chestnut oak. |
| 12. <i>Juglans nigra</i> .         | Black walnut.        |
| 13. <i>Pinus contorta</i> .        | Scrub pine.          |
| 14. <i>Acer nigrum</i> .           | Black maple.         |
| 15. <i>Larix Americana</i> .       | Tamarack.            |
| 16. <i>Tsuga Mertensiana</i> .     | Western hemlock.     |
| 17. <i>Prunus serotina</i> .       | Black cherry.        |
| 18. <i>Ostrya Virginica</i> .      | Ironwood.            |
| 19. <i>Ulmus fulva</i> .           | Red elm.             |
| 20. <i>Quercus prinus</i> .        | Chestnut oak.        |
| 21. <i>Cornus Florida</i> .        | Dogwood.             |
| 22. <i>Carya amara</i> .           | Bitter hickory.      |
| 23. <i>Pseudotsuga Douglasii</i> . | Douglas fir.         |
| 24. <i>Quercus alba</i> .          | White oak.           |

The 24 woods with the greatest resistance to indentation, to the depth of 1.27 millimeters, are as follows:—

- |                                    |                      |
|------------------------------------|----------------------|
| 1. <i>Cornus Florida</i> .         | Dogwood.             |
| 2. <i>Carya porcina</i> .          | Pignut hickory.      |
| 3. <i>Amelanchier Canadensis</i> . | June berry.          |
| 4. <i>Carya tomentosa</i> .        | White heart hickory. |
| 5. do <i>alba</i> .                | Shell bark hickory.  |
| 6. <i>Quercus prinoides</i> .      | Yellow chestnut oak. |
| 7. <i>Taxus brevifolia</i> .       | Western yew.         |
| 8. <i>Acer nigrum</i> .            | Black maple.         |
| 9. do <i>saccharinum</i> .         | Sugar maple.         |
| 10. <i>Pirus coronaria</i> .       | Crab apple.          |
| 11. <i>Cornus Nuttallii</i> .      | Western dogwood.     |
| 12. <i>Carya amara</i> .           | Bitter hickory.      |
| 13. <i>Quercus Garryana</i> .      | Western white oak.   |
| 14. <i>Crategus tomentosa</i> .    | Black thorn.         |
| 15. <i>Quercus macrocarpa</i> .    | Burr oak.            |
| 16. <i>Ostrya Virginica</i> .      | Ironwood.            |
| 17. <i>Quercus prinus</i> .        | Chestnut oak.        |
| 18. <i>Betula lenta</i> .          | Black birch.         |

19. *Quercus*
20. *Fraxin*
21. *Celtis*
22. *Carpin*
23. *Prunus*
24. *Quercu*

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*Larix Americana*  
*Picea alba* . . . . .  
do *nigra* . . . . .  
*Pinus Banksiana*  
do *resinosa* . . . . .  
do *strobus* . . . . .  
*Thuja occidentalis*  
*Tsuga Canadensis*

Pacific

*Picea Sitchenisii*  
*Pinus monticola*  
*Pseudotsuga Douglasii*  
*Thuja excelsa* . . . . .

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19. *Quercus bicolor*.  
 20. *Fraxinus viridis*.  
 21. *Celtis occidentalis*.  
 22. *Carpinus Caroliniana*.  
 23. *Prunus Americana*.  
 24. *Quercus alba*.

- Blue oak.  
 Green ash.  
 Sugar berry.  
 Hornbeam.  
 Wild plum.  
 White oak.

## COMPARISON WITH UNITED STATES WOODS.

In the tables of weight, strength, &c., of woods in the United States census returns of 1880, there are no Canadian specimens among the hardwoods tested, so that no comparisons can be made between the woods in the two countries.

As regards the coniferous trees, in the case of many species and among them the most important, tests of Canadian specimens have been given with those of the United States to make up the averages. In the preceding tables, these combined averages have been given, but in the following table the averages have been calculated separately for the two countries, so as to allow of comparison.

The following table gives the specific gravity of some of the principal coniferous woods of Canada and the United States, the averages for the two countries being given separately :—

AVERAGE SPECIFIC GRAVITY OF WOODS OF CANADA AND UNITED STATES, COMPARED.

Botanical name.	English name.	CANADA.		UNITED STATES.	
		No. of specimens.	Specific gravity.	No. of specimens.	Specific gravity.
<i>Atlantic Coast.</i>					
<i>Larix Americana</i> .....	Tamarack .....	4	0·5764	4	0·6709
<i>Picea alba</i> .....	White spruce .....	3	0·4060	2	0·4038
do <i>nigra</i> .....	Black spruce.....	3	0·4400	3	0·4768
<i>Pinus Banksiana</i> .....	Banksian pine .....	2	0·4744	1	0·4794
do <i>resinosa</i> .....	Red pine.....	2	0·4587	6	0·4944
do <i>strobus</i> .....	White pine.....	4	0·3678	6	0·3972
<i>Thuja occidentalis</i> .....	White cedar.....	5	0·3160	4	0·3169
<i>Tsuga Cana tensis</i> .....	Hemlock.....	5	0·5527	6	0·40·1
<i>Pacific Coast.</i>					
<i>Picea Sitchensis</i> .....	Western white spruce....	1	0·3816	4	0·4405
<i>Pinus monticola</i> .....	White mountain pine....	1	0·4197	1	0·3619
<i>Pseudotsuga Douglasii</i> .....	Douglas fir .....	4	0·4804	17	0·5226
<i>Thuja excelsa</i> .....	Yellow cypress.....	1	0·4999	3	0·4710

It appears that on the Atlantic side of the continent the woods of the tamarack, black spruce, banksian pine, red pine, white pine and white cedar were found to be lighter in the Canadian than the United States specimens; the Canadian white spruce and hemlock were heavier. On the Pacific coast, the Canadian Douglas fir and Western white spruce were lighter, and the Canadian white mountain pine heavier, than the United States woods. In the case of the yellow cypress, all the United States specimens were from Alaska, and they were lighter than the Canadian.

The following table gives the coefficient of elasticity, kilograms on millimeters, of the same woods as above for the two countries:

## COEFFICIENT OF ELASTICITY OF WOODS OF CANADA AND UNITED STATES COMPARED.

Botanical Name.	English Name.	CANADA.		UNITED STATES.	
		No of specimens.	Coefficient of elasticity.	No of specimens.	Coefficient of elasticity.
<i>Atlantic Coast.</i>					
<i>Larix Americana</i> .....	Tamarack.....	8	1,230	4	1,324
<i>Picea alba</i> .....	White spruce.....	6	1,121	2	729
<i>Picea nigra</i> .....	Black spruce.....	6	1,032	3	1,207
<i>Pinus Banksiana</i> .....	Banksian pine.....	4	1,077	2	671
<i>Pinus resinosa</i> .....	Red pine.....	2	944	6	1,195
<i>Pinus strobus</i> .....	White pine.....	8	888	5	791
<i>Thuja occidentalis</i> .....	White cedar.....	8	487	6	596
<i>Tsuga Canadensis</i> .....	Hemlock.....	10	910	10	890
<i>Pacific Coast.</i>					
<i>Picea Sitichensis</i> .....	Western white spruce.....	2	1,128	7	957
<i>Pinus monticola</i> .....	White mountain pine.....	1	1,191	2	830
<i>Pseudotsuga Douglasii</i> .....	Douglas fir.....	6	1,316	30	1,277
<i>Thuja excelsa</i> .....	Yellow cypress.....	2	1,206	7	978

On the Atlantic side the white spruce, banksian pine, white pine and hemlock were found to have more elasticity in Canada than in the United States; the tamarack, black spruce, red pine and white cedar less elasticity in Canada. On the Pacific coast all four species tested were found to be more elastic in Canada.

The following table gives the ultimate transverse strength in kilograms of the same woods as before for the two countries:

## TRANSVERSE STRENGTH OF WOODS OF CANADA AND UNITED STATES COMPARED.

Botanical Name.	English Name.	CANADA.		UNITED STATES.	
		No of specimens.	Ultimate transverse strength.	No of specimens.	Ultimate transverse strength.
<i>Atlantic Coast.</i>					
<i>Larix Americana</i> .....	Tamarack.....	8	370	4	412
<i>Picea alba</i> .....	White spruce.....	6	323	2	307
<i>Picea nigra</i> .....	Black spruce.....	6	298	3	360
<i>Pinus Banksiana</i> .....	Banksian pine.....	4	286	2	261
<i>Pinus resinosa</i> .....	Red pine.....	2	315	6	350
<i>Pinus strobus</i> .....	White pine.....	8	269	5	263
<i>Thuja occidentalis</i> .....	White cedar.....	8	202	6	241
<i>Tsuga Canadensis</i> .....	Hemlock.....	10	329	10	299
<i>Pacific Coast.</i>					
<i>Picea Sitichensis</i> .....	Western white spruce.....	2	281	7	276
<i>Pinus monticola</i> .....	White mountain pine.....	1	292	2	244
<i>Pseudotsuga Douglasii</i> .....	Douglas fir.....	6	352	30	381
<i>Thuja excelsa</i> .....	Yellow cypress.....	2	416	7	321

It appears that on the Atlantic side the white spruce, banksian pine, white pine and hemlock had greater transverse strength in Canada than in the United States; while tamarack, black spruce, red pine and white cedar had less transverse strength in Canada. On the Pacific coast the Douglas fir showed less transverse strength and the other three species more transverse strength in Canada.



The following table gives the ultimate resistance to longitudinal crushing in kilograms, of the same woods as before for the two countries :—

RESISTANCE TO LONGITUDINAL CRUSHING OF WOODS OF CANADA AND UNITED STATES COMPARED.

Botanical Name.	English Name.	CANADA.		UNITED STATES.	
		No. of specimens.	Resistance to longitudinal crushing.	No. of specimens.	Resistance to longitudinal crushing.
<i>Atlantic Coast.</i>					
Larix Americana.....	Tamarack .....	8	8,531	6	8,653
Picea alba.....	White spruce.....	6	5,688	4	5,140
Picea nigra.....	Black spruce.....	6	6,259	3	7,040
Pinus Banksiana.....	Banksian pine.....	4	6,959	2	5,069
Pinus resinosa.....	Red pine.....	2	7,666	6	7,143
Pinus strobus.....	White pine.....	8	5,386	5	5,470
Thuja occidentalis.....	White cedar.....	10	4,635	6	5,316
Tsuga Canadensis.....	Hemlock.....	10	5,918	10	6,367
<i>Pacific Coast.</i>					
Picea Sitchenis.....	Western white spruce.....	2	5,647	7	5,655
Pinus monticola.....	White mountain pine.....	1	6,123	2	4,963
Pseudotsuga Douglasii.....	Douglas fir.....	7	8,136	28	8,703
Thuja excelsa.....	Yellow cypress.....	2	7,995	6	7,044

On the Atlantic side the white spruce, banksian pine and red pine of Canada, were found to offer more resistance to longitudinal crushing than those of the United States; the tamarack, black spruce, white pine, white cedar and hemlock of Canada offered less resistance. On the Pacific coast the white mountain pine and the yellow cypress offered more resistance, and the western white pine and Douglas fir less resistance in Canada than in the United States.

The following table gives the resistance to indentation to 1.27 millimeters in kilograms of the same woods as before for the two countries :—

RESISTANCE TO INDENTATION OF WOODS OF CANADA AND UNITED STATES COMPARED.

Botanical Name.	English Name.	CANADA.		UNITED STATES.	
		No. of specimens.	Resistance to indentation.	No. of specimens.	Resistance to indentation.
<i>Atlantic Coast.</i>					
Larix Americana.....	Tamarack.....	8	1,467	6	2,215
Picea alba.....	White spruce.....	6	1,658	4	1,358
Picea nigra.....	Black spruce.....	6	1,179	3	1,361
Pinus Banksiana.....	Banksian pine.....	4	1,569	2	1,690
Pinus resinosa.....	Red pine.....	2	1,592	6	1,273
Pinus strobus.....	White pine.....	8	1,046	5	1,431
Thuja occidentalis.....	White cedar.....	10	969	6	936
Tsuga Canadensis.....	Hemlock.....	10	1,491	10	1,138
<i>Pacific Coast.</i>					
Picea Sitchenis.....	Western white spruce.....	2	1,146	7	1,165
Pinus monticola.....	White mountain pine.....	1	1,139	2	1,037
Pseudotsuga Douglasii.....	Douglas fir.....	7	1,392	28	1,650
Thuja excelsa.....	Yellow cypress.....	2	1,674	6	1,690

On the Atlantic side it appears that the red pine and hemlock of Canada offer more resistance to indentation than those of the United States; the tamarack, white spruce, black spruce, banksian pine, white pine and white cedar of Canada offer less resistance. On the Pacific coast the western white spruce, white mountain pine and Douglas fir of Canada offer less resistance to indentation than those of the United States; the yellow cypress of British Columbia offers more resistance to indentation than that of Alaska.

To sum up the results of these tests: The tamarack, black spruce and white cedar of Canada were found to have less weight, less elasticity, less transverse strength, less resistance to longitudinal compression and less resistance to indentation than those of the United States; the white spruce of Canada was found to have more weight, elasticity, transverse strength and resistance to longitudinal compression but less resistance to indentation; the banksian pine more elasticity, transverse strength and resistance to longitudinal compression, but less weight and resistance to indentation; the red pine more resistance to longitudinal compression and to indentation, but less weight, elasticity and transverse strength; the white pine more elasticity and transverse strength, but less weight and resistance to longitudinal compression and to indentation; the hemlock more weight, elasticity, transverse strength and resistance to longitudinal compression, but less resistance to indentation. Of the Pacific coast trees the western white spruce of Canada appeared by the tests to have more elasticity and transverse strength, but less weight and resistance to longitudinal compression and indentation than those of the United States; the white mountain pine more weight, elasticity, transverse strength and resistance to longitudinal compression, but less resistance to indentation; the Douglas fir more elasticity but less weight, transverse strength and resistance to longitudinal compression and indentation. The yellow cypress of British Columbia showed more weight, elasticity, transverse strength and resistance to longitudinal compression and indentation than those of Alaska.

In tabular form the results of these tests were as follow; the plus sign being used where the figure for the Canadian wood is higher, and the minus sign where it is lower than for woods of the same species of trees in the United States:—

## WOODS OF CANADA AND UNITED STATES COMPARED.

Botanical Name.	English Name.	Specific gravity.	Elasticity.	Ultimate transverse strength.	Resistance to longitudinal compression.	Resistance to indentation.
<i>Atlantic Coast.</i>						
<i>Larix Americana</i> .....	Tamarack.....	—	—	—	—	—
<i>Picea alba</i> .....	White spruce.....	+	+	+	+	—
<i>Picea nigra</i> .....	Black spruce.....	—	—	—	—	—
<i>Pinus Banksiana</i> .....	Banksian pine.....	—	—	+	+	—
<i>Pinus resinosa</i> .....	Red pine.....	—	—	—	—	+
<i>Pinus strobus</i> .....	White pine.....	—	+	+	+	—
<i>Thuja occidentalis</i> .....	White cedar.....	—	—	—	—	—
<i>Tsuga Canadensis</i> .....	Hemlock.....	+	+	+	—	+
<i>Pacific Coast.</i>						
<i>Picea Sitchensis</i> .....	Western white spruce..	—	+	+	—	—
<i>Pinus monticola</i> .....	White mountain pine..	+	+	+	+	—
<i>Pseudotsuga Douglasii</i> ....	Douglas fir.....	—	+	—	—	—
<i>Thuja excelsa</i> .....	Yellow spruce.....	+	+	+	+	+

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TANNING VALUES.

The United States census report for 1880 gives a table showing the amount of tannin contained in the bark of various North American trees, and those among them to be found in Canada are given below.

The report says: "These determinations give the proportion of tannin. They do not indicate the real value of the bark of the species for tanning, which can only be obtained by actual experiments made on a large scale, other properties in the bark, besides the percentage of tannin, affecting the value of the leather prepared with it. These determinations must, therefore, be regarded as approximations, which will serve, in some cases, to indicate species not now in general use for this purpose, which may be looked to as possible sources of tannin supply. The tannin in each case was determined in the rossed bark; that is, bark deprived of the main part of the outside coating."

PERCENTAGE OF TANNIN IN BARK OF CANADIAN TREES.

Botanical Name.	English Name.	Tannin.
<i>Castanea Americana</i> . . . . .	Chestnut. . . . .	p. c.
<i>Picea nigra</i> . . . . .	Black spruce. . . . .	6.25
<i>Picea Engelmanni</i> . . . . .	Western white spruce. . . . .	7.20
do . . . . .	do do . . . . .	20.56
do . . . . .	do do . . . . .	17.01
<i>Pseudotsuga Douglasii</i> . . . . .	Douglas fir. . . . .	12.60
<i>Quercus alba</i> . . . . .	White oak. . . . .	13.79
do <i>macrocarpa</i> . . . . .	Burr oak. . . . .	5.90
do <i>prinus</i> . . . . .	Chestnut oak. . . . .	4.50
do <i>prinoides</i> (old tree). . . . .	Yellow chestnut oak. . . . .	6.25
do do (young tree). . . . .	do do . . . . .	4.33
do <i>rubra</i> . . . . .	Red or black oak. . . . .	10.33
do <i>tinctoria</i> . . . . .	Yellow oak. . . . .	4.56
<i>Tsuga Canadensis</i> . . . . .	Hemlock. . . . .	5.90
do <i>Mertensiana</i> . . . . .	Western hemlock. . . . .	13.11
do do . . . . .	do do . . . . .	14.42
do <i>Pattoniana</i> . . . . .	Alpine hemlock. . . . .	15.87
		13.79

It appears from these tests that the western white spruce, the Douglas fir, the western hemlock and the Alpine hemlock, all British Columbian trees, have a greater percentage of tanning in their barks than the common hemlock.

## APPENDIX "K."

## CANADIAN WOODS AND THEIR ECONOMIC USES.

LECTURE BY THE HON. J. K. WARD, IN THE SOMERVILLE COURSE.

*(Montreal Herald, March 22, 1892.)*

In acceding to the request to prepare a paper to be read on this occasion on the Forest Trees of Canada, their use and commercial value, I did so on condition that my remarks would be of a practical character rather than theoretical or technical. What I will have to say has been acquired in the rough school of experience and not in academic halls or at the feet of wise men. Having spent more than half a century in the workshop, the forest, on lake and river and in the saw-mill, I am sure you will not think it out of place or presumptuous on my part to try to impart some of the knowledge I may have acquired in the way indicated, though it be ever so little.

The trees indigenous to our country and climate are of two classes, the coniferous or evergreen and deciduous or those that shed their leaves annually.

Of the first-named class is the common cedar, one of the most useful in our woods. It abounds in nearly every part of the wooded country, is largely used for fence rails, pickets, posts, sills for buildings, telegraph posts, railway ties, where the line is straight, it being considered too soft to resist the pressure on curves. It is very light and durable, has a pleasant aroma, said to be a protection against moths when used for drawers or chests. It also furnishes material for roof shingles for home use and exportation, a large quantity of which find their way into the United States from the Eastern Townships.

Not the least important of the evergreens is the hemlock. It exists in great quantities in almost every part of the province, and is usually found mixed with other woods; it is the cheapest class of sawed lumber that we have, is strong and durable when not exposed to the weather, and is used for rough work such as sheathing, roof boards for shingling on, holding nails better than almost any other wood, joists, studding, stable flooring, as it is said to be proof against rats gnawing through it on account of the prickly nature of the wood. But the great value of the tree when it is not too far from navigable water or rail is in its bark, which is almost invaluable for tanning purposes, and realizes from \$4 to \$7 a cord alongside railroad or barge. Trees that are taken for their bark are usually cut down and stripped during the months of June and July, when it peels easily, but it is no pleasant task for those who have to do it, as the plague of black flies and mosquitoes prevailing at that time can only be appreciated by those who have had some experience in the bush at this particular season. The tree, after the bark is taken off, if not too far from river or mill, is made into saw-logs and sold to the lumbermen or taken to the mill and sawed on halves, the millman taking half for his labour, the farmer selling the other portion or hauling it home for his own use. The extract of hemlock is used in medicine for its narcotic properties.

The balsam or sapin of the French, is of little commercial value. When large enough it is made into lumber. It is usually found in poor soil mixed with white spruce. It makes a nice ornamental tree, is graceful in shape, nicely pointed at the top and of a very dark green colour.

Our ordinary white spruce, one of the best known and most useful of the evergreens, is found in great plenty from Nova Scotia to the Ottawa, including the St. Lawrence and their tributaries, but it is not often seen west of the former river till we reach Lake Superior and Northern Manitoba. The wood of this tree is largely used for building purposes, making excellent floors and joisting timber, as well as for doors, sashes, mouldings and inside finishing when white pine is scarce. It also furnishes spars for sailing vessels, such as yards, masts, &c., as it is both light and strong.

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The sea or black spruce of Nova Scotia and New Brunswick is largely used in the frames of ships and when well salted is said to be almost as strong and durable as oak. I have seen a Nova Scotia barque with part of her frame exposed, as sound as the day it was put up, after eight years of service in many climes and scorns. The spruce is also the favourite wood of pulp-makers, to be manufactured into paper, though other woods to some extent are used, the young trees being preferred. Vast quantities are cut down to supply the demand which is increasing very rapidly. Much of this material is taken to the United States in its natural state, where it enters free of import duty. Our government, I think unwisely, removed the export duty that existed until a year or two ago, thus hastening the denuding of our forests, and robbing the country of one of its principal sources of wealth.

The next in order of this class is the tamarack or larch, sometimes known as hackmatack. It is deciduous in character, and though it has fallen in value of late years owing to the decline of ship-building in Quebec, yet it is an excellent wood, being little inferior to oak for strength and durability, and much more easily worked. Years ago I have sold it in Quebec for 25 cents a cubic foot, while to-day it is difficult to get for the same average quality 12 to 14 cents, and that for only a limited quantity. None of it is exported. What is made is principally used for sills, under plank sidewalks, and in the construction of a few small vessels and scows that are built for local purposes. The smaller trees are mostly made into railroad ties and cordwood which is considered an excellent steam producing fuel on account of its inflammability. Tamarack knees made out of the root of the tree are valuable to export.

The red or Norway pine, another of the coniferous trees, is often found scattered with white pine, largely on the Ottawa and its tributaries; it has much thicker sap than the other pines; it is a valuable timber, strong and elastic, much used in this country for flooring, and the frames of railroad cars; in England largely for flooring, joists and ship planking.

We now come to what every lumberman considers the king of the forest in grandeur, usefulness or value, the white or cork pine, or *pinus strobus* of the scientists—the tree of all others that serves more purposes than we can enumerate. Among them the tiny match, the mast for the great ship, the frame of the sweet sounding piano, and wherever a soft, easy working wood is wanted either in the arts, the workshop or the factory, there it is to be found. As an article of commerce it far surpasses in value and quantity that of any other wood, if not of all sorts put together. It supplies more freight for vessels coming into the St. Lawrence than any other commodity; it gives more employment to wage-earning men than any industry in our country, except agriculture. It employs more capital in manipulating it, from the time the men leave for the woods in the fall to make, haul and drive the logs and timber to the mills—the building of mills for sawing, the construction of barges and steamboats to convey it to the market, as well as the large amount of freight furnished to railroads, the erection of factories to convert it to the various uses to which it is put. It is safe to say that the value of the output of pine lumber alone, produced in Canada, is at least \$25,000,000, or two and a half times as much as that of any other manufacturing industry, and when we consider that 60 per cent is paid for labour and that nearly all to men representing a large population, you can readily see how important it is, either by legislation or otherwise, to protect and conserve the source of this great factor in our prosperity. How can we extol sufficiently this monarch of the forest that we are so much indebted to? The tree when growing in the open country is of little or no value except as a shade tree, its lateral branches reaching almost to the ground, and it is in the dense forest that we have to look for the great tree of commerce, where nature acts the pruner. There the branches decay and drop off, the trunk shoots upward high above its neighbours seeking that which it was deprived of below, light and air. By this action of nature we get our clear pine, so much prized by mechanics. As the branches drop off the wood grows over them and we get the stately tree carrying its size well up and often attaining 60 or 70 feet to the branches. I once saw a tree that measured 40 inches in diameter, 70 feet from the ground, without a knot or defect visible in this space. Naturally, however, it is very rare to get a log, or the best of timber without finding knots or defects as you get near

the heart, the remains of the dead branches that fell off in the tree's youth. My experience teaches me that white pine is of slow growth. The smallest tree that ought to be taken for saw-logs or timber should be at least fourteen inches at the butt. This would take not less than fifty years to produce, and such a tree as I before described, as much as one hundred and fifty. I have a white pine tree near my house that has not gained more than three inches in twenty years, although it is a good rich soil, perhaps too rich. Large groves of pine are usually found on poor, light soil. I think consequently that the bulk of the pine found under such circumstances, is apt to be punky or defective for the want, so to speak, of nourishment. The best pine is usually found on stronger soil mixed with hardwood. It is unpleasant to contemplate the want of this valuable timber. Once gone it is gone forever, and cannot be reproduced in our or our children's time, as unlike mineral or other products of the soil, the quantity produced from these is only limited by the amount of labour employed in producing them. Perhaps, however, time will find a substitute in some artificial wood, or employ metal to take its place. Hardwoods, to which I will briefly refer presently, that were once almost discarded, except for burning, are coming largely into use in consequence of the improved woodworking machinery, that has been devised of late years, making the work of preparing and completing joiner work much more simple and easy than it was to do the same thing in pine (when I served my time over 50 years ago, and when flooring, mortising, tenoning, striking mouldings out of dry spruce with hard knots was done by hand). The facilities also for reaching hardwoods and getting them to market will help to make up for the loss of this favourite material, which I hope is yet a long way off. I might say before closing this part of my subject that the magnificent cedar of British Columbia will no doubt largely take the place of white pine for joiner work. The Douglas fir will be a valuable substitute for our coarser woods, when they become scarce and high in price, that is if the railroads moderate rates coming east so as to come into competition with each other. It will, however, I am afraid, be some time before either takes place.

The last of the soft wood that I will refer to is the basswood, linden or *bois blanc*. It is usually found mixed with other woods, is a handsome tree growing tall and straight and often found from two to three feet in diameter, and sheds its leaves annually. It produces lumber that is much used by carriage-makers, furniture manufacturers and joiners for panels, &c. This wood, when green, readily absorbs water and if put into the river to drive with other logs, many soon find their way to the bottom and are lost. Those that reach their destination lose much of their value for fine work by reason of water stain, &c. The true way to manufacture basswood is to draw it direct from the stump to the saw-mill when possible. The white wood produced under such circumstances is capable of a fine finish and when work is properly done, shell-lacked and oiled, is almost in appearance equal to satinwood. The common or red portion of the log is mostly used for packing cases. I am not aware of any quantity of it being exported, most of it being produced in small mills for home use.

Of the deciduous or leaf-shedding trees, the first I will refer to is the beech, a handsome shade tree with smooth bark and bearing a small triangular nut, not of an unpleasant taste. The wood is used for various purposes, such as carpenters' planes, shoemakers' lasts, bobbins and shuttles for cotton and woollen factories, and largely for firewood, as it makes excellent fuel.

Birch, of which there are several species, principal among them being the large or yellow birch, is much used for furniture, by wheelwrights, for stair building, for hand-rails and balusters, and in ship building, forming a portion of the frame, flooring and keelson, being durable when kept wet. It is also largely exported to Europe as square timber. It is a tree of considerable size, often reaching 20 to 30 inches in diameter. It is also a favourite firewood.

The white birch or *bouleau*, has within a few years become of some value when found within easy reach, having been turned to account for the manufacture of spools and spool wood for thread-makers, the white part of the wood only being used. It is made into squares varying from one inch, in eighths, to say two inches, and three or four feet long. Many ship loads have been shipped to England and Scotland the past few years, principally from the lower St. Lawrence. The red or heart being useless to the

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spool-makers is either used as firewood or left to rot. There are vast quantities of this wood in the interior, too far from navigation or rail to be of any value. It is mostly found on poor soil, mixed with balsam, small spruce and cedar. It makes good firewood when dry. The bark is useful to the Indian for the making of his canoe; the vessel for retaining the sap of the maple; his drinking cup and the cover of his wigwam. The yellow birch also provides him a cough remedy by boiling the sap down to a syrup and lastly, though not least, it furnishes the proverbial birch rod, which though almost obsolete, sometimes does good service, even in these days of advanced ideas. Vast quantities of the dwarf or black birch have been used as withes in rafting logs, some concerns using as many as thirty or forty thousand in a season, each of them representing a young tree, but little of this is done at present.

The elm is much admired as a shade tree, and is of considerable importance. The rock elm found in Ontario, being tough and durable, is much valued for planking the bottoms and bilges of vessels, and where there is chafing on the guards. Common elm is used for barrel staves; it is not thought much of as fuel.

Oak is one of the most valuable woods of commerce. The white and blue oaks of Ontario were famous for their great size and length, as well as strength and durability. In ship building it has no rival, except it be the live oak of Florida. For wagon-making and articles requiring strength, it is invaluable, and is much used in the better class of furniture. The white oak found in Quebec is small and of little value; the red oak, however, is of good size, it makes excellent inside floors, and is much admired for household furniture. It is also valuable for hogshend staves; it makes, when dry, a hot fire, and is said to be good for burning out stoves.

Black walnut is almost a thing of the past, although forty or fifty years ago in the country between Guelph, the St. Clair River and Lake Erie it was cut down, burnt or put to the commonest uses, such as fence-posts, rails, hog-pens, &c. The value of this wood has changed so much since that time that I once saw a log which cost three hundred dollars delivered in Troy, N.Y.

Of the maples there are many varieties, two only which we will refer to, which are commonly known as the soft and hard species. The former is a rapid growing tree, found in low lands as well as on the hill-side, makes, when dry, a good firewood; when sawed into lumber is used for floors, furniture, gunstocks, and lasts. It is comparatively soft and easy to work. The hard, or commonly known as the sugar or rock maple, is one of the handsomest and most useful of our forest trees. It is emblematical of our nationality, is found in almost every part of the country either as shade or ornamental, or as a wood of commerce. As a shade tree it is hardly excelled by any other for the beauty of its foliage or the symmetry of its proportions. Who is it that has not admired the elegance and richness of the curly and birdseye maple, when worked into bedroom sets of furniture, and then the many uses it is put to, where strength and durability are required. By the millwright it is preferred to any other of our woods for boxes and bearings, for shafting when running in water, as well as cogs or teeth for gearing wheels. It is also a favourite wood with the lumberman, as it supplies him with one of the best materials for axe-handles, handspikes and cant-hooks for river driving, &c. As a sugar producing tree it is of great importance, saving a good deal of money to the farmer, as well as employment at a season when there is little else to do, and affording amusement to the young in having a sugar bee and a good time generally. Though a slow grower it will always remain a favourite.

The hickory, a tree of many species, is highly esteemed as being perhaps the best heat producing wood in our country, being considered better for this purpose than even the rock maple. It is much more plentiful in Ontario than Quebec. For toughness and strength it is not excelled by any of our forest trees, and consequently is largely used for axe-handles, and agricultural implement makers use it where strength and lightness are required.

Before closing I wish to call your attention to the desirability of doing what we can towards conserving our forest wealth. I think I am safe in saying that the yearly value of forest products in Canada is not less than \$40,000,000. Forests are also the regulators of the flow of water, holding it back in the glades and swamps, and thus preventing often times what might otherwise be disastrous floods.

## APPENDIX "L."

## "THE BATTLE OF THE FORESTS."

(By Prof. B. E. Fernow.)

In an article in the *New Science Review*, October, 1894, Mr. Charles Barnard gives an account of papers read before the August meeting of the American Association for the Advancement of Science, one of them being as follows:—

The paper read at one of the evening sessions by Prof. B. E. Fernow, Chief of the Forestry Department at Washington, was profusely illustrated, and, while technical in its character, treated of subjects that are of vital importance to all the people. After an instructive and exhaustive history of the rise and progress of the vast forests that once covered the larger part of this country, and after showing the once enormous extent of our forest wealth, Professor Fernow took up the subject of man's interference in the great century-long battle that always goes on in all wooded lands between the weak and the vigorous trees, each striving for a foothold in the soil and a chance to enjoy sun and air.

Forest growth begins on barren sands or bare rocks, by the starting of shrubs and small plants, that, dying, leave their remains to form a humus or soil in which better and larger plants may grow. Trees create soil through their own decay and death, and by catching and holding water and drifting material of all kinds. A forest in active operation creates its own soil at the rate of one foot in five hundred years. The lumberman can strip an acre of forest of its trees in a few days, and leave the soil that it cost two thousand years to lay down, to be totally ruined and destroyed in a few months. The natural processes that instantly follow the cutting off or burning of a forest area, and the correct methods of controlling them and the proper means to be used in saving our forest wealth, form the science of forestry. A rapid and graphic study of this science made the most interesting and valuable part of Professor Fernow's paper.

Rain falling on forest-covered land meets with an elastic surface. The leaves break up its down-pour, and the trees and the vegetable growth under them act precisely as a sponge, checking the on-rush of the water, holding it back, and allowing it to seep slowly away, without injury to the soil. Forests act as moisture holders, and keep the air damp by checking too rapid evaporation. Drying winds and the direct sunlight act more slowly in woods than on bare hillsides. Strip the land of its trees by axe or fire, and the rain strikes the soil with full force, accumulates in swift rivulets, plows up the soil, and sweeps it away to lower levels. The process is simple; the results are enormously destructive. Streams that in forests ran evenly throughout the greater part of the year, become capricious and uncertain, now raging in destructive floods and torrents now dwindling to mere rivulets, of no value to the miller or boatman. With incredible rapidity the costly soil of mountain slopes is swept away and lost, after the forests disappear. The soil gone, the rains sweep down loose rock and cover the once fertile valleys with wastes of sand and gravel. The process begins everywhere the moment the trees are gone, and increases in destructiveness from year to year, leaving stony wastes on the mountains and a wilderness in the valleys. That we do not see more miles of ruined land and sterile mountain side; that our country is not as much impoverished and desolate as Spain and parts of France, is simply because we have not gone far enough. The process has begun already, on a gigantic scale, in several of our states, and it is only a question of time when the states, combined or singly, must interfere and control the farmer, the miner, and lumberman, who are now so barbarously destroying the present and potential wealth of the country. Well may foreign writers, seeing our wasteful methods of tree cutting, and viewing our inexcusable forest fires, say that we are "a barbarous and uncivilized people."

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The science of forestry offers both prevention and cure in forest control and reforestation. Reforestation, or restoring land to a tree-growing condition, is expensive and comparatively slow, so that its general adoption upon a large scale in this country is perhaps doubtful. Forest control we can and must institute at once.

The replanting of forests as practised on the barren and valueless mountains of France was fully described in Professor Fernow's paper, and is interesting, as it is quite possible that some modifications of it may yet prove profitable wherever the price of land will warrant tree culture. These mountains being absolutely denuded of all soil, are washed by every rain, the debris covering the farm lands below. The first step is to check the too rapid flow of storm water, by building little dams of wickerwork on the slopes to catch the water, and compel it to flow slowly in a series of pools and tiny waterfalls. In these slack waters, or catch basins, the drift sand gather and forms little plateaus of soil that in a very short time will sustain a growth of small hardy trees. The roots bind and hold the new soil, and in a comparatively short time the barren hillsides are green with infant forests. Where the slopes are steep, and the damage has been great, masonry dams are used, and soil is carried up and put behind the dams to give a foothold to the young trees. Such prepared hillsides at once begin to act as water-holders, restraining floods, and preventing droughts; in fact, restoring forest conditions. Whether this work will pay here is simply a question of the cost of labour, and the value of the land, the water and the lumber crop. It pays some return at once, by preventing further destruction of good land, and by saving the water and controlling the streams. In New Jersey, where water is money, it would undoubtedly be profitable to reforest many square miles of now valueless mountain sides. There can be no question that in time it will repay to reforest barren mountain sides that are in reasonable reach of large cities, because of the value of the water restrained and restored by forest growth. Ultimately, the lumber crop would be added to the water crop.

Concerning the control of forest lands, Professor Fernow's paper was most impressive. We must do it, or some day meet a lumber and water famine, and see our valley farm lands ruined, and our rivers obstructed, and our cities water-starved. Forest control means simply intelligent supervision over the cutting of trees. The farmer and forest land owner claims he has a right to do as he pleases with his own. Such right implies no injury to others. In the case of forest lands, the right to cut down the trees conflicts with the rights of the entire community, and the rights of posterity—and posterity has moral rights, if not legal rights. Fortunately, forest control is not the mere suggestion of science. Forest control is a science itself. Just as in France the science of reforestation is carried on as a function of government, so in Germany forest control is a proper and profitable branch of the general government. Trained foresters, the police of the woods, patrol all forest lands, protect the trees from fire, decide what trees shall be cut each year, and how and when every single tree shall be felled. Poor and undesirable species are culled out, and valuable commercial varieties saved and protected till of merchantable size. Bare hillsides and all cheap or comparatively valueless agricultural lands, are replanted and made to yield a timber crop where no other crop will grow. In this country, State control of forests must come, and come soon; and the public forester must soon take the hand of the farmer and lumberman. The question is one of vital importance, involving many diverging and apparently conflicting interests. The highest skill and the widest knowledge must be brought by our State legislators to bear on this question of our forests. Forest preservation does not mean shutting up the woods to useless decay and overgrowth. Intelligent forestry means simply control; preservation and protection first, and then the proper and business-like cutting of this, the greatest crop that the soil has ever yielded. As we now stand idle, while the forest fires bring on us a loss of millions every year, and while the unintelligent wood-chopper is permitted to do as he will with what is not truly his own, we are justly charged with being "a barbarous people." "Woodman, spare that tree," was once a sentiment. It is now a command of scientific duty.

Closely allied to the paper by Professor Fernow, were a number of short papers read before the American Forestry Association, that held its sessions during the week of the American Association meetings. The eighteen papers submitted had all, with

one exception, immediate connection with the science of forestry. The one exception was a descriptive illustrated paper by Horace C. Hovey of Newburyport, Mass., upon the petrified forests of Arizona. This paper while entertaining, as an account of a visit to these curious geologic remains, had no direct bearing on forestry as a science. Its most valuable point in the interest of geology was the wanton destruction of these curious and beautiful relics of ancient forest life by persons who only see in them so much money to be won from their ruin and extinction, and the suggestion that the law should be invoked to protect this remarkable deposit before it be too late.

The remaining papers were all written by experts in the science of forestry, and were valuable as showing the present position of the science in this country as far as it relates to the actual control of our woodland wealth. The forests in all our states are now being made the subject of careful study, both by individuals, scientists and Forestry Commissions under State and Federal control. In some instances the matter is under the care of state geologists and state experiment stations. The study of forest fires and their prevention is also the subject of earnest study in several states, notably in New Jersey, where a complete system of fire protection is under consideration. The consensus of opinion at the meetings seemed to be that we must copy the forestry laws of Germany, and establish regular paid forest fire departments and patrol. All the papers of this association, while almost wholly technical, seemed to be worthy of the most earnest public attention, because it was evident from the tone of the discussions of the association that the great need to-day in this country is forest education. It is not that the great mass of the people are indifferent or careless; it is not that they are willingly allowing the lumberman and farmer to ruin the public wealth invested in trees, but that the people do not realize how serious the matter is, how gigantic is the annual commercial loss occasioned by forest fires and how ill directed our forest depletion. The country seems well wooded to the uninstructed eye. The desolated hill country, bereft of its trees, is seldom seen, and the demand for wood is enormous. These things have led to a certain public indifference that is plainly reflected in all our legislatures, and it was clearly the desire of the Forestry Association that educators throughout the country should bring the public to a realizing sense of the value of forestry science in saving our woodland wealth before it is completely lost.

## APPENDIX "M."

### PULPWOOD AND WOOD PULP.

#### THE PRODUCTION OF WOOD PULP.

(From Report of Commission on Forest Reservation.)

The wood pulp industry may be said to have commenced in the year 1846. But its development during the first thirty years was decidedly slow. Since 1876, however, the production of this material has increased rapidly. Its preindustrial period was known only to the chemist. Cellulose was made in the laboratory in 1840, but it was not manufactured, commercially, till 1852. Ground wood was first used for paper-making about the year 1846, when it was manufactured by Keller, under a patent taken out in Saxony in the previous year. Since that date, many improvements have been made in the machinery and methods used in grinding, the main object being to produce a longer and finer fibre. The fibres of the wood are torn away by mechanical pressure against a revolving grindstone, in contact with water. No chemical treatment of the wood is necessary, the only requirements of this industry being cheap wood, abundant water power and suitable machinery.

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Processes, such as Sinclair's, have long been in use for pulping very finely cut coniferous wood, and in the Paris exhibition of 1880, one of the most prominent objects exhibited in the Norwegian section, was a *pâte de bois* or *papier maché*, made in this way from pine wood, and worked into cardboard and various moulded panellings, &c. It has been found, moreover, that in this way the whole of a pine tree trunk—branches, needles, and all—can be converted into paper without waste. Saplings, which it would not pay to cut for firewood, are now profitably worked up in this way into pasteboard.

By the chemical processes for manufacturing wood pulp, a good class of pulp is made from the quick-growing poplar and from spruce. The wood of the slower growing linden or basswood, makes an equally valuable white paper pulp.

Oak can also be used, though yielding an inferior product that requires bleaching. One great advantage in the method is that the tannin in the oak is obtained as a by-product, and the chemicals with it in the lye being rather an aid than a hindrance to the tanning process, it is found that hides can be perfectly tanned in it in ten days. This seems to offer to the cultivator of oak coppice, or the enterprising planter of poplars, a most important source of income, whilst in coniferous plantations, there need be absolutely no waste.

The chemical preparation of fibre has given rise to two distinct processes—the soda process and the acid process.

Chemical pulp (cellulose) is used as an adjunct with esparto rags or mechanical pulp, in the manufacture of news, printing, colours, and some kinds of wrapping paper. It forms (according to Mr. Routledge) an excellent succedane, or filler up, and bleaches to a high colour. Fine prints are also manufactured exclusively from acid pulp.

Mechanical pulp is chiefly used as an adjunct in the manufacture of news, cheap printings, and wall-papers, but there are several distinct classes of paper made from it, without any other ingredient, viz., wood-pulp middles from white pine pulp, and various self-coloured wrappings, and tinted wall-papers from brown, sometimes styled patent, pulp.

Another important use is for wood pulp boards and so-called "patent" or brown boards, the latter being produced from brown pine pulp, and the former from white pine pulp.

The consumption of wood pulp boards is increasing rapidly, chiefly for making paper boxes, for which they possess certain advantages over straw boards.

Although almost any wood can be converted into pulp, experience has hitherto decided in favour of conifers of a certain age.

For chemical pulp, trees on an average of twenty years' growth, and a thickness of six to eight inches at the base of the stem, are said to be the best. Younger wood is more tractable by chemical means, but produces a fibre of inferior quality. Older wood requires stronger chemicals to remove the encrusting matter, and possesses no compensating advantages.

In Canada, many species of wood have been utilized, amongst which may be mentioned pine, poplar, spruce, willow, basswood, cedar, hemlock, maple and birch.

Poplar pulp remains white, birch becomes pink, maple turns of a purple tint, and basswood, reddish after grinding.

The practical operations concerned in the manufacture of pulp from wood, by the caustic soda process, may be divided into the following: Barking, sawing, chopping, crushing, boiling or digesting, washing and bleaching, treatment for sale as half-stuff, and soda recovery.

### THE WOOD PULP INDUSTRY.

(From the "Canadian Trade Review," 24th November, 1893.)

Of all our industries the public at large know less of that of converting wood into paper than perhaps any other. The raw material and the finished product seem so contrary in nature that few outside the trade have any conception of the processes by which wood is converted into paper, nor of the extent or the possibilities of this singular and interesting triumph of scientific skill. Paper to be made from rags presents no

difficulty to the imagination as their affinity is a natural one, but to look at a spruce tree to-day growing in a forest and to think that in a few days it will come to us as the wrapping of a parcel or as a newspaper, it is indeed hard to realize.

There are two kinds of wood pulp, one called mechanical which is produced by grinding the wood between stones, the other is called chemical which is produced by cooking in large boilers under heavy steam pressure. There are two ways of producing, one called the soda, and the other the acid process, the wood fibre being cut into chips is cooked in liquor of either alkali or sulphate of lime.

The market value of mechanical is \$20 per ton, and chemical 2½ to 5 cents per pound according to quality of fibre. Mechanical pulp is used generally wherever a very cheap paper is required, and is used to the extent of 80\* to 90 per cent of the ordinary daily papers, whereas the chemical having strong fibre is used for the better grades of paper, calling for strength and cleanliness, such as book and writing. By the use of the two articles the price of paper is greatly reduced, as they have brought down the price of rags to one-third of their former value before these substitutes were introduced. From the nature of the ground wood, exposure to the sun, indeed to the atmosphere of a room, changes its colour to a dirty yellow, and this to a limited extent also applies to the acid chemical pulp. So that in cases where a paper is wanted to keep its colour no acid pulp is used on account of the extreme difficulty of eliminating traces of sulphur from the paper. Soda chemical fibre pulp on the other hand being naturally free from the encrusting material, contains nothing but pure fibre, and consequently is available for the manufacture of any papers of a better quality. There was at first great difficulty in introducing these pulps to paper-makers, and to get paper buyers to take paper containing any portion of them. But the trade has so far changed that realizing the public appreciated cheap and good paper, which can be made from wood pulp, they have brought it largely into use. The manufacture is pursued at East Angus and other places in Canada. The firm who introduced the process—Messrs. Angus and Logan—continued this manufacture alone for 10 years, and during that time they converted all the pulp they made into paper at their mills. A number of paper mills in Canada make their own wood pulp. Other mills make both chemical and mechanical ground wood pulp for sale to paper mills in Canada, and for export to the United States and Great Britain. The duty on this article in the States is, as we said last week, almost prohibitive—10 per cent on mechanical and \$6 to \$8 per ton on chemical. A cord of wood produces about 900 lbs. of chemical and about 1,400 lbs. ground wood or mechanical. In the Dominion there is now made about 50 tons of sulphite or acid pulp, 50 tons of soda pulp and 100 tons ground wood pulp per day. In order to produce this quantity of sulphite and soda pulp about 225 cords of wood are required daily or 70,000 cords per year, and to produce ground wood manufactured about 160 cords daily or 32,000 cords a year.

It depends on the quality and weight of paper required to determine how much pulp is required per ton. The making and use of chemical and mechanical fibre in the United States is enormous as compared to Canadian production, and our neighbours across the line are finding themselves very short of spruce wood to make pulp. In consequence the large United States mill-owners and capitalists have been buying up large tracts of woodland in Canada to get the control of growing wood thereon, as well as buying all the cut wood they can lay their hands on. As the matter now stands the United States come into Canada and take out our logs free of export duty in large quantities. All that short-sighted improvident Canada gets in the transaction is the cost of the stumpage. If Canadians want to send a ton of pulp into the United States they are charged duty, or if Canadians want to send in sawn spruce lumber \$2 per 1,000 feet is exacted. The net result is that the Government of Canada offer a premium to the United States manufacturer of wood pulp or sawn lumber, as the case may be, and in proportion handicaps the native industry. The saw-mill owners and the pulp makers have interviewed the government repeatedly and have pointed out the injustice of the position. The position can be stated in a few words. Canada owns raw material required for a large manufacturing industry. She has the men, the skill, the capital, needed for converting that raw material into one of great value. The United

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States needs that raw material, but will not allow its manufactured product to enter the States except by paying exorbitant duties. For every dollar Canada gets by exporting this article she would get a hundred or a thousand if she used it at home, in supporting Canadian labour and capital. Are we then so reckless of our resources, so dull, so slow, so careless of national interests as to allow a rival nation to clear out our raw materials for the price of an old song, to take away our labour for our mills, and deprive our skill and capital of profitable employment, to make our people literally mere "hewers of wood" for a more enterprising neighbour? Unless we are content to rest under such disgrace, we shall put an export duty on spruce and on pine saw-logs, at least equivalent to the duty the States impose on sawn lumber and pulp, say \$4 per cord on pulp-wood.

### CANADA'S TIMBER AND PULP.

(*New York Journal of Commerce, 1893.*)

The Ways and Means Committee has done well in putting timber on the free list, but it was hoped that it would put all lumber and wood pulp on the free list. We are brought to a consideration of this subject from the remarks made by the Hon. Mr. Foster, Finance Minister of the Canadian Government, in which he intimates that the existing conditions of the interchange of forest products between this country and Canada cannot any longer be permitted to remain in their present unsatisfactory state. The threat made by our western lumbermen that they will make the waters of the lake smooth towing over Canadian logs to start their mills in Michigan now that they have used up their own timber, has forced the Canadian Government to inquire into the conditions; and although Mr. Foster does not appear to distinctly state that it is the intention of his government to reimpose the export duties, he leaves no question that this must be the outcome in case we still persist in exacting heavy duties on Canadian lumber and pulp.

His remarks are sufficiently clear on this point to leave little doubt of the result. When he says: "If conditions remain as they are, when Parliament meets it will become a subject for very grave consideration whether the interests of Canada and her lumber and pulp productions generally, both present and prospective, will not require a strong remedy," and intimates that remedy to be "the imposition of an equivalent export duty on logs exported to any country which imposes heavy duties on Canadian lumber and pulp."

It is well known that there is in Canada a very strong feeling, among those at least whose mills have been forced to close down, from what they claim to be an unfair discrimination in favour of the manufactures of this country by the Canadian Government; and some go so far as to ask for an export duty higher than the United States import duties on Canadian lumber and pulp, as our lumbermen have always insisted that \$2 a thousand feet was only a fair rate of duty to protect the saw-milling industry of the United States, so long as they had timber, and the Canadians think, now that the Michigan millmen must depend on Canadian timber for the future, that it is but just their own agreement should apply to protect the Canadian milling industry, but this idea Mr. Foster does not appear to entertain, for he speaks only of "an equivalent rate of export duty," and leaves it optional with us to have free logs and pulpwood in exchange for free lumber and pulp.

Many of our best informed people believe, irrespective of protective or free trade principles, that the time has arrived when the conditions of our forests, especially those containing white pine and spruce, require most careful consideration to try to extend their usefulness as long as possible, so as not to leave us in a position of having to depend on the generosity of others for our own requirements of such indispensable material as white pine and spruce lumber and pulp. Even now the aspect is by no means reassuring, for we get from the extra census bulletin of 1890, relating to the saw-milling industry of our great white pine producing states—Michigan, Wisconsin and Minnesota—an insight into their condition at that time, when it would appear that outside of that

owned by the Federal and State governments, the quantity of white pine barely reached 50,000,000,000 feet, while the amount cut during the census year reached the enormous total of 10,670,000,900 feet, or over one-fifth as much, the remarks made on this point being: "The manufacturers' holdings of such timber are only sufficient to supply them for about five years at the present rate of cutting. The quantity in reserve is believed to be principally that standing on lands owned by the Federal and State governments."

Since then, the three years' cutting of pine in Michigan has about gleaned the lower peninsula of this timber held by the millmen. The largest amount now held by any one party is that of Mr. David Ward, of Detroit, which he is withholding from the market at present. And, while the Saginaw River is largely dependent on Canadian logs to stock its mills, the Muskegon, the next largest producing river, is styled in a recent issue of the *Chicago Timberman* "A Worn-out Stream"—a sad picture to those who remember what the Muskegon River was in its earlier days; and Muskegon itself has dropped from one of the greatest lumber producing centres of the world to a position of unimportance. From over 750,000,000 feet of annual production only a few years ago, it has fallen to about 100,000,000 feet at the present time, of poor average quality—the mere clearings up of the great hauling operations of the past.

And the same may be said of the great tributary of the Saginaw, the Tittabawassee, which, in 1882, turned out over 600,000,000 feet of logs. In fact, the lower peninsula of Michigan, which up to last year gave the largest production of sawn pine lumber of any State of the Union, may be said to be now out of the field for the future as a pine lumber producer. There then remains, outside of Wisconsin and Minnesota, but the limited tracts of white pine still uncut in the Alleghany mountains south of Pennsylvania, which, like her sister states of New York and the New England States, has now parted with the white pine of commercial importance, while Wisconsin and Minnesota are fast using up the limited quantity left here. So that, in so far as regards white pine, it would appear that the case is even now past repair.

And whatever may be said about the white pine will apply with fully as great force to spruce, for this being a peculiarly northern wood, we must, whether we like it or not, depend on Canada for supplies of this timber, both for lumber and pulp. An examination of the reports of Professor Sargent, respecting the amount of spruce remaining uncut in 1880, showing at that time barely a supply for ten years in the New England States, which would have been pretty well harvested by this time if the same quality and amount had been cut continuously since his report was made, and the almost mathematical accuracy of his estimate of the white pine of Michigan, when carefully considered, should cause us to regard his other estimates with confidence. His estimates of the white pine of Michigan were to include only trees of twelve inches in diameter, twenty feet from the ground, whereas, most of the timber cut for the past half dozen years has been from trees that were not to be taken into consideration, and which should have been allowed to grow to supply timber for the future, and not leave the state, as now, wholly gleaned of pine timber. Pine and spruce lumber and pulp should be admitted free.

### THE CUTTING OF TIMBER FOR PULPWOOD.

(Report of Commission on Forest Reservation.)

The conditions which obtain in the area covered by the Adirondack Park of the state of New York, in so far as the forest itself is concerned, are analogous to those in the wooded parts of Ontario, and the following extracts from the report of the New York Forest Commission for 1891, relating to the wood pulp industry, the tendency to a natural regeneration of the forest under favourable circumstances, &c., are interesting in view of what is going on in our own province:—

"The manufacture of paper from wood is a comparatively new industry in this country. Its rapid development and the consequent increase in the consumption of valuable forest products demands the attention of everyone interested in American

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forestry. The introduction of wood pulp was regarded with satisfaction by students of the forestry question, because they saw in its use a market for certain small-sized timber, the sale of which is necessary to an economic forestry management. The successful pecuniary results obtained in the management of European forests are due, largely, to the fact that there is a market for everything that is left after cutting the large-sized timber; and so the advent of the wood pulp industry encouraged our forestry people to believe that operations in interlucation could now be carried on as the sale of the thinnings would cover the expense.

"But the consumption of timber by the pulp mills has increased so rapidly as to endanger, instead of promote, the welfare of our forests. In the last eight years, the amount of timber used for this purpose has increased 500 per cent. In the year just passed, 1891, the timber cut for wood pulp in the great forest of Northern New York, was equal to one-third the amount cut by the lumbermen.

"It is not the increased consumption of this forest product that is so noticeable, but the fact that the entire amount consumed is taken from young trees. Only a small amount of pulp timber can be gathered from the limbs and tops left by lumbering operations. Spruce and balsam furnish the main supply, and owing to their excurrent growth, only the tree trunks of these varieties are available.

"The pulp mills on the eastern side of the great forest use timber whose diameter runs from fourteen down to six inches. On the west side, the mills on the Black River use wood with a diameter as low as three inches. It will thus be seen that the introduction of wood pulp, while it might be a valuable factor in economic forestry under proper management and restrictions, now indicates a speedy extinction of the conifers.

"The mills on the Upper Hudson use poplar to an extent of twenty-five per cent, and spruce for the balance; but the proportion of poplar used is growing less each year. The mills on the Black River use spruce, balsam, poplar, and some small second growth pine. Hemlock is used to some extent, when mixed with other kinds of wood. In making chemical fibre, however, the sulphite mills can use one-third hemlock. Tamarack is also used in small quantities, but it is a dark-coloured wood, and makes a dark, although strong paper. No cedar is used, nor any hardwood. On the Hudson, the pulp timber is cut in the same length as logs, and is floated down the streams with the log drives. It is cut thirteen feet long, and is sent to the mill with the bark on. The most of the pulp timber for the Black River mills comes from St. Lawrence and Lewis counties, where it is cut into four foot lengths, measured, and sold by the cord, and shipped then over the Carthage and Adirondack Railroad. A large proportion of the pulp timber cut in Lewis and St. Lawrence counties is peeled before it is taken from the forest, thereby obviating the use of barking machines at the mills. This supply of peeled timber is cut during the bark season, which lasts from 20th May to 15th August, before or after which time the bark will not peel.

"In estimates of a general character, one cord of timber is said to make one ton of brown pulp, dry weight; but the actual results indicate that a cord of wood will produce only 1,800 pounds. In the chemical process, two cords of wood are consumed making a ton of dry pulp, or chemical fibre, as it is called.

"Wood pulp, or cellulose, when first manufactured in this country, was used for paper only, and to a comparatively small extent. But the industry has developed with surprising rapidity, and now almost the entire bulk of newspaper stock is made from wood. Other uses for it have been discovered, and these new adaptations are multiplying each year. Under the name of indurated fibre, it is used to a large extent in making tubs, pails, barrels, kitchen ware, coffins, carriage bodies, furniture and building material. In this state there are pulp mills at Oswego and Lockport which manufacture various wares of indurated fibre, but these mills do not obtain their timber supply from the Adirondack forest. Wood pulp is also used to some extent in the manufacture of gunpowder.

"Prof. B. E. Fernow, of the Forestry Bureau, at Washington, says in his last annual report:—'While the use of timber has been superseded in ship building, the latest torpedo ram of the Austrian navy received a protective armour of cellulose, and our own new vessels are to be similarly provided. While this armour is to render the effect

of shots less disastrous by stopping up leaks, on the other hand, bullets for rifle use are made from paper pulp. Of food products, sugar (glucose) and alcohol can be derived from it, and materials resembling leather, cloth, and silk have been successfully manufactured from it. An entire hotel has been lately built in Hamburg, Germany, of material of which pulp forms the basis, and it also forms the basis of a superior lime mortar, fire and water proof for covering and finishing walls.

"The state of New York leads all other states in the manufacture of wood pulp, having seventy-five mills engaged in the industry, out of the 237 mills in the United States. Wisconsin comes next, with twenty-six mills; then comes Maine, with twenty-four; and then New Hampshire and Vermont with eighteen each. Canada has also a very large production of wood pulp from its thirty-three mills, besides supplying large quantities of timber to mills situated in the United States.

"Of the seventy-five mills in the state of New York, sixty-four mills draw their entire supply from the great forest of Northern New York, or what is known as the Adirondack woods."

#### THE FINANCE MINISTER ON SAW-LOGS AND PULPWOOD.

*From "The Canadian Trade Review."*

Since our last week's article on wood pulp, in which we made a strong protest against sending our raw materials to the States, the Finance Minister has declared that the question will require the gravest consideration of Parliament next session. The duty of Canada is to make hay while the sun shines. The Americans must have our logs or close their mills, or buy our manufactured lumber and our pulpwood or close their paper mills in New York and New England. If we put an export duty on them they will largely go to the States, but we shall have a revenue out of them. The true, sensible course is to keep the logs at home, and let Americans buy the manufactured article, which they would be compelled to do, as their native supplies are fast disappearing.

#### SIR CHAS. TUPPER, BART., ON WOOD PULP IN UNITED KINGDOM.

*(Circular, Department of Trade and Commerce, July 6th, 1893.)*

DEPARTMENT OF TRADE AND COMMERCE, OTTAWA, July 6th, 1893.

I am directed by the Honourable the Minister of Trade and Commerce to call your attention to information that has reached this department through the High Commissioner in London, having reference to the demand for, and importation of wood pulp into Great Britain, which would seem to indicate that with the resources at the command of Canadian manufacturers of the article an extensive trade could be worked up with the consumers in that country.

The information may be summarized as follows:—

Most of the pulp imported into Great Britain is from Germany and Scandinavia.

The best sulphite pulps are made in Germany, though large quantities are also made in Scandinavia and Austria, those from the latter country being very good.

The products of the best known works in Germany bring high prices, samples from some of them are marked as being worth in Liverpool £11 5s., £12 5s., £12 10s., £12 15s., £13 5s., £13 10s., and £16, less 2½ per cent per ton.

Samples of sulphite pulp from Norway are marked £12, £12 5s., £12 10s., and £13 5s.; of Scandinavian pulp, £12 5s., £12 10s., £13 5s.; of Austrian, £12 10s., and £13. 10s. These samples can be seen at this office by any one interested in the trade.

In Norway and Sweden different kinds of wood pulps are made, viz.: soda pulp and mechanical pulp, these latter being quoted on the 14th June, 1893, at about 40s. to 60s. per ton.

The different qualities of wood pulp are legion, and it seems there is not much difficulty in finding a market for all that is made.

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It is stated that the consumption of wood pulp in Great Britain is at present enormous, and is increasing rapidly, more having been imported during the past year than ever before. The use of rags has fallen off, partly owing to the restrictions that have been imposed upon the importation thereof from cholera-infected countries, such restrictions remaining still in force, and may continue for an indefinite period. It would also appear that there is a large demand for the better quality of pulp in the United States, large quantities being shipped there from Germany, while, though at the same time the United States export pulp to Europe, the quantity manufactured is not equal to the home demand.

Appended are quotations from the High Commissioner's letter bearing date June 14th, 1893.

W. G. PARMELEE,  
*Deputy Minister.*

Extract from Sir Charles Tupper's letter :—

I have been making some inquiry as to the demand for wood pulp of various qualities in this country, and find that most of the product is at present imported from Germany and Scandinavia.

I have obtained some samples of German wood pulp, which I send you, and I also quote a letter explanatory of them, that has been received from manufacturers of paper in a large way of business :—

"The best sulphite pulps are undoubtedly made in Germany. Large quantities are also made in Scandinavia and Austria, those from the latter country being also very good. In Norway and Sweden different kinds of wood pulps are turned out, viz., soda pulp and mechanical pulp, the latter being worth from 40s. to 60s. per ton, and it is used in very common news and printings. We do not use the qualities. The samples we sent you represent about the best qualities of sulphite pulps in an unbleached state. We use a large portion without being bleached in our work here, and where it is necessary to have bleached pulps, we find it very much more economical to bleach it ourselves than pay high prices for it in a bleached state.

"The consumption of wood pulp in this country at present is enormous and is increasing to a tremendous extent, and the employment of rags is in consequence falling off.

"Other materials have been affected by the use of wood pulps, such as esparto, but not to anything like the same extent as rags. Again, more wood pulp has been purchased in this country and America during the past twelve months than ever before, owing to the restrictions imposed by the representative governments upon the importation of rags from cholera-infected countries, and these restrictions yet remain in force, and may continue to be enforced for an indefinite period.

"The different qualities and brands of wood pulps are legion. We have not much experience here of the commoner kinds, but from what we understand, there seems to be not much difficulty in finding a market for all that is made."

In regard to Canada finding a ready market for their goods in England I am not in a position to know much about this question, but I have an opinion on the matter, and it is this: I feel confident that in the near future Canada should prove a very formidable rival to Europe in the manufacture of wood pulps. To my mind there is nothing to prevent this being brought about. Canada possesses the first essential in an unlimited degree. After this, there is no reason why they should not after a time compete with their surplus production against Europe on their own ground.

The United States already manufacture a large quantity but not nearly so much as they require. At present they are not serious competitors against Europe even in their own country.

JOHN DYKE, AGENT AT LIVERPOOL, ON CANADIAN WOOD PULP.

(From *Department of Trade and Commerce Report, 1893.*)

In previous reports I have alluded to the trade which might be done in wood pulp. The imports continue to increase, the figures being 156,609 tons in 1891, 190,946 tons

in 1892 and 215,584 tons in 1893, the value of the latter quantity being given as £1,180,310. I am glad to state that the Canadian makers of wood pulp have made a good start during the past season in commencing this trade, and I have used every means in my power to assist them, and I hope in my next report to be able to say that they have acquired a considerable portion of the large sum of money which is annually paid to foreign countries for this commodity.

#### WOOD PULP IN NORWAY AND SWEDEN.

(From *Department of Trade and Commerce Report, 1893.*)

There was reported a rise in 1892 on the average price of wood pulp to the extent of from 4s. 5d. to 8s. 11d. per ton for dry pulp, the average price having been £3 18s. 11d. per ton, f.o.b. More chemical and mechanical pulp was sold to Great Britain during this year than during the year previous. The number of pulp mills reported as working was 53. For dry sulphite the price per ton quoted has been, [first quality a little over £10, and about from £9 15s. to £10 for second quality. Dry unmixed sulphate pulps are quoted at from £9 14s. to £10 for first quality, and £9 3s. to £9 9s. for second quality. It is stated that there were 11 mills producing sulphite, and 4 producing sulphate pulp. Including Swedish goods the quantity of cellulose was about 20,000 tons of dry, and 8,500 of wet.

#### NEW BRUNSWICK CROWN LAND COMMISSIONERS ON PULPWOOD.

(From *New Brunswick Crown Land Report, 1892.*)

"We are firmly of opinion that the present value of the timber upon the Crown lands is considerably in excess of the rate or price for stumpage now obtained therefor, and if it were husbanded, a rate of stumpage very much larger—perhaps double the present rate—would be realized within a few years. We base this opinion, first, upon the rapidly decreasing spruce areas of New York and the New England States, which with New Brunswick, Nova Scotia and part of Quebec, are the only sections of North America in which this wood grows to any large extent; second, the immense growth of the wood pulp business, which now absorbs one-third of the spruce logs procured in New York and the New England States, which last year amounted to 1,250,000,000 superficial feet, a portion of the supply for which must soon be sought in this province; third, the probability of New Brunswick lumber being, in the near future, admitted into the United States free of duty; fourth, the sure advance of values that must come with increased consumption, coupled with the diminished production in New York and New England on account of the scarcity of timber.

"In this connection we cannot too strongly impress upon Your Honour the necessity of a strict enforcement of the law against the cutting of undersized trees for pulpwood, as well as for piling. The manufacturers of pulp inform us that they prefer the larger logs for their raw material, and it is, therefore, both short-sighted and wasteful to cut immature trees for that purpose. It has also come to our knowledge that government scalers take account of spruce under legal size, and fail to direct operator's attention to their violation of the law. To correct this abuse we advise that in all such cases double stumpage be charged."\*

#### PULP AND PULP MAKING.

By J. H. LEFEBVRE.

(From *Montreal Gazette, 10th November, 1894.*)

Mr. J. H. Lefebvre, C.E., yesterday afternoon read before the *Chambre de Commerce*, an interesting paper on the pulp industry, a subject of great and growing

\* The recommendation of the commission had its effect. By the new form of license issued in 1893 no spruce (or pine) tree may be cut, "even for piling," under a length of 18 feet with ten inches diameter at small end, under penalty of double stumpage and forfeiture of license.

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importance to the country. Mr. Lefebvre began by referring to the establishment of pulp making in Scandinavia, to which most European countries now look for the raw material used in their paper mills. Mr. Lefebvre traced the revolution in the art of paper-making on the continent to the time of the civil war in the United States, where the demand for news of the great conflict led not only to an enlargement of old, but to the creation of new papers. Other publications also increased in size and number, and soon paper manufacturers found it impossible to meet the ever increasing demand for their goods. Rags, cotton waste and straw were neither sufficient nor cheap enough. Manufacturers first tried to utilize vegetable fibres and grasses, especially espartero, which they treated by the soda process. This process, perfected in Germany by the chemist Mitscherlich, was finally adapted to wood, causing a radical change in the manufacture of paper, the cost of which was also considerably reduced. In a word, wood paper was invented. But it was still too costly in production to meet the needs of the case. Further research led to the discovery of ground or mechanical pulp, which Mr. Lefebvre characterized as one of the greatest discoveries of the age. Nearly all the printing paper and a large part of the writing paper is made of wood pulp. Chemical pulp enters to the extent of thirty to forty per cent, and ground or mechanical pulp to sixty or seventy per cent in the composition of paper. Newspaper, which was sold in 1860 at 15 to 16 cents a pound, now sells for three cents. By these discoveries, the cheap journal and the cheap book were made possible.

Mr. Lefebvre said three things were necessary to the success of the pulp industry, suitable wood, extensive water power and cheap labour.

The different kinds of wood suitable for the manufacture of pulp are white and black spruce, Canada balsam, poplar, aspen and pine. Spruce and balsam are the most valuable, on account of the special quality of their fibre, and also on account of their colour. These comparatively soft woods are easily ground. Poplar and aspen have the same property, but they are faulty on account of knots and black veins, which spoil the colour of the paper. Pine is used only in the manufacture of chemical pulp. It gives a good pulp, but the process required to bleach it is rather expensive. Moreover, this wood is too high priced to be used profitably in the manufacture of paper. With the low rate of the present market for paper, pulp manufacturers require wood of small value, and, hence, spruce and balsam are the most profitable, and, in fact, indispensable in the business.

Considerable water powers are also required. To run a mill capable of producing twenty-five to thirty tons of ground pulp per twenty-four hours, takes a motive power of from 2,500 to 3,000 horse-power. The generation of such motive power by means of steam would be a costly matter, and in practice, it is acknowledged that pulp can be manufactured profitably in those places only where power can be supplied by water. Cheap labour is also an essential condition of success in this industry, which employs a large number of hands in comparison with the value of the output.

All the elements indispensable to the success of pulp manufacture are to be found in Canada, besides particular additional advantages. Our immense forests of coniferous trees contain a practically inexhaustible supply of the different kinds of wood required in this line of manufacture. They are, moreover, of a superior quality and very much sought after by manufacturers of the United States, who, in the year 1893, bought from us to the extent of \$454,253. The best proof of the excellent quality of the Canadian wood for pulp manufacturing purposes lies in the yearly increase of the American importations. Exportation to the United States was inaugurated some four years ago. The figures for 1890 are \$57,197, \$170,636 in 1891, \$183,312 in 1892, and, as above stated, in 1893, they reached the sum of \$454,253. The tables of Trade and Navigation for 1894 are not yet published, but it is an acknowledged fact that the exportation of that year extended considerably beyond that of 1893. With regard to quantity and quality, Canada therefore ranks before our neighbour, and is equally, if not better situated than Norway and Sweden, who, up to this time, had monopolized this industry, operating sixty-nine mills throughout the united countries. If the price obtained in England be taken as a criterion, Canadian wood produces better pulp than that of Norway and Sweden, for in 1893 Canadian pulp was sold in England at an average of \$24.80 a ton, as against \$20.77 for the Scandinavian product.

Mr. Lefebvre then detailed the advantages possessed by Quebec in the way of water power, wood and labour, and then went on to show that though the United States duty practically closed the market to our pulp manufacturers, Canada had free access to the markets of England, France and Belgium. Great Britain imported 215,920 tons of wood pulp in 1893, and France 106,049 tons, forming a total of 321,969 tons for those two countries. Belgium, Spain, Italy and other European countries imported at least 200,000 tons, so that the total import exceeds 500,000 tons yearly. And it increases constantly. The importations in England were 121,534 tons in 1888, 156,609 tons in 1890, 190,946 tons in 1892, 215,920 tons in 1893, or an increase of 77 per cent over the importation of 1888. This increase may continue for a long time before any glut in the English market can occur. Thus in 1893, outside of the 215,920 tons of pulp already mentioned, England imported 20,750 tons of linen and cotton rags, 185,450 tons of esparto and 30,358 tons of other materials and pulp of rags, or in all 236,558 tons. And yet this proved to be an inadequate supply, for the Blue Books show that during the same year (1893) there were imported in that country 146,644 tons of paper and pasteboard. The quantity of pulp necessary for this manufacture would have required eighteen mills, running with a motive power of from 2,500 to 3,000 horse power each, and to produce the quantity of pulp represented by the 236,558 tons of raw material imported to complete the supply of the paper mills of Great Britain it would require thirty other pulp manufactures of the same capacity. There are at the present moment only two establishments of the kind in the Dominion of Canada which manufacture for exportation to England, one in the province of Quebec, operated by Americans, and another in Nova Scotia. There is, therefore, room for scores of others without danger of glutting the English market. And then there would still remain the markets of the other European countries which can take yearly over 200,000 tons.

Taking as a basis of calculation the figures given by the official returns of trade, pulp exported from Canada sold in England in 1893 at an average price of \$24.80 per ton. For the 15th September last, the *World's Paper Trade Review* quoted £5 to £5 10s., according to quality, or from \$24.30 to \$26.90 per ton. In those parts of the province of Quebec in close connection with seaports, it is possible to manufacture mechanical pulp or ground pulp and deliver it in England for \$15 to \$16 per ton, leaving a margin of from \$8 to \$10 to pay interest on capital invested and management expenses. A 2,500 horse power mill can easily turn out 25 tons of pulp per 24 hours, and therefore give a benefit of from \$200 to \$250 per day. Are there in the manufacturing industry other lines capable of showing similar results?

Mr. Lefebvre dwelt at length on the advantages to colonization, commercial and transportation interests of the development of pulp making and exportation. He dwelt on the position of the United States towards Canada. The United States took large quantities of spruce logs or raw material, but in the last three years sold us paper and paper articles as follows: \$648,043 in 1891, \$714,474 in 1892, \$730,433 in 1893.

During the same period they purchased from us in pulp-wood, as shown by the figures already mentioned, to the extent of: \$170,636 in 1891, \$183,312 in 1892, \$454,253 in 1893.

The conclusion to be drawn from these figures is obvious. The Americans purchased their wood from us, manufacturing therefrom the paper, which is afterwards sold to us, they retaining all the benefits, profits and advantages adhering to such manufacture. The anomaly, said Mr. Lefebvre, is striking. To remedy it, he advocates the reimposition of the differential rate of dues levied on spruce logs.

Concluding, Mr. Lefebvre said: The province of Quebec with its magnificent forest trees, cheap timber, its unlimited water powers, cheap labour, numerous seaports and low rates of ocean freights, offers exceptional advantages in the manufacture of pulp for export purposes to Europe, and can advantageously compete with Scandinavia on the markets of the old countries. This is one of the soundest and most remunerative industries, worthy of the most favourable consideration of capitalists.

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## BY-PRODUCTS OF THE WOODS.

*(From New York Evening Post.)*

A fact generally overlooked by those interested in the preservation of our forests and woodlands is that many of the minor products of our trees equal in value that of the lumber and timber, and that in the aggregate they make as great a demand upon the forests as the recognized needs of the lumber merchant. Until comparatively recently many of these by-products were not utilized, but were allowed to go to waste after the timber and lumber were secured. The real wealth of the woods is just beginning to be realized, and as the country becomes more thickly settled and timber more valuable many other new forest products that are not now utilized at all will be converted into money.

No country has been so prodigal as the United States in the use of wood for fuel, and this has probably been the heaviest drain upon the woods in the past. In European countries the firewood consists chiefly of inferior material, such as brush and small fagots, but here we often use the best. In nearly nine-tenths of the rural districts the farming classes use wood almost entirely for fuel, taking only the largest limbs, and very often the trunks of the trees. Such waste would not be tolerated for an instant in most of the old countries, and the inhabitants would look upon it almost in the same light as a New York farmer would if his neighbour should use good hay and straw for cooking his breakfast. Even some of our factories, steamboats and railroads use valuable wood as fuel, which greatly increases the consumption. While this wasteful use of wood is going on in sections of the country, considerable quantities of firewood are being imported, amounting in all to nearly \$500,000 worth a year. We also import over \$50,000 worth of wood ashes for general use, after wastefully burning our firewood and throwing the ashes away with other garbage.

Another great drain upon our forests is the manufacture of the so-called "naval stores," which include all of the resinous products of the coniferous trees. The southern States furnish most of these products, and they practically have a monopoly of the whole business. Small quantities of naval stores are produced in Russia, France, Austria, Portugal, Ceylon and Galicia, but they are very insignificant compared with the annual output of the United States. These naval stores are not in as much demand since the age of iron and steel boatbuilding has been ushered in, and this may be looked upon as fortunate, considering the rapid decrease in the supplies. But the turpentine, pitch, brewers' pitch, tar, and oil of tar are all used more or less in the arts, medicines and as insecticides. The demand for these products will consequently be pretty well sustained even though our business of building wooden vessels becomes a lost art.

The manufacture of tan bark is one of the most important industries connected with the utilization of the forest products, and vast quantities of this are annually demanded. In addition to our own supply we import nearly \$250,000 worth in the shape of hemlock from Canada. In the pitch regions of our country a new industry is springing up which promises to increase vastly in the future. It is the simple utilization of the enormous fields of fat pine logs and stumps from which all resinous matter has been extracted. These have in many cases in the past been allowed to decay where they happened to fall. This "lightwood" or fat pine as it is called, is cut up into small bundles and retailed as firewood in most of our eastern cities. A machine is invented for shaving up the logs and stumps into appropriate lengths. The pieces are then tied up in small bundles and sent to the cities by ships. It is said that at the rate of one cent a bundle the old stumps will yield nearly as much profit as the trees sold for as timber or for other uses.

The use of spruce forests for making paper pulp, from which is manufactured most of our paper supplied to periodicals, is well known, and represents an industry that will be limited only by the supply of wood. Already great inroads have been made upon the spruce forests, so that without systematic cultivation of them the raw material for this cheap paper will soon give out. In Germany, where the wood pulp is also made in large quantities, the forester's art is understood better than in this country, and the cultivation of spruce forests is carried on so carefully that the supply is always kept equal

to the demand. Instead of destroying the spruce forests there, they simply thin them out, taking only the large, matured trees, while the young saplings are allowed to remain for future use.

The hardwoods yield many by-products as well as the soft kinds, and especially in producing the charcoal for our iron furnaces. We also make quantities of cedar oil, wood alcohol, or pyroligneous acid, and oil of sassafras. In the manufacture of paints, soaps, varnishes, medicines, perfumes and disinfectants, all of these products of the hardwoods are in demand. The forests of hardwoods are more limited in extent in this country than the soft woods, but they meet with sufficient injury to threaten them with entire extinction. There are considerable quantities of wood used for the manufacture of hoops, barrels, tubs and pails, and only the hard species of trees are available for this work. A curious fact is that most of the poles used by hop-growers to support their vines are imported from Canada, or at least by those growers living along the great lakes. Many poles are used for the vineyards, but these so far have been gathered on home territory.

There are several other minor by-products that are used, but they represent no great value yet, although their future has not been determined. In the aggregate all these by-products of the forests are of greater value than the lumber and timber annually cut.

### QUEER USES OF PAPER AND PULP.

(From *New York Sun*.)

Nothing of recent years has given a greater incentive to the exercise of the forester's art than the discovery of the method of making paper out of wood pulp. Wood pulp to-day supplies 20,000 weekly and daily periodicals with paper, and each year the number increases from 10 to 20 per cent, making the demand upon the spruce forests so great as to threaten their extinction unless intelligent efforts are made to preserve them. In Germany, where the manufacture of wood pulp is even greater than in this country, the forester's art is exercised so that the forests steadily keep up the supply. It is to imitate this method of using, but not abusing, the natural spruce forests here that paper makers are trying to buy up the large areas of woodland covered by these trees.

In the arts and trades new uses are found for paper every year, so that the demand increases as fast as the production. The records at the Patent Office in Washington show an astonishing number of uses to which paper is put, and applications are made for patents for other queer inventions that never see the light of day.

Cigar boxes are made of paper and flavoured with cedar oil to give the impression that they are manufactured of cedar. Medals are pressed out of paper and then coated with a preparation to make them resemble either silver or bronze. Similarly cornices, panels, and friezes are moulded out of the paper pulp, and both interior and exterior architectural effects are obtained at a relatively low cost by this method.

The manufacture of car wheels out of paper is an old story. It is probably the good results obtained with them that suggested the idea of coating ironclad men-of-war with paper. Inventors are now working on the problem of finding a preparation either of compressed paper or of compressed ramie that will form a bullet-proof coating for war vessels. The car wheels and steampipes made of paper admit of being moulded and formed to suit any purpose, and it is suggested that by using paper for coating armour plate the surface could be formed like fish scales with tiny overlapping plates. The surface could be made rough or smooth, and besides giving more strength to the steel armour the paper coating would protect the metal from corrosion.

Another queer use to which paper promises to be put is in the manufacture of telegraph poles. The paper poles are hollow, and are made from paper pulp, and then coated with silicate of potash to preserve them. Electric conduits in successful use are made out of paper pulp, and also steam and water pipes of great strength and durability. Paper roofing material is so common that it is unnecessary to mention it, and also paper pails, basins and pans.

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Undertakers are using cheap collins pressed out of paper pulp. When polished and stained such collins are almost as handsome as those of wood. They last longer in the ground than collins of wood or metal, and they can be hermetically sealed better than the heavy metal collins.

Paper boats are generally looked upon as playthings for very small children, but large, commodious, staunch boats are now manufactured out of paper pulp. They can resist the water, and are lighter than wooden or metal boats. Lead pencils and cigar holders made of paper are in daily use, and even carpets and mattresses are manufactured in a limited way out of paper. The mattresses are made of paper pulp and ordinary sponge, with springs embedded in the composition. Artificial straws for drinking iced beverages, which are superior to the natural straws, are being placed on the market, and so is a peculiar cloth paper for printing bank notes on.

## APPENDIX "N."

### MATCH-MAKING.

(From *Montreal Gazette*—21st November, 1894.)

There is no country as well equipped for this business on a large scale as is Canada. It has for the purpose unrivalled supplies of wood best fitted for the industry and cheap; plentiful and cheap labour; unused water power at convenient points, with excellent lines of transportation inland as well as for foreign markets, such as South America, West Indies, Australia, Japan, China, England and the continent, and likely too could compete even in the United States with local manufacturers there. The magnitude of the business is hardly appreciated, and throughout the world involves a capital of over \$50,000,000. In France it is carried on by a concession to a company from the Government and is supervised by them, prices regulated, etc. The company in France has a capital of 45,000,000 francs, equal to \$9,000,000, and some 6,000 to 7,000 people are employed. In Austria it is a business even larger. Germany is also in the first rank, with Belgium, Norway and Sweden largely engaged in the business. In England two large companies do an enormous business, getting some of the needed material from Canada, but not the finished article; but in England there are yet imported \$1,500,000 of the finished goods that ought to come from Canada. In the United States the business is enormous, and it is dominated by the Diamond Match Company, of Akron, Ohio, with factories scattered over the entire United States and owning large tracks of standing pine so as to ensure supplies. Some idea of the extent of this company's business, which, from a few scattered concerns, has grown by consolidations and additions into its present proportions, may be formed from the fact that in the late autumn forest fires they had 90,000,000 feet of standing pine burned, and the fact that their last business statement showed a capital of \$9,000,000 invested, a surplus accumulated of \$1,100,000, while the market price of its immense capital is \$145 to \$147 per share of \$100 paid, and it is reported that its present year's earnings, in hard times, exceed the previous year by \$1,000,000. All this should be satisfactory evidence of the lucrativeness of the business, which is further confirmed by a recent press despatch that the president, Mr. Barber, considered one of the magnates of business interests in the United States, is about to sail for Liverpool, England, to build the largest factory for that business in the world, and further, that Edwin Gould, son of the late Jay Gould, together with his brothers and associates, have organized a new and large company to engage in the business. Surely all this should tend to encourage and stimulate the growth in Canada of a business for which the country is peculiarly adapted, and which in every way shows exceptional prosperity, and if by means thereof there could be added to Canada's trade an increase in another finished article in place of furnishing cheap new material for others to build industries of finished products and furnishing thereby employment it would be the development of one of many other industries that could be named.

## APPENDIX "O."

## BRITISH COLUMBIA TIMBER RESOURCES.

(R. E. Gosnell in *World, B.C., Annual.*)

British Columbia may be said to possess the greatest compact reserve of timber in the world, and for the reason that heretofore merely a fringe of timber has been cut, and had it not been for forest fires that in years gone by devastated a considerable portion of the interior, within the dry belt, the supply of timber available for commercial purposes would have been nearly double what it is. However, as the coast possessed the great proportion of choice timber trees and accessible, the ravages of fire have not been appreciable to anything like the extent they have been in the interior.

The coast as far north as Alaska is heavily timbered, the forest line following the indents and river valleys and fringing the mountain sides. Logging, so far extends to Knight's Inlet, a point on the mainland opposite the northern end of Vancouver Island. Here the Douglas fir disappears and the cypress takes its place. North of this cedar, spruce and hemlock are the principal timber trees.

The principal limits and the great bulk of the timber are found on Vancouver Island, principally located and running up the valleys of Cowichan, Chemainus, Nanaimo, Englishman's, Little Qualicum, Big Qualicum, Comox, Oyster, Campbell, Salmon, Adams and Ninkish rivers, and French and Black creeks, and other streams and tributaries of the above rivers and in the Alberni valley; in Westminster district—along the Fraser and Pitt rivers, on Burrard Inlet, in South Vancouver, and on Howe Sound; the principal inlets of the coast as far as Knight's Inlet; and on the islands in the Gulf of Georgia—notably, Cracow, Valdez and Harwick.

A description of the various timbers in British Columbia, with their distribution, will be interesting. Douglas fir (*Pseudotsuga Douglasii*) is named after the noted botanist of that name and not Sir James Douglas, as many imagine. It has a very wide distribution, being found from the coast to the summit of the Rocky Mountain range. On the coast it attains immense proportions, very high and clear of imperfections, sometimes towering three hundred feet high and having a base circumference of fifty feet. The best averages, however, are one hundred and fifty feet clear of limbs, and five to six feet in diameter. This is the staple timber of our commerce, often classed as Oregon pine, and having about the same specific gravity and strength as oak, a wide range of usefulness, and being especially adapted for construction work, where strength is required. Prof. Macoun classifies it as standing midway between the spruce and balsam, and states it as his opinion that it would make a valuable paper-making tree. The cedar has two important representatives, red cedar (*Thuja gigantea*) and yellow cedar or cypress (*Thuja cyressis*)\*. The former is found all over British Columbia, but reaches its greatest majesty on the coast, where it can outgrow any other tree. Besides being a valuable timber of commerce for finishing purposes and shingles, it is the settler's greatest friend, out of which he can build his house, make his furniture and fence his farm, and that without any other aid than an axe, a saw and a hoe. Invaluable as red cedar is, yellow cedar is still more valuable. It is very strong, wonderfully durable, makes a beautiful finishing wood and grows to great size. It is found in great quantities in the interior of Vancouver Island, and on Mount Benson comes within 1,200 feet of the sea. Towards the north of the island, on the Queen Charlotte Islands and on the north coast of the mainland, it is found lower down and is very plentiful. It is out of the cypress that the Hydah Indians build their great war canoes, many of which have an eight-foot beam, are sixty feet long and can stem the heaviest seas of the

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coast waters. Probably the next most useful tree is the white spruce (*Picea Sitcheusis*). It is found interspersing the forests of fir and other trees, principally in low, swampy and delta lands, but no place in very large quantities. It attains a circumference almost equal to the Douglas fir but does not grow so tall or clear of branches. It makes beautiful lumber for doors, dressing, etc., and is largely used for making salmon and fruit boxes, as well as barrels. It will also provide excellent material for paper-making. The Menzies spruce increases in quantity as you go north. Hemlock (*Tsuga Mertensiana*) is common, and up the coast is found in large quantities. It is a useful timber, but answering about the same purposes as Douglas fir, it will not come into use until the latter is exhausted. White pine (*Pinus monticola*) is very valuable, but limited. Balsam (*Abies nobilis*) is widely distributed, being found principally in river valleys, but is commercially of but little value. With the exception of the yew (*Taxus brevifolia*) and tamarack, the above are the principal representatives of the family of evergreens found in British Columbia, and these latter are by no means unimportant. Of deciduous trees, the large leaf maple (*Acer macrophyllum*), vine maple (*Acer circinatum*), alder (*Alnus rubra*), crab apple (*Pirus rivularis*), oak (*Quercus Garryana*), two varieties of poplar or cottonwood (*Populus balsamifera* and *trichocarpa*), aspen poplar (*Populus tremuloides*), arbutus (*Arbutus Menziesii*) and birch, willow and juniper. The maple, alder and arbutus make beautiful cabinet woods, and though not abundant are very popular finishings. Poplar, or cottonwood as it is commonly called, is used for the manufacture of "Excelsior" and could be extensively used for paper-making. The aspen poplar is common on Vancouver Island and in the northern interior. The oak is a stunted, gnarled species, only found in the southern part of the island. It is not useful but is very picturesque. Crab-apple is plentiful in swampy places around ponds, beaver meadows and along river banks. Nearly all the hardwoods referred to are usually found in bottom lands and their presence indicates fruitfulness. There is no part of British Columbia where the timber supply is not sufficient for local demands.

A most remarkable feature of the timber is not the extent so much as its density. As high as 500,000 feet have been taken off a single acre, while about 75,000 feet would be an average yield.

There are fifty-one saw-mills in the province, with a daily capacity of 3,000,000 feet. Of these, thirty-five are on the coast, having a daily capacity of between 1,750,000 feet and 2,000,000 feet. Last year the whole cut of the province was 65,000,000 feet. It has been estimated that there are over 100,000,000,000 feet of good timber in sight and that the present saw-mills running fully employed, and making an average output, would take between one hundred and fifty and two hundred years to exhaust the present supply. So that there may be no immediate anxiety about what our houses are to be built of in the near future.

However, when the Niagara canal shall have been completed and the foreign demand, now and for some time back very much depressed, shall have revived, British Columbia, being practically the final resort of lumbermen on this continent, may expect to experience a boom in her lumber industry greater than was ever known in America. When that time comes, those who own large timber limits—and there are a good many who do—will reap a rich harvest.

#### TIMBER REGULATIONS.

Leases of surveyed, unpre-empted crown timber lands may be obtained for a period not exceeding twenty-one years by those tendering the highest cash bonus, subject to the payment of an annual rental of 10 cents per acre and a royalty of 50 cents per thousand feet on the sealed measurement of the logs. The lessee, if not actually engaged in the manufacture of lumber, must, to retain his limits, erect a mill capable of cutting at least 1,000 feet a day for every 400 acres of land included in the lease, within two years, and give a guarantee equivalent to 10 cents an acre that he will do so before obtaining his lease.

A timber license may be granted for 1,000 acres for four years, on payment of \$10 annually and 15 cents for each tree (except hemlock), and no person, not licensed, may

cut timber on crown lands except for farming and mining purposes. Only one license at one time is obtainable, and is not transferable. A special license for 1,000 acres for one year may be obtained by application in the *Official Gazette*, and the payment of \$50 to the Chief Commissioner of Lands and Works.

#### LUMBER FLEET, 1892.

In all forty-six vessels, loaded principally in Burrard Inlet, the aggregate cargo being 40,420,091 feet for export, or an average cargo of 878,697 feet per vessel. The value of the year's export, as above, was \$411,351, or an average of \$8,943 per vessel. The gross tonnage of lumber ships was 50,306 tons, or an average tonnage of 1,311 tons each.

In addition to the regular export by vessels and the local consumption, British Columbia lumber and manufactures thereof are finding a market in Eastern Canada for shingles, house and office finishings, car sills, spars and timbers for heavy construction work, and will ultimately find a market in many other parts of the world. Another industry growing out of the forests of this country has already been treated upon, and that is paper-making. The woods for utilization in this way are Douglas fir, spruce, poplar, birch and tamaruck, of which there is a plentiful supply.

### APPENDIX "P."

#### FOREST RESERVES IN THE UNITED STATES.

(By Robert Underwood Johnson, in *Review of Reviews*, Dec., 1894.)

It is related of General Sherman that when he was asked if he would like to be President he replied in the negative and gave as his reason that the presidency was not really a position of power. Many would differ with that opinion. What President Cleveland has just done, for instance, towards rescuing the country from the spoils system is an exercise of power of the most far-reaching and beneficent sort. The General himself lived to see Congress confer upon the executive in the McKinley bill, so novel and considerable a power in the direction of control over international commerce as to awaken grave concern on other than partisan grounds and to lead to its repeal. A few days after Sherman's death, viz., on March 3rd, 1891—a substantial extension of the President's prerogative was made in the following provision:—

"That the President of the United States may, from time to time, set apart and reserve in any state or territory having public land bearing forests, in any part of the public lands, wholly or in part covered with timber or undergrowth, whether of commercial value or not, as public reservations; and the President shall, by public proclamation, declare the establishment of such reservation and the limits thereof."

Under this Act—a happy thought of the present efficient assistant land commissioner, Hon. E. A. Bowers—the power of the President to be of service to his country is so great that many a not unambitious man would be satisfied to possess it, with or without the Presidency. And as the action of the executive may at any time be reviewed, and if desirable nullified by Congress, there is no danger herein of any peril to the public interests.

On the contrary, the advantage to the public interests is enormous. President Harrison's exercise of his discretion under this law was intelligent and judicious. At the suggestion of secretary Noble, who was himself incited thereto by advocates of forest preservation, the President made a series of reserves, the value of which to the adjoining regions of lower altitude is simply incalculable. Passing over such as had chiefly the virtue of being reservations of great scenery from private encroachment, such as the incomparable Grand Cañon of the Colorado and the beautiful region including Mount Rainier (Tacoma and Seattle contending so hotly over the name of the new tract that it had to be called "Pacific Forest Reserve,") we come to those made chiefly for the con-

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ervation of water supply—a series of five in Colorado and three in California. Of these, the greatest is the “Sierra Reserve,” extending for 200 miles northward, along the high altitudes of the mountains to the southern boundary of the Yosemite National Park. This tract comprises over 4,000,000 acres and its imperial proportions are more evident when one realizes that it is nearly five times as large as Rhode Island, half as large again as Connecticut, and two-thirds as large as New Jersey. And yet this territory, including as it does, magnificent forests of sequoias and the noble King’s River Cañon, which John Muir, the explorer, calls “the rival of Yosemite,” contains probably not a square mile that ought not to be devoted to reservation purposes. Next to Muir himself, who knows the region by heart, and I think made the original suggestion of this reserve, there was no better authority on the subject than the late Senator George Hearst. I remember how emphatically he spoke to me in favour of such a reserve in 1890, in Washington. I had come to him to solicit his influence in favour of the plan of a Yosemite National Park to surround, but not include the old grant of the valley made to California in 1864. This grant is bounded by a coffin-shaped line running one mile back from the rim of the gorge, and thus does not include the magnificent scenery adjoining and does not even give control over the headwaters of the great Yosemite falls.

Sitting about our camp fire on the upper Tuolumne, in June, 1889, Muir and I determined to revive a former scheme, which had fallen through, to make a large reservation in this region, and it was substantially Muir’s plan that was formally adopted by Congress, on October 1st, 1890. The new park thus made is as large as the State of Rhode Island, and twenty times as large as the State grant. When I mentioned the subject to Senator Hearst, he broke out: “Reserve the Tuolumne? Why, I’d favour reserving the whole of the Sierra top from Shasta down. It includes very little agricultural land, the region has been pretty thoroughly prospected, and, of course, mining and other private rights would not be interfered with.” It may be imagined that in urging the Yosemite National Park scheme, I did not fail to make use of this pronouncement of the shrewd and far-sighted Californian.

That public sentiment is rapidly coming up abreast of Senator Hearst’s opinion, is proved by the favourable reception of the presidential proclamations establishing the reserves, which in all now comprise over 17,000,000 acres, in seventeen tracts, located in Arizona, California, Colorado, Montana, New Mexico, Oregon, Utah, Washington and Wyoming. This action was particularly well received in California. It was to be expected that a few would cry out against the policy. Owners of sheep who desired to pasture their flocks upon the public domain, to the extraordinary injury of it; hewers of Government timber, willing to fell a giant tree to obtain its seed for foreign sale at \$8 a pound; fraudulent “settlers,” who gave picnics to acquaintances for the purpose of “taking up” land which their guests were never again to see—these few barbarians were of course indignant at the interference with their “vested rights,” but disinterested people, and the large population in the foothills who saw in the reservation the perpetual source of water supply for which every summer they had been calling upon Hercules, rejoiced with one voice at the salvation of the San Joaquin valley. Without irrigation that valley was merely a poor cattle pasture; to-day the portions reclaimed by irrigation are among the most productive in the world.

Nor has President Cleveland been indifferent to the great advantage of this policy. During his administration but one large reserve has been made, yet it is in point of size the most considerable of all. It is situated in Oregon, on the ridge of the Cascade range, and comprises some 4,500,000 acres, and will do for that State what the Sierra reserve has done for California.

It is greatly to be hoped that the President will see his way clear to establish a third in Northern California, which shall reach from Yosemite to Mt. Shasta, and virtually connect the other two. Thus shall the great valleys of the Pacific slope be secure in a perpetuity of water supply and timber.

The question naturally arises:—Why should not this policy be systematically extended throughout the great west until the headwaters of every important river within national control is the seat of a forest reserve? As we have already seen, the President has the power, and thus far the voice of no intelligent person has been

raised against the policy. Let us consider on what grounds of necessity such sweeping action may be urged.

It is almost a superfluity of words to point to the well-recognized perils involved in the destruction of forests. Humboldt said: "In felling trees growing on the sides and summits of mountains, men, under all climes, prepare for subsequent generations two calamities at once—a lack of fuel and a want of water." China, India, Cyprus, Syria, North and South Africa have been conspicuous sufferers from this folly. The decay of the political ascendancy of Spain is attributed to the same cause, and the slopes of Andalusia, even now showing only a fuzzy growth of olives, are the scene of alternate floods and drought of great destructiveness. A similar story is told by the southern border lands of Austro-Hungary, by large sections of Italy, and especially by the South of France, where, in the last thirty years, thirty-five millions of dollars have been spent to reforest hills which were devastated to pay for Napoleon's wars, though the work is but half completed. The fall in the depth of the rivers of Central Europe—from 17 to 55 inches in fifty years—bears witness to the fate in store for us unless there is a radical change for the better in our public policy. In our own country, the disappearance of the empire that once flourished in Arizona and New Mexico, and the annual overflow of the Mississippi, Ohio and Red rivers, are attributed to deforestation. That the peril is not overstated, may be seen in a volume which every American legislator ought to know by heart—George P. Marsh's treatise, "The Earth as Modified by Human Action." Forty years ago Mr. Marsh said: "A desolation like that which has overwhelmed many once beautiful and fertile regions of Europe, awaits an important part of the territory of the United States, unless prompt measures are taken to check the action of destructive causes already in operation." Let any one who has attempted to keep pace with the subject say how far this fails of true prophecy—the prophecy which Mr. Froude thought an essential test of science. Expert authorities have gone so far as to fix twenty-five years hence as the period of virtual exhaustion of the timber supply at the present rate of depletion. It is not merely the intemperance of the axe with which we must reckon. Eighteen centuries ago the poet Horace warned his countrymen against exposing forests to the havoc of sheep—a warning which has come down the ages almost unheeded. Last of all, in this country, in the trail of both lumbermen and shepherd, more destructive than the edge of the axe or the spade of the sheep's hoof, comes the conflagration. One did not need the object lesson of the recent forest fires in the North-west, to realize that the public domain is daily exposed to a similar danger. Ride along any railway in the North-west and you may read the story in a record of blackened stumps or overhanging smoke. Not a summer passes without news of raging fires upon Government lands. The only wonder is how they ever cease. And yet with all this constant ravaging of the forest, our easy-going people do not realize the critical situation of the great West. Worst of all, the West itself does not realize it.

Statutes are not often enacted by Congress until the need for them is formulated into something like a truism in the public mind. Therefore, it needs to be reiterated to tediousness that the mountain forest has a more vital service to render than even its important function of furnishing timber. It is a source of life and health to the regions below. Its relations to agriculture, commerce, climate and social life, are most intimate and fundamental. "It may be considered as established," says Marsh, "that forests tend to mitigate, at least, within their own precincts, extremes of temperature, humidity and drought." Speaking of the electrical influence of trees, he observes that hailstorms, which appear to be always accompanied by electrical disturbances, "are believed in all countries particularly exposed to that scourge, to have become more frequent and destructive in proportion as the forests have been cleared," and he cites that one joint stock insurance company in Northern Italy, during seven years (1854-61), paid 6,500,000 francs for damage by hail. The influence of trees as a protection against malaria and as shelter to ground to the leeward, is also considered worth mention by Marsh, in whose judgment the climatic influence of their destruction has been of the largest importance, especially in Southern Europe.

In one significant respect the cause of forest reservation has indirectly made progress in Congress—in the grant at the last session of 1,000,000 acres of arid land to each of a num-

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ber of western states for irrigation and colonization. This act commits Congress logically to the conservation of the water supply, since otherwise one would be offering the thirsty but an empty cup. In the light of such a pressing need, how ridiculous and yet how tragic was the action at the last session of certain representatives from western states in obstructing, by parliamentary tactics, the moderate (even too moderate) measure of conservation known as the McRae Bill. This Bill, which is still on the calendar of the House of Representatives, provides for the restriction and regulation of the sale of timber on the forest preserves in such manner as to insure the object and perpetuity of the reservations, sale to the highest bidder being substituted for the present loose system of issuing timber permits and careful provision being made for the needs of the *bond fide* settler. Instead of hesitating for a moment over a measure so manifestly in the general interest of their constituents these representatives would better have united in petitioning the President to extend the reservation system in the states which they represent, and in obtaining much needed legislation to secure for the reserves, already made or to be made, the most efficient and intelligent control, a system of control which shall produce an equal yield of lumber without destroying its source. In the absence of such legislation these reserves will exist only in name. The responsibility of Congress, let it be plainly said, is not longer to be concealed or evaded.

The McRae Bill, admirable as it is, is likely to prove only a temporary expedient, the good features of which may hereafter be embodied in our permanent forest policy. What is needed is a broad, thorough and practical—because imaginative—measure, which shall legislate for posterity and once for all shall run with the best scientific opinion. I believe that this is supplied by the scheme of Prof. Charles S. Sargent, of the Arnold Arboretum of Harvard University, whose careful report on the subject of forests and whose "Silva of North America" have given him a unique position as an expert. This is a comprehensive plan by which the control of the reserves is to be transferred to the War Department. The army must defend them (does now theoretically defend them) against encroachment, as requisition is made by the Secretary of the Interior. How much simpler that the military should have initial control. The evil of the dual system now is that the permanent interest of the reserves must always be sacrificed to the temporary exigencies of public order. A strike in Sacramento or a petty quarrel on an Indian reservation would deprive the Yosemite National Park of the efficient military protection which it now enjoys. The Yellowstone National Park is admirably managed by a military detail. These two parks furnish all the precedent for the plan that is needed. I believe the seventeen forest reservations are virtually without patrol. The chief reason for placing them also in the hands of the military is that only thus can we provide for their care and culture on scientific principles. For this West Point offers a well-established system and means of education. It is not proposed that the military academy should be turned into a school of forestry, but that facilities should be provided for systematic instruction in the principles of the science, so that all graduates should know its elements, while certain others should be able intelligently to supervise the reservations incidental to their other duties, and to superintend practical work to be carried on by a body of men locally enlisted as a forest guard.

There is no alternative, except to let the forests remain the prey of destructive agencies, or else to establish a civil school with all its accompaniments of political manipulation. Surely the country is already too tired of the spoils system to wish more fuel to go into that flame. The army is the only hope. Its traditions of thoroughness and integrity may be relied upon for a rigid control in the public interest. Attention would be chiefly needed in the summer, when it is customary to undertake expeditions and establish camps for the good of the troops. To know the elements of forestry, what trees and that kind of trees to cut so as to yield an annual crop of timber without injuring the forest—this is something to be taught and learned, and something as clearly within the province of the military in time of peace as to build docks or bridges. What can be accomplished in the way of mere guard duty is to be seen in the Yosemite National Park, where an efficient troop of cavalry has put an end to the depredations of sheep and lumbermen, so that in four years the tract has resumed its natural appearance and conservative offices, while during the past summer, in defiance of law, 500,000 shee

were pastured on the adjoining unprotected Sierra Reserve. And yet this might easily have been prevented by a squad of soldiers, had such a detail been available.

The delay of Congress in providing for the care of the reservations, however, does not relieve the President of responsibility for delay in creating others. Let the imagination rest for a moment on the opportunity that Mr. Cleveland has. What a chance to serve the country and posterity. What unseen dangers may be averted and what blessings conferred upon generations to come. The warnings of science are imperative. The authority of law is ample. By one stroke of the pen he can make a reservation, for instance, at the headwaters of the Missouri, which, without interfering with private rights, shall control for all time for the public the sources of that great stream. The country would not fail to greet with favour a well-considered scheme for similar tracts in the entire west. Such action would be an honourable challenge to the patriotism and good sense of Congress, qualities which are never found wanting in a crisis; and the necessary legislation for the patrol and care of the reservations would be all the surer to follow by reason of the magnitude of the beneficent scheme.

## APPENDIX "Q."

### DOMINION PARKS AND FOREST RESERVES.

In consequence of the discovery of the hot mineral springs near Banff station, an Order in Council was passed on November 25th, 1885, reserving a tract of land in that region. Subsequently, by Act of Parliament, in 1887 (chapter 32) the "Rocky Mountains Park," including this tract, was set apart as a permanent reserve for a public park, comprising 260 square miles, being 26 miles long and 10 wide. It includes a number of mountains with peaks extending to an elevation of nearly 10,000 feet. The Bow River flows diagonally through it, with an easterly course, nearly fifteen miles long, and is joined within the park by its tributaries, the Spray River, the Cascade River and several creeks. The Minnewanka or Devil's Lake, more than ten miles long, by an average width of half a mile, empties itself by the Devil's creek or Minnewanka River into the Cascade River. There are also the Vermillion Lake and other smaller bodies of water connected with the Bow River. Near the northeast end of the park the Ghost River crosses it with an easterly course of about twelve miles, and its south branch is also partly within the reserve where it takes its rise. Thus the forests which cover a large portion of the area are well situated for preserving the flow of these important headwaters. The preservation of these forests from fire is a remarkable feature in the history of this reservation. Mr. Geo. Stewart, D.L.S., the superintendent, in his yearly reports, repeatedly mentions the fact that forest fires outside the park have not spread within it, which he attributes to two reasons, the clearing away of dead trees, and the existence of fire breaks formed by the roads that have been opened to the different points of interest. This is an indication of the means by which the danger of the destruction of our forests by fire may be minimized. There has also been considerable planting of forest trees. The hot springs, the beautiful scenery and the many objects of interest, attract great numbers of visitors, besides the many invalids seeking it as a sanitarium.

In October, 1886, an Order in Council was passed, setting apart four additional mountain parks, or reservations, in the Rocky Mountains, as follows:—

1. A park at Mount Stephen, including the country surrounding the base of the mountain and adjacent picturesque points.
2. A reservation in the vicinity of the mountain known as Mount Sir Donald, taking in the loop of the railway and adjacent territory.
3. A sufficient area in the Eagle Pass to include Griffin and Three Valley Lakes, and adjoining points of interest.
4. The amphitheatre at the summit of the Selkirk Mountains.

These reservations all contain extensive forests protecting the headwaters of important rivers.

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## APPENDIX "R."

## SUPPLY AND CONSUMPTION OF FOREST PRODUCTS IN THE UNITED STATES.

(By B. E. Fernow, U. S. Forestry Report for 1893.)

Regarding the supply of forest materials, which may be drawn from the virgin forests still in existence, we have no data. The difficulties of obtaining even the crudest approximations, except for certain species, as the white pine, the longleaf pine, the whitewood, etc., are not only great in the first place, for many reasons, but are still further increased by the fact that the methods of using the supplies change with their waning, with methods of transportation, and with other economic developments. Thus the statistics of white pine and longleaf supplies, given by the Tenth Census in 1880, were as approximately correct as could be expected, adverse criticisms notwithstanding; but the lengthening out of the supplies, especially of the white pine, beyond the time when those figures foretold their practical exhaustion, has been possible only through the reduction of the average merchantable log by from 27 to 57 per cent—i. e., while during the census year in Wisconsin (Wausau) for instance, the average log was, say, 200 feet per log or 18 inches in diameter, in 1893 it had dwindled down to 84 feet or 13 inches in diameter. While the census statistics were based on the then practice of taking nothing less than 10 inches in diameter, the lumbering is now extended to logs as low as 5 or 6 inches in diameter.

No more striking statement of the decline in white pine supplies could be made than to cite the number of feet in logs which passed the nine leading booms in the lower peninsula of Michigan in 1887, namely, 2,217,104,985 as against 505,134,656 feet in 1893, a decrease of nearly 80 per cent, chargeable no doubt in part to other modes of transportation, but nevertheless foreshadowing unmistakably the practical exhaustion of supplies.

## EXTENT OF FOREST AREAS.

While we can not then with any degree of even approximate accuracy speak of the amounts of standing and growing timber, we have somewhat better (although far from accurate) data of the forest areas, from which at least the capacity of wood production may be surmised. But here, too, absence of knowledge as to the condition of these areas makes a statement of the actual supplies possibly on hand or growing mere guess-work. Not only are there to be distinguished the timber areas which contain supplies ready for the axe and for present consumption, but in the so-called second growth we must distinguish the areas which promise new supplies of value and those brush lands which are not only not growing a new timber crop, but on the contrary prevent the growth of timber and will for generations to come be mere waste lands.

It will appear astonishing to those who have not paid attention to the question of the settlement of this country to learn from the subjoined table that while of the total country only 18 per cent is improved, the better developed eastern part (east of Colorado) shows only 29 per cent improved, and even the long-settled Atlantic coast which we are apt to consider fully occupied, still possesses 65 per cent of unimproved land, of which we estimate 43 per cent as woodland, while the percentage of woodland for the whole country is 25. There would be woodland enough to satisfy our needs for many decades if attention were but paid to its rational use and to the recuperation of the cut-over areas; but the condition of the wooded areas, which have been culled, is well

known to be so poor, as far as market supplies are concerned, that for generations to come they must be left out of consideration.\*

The following table, compiled from the most reliable sources of information attainable and correcting any previous statements made by this division, is intended to give information as to approximate relation of improved land, forest and waste land :—

\*Elsewhere in the same report Mr. Fernow says :—

"In the well-managed forests of Prussia (some 35,000,000 acres), largely stocked on poor land, the average total production of wood per acre for a long series of years has not been more than 21 cubic feet, but this includes branch wood, brush and roots, which are not used in our country. Of this, only 14 per cent, or hardly 3 cubic feet, represents material fit for the industrial uses; and we should add that in the United States firewood is also made from such material. In the Government forests of Prussia (some 8,000,000), exemplary in their management, the production reaches nearly 6 cubic feet. The highest wood production in German forests is reported from Baden (over only 4,330,000 acres of forest) with somewhat over 50 cubic feet of wood per acre per year. Assuming also a larger per cent of sizable timber, namely, 20 per cent, we would here find the annual production per acre of such material as we are in the habit of using at the rate of 10 cubic feet per acre. Competent writers on the subject, who believe that the Government reports understated the annual growth, have calculated the same to be as high as 55 cubic feet per acre (see report of Forestry Division, 1886, p. 184), of which they assume 27 per cent to represent wood over three inches in diameter; even this larger figure would bring the product of sizable wood to less than 15 cubic feet per year. And I repeat what is well known, that in the United States we hardly use the smaller sizes even for firewood.

"To come now to more familiar measurements, we can figure out the possibilities or probabilities in the following manner, leaning toward extravagance rather than conservatism :—

"Any lumberman acquainted with the various forest regions of the United States will admit that, leaving out the exceptional conditions on the Pacific coast, a cut of 20,000 feet b. m. per acre from our virgin forests would be an absurdly larger average estimate; this would represent, with excellent practice in the preparation of the material, say 2,000 cubic feet of round forest grown timber, and since the trees cut to yield such material are at least 150 years old—they are in reality mostly over 200 years—the annual production would appear under such conditions as 14 cubic feet per acre per annum, or about as much as the most advantageous results afforded from well-managed German forests."

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IMPROVED and Forest Land in the United States.

	AREA.		PER CENT.				
	Total land surface.	Improved land in farms.	Im- proved land.	Brush, forest, and waste land.	Prob- ably forest.	Brush land.	Open country.
	Acres.	Acres.					
United States.....	1,900,800,000	357,616,000	18	82	26		
Maine.....	19,132,000	3,044,000	15	85	64		
New Hampshire.....	5,783,000	1,727,000	29	71	62		
Vermont.....	5,846,000	2,653,000	45	55	62		
Massachusetts.....	5,155,000	1,657,000	32	68	29		
Rhode Island.....	694,000	274,000	39	60	40		
Connecticut.....	3,100,000	1,379,000	44	55	29		
New England States.....	39,710,000	10,736,000	27	73	52		
New York.....	39,376,000	16,386,000	54	46	30		
Pennsylvania.....	28,790,000	13,210,000	45	65	24		
New Jersey.....	4,071,000	1,999,000	42	58	41		
Delaware.....	1,254,000	762,000	60	40	24		
Maryland.....	6,310,000	3,412,000	54	46	32		
Middle Atlantic States.....	71,401,000	35,772,000	50	50	28		
Virginia.....	25,680,000	9,125,000	35	65	48		
North Carolina.....	31,089,000	7,828,000	25	75	54		
South Carolina.....	19,308,000	5,255,000	27	73	45		
Georgia.....	38,647,000	9,582,000	24	76	50		
Southern Atlantic States.....	114,724,000	31,790,000	27	73	49		
Atlantic coast.....	225,835,000	78,298,000	35	65	43		
Florida.....	34,713,000	1,145,000	3	97	58		
Alabama.....	32,986,000	7,698,000	23	77	53		
Mississippi.....	29,658,000	6,849,000	23	77	44		
Louisiana.....	29,069,000	3,775,000	13	87	45		
Gulf States.....	126,426,000	19,467,000	16	84	50		
Texas.....	167,808,000	20,746,000	12	88	23		
Michigan.....	36,755,000	9,865,000	26	74	50		
Wisconsin.....	34,848,000	9,793,000	28	72	47		
Minnesota.....	50,691,000	11,128,000	21	79	36		
Northern lumbering States.....	122,294,000	30,786,000	25	75	43		
Ohio.....	26,086,000	18,338,000	71	29	16		
Indiana.....	22,982,000	15,107,000	65	35	15		
Illinois.....	35,840,000	25,669,000	71	29	10		
Northern agricultural States.....	84,508,000	59,114,000	69	31	13		
Lake States.....	207,202,000	89,900,000	43	57	31		

## IMPROVED and Forest Land in the United States—Continued.

	AREA.		PER CENT.				
	Total land surface.	Improved land in farms.	Im- proved land.	Brush, forest, and waste land.	Prob- ably forest.	Brush land.	Open country.
	Acres.	Acres.					
West Virginia.....	15,772,000	4,554,000	28	72	52		
Kentucky .....	25,600,000	11,819,000	46	54	43		
Tennessee .....	26,720,000	9,362,000	35	65	55		
Arkansas .....	33,949,000	5,475,000	16	84	60		
Missouri .....	43,990,000	19,792,000	45	55	36		
Central States.....	146,031,000	51,002,000	35	65	48		
Iowa .....	35,504,000	25,429,000	71	29	13		
North Dakota.....	45,308,000	4,658,000	10	90	1		
South Dakota.....	49,696,000	6,559,000	14	86	2		
Nebraska .....	42,398,000	15,247,000	34	65	3		
Kansas .....	52,288,000	22,303,000	42	53	7		
Oklahoma.....	24,960,000	564,000	2	98			
Prairie States.....	250,754,000	75,160,000	30	70	4		
Interior States .....	396,785,000	126,162,000	32	68	20		
Montana .....	92,998,000	915,600	1	99	18	20	61
Wyoming .....	62,448,000	476,000	0.7	99	12	16	71
Colorado.....	66,332,000	1,823,000	2.7	97	16	21	60
New Mexico.....	78,374,000	263,000	0.3	99	6	21	72
Eastern Rocky Mountain region .....	300,154,000	3,477,000	1	99	13	20	66
Idaho.....	53,945,000	606,000	1	99	20	40	39
Nevada.....	70,233,000	723,000	1	99		9	90
Utah.....	52,601,000	548,000	1	99	16	27	56
Arizona.....	72,268,000	104,000	0.1	99.9	14	12	74
Western Rocky Mountain region .....	249,047,000	1,981,000	0.7	99.3	8	22	69
Rocky Mountain region.....	549,201,000	5,458,000	1	99	10	21	68
California .....	99,827,000	12,222,000	12	88	18	27	43
Oregon .....	60,518,000	3,516,000	6	94	34	28	32
Washington.....	42,703,000	1,820,000	4	96	55	21	20
Pacific coast .....	203,048,000	17,558,000	8	92	30	27	35

NOTE.—The authority for the area of improved farm land is furnished by the census of 1890. The areas of forest, brush, and waste lands were ascertained by subtracting the area of cultivated land from the total land areas of the several States, and are placed as per cent of the total areas in column 4. The part of these supposed to be forest is estimated on information obtained by various agencies. For the western section of the country the further subdivision into forest, brush, and open country is based partly on statistics gathered by Col. Ensign and published in bulletin 2 of this division, partly on the map prepared as stated before and here published, and partly on timber estimates of the Puget Sound *Lumberman*.

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INADEQUACY OF FOREST SUPPLIES.

In regard to the consumption of forest supplies no full statistics are available, yet we have a better basis for estimates. In the report for the year 1892 it was stated that the total annual consumption cannot fall short of 22,000,000,000 cubic feet, or 350 cubic feet per capita, of all kinds of wood. This figure was arrived at by a series of careful estimates, the basis for which was stated. With additional information furnished by the Eleventh Census, it may be readily increased to 24,000,000,000 feet. The consumption of mill timber (sizable logs) was stated as about 4,000,000,000 cubic feet (now found to be an understatement by 15 per cent), representing about 30,000,000,000 feet, B. M., or between 20 and 25 per cent of the total consumption—a proportion which may be readily admitted to represent a rather extravagant average for the "millable" part of the forest growth, indicating that if we assume the annual growth of such timber per acre at 10 cubic feet, at least 400,000,000 acres of fully stocked forest are necessary to furnish this part of our consumption. Add the consumption of firewood, which is largely made of sizable timber, and it is safe to say that three times that area is necessary to furnish the amount of present consumption by its annual growth. From this statement alone, which is highly favourable to those who claim sufficient and "inexhaustible" supplies, the inadequacy of our forest area to meet growing demands will appear.

QUANTITY AND VALUE OF FOREST PRODUCTS.

The Eleventh Census statistics of lumber production, ably and conscientiously gathered by Mr. George A. Priest, agent of the census, have not yet been published. Like all statistics of this kind, the figures given must be incomplete, always remaining somewhat short of the truth and requiring estimated additions. Nevertheless, they furnish gratifying proof that the above estimates by the writer are within bounds.

By the courtesy of the Superintendent of the Census, the Hon. Carroll D. Wright, the writer is permitted to produce, in advance of the regular publication by the census, a summary statement, prepared in part by Mr. Priest and supplemented by canvass and estimates of this division, showing approximately the variety, quantity, and value of forest products used in the United States during the census year.

AMOUNT and value of forest products used during the census year 1890.

Classes of products.	Quantity.	Estimated cubic contents of forest-grown material. <i>b</i>	Value.
I. Mill products: <i>a</i>		Cubic feet.	
Agricultural implement stock.....feet, B.M	30,000,000		\$582,000
Bobbin and spool stock..... "	49,000,000		688,000
Carriage and wagon stock..... "	66,000,000		1,306,000
Furniture stock..... "	94,000,000		1,435,000
All other sawed lumber..... "	27,630,000,000		310,818,000
Total sawed lumber..... "	27,869,000,000	4,000,000,000	314,829,000
Lath.....pieces.	2,365,000,000		3,709,924
Pickets and palings..... "	110,000,000		750,000
Shingles..... "	9,276,000,000	200,000,000	17,000,000
Staves..... "	1,178,000,000	500,000,000	7,762,000
Headings.....sets	183,000,000	175,000,000	4,934,000
Total lumber and cognate products, directly from logs.....		4,675,000,000	348,984,924
II. Railroad construction:			
Ties <i>c</i> .....pieces.	80,000,000	400,000,000	
Round and hewn timber used for bridges and trestles.....		80,000,000	
Telegraph poles.....		5,000,000	
Total.....		485,000,000	40,000,000

AMOUNT and value of forest products used during the census year 1890—*Concluded.*

Classes of products.	Quantity.	Estimated cubic contents of forest-grown material. <i>b</i>	Value.
<b>III. Exported timber not included in subdivision I <i>d</i></b>			
Hewn timber, 6,900,000 cubic feet.....		9,000,000	1,230,000
Logs and round timber.....		2,500,000	2,000,000
Rived staves, and stave bolts.....		500,000	1,500,000
		12,000,000	4,730,000
<b>IV. Wood pulp : <i>b</i></b>			
300,000 tons ground paper pulp.....		75,000,000	3,550,000
80,000 tons soda pulp.....			
60,000 tons sulphite pulp fibre.....			
50,000 tons pulp for other purposes.....			
<b>V. Miscellaneous mill products other than lumber manufactured directly from logs or bolts <i>e</i>.....</b>			
		80,000,000	20,765,000
Total materials requiring bolt or log size.....		5,327,000,000	418,029,924
This last figure of "miscellaneous products" is a very considerable underestimate, based upon census returns and we are entirely safe in rounding off the total of sizable timber used and its value to.....			
		5,500,000,000	450,000,000
<b>VI. Fuel <i>f</i> in the shape of wood.....</b>			
In the shape of charcoal.....		18,000,000,000	450,000,000
<b>VII. Wood used for dyeing extracts and charcoal for gunpowder <i>e</i>.....</b>			
		250,000,000	7,000,000
		16,200,000	437,000
Total amount and value of wood consumption.....		23,766,000,000	907,437,000
<b>VIII. Naval stores <i>e</i>—</b>			
	Quantity.	Value.	Total value.
Turpentine.....barrels	346,544	\$5,459,115	.....
Rosin....."	1,429,154	2,413,757	87,872,872
<b>IX. <i>e</i> Wood alcohol.....gallons,</b>			
Acetic acid in acetate of lime.....	2,000,000	1,750,000	.....
		360,000	2,110,000
<b>X. Tanning materials <i>e</i>—</b>			
Hemlock bark.....cords.	1,056,000	6,925,000	.....
Oak bark....."	322,150	2,783,500	.....
Hemlock bark for extract....."	64,200	307,500	.....
Sumac leaves for tanning.....tons	3,300	198,800	.....
Sumac leaves for extract....."	3,750	112,000	.....
Various not accounted for.....		74,000	.....
			10,400,000
<b>XI. Maple sugar.....pounds <i>e</i></b>			
Maple syrup.....gallons <i>e</i>	32,952,927	3,300,000	.....
	2,258,376	2,200,000	5,600,000
Total value of forest by-products.....			25,882,872
Total value of all forest products.....			933,319,872
Add 10 per cent for omissions and underestimates <i>b</i> .....			93,331,987
Total value of wood and forest products at original place of production, estimated to have been used during census year, 1890.....			1,026,650,859

*a* These data have been compiled by Mr. Priest from the reports of 21,011 establishments (representing probably 70 per cent in number and 95 per cent in value of product), of which 18,064 manufactured sawed lumber as principal product, 792 manufactured shingles exclusively, 438 manufactured staves and headings exclusively, and 1,807 used logs or bolts in the manufacture of the various classes of products stated under the head of "Miscellaneous," and corrected by the inclusion of the quantities used for customs sawing not given in the census figures.

*b* Estimated by the Division of Forestry.

*c* Canvass of Division of Forestry.

*d* From returns of Bureau of Statistics, U. S. Treasury Department.

*e* Based on figures of the 11th Census.

*f* Based on figures of the 10th Census and canvass of Division of Forestry.

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The following interesting separation of mill products according to regions and kinds is given by Mr. Priest, the quantities being based on various returns, and hence somewhat at variance :

LUMBER, of different kinds, sawed during census year 1890.

Value.	Kind.	Feet, board measure.
1,230,000		
2,000,000		
1,500,000		
4,730,000		
3,550,000	White pine.....	11,300,000,600
	Spruce and fir.....	4,483,000,000
	Hemlock.....	3,390,000,000
	Hard pine, cypress, etc.....	5,515,000,000
	Redwood.....	317,000,000
	Hardwood, and all others.....	5,517,000,000
20,765,000		30,593,000,000
418,029,924		

AMOUNTS and value of lumber sawed, in different sections of the United States, during census year 1890.

	*Region.	Amount (M. feet).	Value.
450,000,000			
450,000,000			
7,000,000			
437,000			
907,437,000			
Total value.	Eastern group.....	4,808,761	\$51,939,519
	Central group.....	3,129,988	44,407,296
	Lake group.....	3,259,702	98,110,488
	Southern group.....	4,925,331	46,790,542
\$7,872,872	Pacific group.....	2,027,848	22,465,088
	Miscellaneous.....	866,796	11,306,807
2,110,000	Total.....	24,010,446	272,020,740

\*Eastern group comprises the New England and North Atlantic States; Central group, Ohio, Indiana, Illinois, West Virginia, Kentucky, Tennessee, Missouri; Lake group, Michigan, Wisconsin, Minnesota; Southern group, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Arkansas, Texas; Pacific group, California, Oregon, Washington; miscellaneous, all other States and Territories.

IMPORTS of Wood and Wood Products for home consumption by United States.

	1891-92.	1892-93.
	\$	\$
Free of duty.....	7,442,640	8,865,408
Dutiable.....	14,364,100	17,163,589
Totals.....	21,806,740	26,028,997

Exports of wood and wood products from the United States for 1891-92 was \$42,729,407, and for 1892-93, \$43,097,786.

## EXPORTS OF WOOD AND WOOD PRODUCTS IN 1892-93 BY DISTRICTS.

	*DISTRICTS.				Totals.
	I.	II.	III.	IV.	
	\$	\$	\$	\$	\$
Raw material.....	9,633,527	10,234,058	6,631,539	1,640,202	28,139,326
Manufactures.....	13,085,563	221,140	558,392	390,020	14,255,015
Totals.....	22,719,120	10,455,998	7,189,931	2,030,222	42,395,271

\* District No. I. includes all of the United States north of Baltimore and east of the Rocky Mountains. District No. II. includes the territory having its outlet by the S. Atlantic ports. District No. III. includes the territory adjacent to the Gulf ports. District No. IV. embraces that portion of the United States on the Pacific coast.

## ADVANCE OF FORESTRY INTERESTS DURING THE YEAR.

The year has been fruitful of signs which point to promising results in the near future of the efforts to establish a rational forest policy in this country. The policy of establishing forest reservations on the public domain has been further extended by the President's proclamation of the Sierra Nevada and Ashland Reserves, aggregating 4,511,360 acres. This makes the total acreage of forest reservations established under that title 17,564,800 acres.

## LIST OF NATIONAL FOREST RESERVATIONS AND NATIONAL PARKS OF THE UNITED STATES.

No.		Established.	Area.
			Acres.
1	Yellowstone National Park timberland reserve (Wyo.).....	Sept. 10, 1891	1,239,040
2	White River Plateau timberland reserve (Colo.).....	Oct. 16, 1891	1,198,080
3	Pecos River forest reserve (N. Mex.) .....	Jan. 11, 1892	311,040
4	Sierra forest reserve (Cal.).....	Feb. 14, 1893	4,096,000
5	Pacific forest reserve (Wash.).....	Feb. 20, 1893	967,580
6	Pike's Peak timberland reserve (Colo.).....	Mar. 18, 1892	184,320
7	Bull Run timberland reserve (Oreg.).....	June 17, 1892	142,080
8	Plum Creek timberland reserve (Colo.).....	June 23, 1892	179,200
9	South Platte forest reserve (Colo.).....	Dec. 9, 1892	683,520
10	San Gabriel timberland reserve (Cal.).....	Dec. 29, 1892	555,520
11	Battlement Mesa forest reserve (Colo.).....	Dec. 24, 1892	858,240
12	Afognak Forest and Fish Culture reserve (Alaska).....	Dec. 24, 1892	Unknown.
13	Grand Canyon forest reserve (Ariz.).....	Feb. 20, 1893	1,851,520
14	Trabuco Canyon forest reserve (Cal.).....	Feb. 25, 1893	49,020
15	San Bernardino forest reserve (Cal.).....	Feb. 25, 1893	737,280
16	Ashland forest reserve (Oreg.).....	Sept. 28, 1893	18,530
17	Cascade Range forest reserve (Oreg.).....	Sept. 28, 1893	4,492,800
	Total acreage of forest reserves.....		17,564,800

## NATIONAL PARKS.

18	Yellowstone National Park.....	Mar. 1, 1872	2,142,720
19	Yosemite National Park.....	Oct. 1, 1890	967,680
20	Sequoia National Park.....	Oct. 1, 1890	161,280
21	General Grant National Park.....	Oct. 1, 1890	2,560

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The present great need of providing protection and suitable administration for these reservations is to be met by the enactment of a law (H. R. 119) which, while less comprehensive than that contemplated in the fifty-second Congress (S. 3235), contains the essential features for a first step towards a more thorough organization, and recommends itself on account of its simplicity. Having been reported favourably by the Committee on Public Lands and placed on the calendar, its early passage, which is so necessary to a clinching of the policy expressed in the proclamation, is hoped for. This bill provides in the first place the use of the army for protection of the reservations. Experience in Yellowstone Park and elsewhere points out the efficiency of such a service, which is also satisfactory to the officers and troops, as it breaks the monotony of camp life, furnishes useful occupation, and keeps the troops in practice for field work.

The next important provision lies in the authority given to the Secretary of the Interior to regulate the use and occupancy of the reservations, thus settling their legal status. The sale of ripe timber from reservations and other public timber lands under such supervision as to insure the inviolability of the forest cover is also permitted, in the discretion of the Secretary. This provision, which has been severely criticised, is most important and essential to any kind of successful forest policy. Its absence from the statutes hitherto has been the fruitful source of depredations and forest destruction, for the resident population must be provided with wood material, and, in the absence of legal methods and fair means to do so, it is driven to supply its necessities by unfair means. As soon as a value is placed on the timber of the public domain it will be possible not only to dispose of it advantageously, but also to control the manner of its use without injury to the forest conditions and the future, and an interest in the same will grow up. In this or a similar provision, which attempts a rational use of the forest resources, lies the only salvation of our western forests and of the soil and water conditions dependent on the same.

The funds derived from the sale of ripe timber and other income are to be set aside for the purpose of establishing gradually a more amplified and effective system of forest management, so that the forest itself shall pay for its own protection.

State Governments are also becoming more active in regard to their forestry interests. New Hampshire acted in part upon the recommendations of its investigating forestry commission, by making the same permanent (with a new personnel), constituting the selectmen of the several towns firewardens with power, or allowing the commissioners to appoint special firewardens, the expense to be charged to town or county.

New York has passed new legislation having in view the final establishment of a compact State forest and also introducing some methods designed for the utilization of the spruce in the present State forest reserve. This last provision is faulty in that it is based on the misconception that the restriction of cutting to certain sizes is sufficient to preserve acceptable forest conditions.

Pennsylvania has passed a law establishing a well-considered plan of examining into the condition of its forest cover, especially at head-waters of rivers, with a view of formulating further action. The Pennsylvania Forest Association, which represents by all odds the most active, business-like and intelligent element in the forestry movement, has made this action possible; the association is thriving, increasing its membership constantly, and with the publication of its now nearly regularly issued *Forest Leaves* is the most powerful ally of the national association.

New Jersey is promising to enter the ranks of those States which recognize the importance of their forest areas, the first step being an examination by a committee of the State board of health into the needs of forest preservation on the highlands, the director of the Geological Survey having furnished the basis and first suggestion for such action.

Maine having inaugurated a tolerably satisfactory fire law, the north-eastern Atlantic States seem to be in a fair way of establishing a forest policy.

In the West we have to note rather a retrograde movement. California found it necessary to abolish for political reasons its forestry commission, inaugurated eight

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683,520

555,520

858,240

Unknown.

1,851,520

49,920

737,280

18,560

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17,564,800

2,142,720

967,680

161,280

2,560

years ago with so much promise, warranted by the eager and intelligent work of the first commission. Colorado also has practically abandoned its first attempts at a forest policy by leaving the competent and useful forest commissioner without salary and means to proceed in his work.

Wisconsin has entered the ranks of forestry States by the inauguration of a forestry association starting upon a practical basis, which has in view the active co-operation of lumbermen.

## APPENDIX "S."

### FRENCH TREATY AS AFFECTING FOREST PRODUCTS.

The Commercial Treaty affecting the relations between Canada and France in respect of their customs tariffs has now been finally ratified.

The following forest products (among other articles) imported direct from Canada shall receive the advantage of the minimum tariff on entering France, Algeria or the French Colonies :—

- Building timber in rough or sawn.
- Wood pavement.
- Staves.
- Wood pulp (cellulose).
- Tanning extracts.
- Furniture of common wood.
- Furniture, other than chairs, or solid wood, common.
- Flooring in pine or soft wood.
- Wooden sea-going ships.



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## STATISTICAL TABLES

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TABLE 1 (a.)  
FOREST PRODUCTS OF 1890-91.—(From Census Returns 1891.)

Timber.	Ontario.	Quebec.	New Brunsw- wick.	Nova Scotia.	P. E. Island.	Mani- toba.	British Col- umbia.	Terri- tories.	Total Canada.
White pine, square cubic feet. ....	6,884,808	1,665,231	414,727	202,938	1,550	550	19,000	2,410	9,191,244
Red pine, sq. c. ft.	595,879	317,609	2,805	148,055	2,651	100	336,890	2,410	1,406,309
Oak, sq. ....	1,765,544	68,863	1,412	26,226	400	32,035	600	.....	1,895,080
Tamarack, sq. or sided. ....	562,728	2,595,980	266,320	19,600	1,400	189,508	16,333	13,265	3,665,134
Birch and ma- ple, sided. ....	1,133,790	959,304	636,161	670,478	237,713	295	.....	4,728	3,642,079
Elm " " "	2,086,725	166,781	430	1,040	1,880	6,334	.....	1,232	2,864,422
Black walnut, sided. ....	38,042	7,696	.....	.....	.....	.....	.....	.....	45,738
Other walnut, sided. ....	30,736	71,477	5,010	1,674	.....	.....	.....	.....	108,927
Hickory, sided. ....	316,977	49,786	.....	9,192	3,500	700	6,300	.....	386,455
All other " " "	4,811,878	11,437,966	883,679	2,206,675	338,503	323,110	740,905	763,488	21,596,204
Pine logs, ) Spruce ) and ) other ) logs ) 100 ft. ..... ) B. M.	10,293,171	2,560,298	532,917	402,021	20,144	613	1,194,156	88,138	15,090,528
Spars and masts ..... No.	11,660,690	10,757,148	4,619,901	4,793,477	469,310	270,384	908,053	59,594	33,538,537
Staves ..... M	40,685	59,498	187,965	22,836	2,318	200	18,628	.....	323,140
Lathwood ..... cords.	29,550	44,628	8,026	9,163	788	2	163	.....	92,260
Tanbark " " "	97,684	172,594	11,471	9,598	1,011	716	313	25	293,412
Firewood " " "	110,124	148,851	56,268	12,574	610	1,049	320	23	329,810
Fence posts. No.	5,192,399	3,380,389	616,049	703,809	160,532	274,992	157,006	69,988	10,535,164
Railway ties " "	6,828,980	10,670,437	1,494,484	2,541,881	2,120,486	1,508,353	2,284,660	1,213,974	28,363,255
Telegraph posts " "	4,813,666	2,404,593	1,483,334	317,222	42,130	473,672	940,690	209,600	10,684,907
Pulp wood, cords.	220,818	97,295	12,634	40,777	10	305	22,002	59	393,861
Shingles. .... M	114,959	131,191	11,372	3,334	24	.....	267	.....	261,155
	610,474	175,625	34,359	88,267	19,169	548	10,386	1,008	939,736

FOREST PRODUCTS OF 1880-81.—(From Census Returns 1881.)

White pine, square cubic feet. ....	12,262,570	4,840,462	130,762	124,451	1,524	2,168	1,945,708	18,610	19,326,255
Red pine, sq. c. ft.	1,848,927	654,721	31,954	35,726	342	.....	19,382	11,500	2,602,552
Oak, sq. ....	5,448,263	59,587	3,316	22,876	180	138,672	.....	.....	5,672,894
Tamarack, sq. or sided. ....	1,515,360	2,707,745	256,389	106,069	11,270	32,792	.....	23,950	4,653,575
Birch and ma- ple, sided. ....	612,760	2,784,395	348,441	549,330	93,742	.....	26,000	127	4,414,795
Elm " " "	2,925,382	163,049	2,400	1,393	290	39,454	.....	.....	3,191,968
Black walnut, sided. ....	59,032	.....	.....	.....	.....	.....	.....	.....	59,032
Other walnut, sided. ....	682,399	66,896	.....	13	5,901	.....	.....	.....	754,219
Hickory, sided. ....	377,811	7,998	.....	630	.....	300	.....	880	387,619
All other " " "	26,200,058	14,382,814	2,371,061	4,091,517	797,851	622,059	430,792	54,806	48,956,958
Pine logs, ) Spruce ) and ) other ) logs ) 100 ft. ..... ) B. M.	14,945,670	5,400,273	657,400	497,785	5,260	14,742	798,119	5,158	22,324,407
Spars and masts ..... No.	7,621,610	8,182,434	5,001,069	2,250,593	192,083	240,033	2,483,024	54,738	26,025,584
Staves ..... M	23,721	104,248	54,406	8,703	196	.....	900	67	192,241
Lathwood ..... cords.	22,857	3,585	955	13,147	1,177	10	148	2	41,881
Tanbark " " "	50,265	31,881	3,434	5,585	814	279	6,653	.....	98,311
Firewood " " "	45,921	285,940	55,535	10,843	629	.....	1,550	.....	499,416
	5,435,414	3,638,928	781,729	697,084	159,619	219,784	82,277	38,390	10,963,234

Fence posts, railway ties, telegraph posts, pulp wood and shingles were not recorded in 1881, these additional columns having been added in the census of 1891, for the first time.

TABLE

## COMPARATIVE STATEMENT of Forest Products in

Year.	Square Pine.		Square Oak.	Square or sided Tamarac.	Square or sided Birch and Maple.	Square Elm.	Walnut.		Cubic feet of Hickory.	All other square or sided timber.	
	White.*	Red.*					*	Black.*			*Other species.
NEW BRUNSWICK.											
1	1891	414,727	2,805	1,412	266,320	636,161	430	5,040	883,679		
2	1881	130,762	31,954	3,316	256,389	348,441	2,400		2,371,061		
3	1871	330,920	90,139	7,360	360,825	827,345	1,250	120	2,192,608		
NOVA SCOTIA.											
4	1891	202,938	148,055	26,226	19,600	670,478	1,040	1,674	9,192	2,206,675	
5	1881	124,451	35,726	22,870	106,069	549,330	1,393	13	630	4,091,517	
6	1871	238,638	22,020	96,494	110,816	518,727	200	2,265	240	3,088,063	
ONTARIO.											
7	1891	6,884,808	595,879	1,765,544	562,728	1,133,790	2,686,725	38,042	30,736	316,977	4,811,878
8	1881	12,262,570	1,848,927	5,448,293	1,515,360	612,760	2,925,382	59,032	682,399	377,811	26,200,058
9	1871	14,791,203	1,524,698	3,144,554	1,223,444	92,290	1,777,965	117,589	72,214	157,975	10,594,943
QUEBEC.											
10	1891	1,665,231	317,609	68,863	2,595,980	959,304	166,781	7,696	71,477	49,786	11,437,966
11	1881	4,840,462	654,721	59,587	2,707,745	2,784,365	163,049		66,806	7,998	14,382,814
12	1871	8,876,060	347,515	53,635	3,994,878	500,965	53,299		28,382	39,612	10,414,710
TOTAL, FOUR PROVINCES.											
13	1891	9,167,704	1,064,348	1,862,045	3,444,028	2,265,943	2,854,076	45,738	108,927	375,955	18,940,198
14	1881	17,358,245	2,571,328	5,534,042	4,585,563	4,294,926	3,092,224	59,032	749,218	386,439	47,045,450
15	1871	24,236,821	1,954,372	3,302,043	5,695,963	1,939,357	1,832,654	117,589	102,981	197,827	26,290,264
TOTAL, OTHER PROVINCES.											
16	1891	23,540	342,051	33,035	220,506	242,340	9,446			10,500	2,166,006
17	1881	1,968,010	31,224	138,852	68,012	119,869	99,744		5,001	1,180	1,911,508
BRITISH COLUMBIA.											
18	1891	1,900	336,890	600	16,333					6,300	740,905
19	1881	1,945,708	19,382			26,000					436,732

\* 50 cubic feet to 1 ton.

1 (b).

Four Pro

Pine Logs.

†

WICK.

532,017  
657,400  
1,214,485

SCOTIA.

402,021  
497,785  
477,187

RIO.

10,293,171  
14,045,670  
5,713,204

BEC.

2,560,298  
5,400,273  
5,011,532

PROVINCES.

13,787,507  
21,501,128  
12,416,468

PROVINCES.

1,203,021  
823,279

CONTRIBUT

1,194,156  
798,119

† 40 cubic ft. to piece.

TABLE  
Products in

1 (b).

Four Provinces.—(Converted into tons from Census Returns, 1891, '81 and '71.)

All other square or sided timber.	Pine Logs.	Spruce and other logs.	Spars and Mastis.	Staves.	Lathwood.	Tanbark.	Firewood.	Fence Posts.	Railway Ties.	Telegraph Posts.	Pulp Wood.	Shingles.	
*	†	†			‡	‡	§			**			
<b>WICK.</b>													
883,679	532,017	4,619,901	187,965	8,026	11,471	56,268	616,049	4,483,452	4,450,002	126,340	11,372	34,359	1
2,371,061	657,400	5,001,069	54,406	955	3,434	55,535	781,729	.....	.....	.....	.....	.....	2
2,192,608	1,214,485	3,533,152	11,356	747	2,490	28,228	545,679	.....	.....	.....	.....	.....	3
<b>NOVA.</b>													
2,206,675	402,021	4,793,477	22,836	9,103	9,598	12,574	763,806	7,625,643	951,666	407,770	3,334	88,267	4
4,091,517	497,785	2,250,593	8,703	13,147	5,585	10,843	637,084	.....	.....	.....	.....	.....	5
3,088,003	477,187	897,595	10,631	11,811	924	12,388	526,472	.....	.....	.....	.....	.....	6
<b>ONTA.</b>													
4,811,878	10,293,171	11,660,690	40,685	29,550	97,684	110,124	5,192,390	19,586,940	14,410,998	2,268,180	114,959	610,374	7
26,200,658	14,945,670	7,621,610	23,721	22,857	50,265	45,921	5,435,414	.....	.....	.....	.....	.....	8
10,594,943	5,713,204	1,255,090	4,876	20,964	15,095	30,854	4,519,320	.....	.....	.....	.....	.....	9
<b>QUE.</b>													
11,437,966	2,560,298	10,757,148	50,498	44,628	172,594	148,851	3,380,389	32,011,311	7,213,779	972,650	131,199	175,625	10
14,382,814	5,400,273	8,182,434	104,248	3,585	31,881	285,940	3,638,928	.....	.....	.....	.....	.....	11
10,414,710	5,011,532	3,628,720	94,822	1,184	7,148	91,051	3,121,612	.....	.....	.....	.....	.....	12
<b>L. FOUR PROVINCES.</b>													
18,940,198	13,787,507	31,831,216	301,984	91,307	291,347	327,817	9,892,646	63,707,346	27,026,445	3,714,940	260,864	908,625	13
47,045,450	21,501,128	23,055,706	191,678	40,544	91,165	398,239	10,493,155	.....	.....	.....	.....	.....	14
26,290,264	12,416,468	9,314,557	121,085	34,706	25,657	162,521	8,713,093	.....	.....	.....	.....	.....	15
<b>OTHER PROVINCES.</b>													
2,166,006	1,203,021	1,707,341	21,156	953	2,065	1,993	662,518	21,382,419	4,998,276	223,070	291	31,311	16
1,911,508	823,279	2,969,878	1,163	2,144	7,146	2,179	500,079	.....	.....	.....	.....	.....	17
<b>CONTRIBUTION.</b>													
740,905	1,194,156	908,053	18,638	163	313	320	157,006	6,853,930	2,822,070	220,020	267	10,386	18
436,792	798,119	2,483,024	900	148	6,053	1,530	82,277	.....	.....	.....	.....	.....	19

† 40 cubic feet to 1 ton. ‡ 128 cubic feet to ton. § 100 cubic feet to ton. || 3 c. feet to piece. \*\* 10 c. ft. to piece.

TABLE  
SUMMARY of Sawmills in Canada.—

SAWMILLS. — 1891.	Establishments.	FIXED CAPITAL			Working Capital.
		In Land.	In Buildings.	In Machinery and Tools.	
1 British Columbia .....	67	891,435	437,311	944,631	2,399,142
2 Manitoba .....	31	17,308	57,025	104,959	312,025
3 New Brunswick .....	496	437,873	738,420	1,120,070	2,329,545
4 Nova Scotia .....	1,172	499,542	361,677	786,738	869,597
5 Ontario .....	1,895	2,355,168	2,615,883	5,403,534	15,375,446
6 Prince Edward Island .....	172	30,438	41,390	97,462	42,663
7 Quebec .....	1,815	1,856,663	1,628,986	2,493,640	5,433,279
8 Territories .....	18	16,575	39,425	87,120	388,150
Total .....	5,606	6,105,062	5,910,117	11,038,145	27,149,847
1881.					
1 British Columbia .....	27				1,343,600
2 Manitoba .....	37				609,350
3 New Brunswick .....	478				2,987,860
4 Nova Scotia .....	1,190				1,640,487
5 Ontario .....	1,751				11,004,042
6 Prince Edward Island .....	165				190,919
7 Quebec .....	1,729				7,637,975
8 Territories .....	3				64,000
Total .....	5,390				*25,487,233

\* Total capital.

TABLE  
SUMMARY of Shingle Mills in Canada.—

SHINGLE MILLS.					
1 British Columbia .....	9	2,300	6,200	20,800	7,500
2 Manitoba .....	1			2,200	2,200
3 New Brunswick .....	126	15,820	36,365	112,159	109,710
4 Nova Scotia .....	213	12,280	22,455	52,301	15,515
5 Ontario .....	295	96,188	90,225	295,027	286,812
6 Prince Edward Island .....	32	2,575	6,361	11,469	1,955
7 Quebec .....	201	11,564	25,623	101,247	182,767
8 Territories .....					
Total .....	877	140,527	187,169	595,263	606,459

1 (c.)  
(From C)

AVENUE  
EMMA

MALES

Over 16 yrs. Un-

1,542  
517  
6,296  
4,512  
22,484  
817  
12,169  
567

48,074 3

393

563

6,440

3,970

15,765 1

385

11,575

44 ...

30,135 2

1 (d.)  
(From C)

96

4

737

396

1,321

42

454

3,050 3

TABLE  
1 (c.)  
(From Census Returns, 1891 and 1881.)

Working Capital.	AVERAGE NO. OF EMPLOYED.						Aggregate amount of yearly wages in \$.	MONTHS IN OPERATION.			POWER USED IN MANUFACTURE.				Materials used, cost at the factory using them, including freight charges.	PRO-DUCTS. VALUE.	
	MALES.			FE-MALES.				Full time.	Half time.	Quarter time.	STEAM.		WATER.	All others, electric, gas, &c., h.p.			
	Over 16 yrs.	Under 16 yrs.	Total.	Over 16 yrs.	Under 16 yrs.	Total.					Engines.	Horse power.					Horse power.
2,399,142	1,542	12	2	697,868	43	13	11	86	6,865	743	10	1,060,176	2,212,910	1			
312,025	517	10	2	156,681	19	7	5	30	999	40		240,356	511,976	2			
2,329,545	6,296	50	4	1,448,837	254	118	123	178	11,232	9,694	163	3,785,836	6,673,701	3			
869,597	4,512	25	8	921,028	476	358	338	213	7,003	18,640	1	1,944,630	4,083,980	4			
15,375,446	22,484	1,342	24	6,577,006	1,039	477	380	1,387	52,434	26,701	82	14,554,541	26,987,259	5			
4,663	317	23	3	68,996	96	35	40	30	689	2,392	2	157,163	324,743	6			
5,433,379	12,169	1,044	20	2,662,319	716	431	773	456	22,054	45,591	422	4,959,148	10,082,891	7			
388,150	267	2	1	93,160	8	5	5	16	603	60	60	186,160	384,975	8			
27,149,817	48,074	3,233	61	12,625,895	2,651	1,444	1,675	2,396	101,879	103,861	740	26,888,010	51,262,435				
1,343,600	393	5	1	202,420								223,961	550,321	1			
604,350	563	13	6	208,190								513,158	888,173	2			
2,987,809	6,440	707	20	1,243,628								4,355,735	6,532,826	3			
1,640,487	3,970	156	34	549,480								1,446,858	3,094,137	4			
11,004,042	15,765	1,004	69	3,581,225								8,985,797	16,601,175	5			
199,919	385	16	17	58,262								127,194	240,153	6			
7,637,375	11,575	841	37	2,287,191								5,101,884	10,542,649	7			
64,000	44			16,600								43,802	95,318	8			
*25,487,233	39,135	2,742	183	8,146,996								20,798,389	38,541,752				

TABLE  
1 (d.)  
(From Census Returns, 1891.)

7,500	96	2		22,464	5	3	1	0	178	40		39,810	109,688	1
2,200	4			240		1		1	16			150	500	2
109,710	737	17	3	172,742	23	15	88	27	1,339	565		173,479	438,744	3
15,515	396	36	1	51,343	62	78	73	9	197	2,613	15	51,967	149,077	4
286,812	1,321	169	1	282,385	119	80	94	192	4,569	1,796	50	495,377	1,126,849	5
1,955	42	11		6,519	6	9	17	3	75	375		9,748	22,531	6
182,767	454	76	2	80,063	60	65	94	45	1,252	1,997		90,277	246,535	7
														8
606,459	3,050	311	6	616,356	275	251	367	283	7,626	7,296	65	860,808	2,093,924	

TABLE 1 (e.)  
CENSUS OF 1891.  
Woodworking Industries.

Names of Industries.	Invested Capital.	Wages.	Value of Product.
	\$	\$	\$
Ashery, pot and pearl.....	113,019	45,139	153,441
Basket making.....	80,540	66,987	151,003
Boat building.....	421,395	179,092	477,522
Cabinet and furniture.....	6,094,435	2,432,771	7,706,093
Carpenters and joiners.....	5,012,670	2,949,803	9,111,299
Carriage factories.....	8,029,021	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
Cigar box factories.....	19,500	6,000	15,000
Coffin and casket making.....	502,346	166,039	498,440
Cooperages.....	1,896,931	744,534	2,382,072
Hub and spoke factories.....	106,895	30,010	105,400
Invalid and baby carriages.....	51,300	43,400	145,500
Last and peg factories.....	67,000	28,630	72,500
Lath mills.....	23,365	11,180	37,800
Mast and spar making.....	58,065	15,620	59,800
Match factories.....	336,650	143,034	434,933
Packing cases.....	137,305	68,000	293,869
Pail and tub factories.....	192,130	36,280	99,932
Patterns and moulds.....	3,700	4,250	10,100
Piano action factory.....	11,000	10,800	29,500
Picture frame making.....	289,962	122,014	564,579
Planing mills.....	2,955,650	970,112	5,211,592
Pulp mills.....	2,900,907	292,099	1,067,810
Pump and wind mills.....	519,890	163,325	601,513
Refrigerator factories.....	22,775	22,840	56,350
Sash, door and blind factories.....	7,108,076	2,309,267	9,891,510
Saw mills.....	50,203,111	12,625,895	51,262,435
Shingle mills.....	1,529,358	616,356	2,063,924
Ship building.....	2,045,456	998,615	3,101,275
Show case making.....	233,425	84,250	441,750
Shook factories.....	73,677	28,127	99,714
Spinning wheel making.....	12,915	5,050	8,788
Spool factories.....	63,400	25,000	50,000
Stave mills.....	724,242	296,008	814,339
Street car works.....	13,858	2,400	13,600
Tanneries.....	6,322,963	1,522,007	*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.

Quantities,  
Census log, (as  
\* For 1891,  
birch at \$6.77;  
Navigation Ret  
† For 1891,

PRODU  
Article

Square Timb  
White pine  
Red do  
Oak  
Tamarack  
Birch a n  
maple  
Elm  
All other so  
timber  
Logs, pine  
do all othe  
Staves & mast  
Lathwood  
Tanbark  
Firewood  
Fence posts  
Rwy. ties  
Telegraph  
poles  
Pulp wood  
Shingles

PRODUCT

Square Timbe  
White pine  
Red do  
Oak  
Tamarack  
Birch a n d  
maple  
Elm  
All other sq  
timber  
Logs, pine  
do spruce &  
all other  
Staves & masts  
Lathwood  
Tanbark  
Firewood  
Fence posts  
Rwy. ties  
Telegraph  
poles  
Pulp wood  
Shingles



FOREST WEALTH OF CANADA.

159

TABLE 1 (f.)  
PRODUCTS OF THE FOREST (4 PROVINCES).—From Census Returns 1891-'81-'71.

Article.	1891.		1881.		1871.		1891. 1881. 1871.		
	Qty.	Value.	Qty.	Value.	Qty.	Value.	Value per Customs returns.		
		\$		\$		\$	\$	\$	\$
Square Timber—									
White pine, tons	183,354	2,420,298	347,165	3,558,442	484,738	3,635,535	14 40	10 25	7 50
Red do .. "	21,287	200,638	51,428	421,710	39,090	287,702	9 82	8 20	7 36
Oak .....	37,241	782,061	110,700	1,011,789	66,941	775,972	21 00	17 27	11 75
Tamarack .. "	68,900	482,300	91,712	650,274	113,919	404,412	7 00	6 00	3 55
Birch and maple .....	45,319	376,941	86,000	574,270	38,800	257,247			
Elm .....	57,100	702,285	61,845	749,561	36,653	344,538			
All other sq. timber .....	389,416	6,674,590	965,000	11,753,700	536,173	5,576,200	13 35	12 12	9 40
Logs, pine...No.	13,787,507	11,581,506	21,501,128	17,845,636	12,416,468	8,877,774	17 14	12 18	10 40
do all other. "	31,831,216	19,098,729	23,055,706	11,527,853	9,314,557	3,725,823	84c p. log	83c p. log	71½c p. log
Spars & masts, pcs.	301,984	256,686	191,078	171,971	121,085	227,640	60c do	50c do	40c do
Staves .....	91,307	418,724	40,544	290,253	34,707	321,659	85c	90c	1 88
Lathwood .. cords.	201,347	1,456,735	91,165	455,825	25,657	128,285	† See foot note.		
Tanbark .. "	327,817	1,475,176	398,239	1,792,576	162,521	791,246	5 00	5 00	5 00
Firewood .. "	9,892,646	21,261,189	10,493,155	21,825,702	8,713,089	19,168,783	4 50	4 50	4 50
Fence posts .. cu.ft.	63,707,946	2,123,578					2 15	2 08	2 20
Rwy. ties .. "	27,026,445	1,803,763					10c		
Telegraph poles .. "							20c		
Pulp wood .. cords.	3,714,940	315,770					85c		
Shingles .....	260,864	782,592					3 00		
	908,625	1,908,112					2 10		

PRODUCTS OF THE FOREST OF THE DOMINION.—(From Census Returns 1891-'81-'71.)

Article.	1891.		1881.		1871.		1891. 1881. 1871.		
	Qty.	Value.	Qty.	Value.	Qty.	Value.	Value per Customs returns.		
		\$		\$		\$	\$	\$	\$
Square Timber—									
White pine, tons	184,000	2,649,600	386,525	3,961,881			14 40	10 25	
Red do .. "	28,130	276,237	52,050	426,810			9 82	8 20	
Oak .....	38,000	798,000	113,458	1,054,420			21 00	17 27	
Tamarack .. "	73,300	513,100	93,070	538,420			7 00	6 00	
Birch and maple .....	50,166	417,255	88,300	604,769					
Elm .....	59,300	791,655	63,840	773,749					
All other sq. timber .....	433,000	7,421,620	1,003,156	12,218,440			13 35	12 12	
Logs, pine...No.	14,990,528	12,741,950	22,324,407	18,529,258			17 14	12 18	
do spruce & all other. "	33,538,567	20,123,134	26,025,584	13,012,792			84c p. log	83c p. log	
Spars & masts, pcs.	323,140	274,669	192,241	173,017			60c do	50c do	
Staves .....	92,260	434,868	41,881	300,128			85c p. pc.	90c p. pc.	
Lathwood .. cords.	293,412	1,467,060	98,311	491,568			† See foot note.		
Tanbark .. "	329,810	1,494,145	400,418	1,801,881			5 00	5 00	
Firewood .. "	10,555,164	22,693,602	10,993,234	22,965,923			4 50	4 50	
Fence posts .. cu.ft.	85,080,765	2,836,325					2 15	2 08	
Rwy. ties .. "	32,064,721	2,136,982					10c		
Telegraph poles .. "							20c		
Pulp wood .. cords.	3,938,610	333,882					85c		
Shingles .....	261,155	783,465					3 00		
	939,736	1,973,866					2 10		

Quantities, when in tons, taken at 50 cubic feet = 1 ton of square timber; 40 cubic feet, 1 ton of logs. Census log, (as above): 100 ft. board measure = 8 3/4 cubic feet. Standard log, in common use = 200 ft.

\* For 1891, 1/3th maple at \$14.07, remainder birch at \$8.17; for 1881, 1/3th maple at \$13.19, remainder birch at \$6.77; for 1871, 1/3th maple at \$5.75, remainder birch at \$7.07. Estimate taken from Trade and Navigation Returns.

† For 1891, 280 M. at \$42, 91,980 M. at \$4.60; for 1881, 1,000 M. at \$42, 40,881 M. at \$7.34 per M.

TABLE 1 (f).  
PRODUCTS OF THE FORESTS OF CANADA, 1891. (From Census Returns, 1891.)

Article.	Quantity.	Value.	Value from Census Returns and Remarks.
\$			
Square timber—			
White pine.....tons.	184,000	2,649,600	\$14.40 per ton.
Red do....."	28,134	276,237	\$9.82 do
Oak....."	38,000	708,000	\$21.00.
Tamarack....."	73,300	513,100	\$7.00.
Birch and maple....."	50,166	417,255	1/3th maple at \$14.07; rest birch at \$8.17.
Elm....."	59,300	791,655	\$13.35 per ton.
All other square timber....."	433,000	7,421,620	\$17.14 do
Logs—			
Pine.....No.	14,990,528	12,741,950	84c. per log.
Spruce and all other....."	33,538,557	20,123,134	60c. do
Masts and spars.....pcs.	323,130	274,669	85c. per piece.
Staves.....M.	92,260	434,868	* 280 M. at \$42; 91,980 M. at \$4.60.
Lathwood.....cords.	293,412	1,467,060	\$5.00 per cord.
Tanbark....."	329,810	1,494,135	\$4.50 do
Fence poles.....No.	28,363,255	2,836,325	† 10c. each.
Railway ties....."	10,684,067	2,136,982	† 20c. do
Telegraph poles....."	393,861	333,882	85c. do
Firewood.....cords.	10,555,164	22,693,062	\$2.15 per cord.
Pulp wood....."	261,155	783,465	\$3.00 do
Shingles.....M.	930,736	1,973,866	\$2.10 do

Quantities when in tons taken at 50 cubic feet for 1 ton of square timber; 40 cubic feet for 1 ton of logs. Census log: 100 feet board measure = 8.3 cubic feet; standard log, 200 feet board measure.  
\* Proportion estimated from T. and N. Report for 280 M. feet; for the remainder, price obtained from local sources.  
† Value estimated.

PRODUCTS OF THE FORESTS OF CANADA, 1881. (From Census Returns, 1881.)

Square timber—			
White pine.....tons.	386,525	3,961,881	\$10.25 per ton.
Red do....."	52,050	426,810	\$8.20 do
Oak....."	113,458	1,954,420	\$17.27.
Tamarack....."	93,070	558,420	\$6.00.
Birch and maple....."	88,300	604,769	1/3th maple at \$13.10; 2/3th birch at \$6.77.
Elm....."	63,840	773,740	\$12.12.
All other square timber....."	1,063,156	12,218,440	\$12.18.
Logs—			
Pine.....No.	22,324,407	18,529,258	83c. per log of 100 ft.
Spruce and all other....."	26,025,584	13,012,792	56c. do do
Masts and spars.....pcs.	192,241	173,017	90c.
Staves.....M.	41,881	300,128	† 1,000 at \$42, 40,881 at \$7.34 per M.
Lathwood.....cords.	98,311	491,555	\$5.00 per cord.
Tanbark....."	400,418	1,801,881	\$4.50 do
Fence poles.....No.			
Railway ties....."			
Pulp wood.....cords.			
Shingles.....M.			
Firewood.....cords.	10,993,234	22,865,926	\$2.08.
Telegraph poles.....No.			

Quantities when given in tons taken at 50 cubic feet for 1 ton of square timber and 40 cubic feet for logs. Value taken from Trade Returns. Census log is 100 feet board measurement.  
\* Proportion estimated from T. and N. Returns.  
† Proportion estimated from T. and N. Returns for 1,000 M.; for the remainder, price obtained from local sources.

COMP

White pine  
Red do  
Oak  
Tamarack  
Birch and  
Elm  
All other  
Logs—pine  
All  
Spars and  
Staves  
Lathwood  
Tanbark  
Firewood

Total of abo  
Percentage  
Percentage  
Increase of  
Decrease in  
Dominion d  
Total for D

1876  
1877  
1878  
1879  
1880  
1881  
1882  
1883  
1884  
1885  
1886  
1887  
1888  
1889  
1890  
1891  
1892  
1893

\*Some o  
8a-

TABLE I (f.)

COMPARATIVE VALUE of Products of the Forest for the four Provinces, 1891-'81-'71.

(From Census and Trade and Navigation Returns.)

Articles.	1891.	1881.	1871.
	\$	\$	\$
White pine.....	2,420,298	3,558,442	3,635,585
Red do.....	209,038	421,710	287,702
Oak.....	782,061	1,911,789	775,972
Tamarack.....	482,360	550,274	404,412
Birch and maple.....	376,941	574,270	257,247
Elm.....	762,285	749,561	344,638
All other square timber.....	6,674,500	11,763,700	5,576,200
Logs—pine.....	11,581,606	17,845,936	8,877,774
All other.....	19,098,729	11,527,853	3,725,823
Spars and masts.....	256,686	171,971	227,640
Staves.....	418,724	290,253	321,650
Lathwood.....	1,456,735	455,825	128,285
Tanbark.....	1,475,176	1,792,576	731,346
Firewood.....	21,269,189	21,825,762	19,168,788
	67,264,258	73,429,922	44,462,907
Total of above articles for the Dominion.....	72,096,795	77,673,040	
Percentage of four Provinces.....	93.3	94.5	
Percentage of other Provinces.....	6.7	5.5	
Increase of four provinces in 1881 over 1871.....		65 p.c.	
Decrease in 1891 compared with 1881.....	8.4		
Dominion decrease, 1891 compared with 1881.....	7.18		
Total for Dominion, with extra articles. See sheet A.	80,161,415		

TABLE 2.—LUMBER &c., CARRIED BY RAILWAYS.

(From Railway Statistics—Department Railways and Canals.)

Year.	Lumber of all kinds.		*Saw logs.	Firewood.
	Feet.	Tons.	Tons.	Tons.
1876.....	517,623,083	723,183		113,435
1877.....	464,250,672	833,713		143,165
1878.....				
1879.....	393,117,149	986,169		181,350
1880.....				
1881.....	728,903,172	1,197,972		265,896
1882.....				
1883.....	889,994,325	1,183,354		560,152
1884.....				
1885.....	1,689,887,638	2,350,510		490,297
1886.....	1,561,609,941	2,302,382		498,285
1887.....	1,816,968,458	2,548,807	200,000	540,821
1888.....	1,618,006,137	2,361,351	297,500	652,636
1889.....	1,946,986,627	2,587,503	267,000	1,073,379
1890.....	2,303,168,858	3,178,960	211,500	806,614
1891.....	2,301,741,757	3,191,806	76,800	946,175
1892.....	2,424,050,459	3,898,854	152,570	895,522
1893.....	2,321,317,135	3,417,446	82,670	1,064,812

\*Some other saw logs are included in the columns "Lumber of all kinds."

TABLE 2.—LUMBER AND OTHER FOREST PRODUCTS PASSED THROUGH CANALS—FROM REPORTS OF DEPARTMENTS OF INLAND REVENUE, AND RAILWAYS AND CANALS.

TRAFFIC ON CANALS, PRODUCTS OF THE FOREST BY ARTICLES. FISCAL YEARS 1876 TO 1893.

Years.	Bark.		Boat knees.		Floats.		Firewood.		Hoops and hop poles.		Lumber sawed.		Masts, spars.		Rail-way ties.		Saw logs.		Staves, all kinds.		Shingles.		Split posts.		Timber, square.		Timber, other wood.		Totals.			
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.			
1876.	150	177	14,407	361,874	2,525	484,023	16,318	8,757	31,818	13,533	777	217	102,896	18,661	1,056,133																	
1877.	340	116	21,345	337,658	2,331	648,007	16,115	7,692	45,829	13,346	811	179	128,137	18,661	1,237,508																	
1878.	307	116	19,330	299,380	3,006	562,466	5,352	3,652	23,098	4,583	819	134	114,070	16,335	997,979																	
1879.	422	34	12,230	295,748	3,922	450,225	7,670	6,106	14,565	3,554	849	136	65,622	11,968	870,357																	
1880.	253	26	8,925	274,595	2,560	565,682	12,095	9,890	21,531	2,391	734	133	60,614	13,417	972,564																	
1881.	309	133	14,485	236,437	1,331	706,940	11,448	16,188	34,414	5,624	643	142	119,445	13,045	1,088,484																	
1882.	201	44	23,758	297,461	5,965	689,910	14,657	44,185	88,398	10,077	643	423	133,523	14,640	1,508,515																	
1883.	104	38	15,213	203,539	1,790	764,615	11,281	63,558	124,187	13,346	769	477	129,654	18,257	1,369,754																	
1884.	182	25	13,062	225,124	947	733,794	15,381	29,338	51,179	3,297	869	232	129,654	12,182	1,266,727																	
1885.	126	10	13,876	171,001	999	699,652	10,700	11,265	50,363	2,821	838	52	100,262	8,467	1,004,481																	
1886.	63	..	24,095	174,330	131	863,769	12,797	17,159	38,257	1,305	1,107	96	97,724	12,082	1,231,319																	
1887.	74	..	30,738	119,083	119	867,788	31,337	24,807	45,068	1,801	790	56	57,823	11,967	1,086,669																	
1888.	138	..	34,492	121,692	61	816,738	21,864	22,835	43,051	3,234	885	62	73,451	11,967	1,147,572																	
1889.	248	..	41,473	133,674	86	841,102	25,416	17,698	54,484	1,032	755	78	118,048	14,472	1,259,519																	
1890.	362	..	22,678	130,069	109	857,559	22,228	17,698	41,506	1,566	1,019	55	83,150	12,676	1,408,448																	
1891.	118	1,128	31,906	133,526	247	736,702	19,450	24,380	41,506	1,566	1,011	18	50,047	9,918	1,092,001																	
1892.	118	1,128	50,467	135,885	4	662,959	19,313	34,689	51,053	391	1,011	30	50,047	10,943	1,170,867																	
1893.	138	..	76,728	191,742	418	718,484	15,544	13,621	48,466	724	1,203	30	93,729	10,943	1,170,867																	
Total.	3,692	1,731	489,399	3,802,758	13,630	12,611,035	288,966	341,287	872,065	92,468	15,723	8,638	1,688,510	47,942	251,771	29,599,295																
Average.	191	96	27,189	211,354	737	700,613	16,654	18,969	48,448	5,134	873	489	93,896	13,967	1,140,516																	

†The Department of Railways and Canals took over these statistics for 1889 and following years.

TABLE 2.—Continued.

TRAFFIC ON CANALS—Products of the Forest, by Canals—Fiscal years 1876 to 1893—(From Reports of Departments of Inland Revenue and Railways and Canals.)

TABLE 2.—Continued.  
TRAFFIC ON CANALS—Products of the Forest, by Canals—Fiscal years 1876 to 1893—(From Reports of Departments of Inland Revenue and Railways and Canals.)

Years.	Welland Canal.	St. Lawrence Canals.	Chambly Canal.	Burlington Bay Canal.	Murray Canal.	Ottawa Canals.	Rideau Canal.	St. Peter's Canal.	Trent Valley Canals.	Totals.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1876	212,233	293,963	65,008	14,404		428,455	125,534	1,220	5,316	1,656,133
1877	271,605	247,868	44,878	13,873		538,139	110,943		40,196	1,267,006
1878	208,784	173,756	46,992	3,406		451,808	98,113		14,450	976,079
1879	148,709	129,083	49,997	3,836		437,355	90,239		10,889	876,279
1880	146,718	145,510	57,455	11,450		503,982	87,934		19,008	972,564
1881	173,700	154,848	74,123	22,921		539,418	86,818		14,264	1,168,484
1882	177,905	160,303	101,970	29,713		703,634	78,451	392	13,060	1,268,515
1883	158,555	174,026	122,730	14,431		742,002	81,380	1,638	14,962	1,369,734
1884	178,856	185,421	109,836	11,083		727,065	72,373	1,374	10,749	1,246,727
1885	174,994	104,791	76,271	8,129		627,409	59,465	2,051	12,829	1,060,481
1886	211,043	188,910	80,799	4,748		753,405	71,003	2,064	28,347	1,291,519
1887	158,196	138,709	77,809			718,599	66,570	2,858	17,309	1,180,650
1888*	119,354	151,194	103,164			688,105	73,860	4,310	14,075	1,136,562
1889	135,355	139,990	102,102			687,353	61,839	5,293	13,491	1,197,277
1890	132,854	134,282	88,955		6,832	698,978	105,237	3,362	25,899	1,259,389
1891	136,619	120,061	98,808		4,124	622,329	74,520	2,619	25,088	1,083,448
1892	107,617	112,613	123,061		4,530	542,950	73,588	3,429	21,792	992,001
1893	165,350	106,092	177,008		7,363	613,503	77,585	4,516	19,730	1,170,867
Totals..†	3,102,567	2,671,420	1,602,096	138,748	22,849	11,090,240	1,529,846	39,196	328,393	20,328,295

Total all freight carried by canals, 1887-91..... 14,535,530 tons.  
Carried same period products of forests..... 5,845,480 " = 40.2 per cent.

\* The Department of Railways and Canals took over these statistics for 1889 and following years.  
† Formerly Newcastle District Canals.

Some duplication in departmental canal figures in total freights for 1889-90 and 1891, but thrown out in above.

TABLE 2—Continued.  
 TRAFFIC ON CANALS—Products of the Forest—Fiscal year ending June, 1876.—(From Report of Inland Revenue Department.)

Articles.	Welland Canal.		St. Lawrence Canals.		Chambly Canal.		Burlington Bay Canal.		Ottawa Canals.		Rideau Canal.		St. Peter's Canal.		Newcastle Dist. Canals.		TOTALS.	
	Tons.		Tons.		Tons.		Tons.		Tons.		Tons.		Tons.		Tons.		Tons.	
Bark kessels.....	125		33								117						150	
Floats.....	390		51														177	
Firewood.....	5,324		5,824		368				2,359		6,631						14,407	
Hoops and hop poles.....	56,472		72,894		5,162		615		133,626		92,160					945	361,874	
Lumber, sawed.....	176		1,542						2		805						484,923	
Masts, spars and telegraph poles.....	73,305		62,625		46,138		2,764		284,235		9,864		1,220			3,872	484,318	
Railway ties.....	258		15,310		49		621				80						8,737	
Saw-logs.....	378		337		6,947		100				473					132	8,707	
Staves, all kinds.....	9,069		9,943						5,013		7,689					107	31,818	
Staves, straight.....	7,303		45						566		1,331						13,523	
Split posts and rails.....	2,066		45		45		5		186		209					48	777	
Timber, square.....	100		19,706		5,968		10,259		2,169		481					10	102,896	
Traverses.....	64,132		11,709		365				285		6,220					52	18,961	
Totals.....	212,233		293,963		65,068		14,404		428,455		125,534		1,220		5,716		1,056,133	

TRAFFIC ON CANALS—Products of the Forest—Fiscal year ending June, 1877.—(From Report of Inland Revenue Department.)

Articles.	Welland Canal.		St. Lawrence Canals.		Chambly Canal.		Burlington Bay Canal.		Ottawa Canals.		Rideau Canal.		St. Peter's Canal.		Newcastle Dist. Canals.		TOTALS.	
	Tons.		Tons.		Tons.		Tons.		Tons.		Tons.		Tons.		Tons.		Tons.	
Bark kessels.....	40		78								138						84	
Floats.....	70		7,355						6,965								80	
Firewood.....	62,084		62,937		849		548		149,094		6,874					9,303	21,345	
Hoops and hop poles.....	448		759		43,074		1,533		21		73,132					9,368	357,658	
Lumber, sawed.....	101,045		101,629		43,074		283		374,932		12,016					13,177	648,007	
Masts, spars and telegraph poles.....	1,117		515		267		894		1,304		3,453						16,115	
Railway ties.....	6,632		17,451						1,623		4,368					50	7,692	
Saw-logs.....	10,963		3,757						1,623		689					15,740	45,852	
Staves, all kinds.....	208		24		24		283		163		104					22	811	
Staves, straight.....	88,938		23,578		495		10,100		2,484		1,469					57	128,137	
Split posts and rails.....	14,308		14,308		20				1,327		7,500					1,043	23,135	
Timber, square.....	271,605		247,868		44,878		13,879		538,139		110,943					40,136	1,267,663	
Traverses.....																		
Totals.....	271,605		247,868		44,878		13,879		538,139		110,943		1,220		5,716		1,267,663	

TABLE 2—Continued.  
 TRAFFIC ON CANALS—Products of the Forest—Fiscal year ending June, 1878.—(From Report of Inland Revenue Department.)



TABLE 2.—Continued.  
TRAFFIC on Canals—Products of the Forest—Fiscal year ending June, 1880.—(From Report of Inland Revenue Department.)

Articles.	Welland Canal.	St. Lawrence Canals.	Chambly Canal.	Burlington Bay Canal.	Ottawa Canals.	Rideau Canal.	St. Peter's Canal.	Newcastle Dist. Canals.	TOTALS.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Bark.....	20	28			83	142			253
Boat knees.....		6							26
Floats.....	3,832		1,038		1,599	2,456			8,925
Firewood.....	47,354	46,390	1,836	300	110,973	58,170		9,012	274,595
Hoops and hop poles.....	57,816	48,091	54,409	1,331	388,063	15,084		808	565,682
Lumber, sawed.....	1,013	10,620	377		30	150			12,085
Masts, spars and telegraph poles.....	127	47	22		8	3,533			37,880
Railway ties.....	9,416	9,258			22	505			5,730
Saw-logs.....	1,147	51		560		683			2,431
Staves, all kinds.....	53	163		5	253	258			734
Shingles.....	4	3		14		117			151
Split posts and rails.....	29,588	17,981	199	9,260	2,241	329			60,614
Timber square.....	180	8,091	55		671	6,429			15,417
Trawsers.....									
Totals.....	146,718	143,510	57,955	11,450	503,982	87,034		19,006	972,564

TRAFFIC on Canals—Products of the Forest—Fiscal year ending June, 1881.—(From Report of Inland Revenue Department.)

Bark.....	22				112	175			309
Boat knees.....	133								133
Floats.....	4,416	4,286			1,214	4,326			14,485
Firewood.....	37,093	972			97,719	52,533		6,042	286,437
Hoops and hop poles.....	8	157			40	1,291			1,531
Lumber, sawed.....	45,292	65,376		1,183	530,908	8,225		392	706,390
Masts, spars and telegraph poles.....	35				650	91			11,448
Railway ties.....	3								16,188
Saw-logs.....	14,021	2,281			779	7,903			34,414
Staves, all kinds.....	3,132	2,281		287	2,275	2,022			5,624
Shingles.....	30					646			643
Split posts and rails.....	101	92			270				1,842
Timber square.....	23,381	25		1,600	43	55			110,449
Trawsers.....	8,450	744		19,201	5,462	1,892			19,045
Totals.....	173,700	74,123		22,921	630,418	88,818		392	1,168,484

TABLE 2.—Continued.  
TRAFFIC on Canals—Products of the Forest—Fiscal year ending June, 1882.—(From Report of Inland Revenue Department.)



TABLE 2.—Continued.  
TRAFFIC ON CANALS—Products of the Forest—Fiscal year ending June, 1882.—(From Report of Inland Revenue Department.)

68,790	23,331	744	43	55	100	1,842
8,450	8,201	190	5,462	1,392	475	119,445
173,700	154,848	74,123	639,418	88,818	392	1,168,484
Totals.....						

Articles.	Welland Canal.		St. Lawrence Canals.		Chamby Canal.		Burlington Bay Canal.		Ottawa Canals.		Rideau Canal.		St. Peter's Canal.		Newcastle Dist. Canals.		Totals.	
	Tons.		Tons.		Tons.		Tons.		Tons.		Tons.		Tons.		Tons.		Tons.	
Bark.....			31						115		86						201	
Boat keels.....			3,712		13				5,810		5,083						44	
Floats.....	41,139		39,662		9,151		60		101,763		43,900						23,758	
Firewood.....			37		2,484						328						237,461	
Hoops and hop poles.....	46,758		64,318		73,044		1,404		496,130		6,901		1,479				595	
Lumber, sawed.....	1,019		13,664		73,044				498								689,910	
Masts, spars and telegraph poles.....	1,019		11,759		15,396				1,241		13,735						14,657	
Railway ties.....	6,156		5,366						73,100		2,467						88,398	
Saw-logs.....	5,511		1,571						10		329						10,077	
Staves, all kinds.....	32		148		64				261		113						4	
Shingles.....			2		89				4,100		94						4	
Split posts and rails.....	76,735		12,073		2,369		21,493		23,598		480						4,233	
Timber, square.....	60		7,960		360				677		5,583						139,123	
Traverses.....																	14,040	
Totals.....	177,906		160,303		101,970		29,713		703,634		78,451		1,479		15,060		1,268,515	

TRAFFIC ON CANALS—Products of the Forest—Fiscal year ending June, 1883.—(From Report of Inland Revenue Department.)

Articles.	Welland Canal.		St. Lawrence Canals.		Chamby Canal.		Burlington Bay Canal.		Ottawa Canals.		Rideau Canal.		St. Peter's Canal.		Newcastle Dist. Canals.		Totals.	
	Tons.		Tons.		Tons.		Tons.		Tons.		Tons.		Tons.		Tons.		Tons.	
Bark.....			38								104						104	
Boat keels.....			4,638		3,948				890		5,797						38	
Floats.....	31,813		39,477		2,812		129		89,897		43,047						15,213	
Firewood.....			89						27		63						293,539	
Hoops and hop poles.....	48,409		60,236		93,025		1,311		590,458		8,896		1,638				179	
Lumber, sawed.....	2,166		11,146		22,601				13								764,615	
Masts, spars and telegraph poles.....	9,514		19,818						5,579		12,390						11,281	
Railway ties.....	8,502		21,494						84,112		1,647						63,358	
Saw-logs.....	25		2,275						10		381						134,187	
Staves, all kinds.....	4		10		44		5		408		76						769	
Shingles.....			13,489		9				9		366						474	
Split posts and rails.....	58,122		10,062		151		10,645		10,324		1,822						94,394	
Timber, square.....					140				176		7,885						18,257	
Traverses.....																		
Totals.....	158,555		174,026		122,730		14,451		742,002		81,390		1,638		14,962		1,309,754	



TABLE 2—Continued.  
TRAFFIC ON CANALS—Products of the Forest—Fiscal year ending June, 1886.—(From Report of Inland Revenue Department.)

Articles.	Welland Canal.		St. Lawrence Canals.		Chambly Canal.		Burlington Bay Canal.		Ottawa Canals.		Rideau Canal.		St. Peter's Canal.		Newcastle Dist. Canals.		Totals.	
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Bark.....																		
Boat keels.....																		
Floats.....																		
Firewood.....		25,709	3,696	22,512	441		18,720	2,250										94,656
Hoops and hop poles.....			13				88,070	23,300										174,220
Lumber, sawed.....		98,672	55,676	12,594	73,804		593,638	39,289	2,179									863,707
Masts, spars and telegraph poles.....		133	336	187	6,267		1,130	3,621	9									12,737
Railway ties.....		6,389	22,702	57			11,517	320										11,664
Saw-logs.....		2,264	187	7			473	66										2,321
Staves, all kinds.....		159	187	128			3	39										1,107
Split posts and rails.....		78,687	12,248	120			2,537	40										97,724
Timber, square.....			8,878				41,460	681										41,460
Timber, &c., free.....							885	1,674										11,088
Traverses.....																		
Totals.....	211,043	138,910	80,739	4,748	71,603	2,664	28,347	1,291,519										

TRAFFIC ON CANALS—Products of the Forest—Fiscal year ending June, 1887.—(From Report of Inland Revenue Department.)

Articles.	Welland Canal.		St. Lawrence Canals.		Chambly Canal.		Burlington Bay Canal.		Ottawa Canals.		Rideau Canal.		St. Peter's Canal.		Newcastle Dist. Canals.		Totals.	
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Bark.....																		
Boat keels.....																		
Floats.....																		
Firewood.....		29	4,256	13,625	360		23,704	2,758										39,738
Hoops and hop poles.....		15,045					62,703	18,046										119,083
Lumber, sawed.....		84,856	61,637	72,692			603,513	39,241	2,858									867,788
Masts, spars and telegraph poles.....		29	21,027	1,946	4,468		10,256	25										31,357
Railway ties.....		2,496	17,841	3,049			3,049	4,989										17,139
Saw-logs.....		5,013	1,273	32			11,241	137										38,257
Staves, all kinds.....		365	139	264			17	33										1,301
Split posts and rails.....		49,055	7,830	43			354	43										58,257
Timber, square.....			10,364				2,694	140										14,301
Timber, &c., free.....							609	1,068										60,414
Traverses.....																		12,062
Totals.....	158,196	138,709	77,869	4,748	66,570	2,858	718,599	17,309	1,180,650									

100,322  
325  
6,482  
8,967  
524  
1,968  
524  
1,968  
17,982  
6,482  
198  
621,960  
7,000  
4,060  
60  
6,746  
104,791  
76,271  
8,129  
2,051  
12,829  
1,060,481

TABLE 2—Continued.  
 TRAFFIC ON CANALS—Products of the Forest—Fiscal year ending June, 1888—(From Report of Inland Revenue Department.)

Articles.	Welland Canal.	St. Lawrence Canals.	Chambly Canal.	Ottawa Canals.	Rideau Canal.	St. Peter's Canal.	Newcastle Dist. Canals.	Totals.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Bark.....	.....	.....	.....	.....	104	.....	.....	153
Beet kners.....	.....	.....	.....	.....	.....	.....	45	.....
Boats.....	.....	.....	.....	.....	.....	.....	.....	.....
Firewood.....	.....	4,786	430	28,696	580	.....	.....	34,492
Hoops and hop poles.....	19,620	20,118	300	52,485	19,932	.....	9,237	121,692
Manter, sawed.....	46,679	9	.....	29	.....	.....	.....	61
Nails, spars and telegraph poles.....	.....	63,292	92,668	559,632	48,576	4,510	1,381	816,738
Railway ties.....	.....	21,799	.....	.....	.....	.....	.....	21,864
Saw-logs.....	.....	2,596	9,661	65	.....	.....	.....	24,807
Saw-logs, all kinds.....	11,092	15,303	.....	3,637	5,749	.....	177	45,068
Shingles.....	1,171	630	.....	14,471	822	.....	.....	1,801
Staves.....	35	82	45	501	.....	.....	.....	759
Staves and rails.....	.....	10	.....	5	33	.....	.....	.....
Timber square.....	38,161	11,626	52	7,724	.....	.....	260	57,823
Traverses.....	.....	10,068	.....	840	.....	.....	.....	10,908
Totals.....	119,354	151,194	103,164	668,105	75,860	4,510	14,075	1,136,262

TABLE 2—Continued.  
 TRAFFIC ON CANALS—Products of the Forest—Fiscal year ending June, 1889—(From Report of Department of Railways and Canals.)

TABLE 2—Continued.  
TRAFFIC ON CANALS—Products of the Forest—Fiscal year ending June, 1889.—(From Report of Department of Railways and Canals.)

Articles.	Welland Canal.	St. Lawrence Canal.	Chambly Canal.	Ottawa Canals.	Rideau Canal.	St. Peter's Canal.	Trent Valley Canal.	Totals.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Bark.....	429	4,694	833	35,187	83	.....	.....	83
Boat knees.....	17,922	10,720	780	68,670	830	.....	.....	41,473
Flouts.....	.....	10	.....	14	22,676	.....	.....	133,674
Firewood.....	74,289	53,049	92,678	535,932	52	.....	.....	133,674
Hoops and hop poles.....	.....	24,897	.....	.....	59,412	5,293	.....	841,102
Masks, staves and telegraph poles.....	.....	3,693	8,084	.....	519	.....	.....	29,833
Railway ties.....	603	22,843	.....	3,423	6,889	.....	.....	43,061
Saw logs.....	5,650	1,192	.....	12,657	676	.....	.....	3,234
Staves of all kinds.....	2,040	.....	87	1	1	.....	.....	685
Shingles.....	23	.....	126	548	44	.....	.....	52
Split posts and rails.....	54,339	7,191	14	10,810	290	.....	.....	73,451
Timber, square.....	.....	11,612	.....	100	261	.....	.....	11,987
Traverses.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals.....	*153,355	†139,990	102,102	687,353	91,693	5,293	15,491	1,197,277
Free goods.....	1,416	19,440	.....	.....	.....	.....	.....	20,856

\* Welland Canal—1,416 tons square timber passed free, having paid toll and been recorded at St. Lawrence Canals.

† St. Lawrence Canals—6,532 tons lumber, 1,398 tons staves, 11,510 tons square timber, total, 19,440 tons, passed free, having paid toll and been recorded at Welland Canal.

TABLE 2.—Continued.  
 TRAFFIC ON CANALS—Products of the Forest—Fiscal year ending June, 1890.—(From Report of Department of Railways and Canals.)

Articles.	Welland Canal.	St. Lawrence Canals.	Chambly Canal.	Murray Canal.	Ottawa Canals.	Rideau Canal.	St. Peter's Canal.	Trent Valley Canal.	Totals.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Bark.....					13			336	349
Boat lines.....		5,224			32,746	4,338		50	42,078
Floats.....	13,707	12,146	4,568	228	46,432	34,914		13,014	130,009
Firewood.....		3			27	79			109
Hoops and hon poles.....		50,080	81,955	85	584,731	53,779	5,362	700	857,559
Lumber, sawn.....	80,898	21,820	2,350		5,608	6,948		111	22,228
Masts, spars and telegraph poles.....	949	14,596			27,847	559		217	17,068
Railway ties.....	3,036	18,179			8	8		4,863	54,484
Saw-logs.....	860	156			323	166		88	1,632
Staves, all kinds.....	33	70	64	11	3	8		11	755
Shingles.....	17	12,799	18	6,500	1,240	1,890		1,500	118,048
Split posts and rails.....	94,129	11,674				2,528			14,402
Timber, square.....									
Travelses.....									
Totals.....	* 103,854	† 134,282	88,955	6,832	6,832	105,257	5,362	25,899	1,259,339
Free goods.....	290	10,179							10,469

\* Welland Canal—290 tons saw-logs passed free, having paid toll and been recorded at St. Lawrence Canals.

† St. Lawrence Canals—580 tons floats, 6,280 tons lumber, and 3,319 tons square timber, total 10,179 tons, passed free, having paid toll and been recorded at Welland Canal.

TABLE 2.—Continued.

TRAFFIC ON CANALS—Products of the Forest—Fiscal year ending June, 1891.—(From Report of Department of Railways and Canals.)

TABLE 2—Continued.  
TRAFFIC ON CANALS—Products of the Forest—Fiscal year ending June, 1891.—(From Report of Department of Railways and Canals.)

Articles.	Welland Canal.		St. Lawrence Canal.		Chambly Canal.		Murray Canal.		Ottawa Canals.		Rideau Canal.		St. Peter's Canal.		Trent Valley Canal.		Totals.		
	Tons.		Tons.		Tons.		Tons.		Tons.		Tons.		Tons.		Tons.		Tons.		
Bark.....																			
Peak knees.....																			
Planks.....																			
Firewood.....																			
Hoops and hop poles.....																			
Lumber, saws.....	13,322		5,572		8,333		1,966		23,880		1,597		5		457		31,595		
Maats, spars and telegraph poles.....	56,586		39,840		85,620		246		53,332		29,840		5		16,416		133,595		
Railway ties.....	27		18,522		854		854		312,322		38,343		2,619		418		736,762		
Saw-logs.....	207		1,004		28		28		12,323		94		456		402		19,450		
Saves, all kinds.....	4,750		20,562		4,223		153		13,259		5,391		402		2,380		23,380		
Shingles.....	190		9						13,258		658		2,199		41,596		41,596		
Split posts and rails.....	14		49		192		16		422		154		172		1,019		1,559		
Timber, square.....	62,804		10,981		7		7		11		29		8		55		83,159		
Traverses.....									5,460		742		1,613		880		12,676		
Totals.....									200		742		2,619		880		1,083,448		
Free goods.....									622,320		74,530		2,619		23,638		6,363		
									98,868		4,124		2,619		23,638		6,363		
									† 120,061										
									6,067										

\* Welland Canal—25 tons railway ties, 301 tons saw-logs, total 326 tons, passed free, having paid toll and been recorded at St. Lawrence Canals.  
† St. Lawrence Canals—3,947 tons lumber, 400 tons split posts and rails, 2,320 tons square timber, total 6,067 tons, passed free, having paid toll and been recorded at Welland Canal.

TABLE 2.—Continued.  
 TRAFFIC on Canals—Products of the Forest—Fiscal year ending June, 1892.—(From Report of Department of Railways and Canals.)

Articles.	Welland Canal.	St. Lawrence Canals.	Chambly Canal.	Murray Canal.	Ottawa Canals.	Rideau Canal.	St. Peter's Canal.	Trent Valley Canal.	Totals.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Bark.....		13				73		32	118
Boat knees.....					1			1,127	1,128
Fleets.....	40	4,204	5		45,500	740		50,487	50,487
Firewood.....	9,321	11,673	24,629	342	43,772	31,944		14,204	135,985
Hoops and hop poles.....									4
Limber, sawed.....	70,122	42,389	97,075	852	414,472	33,539	3,420	1,070	662,969
Laths, spars and telegraph poles.....	241	19,068	1,919	27	435	24		171	19,313
Railway ties.....	3,190	526			4	6,246		265	9,689
Saw-logs.....	383	14,577	8		29,824	248		3,214	51,063
Staves, all kinds.....	19	10	35	4	634			171	391
Shingles.....									1
Split posts and rails.....	26,131	10,759		3,305	8,044	14		1,283	47,237
Timber, square.....		9,275			220			223	9,718
Traverses.....									
Totals.....	109,447	612,615	129,631	4,530	542,950	73,588	3,420	21,792	992,001
Free goods.....	263	5,826							6,089

a. Welland Canal.—263 tons saw-logs passed free, having paid toll and been recorded at St. Lawrence Canals. b. St. Lawrence Canals.—3,738 tons lumber, 128 tons staves, 1,960 tons square timber—total 5,826 tons, passed free, having paid toll and been recorded at Welland Canal.

TABLE 2.—Continued.  
 TRAFFIC on Canals—Products of the Forest—Fiscal year ending June, 1893.—(From Report of Department of Railways and Canals.)



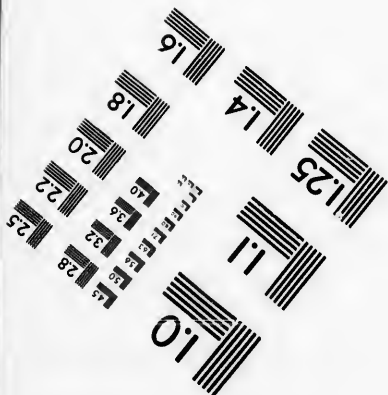
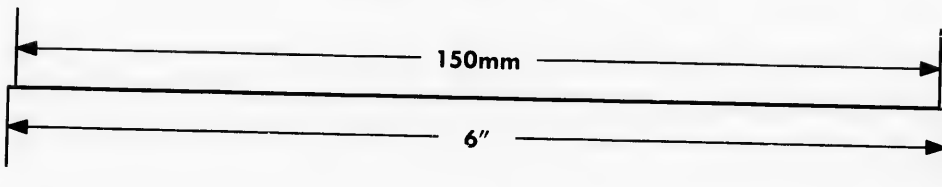
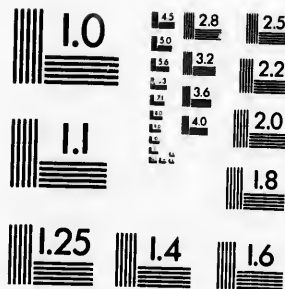
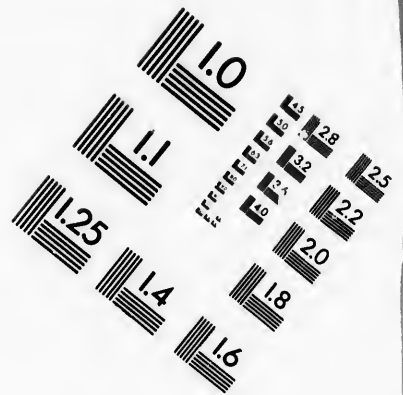
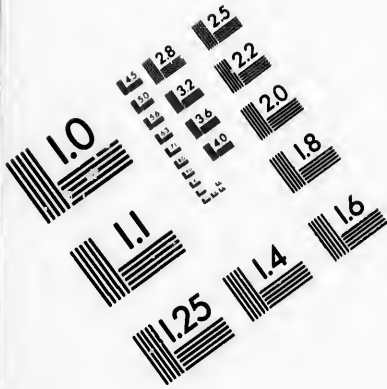
TABLE 2.—Continued.  
TRAFFIC ON CANALS—Products of the Forest—Fiscal year ending June, 1893.—(From Report of Department of Railways and Canals.)

Articles.	Welland Canal.	St. Lawrence Canals.	Champlain Canal.	Murray Canal.	Ottawa Canals.	Rideau Canal.	St. Peter's Canal.	Trent Valley Canal.	Totals.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Bark.....		5				52		78	135
Boat lines.....									
Floats.....		7,172				1,380		152	76,758
Firewood.....	4	13,271	82,594	229	40,837	36,875		12,144	191,732
Hoops and hop poles.....	6,162		347		40	41			418
Lumber, sawed.....	107,388	39,958	89,048	2,436	441,977	32,109	4,316	1,302	718,484
Masts, spars and telegraph poles.....	5	13,992			415	54		1,078	15,544
Railway ties.....	128	148	5,366	25	1,401			250	13,621
Saw-logs.....	3,732	15,456			27,823	5,863		1,629	48,466
Staves, all kinds.....	499	224		1		266			724
Shingles.....	25	31	43	72		101		482	1,203
Split posts and rails.....	47,347				21	9			30
Timber, square.....				4,600	30,860	200		1,505	93,729
Traverses.....					1,000	615		210	10,443
Totals.....	163,350	106,092	177,068	7,363	613,503	77,505	4,316	19,730	1,170,867
Free goods.....		c1,142							1,142

c. Passed free, having paid tolls and been recorded at Welland Canal.

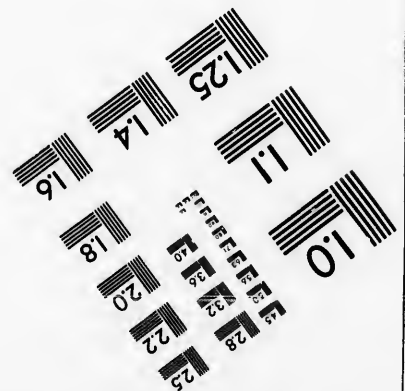


# IMAGE EVALUATION TEST TARGET (MT-3)



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10  
16  
18  
20  
22  
25

10  
12  
15  
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TABLE 3 (a)  
EUROPEAN Forests—Area and ownership.

Date.	Country.	Per Cent Forest.	Forest Area.	State or Crown Lands.	Municipal Institutions, &c.	Private.	Not Specified.	Remarks.
			Acres.	Acres.	Acres.	Acres.	Acres.	
a. 1863	Austria	32.55	24,172,360	2,347,868	3,594,264	18,300,228		
a. 1862	Hungary	23.52	18,777,771	2,923,555	6,481,730	9,372,477		
a. 1863	Belgium	17.08	1,243,507	61,945	403,197	778,365		
d. 1862	Bosnia and Herzegovina	45.00	6,690,456					
a. 1888	Bulgaria	4.64	1,135,996				6,090,450	
b. 1887	Denmark	4.80	469,490				1,135,996	
a. 1893	France	17.92	23,466,450	2,691,156	4,738,464	(1) 16,496,472	463,480	
a. c. 1893	German Empire.	25.70	34,397,651	11,341,325	6,529,854	16,496,472		
a. c. 1889	Greece	12.60	2,025,400	1,620,320		405,080		
a. c. 1892	Holland	6.93	561,456				561,456	
f. c. 1889	Italy	14.31	10,131,235	425,835		9,705,400		Municipal included with private.
a. c. 1892	Norway	24.53	13,288,626	2,314,635	57,8,659	16,395,332		
a. c. 1893	Portugal	5.25	1,163,841	53,964		1,109,877		
a. c. 1892	Roumania	13.22	4,942,000	2,254,070				
a. c. 1892	Russia (Europe)	37.15	498,200,000	298,920,000		199,280,000		
g. 1891	Servia	48.00	5,763,163				5,763,163	
b. 1890	Spain	13.03	16,354,941	722,656	15,632,285	30,180,000		
b. 1890	Sweden	40.65	44,480,000	14,300,000		57,791,515		
a. 1893	Switzerland	20.12	2,039,018	85,151	1,394,042			
d. 1892	Turkey (Europe)	8.93	3,500,000					
i. 1892	United Kingdom	4.00	2,695,000					
	Europe	30.26	721,497,271	340,063,490	39,283,404	318,637,976	23,512,401	

Of this 629,850 acres cork trees. The British consul from official report gives 66.67 per cent forest, 68,256,171, apparently including some unwooded state lands. The British consul gives: Ottoman Empire forest area, 25,741,717 acres; state, 18,328,717; private, 7,413,000.

U. S. Cons., Rep. No. 122, 1890.  
 f. U. S. Cons., Rep. No. 122, 1890.  
 g. do do 143, 1892.  
 h. do do 123, 1891.  
 i. Hazell's Annual, 1893.  
 k. Official Forestry Report (French Department of Agriculture), 1894.

British representatives' special reports.  
 a. L'Economiste Français, July, 1888.  
 b. Schuler's Manual of Forestry, 1884.  
 c. Schuler's ear book, 1893.  
 d. U. S. Cons. Rep., "Forestry in Europe," 1887.  
 e. U. S. Cons. Rep., "Forestry in Europe," 1887.  
 f. The private forests are as ascertained by the cadastral valuations of 1873-81.

Date.

1894..  
 1894..  
 a. 1893..  
 b. c. 1893..  
 c. 1892..  
 d. 1887..  
 e. 1887..  
 f. 1887..  
 g. 1889..  
 h. 1882..  
 i. Hon..  
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TABLE 3 (b).—FOREST STATISTICS  
FORESTS in America, Asia, Africa and Australasia

Date.	Countries.	Per Cent Forest	Total Forest.	State or Crown.	Municipal and Private.	Remarks.
			Acres.	Acres.	Acres.	
1894.	Canada . . . . .	37.66	799,230,720	.....	.....	
1894.	United States . . . . .	23.29	450,000,000	.....	.....	
a. 1893.	British Guiana . . . . .	18.00	5,760,000	.....	.....	
b. c. 1893.	India . . . . .	25.00	140,000,000	70,000,000	70,000,000	33,000,000 acres reserved State (perpetual). 22,000,000 acres State protected. 15,000,000 do Government, not under Forest Department.
c. 1892.	Turkey in Asia . . . . .	.....	17,500,000	.....	.....	
i. 1888.	Japan . . . . .	30.24	28,700,000	.....	.....	
d. 1887.	Algiers . . . . .	5.50	5,833,100	5,038,060	775,040	
e. 1887.	Cape Colony . . . . .	.....	224,000	.....	.....	
f. 1887.	New South Wales . . . . .	10.00	19,230,000	5,400,000	.....	
g. 1889.	Victoria . . . . .	.....	.....	1,355,442	.....	State, 664,710 acres; timber reserves, 690,732 acres. Does not include other forests.
g. 1889.	South Australia . . . . .	.....	.....	165,324	.....	
h. 1882.	New Zealand . . . . .	29.61	20,000,000	10,000,000	10,000,000	Including 6,685 acres enclosed for planting. Does not include other forests.

- a. Hon. J. J. Quetch, Forestry Congress, World's Fair.  
 b. Schliek's Manual of Forestry 1884.  
 c. Statesman's Year Book, 1893.  
 d. U. S. Consular Reports—"Forestry in Europe."  
 e. do Report, Vol. 24.  
 f. Schliek—Proceedings R. Colon. Instit., Vol. xxi. 1889-90.  
 g. U. S. Consular Reports, Vol. 23.  
 h. do do Commercial No. 25.  
 i. Heinrich Semler, 1888.

TABLE 3 (c).

Wood and Products of the Forest Imported and Exported by the Countries named, with the Area in Forest.

Country.	Years.	Unit of Value.	Exports.	Equivalent in \$ Exports.	Imports.	Equivalent in \$ Imports.	Exports + or - Imports.	Per cent of Area in Forest.
				\$		\$	\$	p. c.
Austria-Hungary	1881	Gulden.	68,057,000	27,700,000	5,808,000	2,400,486	+ 25,300,000	30
do	1891	do	81,771,000	33,252,000	4,273,000	1,739,110	+ 31,513,000	30
Belgium	1881	Franc.	.....	.....	49,658,000	9,584,000	- 9,584,000	17
do	1891	do	.....	.....	60,887,000	11,752,000	- 11,752,000	17
Canada	1881	\$	23,643,000	23,643,000	2,206,400	2,206,400	+ 21,436,600	38
do	1891	\$	27,169,000	27,169,000	2,563,200	2,563,200	+ 24,575,000	38
Denmark	1881	Kroner.	3,333,000	899,913	19,463,000	4,868,910	- 3,969,000	5
do	1891	do	3,311,000	893,970	19,463,000	5,265,000	- 4,371,030	5
France	1881	Franc.	31,729,000	6,123,700	211,387,000	49,797,700	- 34,674,000	18
do	1891	do	47,362,000	9,140,900	251,257,000	48,492,000	- 39,351,700	18
Germany	1881	Mark.	41,400,000	9,853,200	109,600,000	25,084,800	- 15,231,600	26
do	1891	do	51,300,000	12,328,400	137,600,000	32,448,800	- 20,120,100	26
Holland	1881	Gulden.	.....	.....	18,282,000	7,440,600	- 7,440,600	7
do	1891	do	.....	.....	23,562,000	9,500,000	- 9,500,000	7
Italy	1881	Lire.	.....	.....	33,820,000	6,494,000	- 6,494,000	14
do	1891	do	.....	.....	26,483,000	5,084,740	- 5,084,740	14
Norway	1881	Kroner.	37,802,000	10,206,540	.....	.....	+ 10,206,540	25
do	1891	do	30,422,000	8,213,900	.....	.....	+ 8,213,900	25
Romania	1881	Lei.	6,902,000	1,158,400	7,377,090	1,423,800	- 295,400	15
do	1891	do	2,778,000	536,200	2,030,000	391,800	+ 144,400	15
Russia	1881	Rouble.	29,635,000	23,115,300	2,200,000	1,711,600	+ 21,403,700	38
do	1891	do	43,306,000	33,778,680	4,428,600	3,453,840	+ 33,324,840	38
Spain	1881	Peseto.	.....	.....	31,610,000	6,100,100	- 6,100,100	13
do	1891	do	.....	.....	42,990,000	8,297,100	- 8,297,100	13
Sweden	1881	Kroner.	99,901,000	26,973,270	1,195,000	322,650	+ 26,650,600	40
do	1891	do	111,376,000	30,071,500	4,725,000	1,275,750	+ 28,794,750	40
Switzerland	1881	Franc.	8,341,000	1,669,800	3,826,000	738,420	- 871,200	20
do	1891	do	6,033,000	1,164,400	7,972,000	1,538,600	- 374,200	20
United Kingdom	1881	£	.....	.....	14,396,366	71,084,302	- 71,084,302	4
do	1891	£	.....	.....	16,766,996	81,655,270	- 81,655,270	4
United States	1881	\$	18,600,000	18,600,000	11,652,000	11,652,000	- 6,984,000	25
do	1891	\$	28,715,700	28,715,700	19,888,200	19,888,200	- 8,27,500	25
India	1881	£	545,831	2,658,196	.....	.....	.....	25
do	1891	£	695,250	3,338,911	.....	.....	.....	25

TABLE 3 (d).—POPULATION and Forest Area per Head.

Country.	Acres, Area in Forest.	Population, 1891.	Acres, Forest area per head.
Norway	19,285,626	2,001,000	9.64 acres.
Sweden	44,480,000	4,802,751	9.25 "
Denmark	469,490	2,185,935	0.21 "
Germany	34,367,650	49,428,470	0.69 "
Holland	561,330	4,621,744	0.12 "
Belgium	1,243,507	6,136,444	0.20 "
France	23,538,936	38,343,192	0.61 "
Switzerland	2,639,018	2,950,000	0.89 "
Spain	16,348,322	17,290,000	0.94 "
Italy	10,250,000	30,850,000	0.33 "
Austria-Hungary	42,950,130	41,358,886	1.04 "
Romania	2,254,000	5,500,000	0.41 "
United States	450,000,000	64,000,000	7.03 "
United Kingdom	2,635,000	37,795,000	0.07 "
Canada	799,000,000	4,833,240	163 acres.
Russia, Europe	387,600,000	97,600,000	3.97 "

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TABLE 4 (a).  
\*AREA of Forests and Woodlands of Canada.

Provinces.	Total Area.	aForest and Woodland.	Percentage Woodland.	bPine lands, White and Red Pine.	cOther Woods.
	Sq. miles.	Sq. miles.	Sq. miles.	Sq. miles.	Sq. miles.
Ontario	219,650	102,118	46.49	38,808	63,310
Quebec	227,500	110,521	51.22	31,468	85,053
New Brunswick	28,100	14,766	52.55	31.45	
Nova Scotia	20,550	6,464	39.85		
Prince Edward Island	2,000	797	40.00		
Manitoba	64,066	25,026	74.69		
British Columbia	382,300	285,554	29.38		
The Territories	2,371,481	696,952			
Total, Canada	3,315,647	1,248,798	37.66		

\*A careful estimate has been prepared of the areas of forest and woodland—distinguishing the pine lands—of the various provinces and territories of Canada. This estimate has been founded upon the returns of the provinces as to their licensed lands, and the reports of their surveyors—similar returns by the Departments of the Interior and of Indian Affairs for their licensed lands and the reports of their surveyors—the maps and the reports of the Geological Survey—the census returns and any other trustworthy data procurable.

It must be admitted that the data now available are not sufficiently exact or full to make these estimates as precise as is desirable. Much more detailed information might be compiled by the provincial governments from the reports of their surveyors, timber agents and other officials, especially in regard to them so as to be available for estimating the forest wealth of the country.

a. The area of woodland thus estimated is far from all being forest fit for lumbering, much being covered with small growth, of some use locally, but of little, if any merchantable value.

b. Pine lands thus estimated must not be supposed to be dense forests of pine, but in most cases as having a more or less considerable quantity of white and red pine mingled with other timber. In the Maritime Provinces the greatly diminished pine is so scattered through the woods that no estimate of area can be formed. In Manitoba and the Territories there is no white or red pine, nor in British Columbia, where the white pine (*P. strobus*) of Eastern Canada, is absent, being replaced by Douglas fir, cedar, spruce, &c.

c. There are no sufficient data at present for even an approximate estimate of the area or quantity of spruce in the Dominion.

Province of Ontario—Wooded Area.

Settled counties, south of timber limits.	31,530	7,834	25	100	7,734
Lands under timber licenses.	21,380	20,311	95	16,250	4,061
From limits to height of land, east of Thunder Bay.	48,823	36,617	75	18,308	18,309
Total, south of height of land, east of Thunder Bay.	101,733	64,762	63.65	34,658	30,204
Thunder Bay and Rainy Lake districts, south of height of land.	49,700	24,850	50	4,000	20,850
Country north of height of land.	68,216	12,506	18.33	150	12,356
Total, Province of Ontario.	219,650	102,118	46.49	38,808	63,310

Settled counties.—Area from census. Percentage of woodland 25, according to best authorities. A little pine in some spots.

Lands under license.—Area as given by province (less 470 miles in Thunder Bay and Rainy Lake districts), by Department of Indian Affairs, and ten townships of the old Canadian Land and Emigration Co. Area of woodland estimated at 95 per cent, leaving 5 per cent for burnt land, &c. Proportion of pine land estimated at 80 per cent.

To height of land.—Remainder of total area in census of 1871. Area of woodland estimated at 75 per cent; proportion of pine land estimated at 50 per cent.

Thunder Bay and Rainy Lake, south of height of land.—Area computed. Area of woodland estimated at 50 per cent. Pine estimated at 4,000 square miles (470 square miles licensed by province).

North of height of land.—Area computed. Two-thirds partly wooded, proportion 25 per cent, and one-third peat moss, &c.; proportion, wooded, 5 per cent. A little pine in spots.



TABLE 4 (a).—Continued.  
Province of Quebec—Wooded Area.

Description.	Total Area.		Percentage.	Pine Land.	Other Woods.
	Sq. miles.	Forest and Woodland.			
Lands granted .....	33,563	11,391	33.94	.....	11,391
Lands licensed .....	50,119	47,603	95	26,000	21,603
Vacant Crown lands .....	143,818	57,527	40	5,468	52,059
<b>Total, Quebec.....</b>	<b>227,500</b>	<b>116,521</b>	<b>51.22</b>	<b>31,468</b>	<b>85,053</b>

*Lands granted.*—Total area from provincial returns. Proportion of woodland from census and other authorities. Inconsiderable quantity of pine, not estimated.

*Lands licensed.*—Area as given by province. Estimated proportion of forest, 95 per cent, leaving 5 per cent for burnt land, &c. Proportion of pine estimated at 90 per cent of leased area in Upper Ottawa district, 75 per cent for Lower Ottawa, 50 per cent for St. Maurice, and 700 square miles for rest of licensed land.

*Vacant Crown Lands.*—The total area is the remainder of the province, as computed by the Dominion Survey authorities, which somewhat exceeds the provincial estimate. The percentage of woodland, proportion of pine and other woods, are taken from official publication of Crown Lands Department, Quebec.

### The Maritime Provinces.

#### New Brunswick—Wooded Area.

Vacant Crown lands .....	7,915	5,936	75	.....	.....
Licensed land .....	4,420	4,200	95	.....	.....
Granted lands .....	15,765	4,630	29.37	.....	.....
<b>Total.....</b>	<b>28,100</b>	<b>14,766</b>	<b>52.54</b>	.....	.....

The areas are from provincial official figures. Woodland in licensed area is estimated at 95 per cent; on vacant Crown lands 75 per cent; on granted lands from census. Pine lands cannot be estimated, as there are no provincial data and the pine trees are scattered through the forest.

#### Nova Scotia—Wooded Area.

Not granted .....	1,562	78	5	.....	.....
Granted .....	18,988	6,386	33.63	.....	.....
<b>Total.....</b>	<b>20,550</b>	<b>6,464</b>	<b>31.45</b>	.....	.....

Areas from provincial returns. Crown lands, described as rocky and barren, are estimated to have 5 per cent wooded. On granted lands, woodland from census. Pine, fast disappearing, is scattered through the forest.

#### Prince Edward Island—Wooded Area.

Not granted .....	75	22	75	.....	.....
Granted .....	1,930	775	40.15	.....	.....
<b>Total.....</b>	<b>2,000</b>	<b>797</b>	<b>39.85</b>	.....	.....

Areas from official returns. Crown lands, described as wooded, are estimated at 75 per cent; on granted lands, woodland from census. There is a little scattered pine.

TABLE 4 (a)—*Concluded.*  
Province of Manitoba—Wooded Area.

Province.	Total Area.	Forest and Woodland.	Percentage Woodland.
Manitoba .....	sq. miles. 64,066	sq. miles. 25,626	40.0

The wooded area is estimated from the maps and reports of the Geological Survey and the Department of the Interior. Much of the woodland does not contain merchantable timber, large tracts being covered with poplar or small spruce, tamarack, &c., of little value.

There is no white or red pine, except a few scattered trees in the extreme south-east portion.

Province of British Columbia—Wooded Area.

British Columbia .....	382,300	285,554	74.69
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The wooded area is estimated from the maps and reports of the Geological Survey and the Department of the Interior. In the central plateau of agricultural lands what wood is found is chiefly small poplar, &c., of little value.

The white pine of eastern Canada (*P. strobus*) is not found on the Pacific Coast, the Douglas fir, the yellow cedar and the spruces being the chief trees for timber and lumber.

\*The Territories—Wooded Area.

Alberta .....	105,355	64,662	61.38
Assiniboia .....	88,534	5,127	5.79
Saskatchewan .....	101,092	59,017	58.38
Athabasca .....	103,300	59,300	57.40
Unorganized Territories .....	1,973,200	508,846	25.78
<b>Total Territories.....</b>	<b>2,371,481</b>	<b>696,952</b>	<b>29.39</b>

\*Details of Unorganized Territories.

Keewatin .....	267,000	100,125	37.50
North-west Territories .....	559,600	300,860	53.60
East of Keewatin, south of Hudson Bay .....	194,300	72,861	37.50
East of Hudson Bay .....	352,300	35,000	1.00
Islands in Arctic Ocean and Hudson Bay .....	300,000	.....	.....
<b>Total Unorganized Territories.....</b>	<b>1,973,200</b>	<b>508,846</b>	<b>25.78</b>

\*The wooded areas are estimated from the maps and reports of the Geological Survey and the Department of the Interior. A large portion of the wooded area contains no merchantable timber, but is covered with small poplar, spruce, tamarack, &c.

There is no white or red pine in the Territories, but in the part of Alberta on the foothills of the Rocky Mountains there is found the Douglas fir and other British Columbia timber.

TABLE 4 (b).

## APPROXIMATE Estimate of the Quantity of Pine in Canada.

	Feet B.M.
For Ontario, a careful estimate gives 38,808 square miles of pine lands. Assuming half a million feet, board measure, to the mile, which is the provincial estimate for the land under license, and is probably about correct, while the unlicensed area is not likely to produce more, seeing that the pine grows sparser and smaller to the northward and westward, we have in feet, board measure. . . . .	19,404,000,000
For Quebec, a similar estimate gives 31,468 square miles of pine lands. Assuming the same proportionate yield, we have. . . . .	15,734,000,000
For the Maritime Provinces, a similar estimate gives 22,027 square miles of woodland of all kinds. Assuming a fifth part to be pine (probably in excess of the reality) and applying the same measurement, we have. . . . .	2,200,000,000
Total pine from Atlantic to Rocky Mountains. . . . .	<u>37,338,000,000</u>

1. Even at the low estimate of an annual cut of 1,000,000,000 feet B.M., this would exhaust the present supply in about 37 years. And under the present system the annual growth could not greatly prolong that period.

2. No estimate can at present be formed of the amount of Douglas fir and other woods, which in British Columbia supply in a measure the place of our eastern pines.

3. Neither are there sufficient data for even an approximate estimate of the amount of spruce. There is an immense quantity, for it extends from the Atlantic to the Pacific, from the international boundary to the delta of the Mackenzie River, and is found almost everywhere except on the prairies and the barrens, but much of it is very small. Besides its growing use for lumber, the demand for pulpwood is making inroads on the spruce forests.

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TABLE 4 (c).

## PROVINCIAL AND DOMINION LICENSES: AREA OF LIMITS, QUANTITIES CUT, AND RECEIPTS.

The area of limits in Ontario is understated in the provincial returns. This appears to arise from leases being in suspense at the beginning of the years for non-payment of dues. There is therefore added a column in the following tables showing the area as calculated from the rents at \$3 a square mile, which approximates very closely to the statement by the Ontario Crown Lands Department that 20,000 square miles are under license.

There is a similar though proportionately smaller understatement in the case of Quebec. A Crown Lands publication gives the area under license at 50,000 square miles.

In British Columbia, Manitoba and the Territories, in addition to the timber limits, permits are granted by which cutting takes place on land not included in the leased area.

In Nova Scotia and Prince Edward Island there are no leases of limits, the lumbering being done on purchased land. These provinces publish no returns.

The scales for measuring saw-logs, to ascertain the board measure contents, differ in Ontario and Quebec. The discrepancy varies with different sized logs, but averages fully ten per cent additional by the Quebec scale.

The cut of spruce saw-logs in Ontario cannot be given separately, as they are included with "other logs." The whole amount is not large, and only a small proportion is spruce.

Spruce is similarly included with "other logs" in the Quebec returns. This whole amount is large and a great proportion is spruce.

In New Brunswick pine and spruce saw-logs are returned together, and cannot be given separately. The number of logs is not stated, but only the measurement.

In the returns from British Columbia, Manitoba and the Territories, there is no discrimination between the kinds of saw-logs, all being given together, and by measurement only without the number of logs. In Manitoba and the Territories they are chiefly spruce; in British Columbia chiefly Douglas fir, with considerable spruce and cedar.

The province of British Columbia gives no returns for 1887.

The boom and dimension timber in the Ontario returns is chiefly pine (much of it red), as is shown by the returns for 1892 and 1893, where the pine is given separately.

In the Quebec returns boom timber is given by linear feet for 1888-90, and by board measure for 1891-93.

British Columbia, Manitoba and the Territories do not report any square or dimension timber, though besides local use, some is exported from British Columbia, and some sent to other parts of Canada. A part may be cut by permit on unleased lands, and a part measured with the saw-logs and so returned.

A large part of the forest produce of British Columbia is from the railway belt, 40 miles wide by 500 miles long, belonging to the Dominion.

The receipts returned by the province of Ontario for 1892 included only a part of the large bonus from the sale of that year, more than a million dollars remaining unpaid, and swelling the receipts for 1893.

The tables giving the cut of pine in Ontario and Quebec by districts, show the location of that timber. In Quebec it will be seen that the bulk of the pine comes from the Ottawa valley, the St. Maurice being the only other district from which the amount is not trifling.

The table (Table 5b) giving the average dimensions of saw-logs and square timber shows a great falling off in the size of the pine logs in Ontario, while in Quebec the returns show an increase till 1893, when there was a considerable fall. The size of spruce has diminished in Ontario and increased in Quebec. In making comparisons, the difference of the scales used in Ontario and Quebec, giving, as already mentioned, a greater board measure for Quebec by about ten per cent, should be kept in mind.

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TABLE 4 (c).—Continued.  
 ONTARIO.—Area and Amount of Cut.—(From Ontario Crown Lands Returns.)  
 Provincial Lands.

Years.	AREA COVERED BY LICENSES.		SAW-LOGS.						SQUARE TIMBER.						EASEM AND DIMENSION TIMBER.			
	By Provincial Returns	By Rent Returns at \$3.	White Pine.			Other.			White Pine.			Red Pine.			Other.		Pieces.	Feet, R.M.
			Pieces.	Feet, B.M.	Pieces.	Feet, B.M.	Pieces.	Feet, B.M.	Pieces.	Feet, cubic.	Pieces.	Feet, cubic.	Pieces.	Feet, cubic.	Pieces.	Feet, cubic.		
1887	15,850	19,401½	4,650,258	567,503,200	30,645	2,433,000	37,849	2,013,187	11,510	461,263	1,307	45,329	147,288	31,216,840				
1888	16,984	19,631½	6,364,650	691,581,000	36,684	2,862,000	52,640	2,622,522	11,846	433,256	1,033	38,425	228,521	41,177,000				
1889	17,226½	19,810½	6,892,308	725,727,633	44,801	3,068,113	86,231	4,650,735	13,267	466,415	1,269	43,257	150,052	22,000,257				
1890	13,533	19,365½	5,052,250	519,215,801	43,331	3,398,482	62,296	3,226,164	4,245	166,435	1,768	70,216	148,867	33,337,798				
1891	13,820	19,237	4,718,469	451,297,505	85,365	3,671,249	31,228	1,557,075	537	22,830	2,646	112,251	206,769	37,844,115				
1892	12,887	19,535½	6,424,475	606,190,122	110,415	5,599,354	73,564	3,841,833	428	17,466	1,991	74,472	226,150	42,257,750				
1893	17,244	20,559	7,291,439	718,215,271	142,109	8,065,124	36,814	1,867,346	940	40,383	1,361	50,229	21,244	4,229,583				
Totals	169,516½	197,539½	41,283,829	4,287,949,532	493,490	29,637,322	380,632	20,088,706	40,656	1,542,326	10,505	494,299	1,272,199	243,108,378				
Average	15,645½	19,648½												4,229,583				

\* Pine.  
 † Other timber.  
 ‡ Ash, birch, elm, maple and oak, 491 pieces, 12,143 cubic feet; spruces, hemlock and tamarack, 870 pieces, 38,086 cubic feet. There was also 21,967 cubic feet of cedar, the number of pieces not being stated.

TABLE 4 (c).—Continued.  
 ONTARIO.—Area and Amount of cut, Provincial Lands.—Continued

TABLE 4 (c).—Continued.  
ONTARIO.—Area and Amount of cut, Provincial Lands—Continued.

Years.	MISCELLANEOUS.										RECEIPTS.				Total. \$ cts.
	Cedar. Pt., ln.	Spars. Pes.	Pile Timber. Feet, B. M.	R. R. Ties. Pieces.	Tele- graph Poles. Pes.	Rails, Traver- ses, &c. Pes.	Shingles, Bolts, &c. Cords.	Pulp wood. Cords.	Posts, Stave- bolts, &c. Cords.	Fire- wood, Tan- bark, &c. Cords.	Treasure and Interest. \$ cts.	Timber Dues. \$ cts.	Ground Rents. \$ cts.	Bonus. \$ cts.	
1887	386,240	26	6,765,244	776,142	2,944	4,986	3,104	.....	2,732	48,260	13,212 70	522,063 18	58,201 75	424,030 81	1,014,517 43
1888	+ 1,449	.....	48,732	761,346	2,856	1,719	4,567	.....	2,200	13,698	35,354 14	823,175 08	58,863 85	700,990 34	1,688,015 39
1889	104,039	6	37,360	574,201	2,380	450	3,841	.....	1,544	3,062	12,252 10	992,043 07	54,430 50	100,058 16	1,690,753 83
1890	162,346	.....	11,664	672,416	468	1,324	3,500	.....	1,257	24,571	7,320 33	675,875 97	38,036 00	135,479 53	878,772 03
1891	232,369	.....	3,000	975,841	1,484	2,632	3,006	864	1,267	18,862	37,431 20	573,725 28	36,711 00	172,531 22	837,438 70
1892	226,432	.....	275	628,898	275	3,779	6,763	7,544	2,811	68,160	33,042 71	707,982 80	38,696 25	\$1,200,200 91	2,135,732 67
1893	263,130	.....	+ 157,500	1,130,405	2,667	5,231	1,962	3,717	4,819	16,872	38,975 36	838,080 03	61,678 00	938,538 00	1,897,871 99
Totals.	1,679,406	32	7,073,526	5,324,243	13,075	20,124	28,806	12,125	16,007	202,641	156,490 74	3,112,145 41	412,617 33	3,885,918 56	9,517,172 04

+ Hemlock and spruce, feet, ln.  
‡ Also head blocks, 85,120 feet.

\$ Sale, 1892.

Total bonus ..... \$ 2,315,000 00  
Paid same year ..... 1,257,665 63  
Balance..... \$ 1,057,334 37



TABLE 4 (c)—Continued.  
ONTARIO.—Area and Amount of Cut.—(From Department of Indian Affairs.)  
*Indian Lands and Reserves.*

Years.	Area Under License. Sq. Miles.	SAW-LOGS.				SQUARE TIMBER.				AMOUNTS ACCRUED.				
		Pine.		Spruce.		White Pine.		Red Pine.		Tres- pass.	Timber Dues.	Ground Rent.	Bonus.	Totals.
		Pieces.	Ft., B. M.	Pieces.	Feet, B.M.	Pieces.	Cub. ft.	Pieces.	Cub. ft.					
1887	927.06	65,224	9,638,995	63	7,369	3,533	183,892	290	19,080	.....	13,467.15	799.33	1,633	15,899.50
1888	920.06	124,608	15,835,978	.....	.....	4,191	271,297	3,967	714,060	.....	22,711.38	1,153.35	4,560	28,424.73
1889	953.26	134,297	16,331,104	.....	.....	2,929	138,812	9,693	1,948,293	.....	17,696.03	2,872.05	206	20,774.15
1890	910.72	108,297	14,316,672	.....	.....	146	10,835	3,681	346,630	.....	12,173.83	2,883.05	.....	15,374.80
1891	861.47	257,915	36,176,672	.....	.....	.....	6,465	1,131	206,973	.....	35,242.12	2,739.05	.....	38,212.05
1892	853.77	245,664	30,232,303	.....	.....	.....	.....	5,560	984,120	.....	22,471.74	2,910.80	.....	26,540.40
1893	808.53	473,663	50,520,630	.....	.....	1,621	108,269	1,768	447,468	.....	49,829.24	2,958.90	1,100	54,118.74
Totals...	6,439.87	1,424,690	127,410,502	27,965	1,588,422	12,394	630,590	26,090	5,166,624	1,846.72	173,501.49	16,316.55	7,700	199,364.76
Average.	919.98	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

TABLE 4 (c)—Continued.  
QUEBEC.—Area and Amount of Cut.—(From Quebec Crown Lands Returns and Department of Indian Affairs.)

TABLE 4 (c)—Continued.  
 QUEBEC.—Area and Amount of Cut.—(From Quebec Crown Lands Returns and Department of Indian Affairs.)  
 Total for Provincial and Indian Lands.

Years.	Area under License.		SAW-LOGS.			SQUARE TIMBER.				Boom Timber.	
	Sq. miles.	Acres.	Pine.	Spruce, &c.	White Pine.	Red Pine.	Spruce, Birch, &c.	Pieces.	Cub. ft.	Pieces.	* Feet.
1887	42,631½	2,633,140	1,352,269	107,183,800	11,290	241	9,852	22,490	77,001	841,746	
1888	41,775½	2,406,381	963,894	76,396,318	9,378	3,426	103,830	150,192	44,312	382,291	
1889	41,700½	3,365,747	1,633,033	129,588,734	9,555	2,762	500,451	2,757	15,474	888,009	
1890	45,267	2,946,861	1,337,640	104,703,944	41,504	4,440	1,989,522	2,297	67,428	21	
1891	45,267	2,522,274	2,708,078	193,133,071	50,944	3,046,316	755,198	3,665	78,760	9,500	2,355,649
1892	43,141½	2,346,066	2,596,066	133,234,313	9,964	592	29,087	5,310	166,367	5,878	893,082
1893	46,163½	3,372,469	2,827,773	237,140,838	42,673	1,131,079	129,221	2,342	51,321	1,639	178,277
Totals.	305,219½	19,159,628	13,419,269	1,021,466,638	284,248	3,373,124	621,947	22,848	601,880	78,867	.....
Average.	43,662½										

Years.	AMOUNTS ACCRUED.												
	Flat and Small Timber.	Spars.	Railroad Ties.	Tele-graph Poles.	Shingles.	Rails, Knives, Pickets, &c.	Peep and Robin Wood.	Firewood.	Trespass Interest, Fire tax, &c.	Timber Dues.	Ground Rent.	Bonus and Transfer Bonus.	Total Receipts.
1887	4,730	123,321	101,440	7,360	3,318	62,325	.....	13,796	12,257	473,944	.....	.....	\$ cts.
1888	16,811	828,442	166,314	9,940	2,882	234,004	.....	7,367	7,259	447,376	99,689	3,888	582,650
1889	3,427	100,518	473,623	1,962	3,152	105,090	47	15,372	15,258	708,288	114,739	6,815	603,748
1890	3,099	100,489	120	163,777	3,331	30,883	9,708	9,808	627,296	114,434	119,972	90	953,968
1891	8,401	422,041	6,000	169,150	435	41,365	6,184	10,166	627,296	147,376	19,708	35	806,732
1892	6,362	177,108	2,563	137,615	1,211	4,257	10,014	11,948	470,185	125,264	11,539	37	647,198
1893	34,378	535,133	21	168,038	10,142	21,633	5,847	46,637	12,441	643,655	333,382	43	926,056
Totals.	77,118	2,307,072	18,022	1,325,966	21,874	504,356	33,811	77,107	82,842	3,880,490	915,912	239,205	695,118

\* Boom timber, 1887-90, linear feet; 1891-92, feet, B. M. † Also 255 cords larch wood and 929 cords hemlock bark. ‡ Including arrears of ground rents overdue.

QUEBEC—Area and Amount of Cut.—(From Quebec Crown Lands Returns and Department of Indian Affairs.)  
Provincial Lands.

Years.	Area under License.	SAW-LOGS.				SQUARE TIMBER.				Spruce, Birch, &c.		Boom Timber.		
		Time.		Spruce, &c.		White Pine.		Red Pine.		Cub. feet.			Pieces.	* Feet.
		Pieces.	Feet, B. M.	Pieces.	Feet, B. M.	Pieces.	Cub. feet.	Pieces.	Cub. feet.	Pieces.	Cub. feet.			
1887.	42,440	2,693,119	1,352,260	107,183,800	11,294	528,019	241	9,852	27,691	22,680	27,691	841,796		
1888.	41,584	2,391,098	983,352	76,361,000	9,578	415,253	3,426	103,830	14,569	130,132	14,569	482,191		
1889.	41,563	3,294,165	1,633,066	121,586,400	9,555	590,451	2,752	95,317	19,644	19,644	19,644	888,000		
1890.	44,201	2,804,337	1,324,872	103,421,200	41,504	1,989,522	4,440	162,269	24	25,481	24	888,000		
1891.	45,190	2,137,038	2,673,173	191,394,439	59,944	3,046,316	3,915	99,371	3,065	77,238	3,065	647		
1892.	42,965	2,525,008	2,297,814	149,083,075	9,866	733,875	592	29,087	9,569	76,250	9,569	2,355,649		
1893.	46,006	3,365,425	2,798,355	255,451,466	42,619	1,129,847	3,011	129,221	5,874	166,527	5,874	802,482		
Totals.	393,956	19,083,862	2,667,450,893	13,276,726,101,240,7380	184,070	8,372,313	18,387	621,947	22,848	601,680	22,848	78,728		
Average.	43,422													

Years.	MISCELLANEOUS.										RECEIPTS.		
	Flat and Small Timber.	Spurs.	Railroad Ties.	Tele-graph Poles.	Shingles.	Rails, Knees, Pickets, &c.	Pulp and Bobbin Wood.	Firewood.	Trespass, Fire tax, Interest, &c.	Timber Dues.	Ground Rents.	Bonus and Transfer Bonus.	Total Receipts.
1887.	4,730	123,321	101,440	7,360	3,318	62,325	13,406	13,406	12,327	475,617	3,888	582,618	
1888.	16,811	828,442	166,314	9,040	2,882	234,004	9,772	9,772	7,397	447,200	2,315	598,623	
1889.	3,427	100,518	473,623	1,962	3,152	105,000	1,587	1,587	5,263	707,357	19,972	598,038	
1890.	3,069	109,489	120,104,777	635	3,331	30,883	3,380	3,380	12,380	626,753	147,208	806,257	
1891.	8,401	422,041	6,000	435	2,579	41,365	1,168	1,168	11,851	498,370	11,539	623,967	
1892.	6,382	177,108	137,615	1,211	4,237	9,656	11,948	11,948	13,941	473,900	3,470	623,967	
1893.	34,378	535,153	168,038	1,231	10,142	21,933	5,847	5,847	19,238	642,932	73,811	888,722	
Totals.	77,118	2,307,072	1,825,966	21,874	29,641	504,956	33,811	33,811	83,821	3,673,132	234,705	5,105,228	

\* Boom timber, 1887-90, linear feet; 1891-93, feet B.M. † Also 255 cords lathwood and 929 cords hemlock bark. ‡ Including arrears of ground rents overdue.

TABLE 4 (c)—Continued.

QUEBEC.—Area and Amount of Cut. (Feet, B. M.)

TABLE 4 (c)—Continued.  
 QUEBEC.—Area and Amount of Cut.—(From Department of Indian Affairs.)  
*Indian Lands and Reserves.*

Years.	Area Under License.	SAW-LOGS.						SQUARE TIMBER.				ROOM AND DIMENSION TIMBER.				AMOUNTS ACCRUED.			
		Pine.			Spruce.			White Pine.		Red Pine.		Pieces.	Lin. ft.	Tres- pass.	Timber Dues.	Ground Rent.	Bonus.	Totals.	
		Pieces.	Ft., B. M.	Pieces.	Ft., B. M.	Pieces.	Cub. ft.	Pieces.	Cub. ft.										
		Sq. Miles.																	
1887.....	19½	21	1,616	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
1888.....	19½	15,283	1,161,703	412	35,318	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
1889.....	19½	1,583	189,175	27	2,334	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
1890.....	17½	42,324	3,062,376	12,768	1,274,744	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
1891.....	17½	4,816	400,854	28,905	1,760,632	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
1892.....	17½	4,462	426,633	71,768	4,151,238	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
1893.....	15½	7,044	696,461	28,824	1,684,392	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Totals.....	1,262½	75,733	5,938,848	142,534	8,905,658	178	2,811	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Average.	180½	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

\* Boom timber, 1887-90, linear feet; 1891-93, feet B.M. † Also 253 cords lathwood and 929 cords hemlock bark. ‡ Including arrears of ground rents overdue.

TABLE 4 (c)—Continued.  
NEW BRUNSWICK.—Area and Amount of Cut.—(From N.B. Crown Lands Returns and Department of Indian Affairs.)  
Total for Provincial and Indian Lands.

Years.	SAW-LOGS.										MISCELLANEOUS.										RECEIPTS.						
	Area under License.		Pine and Spruce.		Hemlock.		Cedar.		Hackmatack.		Hardwood.		Pine.		Spruce.		Hardwood.		Boon Poles.		Timber Dues and Stampage.		Rents, Sales and Renewals.		Total Receipts.		
	Sq. miles.	Sup. ft.	Sup. ft.	Sup. ft.	Sup. ft.	Sup. ft.	Sup. ft.	Sup. ft.	Sup. ft.	Sup. ft.	Sup. ft.	Cub. ft.	Cub. ft.	Cub. ft.	Cub. ft.	Cub. ft.	Cub. ft.	Pieces.	Pieces.	\$	\$	\$	\$	\$	\$		
1887.	4,217½	64,412,319	3,367,445	1,525,076	28,067	1,399	28,067	80	1,399	87,070 11	21,308 10	7,332	2,680														
1888.	4,222½	68,625,132	13,104,707	2,997,752	4,456	2,168	4,456	285	2,168	98,568 53	23,619 13	12,009	3,050														
1889.	4,178½	73,287,013	17,594,206	4,063,549	22,841	2,515	22,841	63	2,515	113,822 69	22,217 13	6,480	1,650														
1890.	4,408½	85,663,626	12,227,023	4,746,651	22,587	1,614	22,587	105	1,614	111,031 07	19,499 00	6,720	1,714														
1891.	4,419	96,306,302	12,759,030	5,040,723	16,5	1,614	16,5	101	1,614	81,830 08	19,488 50	2,940	7,375														
1892.	5,690	21,706,842	2,146,824	12,039,918	15,779	946	15,779	75	946	96,553 52	18,913 83	2,504	17,478														
1893.	4,671½	87,075,187	7,252,896	13,951,563	659	13,407	659	659	13,407	106,507 08	289,900 00	3,752	33,188														
Totals.	32,702	541,270,521	68,089,131	44,365,262	16,000	5,365,855	16,000	5,365,855	19,149	20,210	106,269	62,017															
Average.	4,671½																										
Years.	*Spool Wood.		Railroad Ties.		Telegraph Poles.		Shingles.		Posts and Rails, &c.		Rafting Piers, &c.		Firewood, Tanbark, &c.		Timber Dues and Stampage.		Rents, Sales and Renewals.		Total Receipts.								
	Sup. ft.	Pieces.	Pieces.	M.	Pieces.	M.	Pieces.	M.	Cords.	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$							
1887.	1,196,400	63,462	2,190	4,322	28,067	80	1,399	87,070 11	21,308 10	7,332	2,680																
1888.	1,196,400	103,050	4,456	2,168	4,456	285	2,168	98,568 53	23,619 13	12,009	3,050																
1889.	1,196,400	61,808	4,544	4,544	63	2,515	113,822 69	22,217 13	19,499 00	19,488 50	18,913 83																
1890.	1,196,400	79,488	3,233	3,233	105	1,614	81,830 08	19,488 50	18,913 83	19,488 50	18,913 83																
1891.	1,196,400	80,626	1,935	780	101	1,614	96,553 52	18,913 83	19,488 50	18,913 83	19,488 50																
1892.	1,196,400	103,072	3,805	3,805	14,522	946	96,553 52	18,913 83	19,488 50	18,913 83	19,488 50																
1893.	1,196,400	135,513	2,359	2,359	625	15,779	106,507 08	289,900 00	289,900 00	289,900 00	289,900 00																
Totals.	1,196,400	627,619	21,561	16,880	292,705	659	13,407	685,482 99	214,929 06	910,412 10																	

\* White birch. † \$100 is included for trespass on Indian lands. ‡ This great increase was owing to the extension of the terms of leases from 10 to 25 years, and the consequent advances on the upset price at the sales of 1893, when there was also an increase in the number of berths sold.

TABLE 4 (c)—Continued.  
NEW BRUNSWICK.—Area and Amount of Cut.—(From New Brunswick Crown Lands Returns and Department of Indian Affairs.)

TABLE 4 (c)—Continued.  
NEW BRUNSWICK.—Area and Amount of Cut.—(From New Brunswick Crown Lands Returns.)  
Provincial Lands.

Years.	Area under License.	Pine and Spruce Logs.	Hemlock Logs.	Hackmatack Logs.	Cedar Logs.	Hardwood Logs.	Beam Poles.	Pine Timber.	Spruce Timber.	Hardwood Timber.
1887.....	4,200 1/2	64,300,068	3,567,445	.....	1,525,076	106,150	2,080	3,693	6,800	7,332
1888.....	4,605 1/2	68,382,206	13,054,434	.....	2,964,564	351,168	3,050	6,480	4,650	12,000
1889.....	4,761 1/2	79,287,033	17,329,206	.....	4,063,549	749,416	3,230	7,250	6,750	9,614
1890.....	4,549 1/2	95,589,612	17,129,048	.....	4,716,201	390,462	1,575	.....	2,040	14,778
1891.....	4,391 1/2	66,355,307	12,777,850	.....	5,024,723	291,280	1,458	.....	.....	21,480
1892.....	4,402 1/2	79,495,134	7,015,371	16,090	12,034,758	1,668,130	1,454	2,504	.....	33,188
1893.....	5,673	85,809,334	7,915,371	16,090	13,650,423	1,378,945	13,180	5,752	.....	10,888
Totals.....	32,583	540,168,792	67,674,988	.....	44,284,294	5,365,855	62,917	19,149	20,210	109,299
Average.....	4,654 1/2	.....	.....	.....	.....	.....	.....	.....	.....	.....

Years.	Speed Wood.	Railroad Ties.	Telegraph Poles, &c.	Shingles.	Posts, Rails, Knees, &c.	Rafting Piles, &c.	Firewood, Tanbark, &c.	Receipts.	
								Stumpage.	Sales and Renewals of Timber Licenses.
1887.....	Sup. feet.	Pieces.	Pieces.	M.	Pieces.	M.	Cords.	\$ cts.	\$ cts.
1888.....	.....	63,462	2,190	9,322	28,097	80	1,369	87,357 80	21,258 10
1889.....	.....	103,050	3,495	4,466	68,662	235	2,168	98,217 21	23,472 50
1890.....	.....	61,808	4,544	632	25,811	.....	2,515	92,217 21	121,680 71
1891.....	.....	80,628	3,233	615	22,537	63	1,614	113,322 60	22,147 13
1892.....	.....	103,622	1,935	780	27,297	105	1,484	110,897 08	19,429 00
1893.....	.....	135,515	3,805	390	14,522	101	2,518	81,255 84	19,318 50
Totals.....	1,196,400	627,619	21,561	16,830	292,765	659	13,407	96,153 52	18,848 83
Average.....	1,196,400	627,619	21,561	16,830	292,765	659	13,407	105,730 59	89,839 00
Totals.....	1,196,400	627,619	21,561	16,830	292,765	659	13,407	693,613 73	214,259 06
Average.....	1,196,400	627,619	21,561	16,830	292,765	659	13,407	693,613 73	214,259 06

\* This great advance was owing to the extension of the terms of leases from 10 to 25 years, and the consequent advances on the upset price at the sales of 1893; when there was also an increase in the number of berths sold. † White birch.

Totals..... 1,196,400 627,619 21,561 16,830 292,765 659 13,407 693,613 73 214,259 06 196,407 13  
 \* White birch. † \$100 is included for trespass on Indian lands. ‡ This great increase was owing to the extension of the terms of leases from 10 to 25 years, and the consequent advances on the upset price at the sales of 1893, when there was also an increase in the number of berths sold.

TABLE 4 (c)—Continued.  
NEW BRUNSWICK.—Area and Amount of Cut.—(From Department of Indian Affairs.)  
*Indian Lands and Reserves.*

Years.	Area under License.		Pine Logs.		Spruce Logs.		Hemlock Logs.		Cedar Logs.		AMOUNTS AGREED.		
	Sq. mls.	Acres.	Sup. feet.	Sup. feet.	Sup. feet.	Sup. feet.	Sup. feet.	Sup. feet.	Sup. feet.	Sup. feet.	Timber Dues.	Ground Rent.	Totals.
1887	2,064	25,208,269	17	112,221	112,221	33,188	47,273	33,188	112,221	331	140	\$ 252 22	
1888	2,034	24,873,935	17	242,832	242,832	33,188	331	331	331	32	140	\$ 491 32	
1889	2,247	16,273,826	17	46,757	46,757	30,480	87,975	30,480	46,757	70	70	\$ 70 00	
1890	2,163	17,468,953	17	145,101	145,101	11,000	21,290	11,000	145,101	24	70	\$ 243 39	
1891	2,223	22,023,691	17	211,708	211,708	400,000	620,370	400,000	211,708	70	70	\$ 174 24	
1892	2,282	22,610,648	17	265,853	265,853	1,140	237,425	1,140	265,853	54	70	\$ 170 00	
1893	2,284	22,615,730	17	77,247	77,247	80,968	1,014,113	80,968	77,247	31	630	\$ 87 54	
Totals	15,136	148,076,402	110	1,024,482	1,024,482	1,014,113	1,014,113	1,014,113	1,024,482	31	630	\$ 2,499 31	
Average	2,162	21,868,058	17	118,165	118,165	118,165	118,165	118,165	118,165	31	630	\$ 299 93	

MANITOBA AND TERRITORIES.—Area and Amount of Cut.—(From Department of Interior Returns.)  
*Domestic Lands, Department of Interior.*

Year.	Area under Lease.		Lumber Quantity Manufactured.		R.R. Ties.		Shingles.		Poles, Posts, &c.		Kinds of Timber.		RECEIPTS.			
	Sq. mls.	Acres.	Feet, B. M.	Pieces.	M.	M.	Conds.	Chieflly spruce.	Trespass &c.	Royalty and Permits.	Ground Rents.	Bonns.	Timber from School Lands.	Total.		
1887	2,064	25,208,269	7,610	5,653	2,688	2,688	2,688	2,688	5,850 18	40,292 59	1,738 50	1,694 46	1,694 46	\$ 64,407 83		
1888	2,034	24,873,935	7,277	6,242	2,487	2,487	2,487	2,487	4,973 92	41,588 59	1,738 50	1,694 46	1,694 46	\$ 65,966 85		
1889	2,247	16,273,826	62,089	1,771	727	301	842	do	5,490 39	38,081 52	1,738 50	1,694 46	1,694 46	\$ 59,399 50		
1890	2,163	17,468,953	432,764	1,450	371	2,375	5,188	do	2,802 67	30,086 46	1,738 50	1,694 46	1,694 46	\$ 57,183 4		
1891	2,223	22,023,691	99,098	1,027	430	2,696	11,329	do	3,245 51	41,873 91	1,738 50	1,694 46	1,694 46	\$ 58,611		
1892	2,282	22,610,648	97,403	1,155	1,155	2,696	3,635	do	3,875 73	36,726 21	1,738 50	1,694 46	1,694 46	\$ 68,421		
1893	2,284	22,615,730	9,069	1,747	456	*983	3,635	do	3,875 73	36,726 21	1,738 50	1,694 46	1,694 46	\$ 66,846 30		
Totals	15,136	148,076,402	728,033	26,692	8,961	6,165	29,994	..	32,486 14	297,789 16	108,277 01	26,978 41	5,218 35	\$ 440,749 07		
Average	2,162	21,868,058	148,076,402	26,692	8,961	6,165	29,994	..	32,486 14	297,789 16	108,277 01	26,978 41	5,218 35	\$ 440,749 07		

\* Round timber. † \$100 is included for trespass.

TABLE 4 (c)—Continued.  
BRITISH COLUMBIA.—Area and Amount of Cut.—(From B. C. Crown Lands Returns, Departments of Interior and Timber Affairs.)

TABLE 4 (c)—Continued.  
BRITISH COLUMBIA.—Area and Amount of Cut.—(From B. C. Crown Lands Returns, Departments of Interior and Indian Affairs.)  
Total for Provincial, Dominion and Indian Lands.

Years.	Area under Lease.		Quantity of Lumber manufactured.	Ties.	Shingles.	Trespass, Interest, &c.	Timber Dues, Royalties, &c.	Ground Rents and Licenses.	Bonns.	Total Receipts.
	Sq. miles.	Feet, B. M.								
1887.....	18.56	7,114,868	137			\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
1888.....	239.12	56,395,279				1,817.91	8,723.76	1,531.82	8,967.95	15,161.47
1889.....	330.29	66,311,164				14,645.87	20,244.40	6,211.18	2,682.50	43,783.93
1890.....	404.59	95,890,913				238.39	33,481.42	11,445.76	4,692.50	49,292.98
1891.....	698.59	115,613,657	10,119			98.13	62,672.26	29,635.08	11,131.25	93,937.72
1892.....	847.07	84,392,536				129.26	56,363.61	24,199.97	19,275.62	99,898.86
1893.....	1,172.25	76,851,963				189.32	54,073.33	40,542.91	2,626.30	97,426.26
Totals.....						583.23	54,997.86	48,665.90	4,693.25	108,940.25
Average.....	3,620.41	592,479,780	2,397	10,119	17,682.20	284,897.64	153,232.65		52,568.97	598,381.47

BRITISH COLUMBIA.—Area and Amount of Cut.—(From B. C. Crown Lands Returns.)  
Provincial Lands.

Years.	Area under Lease.		Quantity Manufactured	Royalty.	Rental.	Licenses.	Total Receipts.
	Sq. miles.	Feet, B. M.					
1887.....	211	31,806,384		\$ cts.	\$ cts.	\$ cts.	\$ cts.
1888.....	280	42,551,222		† 12,673.50	5,540.83		18,216.42
1889.....	352.1	73,177,055		21,227.28	13,616.33		34,843.61
1890.....	427.4	83,108,335		31,379.06	20,044.23		51,423.29
1891.....	603.1	64,186,820		32,063.41	31,473.63	2,000.00	64,537.04
1892.....	776.5	60,587,300		30,293.68	42,737.68	2,500.00	75,531.36
Totals.....	2,650.4	361,479,116		157,446.73	123,927.33	5,500.00	286,874.06
Average.....	441.3						

\* Round timber. † \$100 is included for trespass.

\* No Provincial Returns of lumber for 1887. † Rebate of royalty on timber exported, \$3,651.40.



TABLE 4 (c)—Continued.  
 BRITISH COLUMBIA.—Area and Amount of Cut.—(From Department of Interior Returns.)  
*Domestic Lands.*

Years.	Area Under Lease.	Quantity of Lumber Manufactured.	Ties.	Shingles.	Kind of Timber.	RECEIPTS.				Totals.	
						Trespass, Interest, &c.	Timber Dues and Permits.	Ground Rents.	Bonus.		
	Sq. miles.	Feet, B.M.	Pieces.	M.		\$	cts.	\$	cts.	\$	cts.
1887	18.56	7,144,868	.....	.....	Douglas fir, spruce and cedar.	1,817	91	1,531	85	8,087	95
1888	27.02	24,436,895	.....	137	do	14,045	85	1,670	35	2,689	50
1889	41.79	23,759,942	.....	.....	do	233	39	1,464	83	4,092	50
1890	43.50	13,546,943	.....	.....	do	98	13	29,258	66	11,131	95
1891	172.84	30,507,439	10,119	530	do	120	26	22,827	29	19,275	62
1892	243.32	20,062,680	.....	1,000	do	183	52	21,836	92	2,626	50
1893	388.75	16,098,067	.....	940	do	583	23	24,625	60	4,693	25
Totals....	936.38	133,544,834	10,119	2,597		17,682	20	121,995	18	52,568	97
Average.....	133.77							21,683	32		
										213,929	67

TABLE 4 (c)—Continued.  
 BRITISH COLUMBIA.—Area and Amount of Cut.—(From Department of Indian Affairs.)

TABLE 4 (c)—Continued.  
 BRITISH COLUMBIA.—Area and Amount of Cut.—(From Department of Indian Affairs.)  
*Indian Lands and Reserves.*

Years.	Area under Lease. Sq. miles.	Quantity Manufactured. Ft., B.M.	AMOUNTS ACCRUED.			Totals.
			Timber Dues. \$ cts.	Ground Rents. \$ cts.		
1887.....						
1888.....						
1889.....						
1890.....	8 <sup>1</sup> / <sub>2</sub>	3,136,915	3,136 80	24 00	24 00	3,160 80
1891.....	8 <sup>1</sup> / <sub>2</sub>	1,997,283	1,997 26	24 00	24 00	2,021 26
1892.....	8 <sup>1</sup> / <sub>2</sub>	143,036	143 00			143 00
1893.....	8	178,596	178 59			178 59
Totals.....	34 <sup>1</sup> / <sub>2</sub>	5,457,830	5,455 74	72 00	72 00	5,527 74
Average—6 years.....	5 <sup>1</sup> / <sub>2</sub>					

1887 to 1893 }  
 (Nova Scotia,  
 Prince Edward Island,  
 Manitoba,  
 The Territories.)  
 } No Indian Lands or Reserves under Timber Licenses.

TABLE 4 (c)—Continued.  
ONTARIO—Pine Saw-logs by Districts.—(From Ontario Crown Lands Returns.)

Timber Districts.	1887.		1888.		1889.		1890.	
	Pieces.	Feet, B. M.	Pieces.	Feet, B. M.	Pieces.	Feet, B. M.	Pieces.	Feet, B. M.
Ottawa.....	2,072,849	268,153,000	2,554,528	302,247,200	1,982,827	237,664,827	1,568,144	193,358,688
Belleville.....	801,675	90,452,000	1,481,498	136,549,000	1,418,946	125,272,526	583,456	57,245,005
Western.....	1,773,231	209,198,200	2,328,024	290,784,800	3,400,484	364,790,280	2,880,680	268,682,108
Totals.....	4,650,258	567,803,200	6,364,050	699,581,000	6,802,308	725,727,633	5,032,290	519,215,801
Timber Districts.	1887.		1888.		1889.		1890.	
Ottawa.....	910,862	109,613,459	1,113,035	125,471,289	1,127,433	109,779,211	710,597	80,354,372
Belleville.....	320,488	52,258,143	670,794	69,649,172	670,794	69,649,172	3,453,389	528,081,688
Western.....	3,287,139	289,335,903	4,604,646	411,069,111	4,113,035	411,069,111	7,291,439	718,215,371
Totals.....	4,718,469	451,207,506	6,424,475	606,190,122	6,064,122	606,190,122	7,291,439	718,215,371

TABLE 4 (r)—Concluded.  
QUEBEC—Pine by Districts.—(From Quebec Crown Lands Returns.)

TABLE 4 (c)—*Concluded*.  
 QUEBEC—Pine by Districts.—(From Quebec Crown Lands Returns.)

Districts.	1887.						1888.						1889.											
	Saw-logs.			Square Timber.			Saw-logs.			Square Timber.			Saw-logs.			Square Timber.								
	Pieces.	Ft., B. M.	Cub. ft.	Pieces.	Ft., B. M.	Cub. ft.	Pieces.	Ft., B. M.	Cub. ft.	Pieces.	Ft., B. M.	Cub. ft.	Pieces.	Ft., B. M.	Cub. ft.	Pieces.	Ft., B. M.	Cub. ft.						
Upper Ottawa.....	2,137,916	10,979	522,890	1,965,918	12,441	516,815	2,852,998	12,317	516,815	2,852,998	12,317	516,815	2,852,998	12,317	516,815	10,780	10,780	548,617						
Lower do .....	298,494	102	2,093	299,000	4	80	364,170	4	80	364,170	4	80	364,170	4	80	1,323	1,323	35,354						
St. Maurice.....	194,157	48	1,347	89,257	359	4,218	111,114	359	4,218	111,114	359	4,218	111,114	359	4,218	14	14	757						
All other.....	63,442	182	5,114	36,941	12,804	521,113	54,582	12,804	521,113	54,582	12,804	521,113	54,582	12,804	521,113	12,917	12,917	604,798						
Total.....	2,693,119	11,311	531,444	2,391,096	12,804	521,113	3,394,164	12,804	521,113	3,394,164	12,804	521,113	3,394,164	12,804	521,113	12,917	12,917	604,798						
Districts.	1890.						1891.						1892.						1893.					
	Saw-logs.			Square Timber.			Saw-logs.			Square Timber.			Saw-logs.			Square Timber.			Saw-logs.			Square Timber.		
	Pieces.	Ft., B. M.	Cub. ft.	Pieces.	Ft., B. M.	Cub. ft.	Pieces.	Ft., B. M.	Cub. ft.	Pieces.	Ft., B. M.	Cub. ft.	Pieces.	Ft., B. M.	Cub. ft.	Pieces.	Ft., B. M.	Cub. ft.	Pieces.	Ft., B. M.	Cub. ft.	Pieces.	Ft., B. M.	Cub. ft.
Upper Ottawa.....	2,434,731	12,441	516,815	44,231	2,115,043	1,857,816	239,374,800	60,617	2,434,731	12,441	516,815	44,231	2,115,043	1,857,816	239,374,800	60,617	2,434,731	12,441	516,815	44,231	2,115,043	1,857,816	239,374,800	60,617
Lower do .....	166,286	639	33,345,290	639	23,921	335,052	48,717,600	3,194	166,286	639	33,345,290	639	23,921	335,052	48,717,600	3,194	166,286	639	33,345,290	639	23,921	335,052	48,717,600	3,194
St. Maurice.....	164,841	497	10,688,000	292	4,973	73,177	8,224,800	48	164,841	497	10,688,000	292	4,973	73,177	8,224,800	48	164,841	497	10,688,000	292	4,973	73,177	8,224,800	48
All other.....	63,273	812	6,802,660	812	7,854	71,892	5,835,400	1,853	63,273	812	6,802,660	812	7,854	71,892	5,835,400	1,853	63,273	812	6,802,660	812	7,854	71,892	5,835,400	1,853
Total.....	2,804,337	392,024,600	45,944	2,151,791	2,137,938	392,152,600	63,859	2,804,337	392,024,600	45,944	2,151,791	2,137,938	392,152,600	63,859	2,804,337	392,024,600	45,944	2,151,791	2,137,938	392,152,600	63,859	2,804,337	392,024,600	45,944
Districts.	1892.						1893.						1894.						1895.					
	Saw-logs.			Square Timber.			Saw-logs.			Square Timber.			Saw-logs.			Square Timber.			Saw-logs.			Square Timber.		
	Pieces.	Ft., B. M.	Cub. ft.	Pieces.	Ft., B. M.	Cub. ft.	Pieces.	Ft., B. M.	Cub. ft.	Pieces.	Ft., B. M.	Cub. ft.	Pieces.	Ft., B. M.	Cub. ft.	Pieces.	Ft., B. M.	Cub. ft.	Pieces.	Ft., B. M.	Cub. ft.	Pieces.	Ft., B. M.	Cub. ft.
Upper Ottawa.....	1,577,034	313,454,400	7,882	143,189	2,788,182	37,061,600	43,464	1,577,034	313,454,400	7,882	143,189	2,788,182	37,061,600	43,464	1,577,034	313,454,400	7,882	143,189	2,788,182	37,061,600	43,464	1,577,034	313,454,400	7,882
Lower do .....	451,538	45,485,400	2,572	128,574	2,900,598	43,035,000	2,169	451,538	45,485,400	2,572	128,574	2,900,598	43,035,000	2,169	451,538	45,485,400	2,572	128,574	2,900,598	43,035,000	2,169	451,538	45,485,400	2,572
St. Maurice.....	190,220	11,659,600	4	199	57,775	8,418,000	6	190,220	11,659,600	4	199	57,775	8,418,000	6	190,220	11,659,600	4	199	57,775	8,418,000	6	190,220	11,659,600	4
All other.....	79,022	5,921,000	199	199	76,451	5,521,600	212	79,022	5,921,000	199	199	76,451	5,521,600	212	79,022	5,921,000	199	199	76,451	5,521,600	212	79,022	5,921,000	199
Total.....	2,297,814	376,570,400	10,438	773,962	3,212,456	429,016,800	45,630	2,297,814	376,570,400	10,438	773,962	3,212,456	429,016,800	45,630	2,297,814	376,570,400	10,438	773,962	3,212,456	429,016,800	45,630	2,297,814	376,570,400	10,438

\* For 1887-89 only the number of saw-logs is returned without the measurement.

TABLE

From Culler's

STATEMENT of Timber, &c., Measured at the Ports of

Description.	1865.		1870.		1875.		1880.	
	Pieces.	Tons, 40 ft.	Pieces.	Tons, 40 ft.	Pieces.	Tons, 40 ft.	Pieces.	Tons, 40 ft.
<i>Wagon Timber.</i>								
1 White pine.....	15,582	31,177.29	39,142	54,714.21	31,514	44,914.14	29,246	44,070.37
2 Red pine.....	1	35	14	40.39	228	541.17	99	99.25
3 Spruce.....								
4 Ash.....								
5 Balm of gilead.....			8	10.30	1,205	1,333.20	484	456.05
6 Basswood.....					1,427	2,167.07		
7 Beech.....			15	18.35	355	396.35		
8 Birch.....	2	2.10			1	1.00		
9 Butternut.....	3	4.13	13	9.06	1,511	1,271.34	2	1.33
10 Buttonwood.....			25	32.04	71	72.06	2	1.39
11 Cherry.....	259	245.39	151	141.06	41	71.23		
12 Chestnut.....					2,092	1,436.24	163	108.16
13 Cottonwood.....								
14 Elm.....					6	5.29		
15 Hemlock.....								
16 Hickory.....	4	8.34	137		3	1.27		
17 Maple.....	8	9.27		108.13			1	1.15
18 Mixed.....					429	493.30	16	23.13
19 Oak.....			401	301.23	2,739	5,012.04		
20 Steamore.....					43	30.26	1	.39
21 Tamarack.....					4	4.05		
22 Walnut.....	1,775	1,847.18	7,067	6,413.14	1,756	1,441.09	1,560	1,180.31
23 Whitewood.....	22	32.02	11	29.26	1,384	2,756.12	10	11.03
	17,656	33,320.07	46,984	61,820.17	44,809	61,958.02	31,590	46,556.16
<i>Square Timber.</i>								
1 White pine.....	302,285	498,140.09	290,778	399,991.37	154,426	208,926.11	50,385	69,731.26
2 Red pine.....	121,583	130,408.29	70,549	68,845.14	100,889	94,606.19	23,678	23,159.02
3 Spruce.....	135	131.23	52	39.24	246	244.05	1	1.19
4 Ash.....	3,234	3,503.17	7,609	8,123.20	26,845	21,689.10	3,395	2,158.15
5 Balm of gilead.....	4	4.17			5	2.37		
6 Balsam.....			9	8.18				
7 Basswood.....	237	306.12	416	435.22	1,261	1,188.02	13	16.01
8 Beech.....	18	15.31	38	28.02	88	78.25	4	3.18
9 Birch.....	13,816	6,950.28	23,018	9,981.69	8,495	3,924.02	27,859	13,067.33
10 Butternut.....	58	72.38	54	39.08	107	56.32		
11 Cedar.....					7,903	7,599.23		
12 Cherry.....	32	36.06	43	32.23	25	25.14	2	3.39
13 Elm.....	19,694	25,168.07	40,235	43,886.32	56,815	60,107.07	10,328	11,705.05
14 Hemlock.....	4,387	4,611.27	3,822	4,012.03	8,651	7,619.21	661	911.21
15 Hickory.....	537	612.16	1,013	1,574.08	4,098	4,326.25	302	327.12
16 Ironwood.....					2	1.11		
17 Maple.....	418	383.37	170	165.12	763	586.28	34	36.06
18 Mixed hardwood					450	301.10		
19 do timber.....	439	305.12						
20 Oak.....	42,541	70,195.39	33,031	50,455.21	59,722	81,526.18	16,996	26,941.01
21 Tamarack.....	21,834	14,719.36	11,925	7,088.29	17,962	9,198.30	2,278	1,308.09
22 Walnut.....	56	34.11	10	14.21	93	75.14		
23 Whitewood.....	47	160.35	77	134.15	95	144.25		
	531,355	755,762.30	482,849	595,457.07	448,851	502,229.09	135,936	149,366.07

5 (a)  
Retur  
Queb  
Pieces  
35,60  
13,04  
116  
36  
264  
156  
42  
76  
931  
100  
11  
62  
2,305  
212  
53,425  
70,134  
8,424  
834  
1,059  
11  
2  
21  
16,430  
24  
2,454  
15,355  
2,181  
324  
161  
17,683  
346  
135,444 1

5 (a).

Returns.

Quebec, Montreal, Iachine, Sorel and Three Rivers.

TABLE  
from Culler's  
the Ports of

1880.		1885.		1890.		1891.		1892.		1893.	
Pieces.	Tons, 40 ft.	Pieces.	Tons, 40 ft.	Pieces.	Tons, 40 ft.	Pieces.	Tons, 40 ft.	Pieces.	Tons, 40 ft.	Pieces.	Tons, 40 ft.
44,670.37	35,090	50,729.20	61,296	89,884.34	85,545	127,493.18	34,792	52,546.33	35,420	51,566.10	
456.05	1	20	20	.....	51	106.06	10	17.30	1	1.23	
.....	13,045	10,416.22	2,839	2,433.04	4,708	3,850.11	10	10.28	24	18.15	
.....	3	3.19	.....	.....	1	.....	4,751	3,418.35	.....	8.06	
.....	118	130.28	55	43.19	.....	38	2	1.19	6	5.10	
.....	1	4.11	393	253.21	1,293	980.18	3	3.16	5	5.10	
.....	395	284.31	28	23.00	100	53.32	7,779	3,372.38	5,491	2,865.16	
.....	39	37.15	297	88.27	88	118.35	110	74.19	12	11.01	
.....	294	139.06	.....	.....	.....	80.22	354	119.31	89	40.08	
.....	159	119.20	31	39.30	1	2.16	131	122.31	261	210.15	
.....	42	51.30	403	204.27	142	78.05	.....	.....	85	81.13	
.....	76	91.32	439	488.28	541	616.38	.....	.....	.....	13	
.....	931	369.02	339	554.08	90	172.21	199	13.35	667	415.24	
.....	100	107.23	.....	.....	22	22.38	.....	207.16	161	219.09	
.....	7	7.32	.....	.....	7	7.18	.....	84.02	8	11.19	
.....	17	16.35	222	163.01	.....	.....	.....	.....	.....	18	
.....	62	38.20	2,301	1,259.20	182	108.14	.....	.....	.....	19	
.....	2,305	1,379.15	270	286.38	411	503.05	.....	.....	.....	20	
.....	212	325.05	.....	.....	.....	.....	.....	.....	.....	21	
.....	53,425	64,244.32	68,820	95,723.20	93,456	134,202.17	48,000	60,515.33	42,593	55,951.01	
.....	70,134	93,782.23	76,994	85,769.04	86,156	95,513.07	27,855	32,347.21	47,452	51,859.13	
.....	8,424	8,076.30	14,895	14,418.36	8,741	8,275.32	927	108.01	9,082	9,872.24	
.....	83	739.00	.....	.....	51	16.36	2	1.07	4	2.39	
.....	1,059	667.25	382	227.18	253	178.09	202	115.19	116	65.13	
.....	.....	.....	1	1.16	2	2.04	.....	.....	.....	.....	
.....	21	15.02	28	26.25	3	3.01	.....	.....	.....	.....	
.....	2	1.12	.....	.....	.....	.....	.....	.....	.....	.....	
.....	16,439	6,849.39	16,853	6,777.13	10,396	3,960.31	11,721	5,305.33	6,926	2,961.20	
.....	24	24.06	.....	.....	1	17	.....	.....	.....	.....	
.....	2,454	1,870.15	6,777	4,641.27	2,808	1,985.05	1,772	1,204.00	814	494.23	
.....	.....	.....	2	1.28	.....	.....	9	4.22	.....	.....	
.....	15,355	17,544.17	12,119	14,805.28	16,350	19,773.04	10,847	13,090.38	11,632	13,423.20	
.....	2,181	1,638.03	425	297.31	8,192	5,101.08	465	280.11	.....	.....	
.....	324	361.12	140	154.37	412	416.35	379	389.28	533	549.12	
.....	101	95.21	34	16.10	26	15.03	.....	.....	.....	.....	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
.....	17,683	28,597.34	20,398	32,979.30	19,362	32,425.14	10,372	17,720.22	15,968	26,613.32	
.....	346	160.19	265	187.35	225	178.35	82	19.32	32	24.19	
.....	.....	.....	.....	.....	4	5.04	.....	.....	.....	.....	
.....	.....	.....	2	2.09	11	14.02	.....	.....	.....	.....	
.....	135,444	160,424.18	149,315	160,308.27	153,083	167,865.08	64,583	71,513.34	93,469	105,881.05	

TABLE

STATEMENT of Timber, &c., Measured at the Ports of Quebec,

Description.	1865.		1870.		1875.		1880.	
	Pieccs.	Tons, 40 ft.	Pieccs.	Tons, 40 ft.	Pieccs.	Tons, 40 ft.	Pieccs.	Tons 40 ft.
<i>Flatted Timber.</i>								
1 White pine.....	10,710	8,648·28			7,498	6,404·15	2,445	2,043·34
2 Red pine.....	405	386·01						
3 Spruce.....	4	4·11			572	436·35	58	52·02
4 Ash.....	332	247·16			751	587·36	36	29·27
5 Basswood.....	66	42·08						
6 Birch.....	30	25·14			62	42·20	15	12·02
7 Cedar.....	7,647	6,662·20						
8 Elm.....	888	744·21						
9 Hemlock.....	8	5·33			310	290·16	1	0·38
10 Maple.....					3,541	2,863·13		
11 Mixed.....	68	46·00	29,613	25,069·06	112	132·37		
12 Oak.....	630	418·13					90	51·12
13 Sleepers.....								
14 Tamarack.....	5,614	5,011·22			2,053	1,750·24	649	446·19
	26,402	22,242·27	29,613	25,069·06	14,899	12,508·36	3,294	2,636·14
<i>Round Timber.</i>								
1 White pine.....	25,563	7,668·36						
2 Spruce.....								
3 Spruce poles.....					5,976	8,343·33		
4 Elm.....							176	155·29
5 Hemlock.....								
6 Maple.....								
7 Mixed.....					238	161·28		
8 Oak.....			3,534	1,229·00			1	38
9 Saw-logs.....					172	82·27		
10 Tamarack.....								
	26,563	7,668·36	3,534	1,229·00	5,986	8,588·08	177	156·27
<i>Lumber.</i>								
1 Deals, pine.....	3,145,532	212,013·00	3,714,951	249,161·09	5,746,503	367,711·38	2,362,652	151,412·06
2 do red pine.....			4,844	313·04				
3 do spruce.....	761,824	42,432·06	1,113,850	61,708·38	2,270,727	127,086·25	714,498	40,711·07
4 do pine and spruce.....								
5 do not specifi'd.....					2,691	154·07		
6 Planks, pine.....	208,051	9,535·28	296,343	13,582·17	394,664	18,088·30	46,874	2,148·15
7 do spruce.....	84,083	3,851·14	105,036	4,814·09	337,387	15,463·24	59,968	2,749·20
8 do ash.....	667	30·24						
9 do oak.....	5,742	296·28						
10 do walnut.....	551	25·11					883	11·07
11 Boards, pine.....	46,736	2,142·03	130,126	5,964·07				
12 do oak.....	14,037	643·15					72,937	3,342·39
13 do walnut.....	5,796	265·26						
14 do not specifi'd.....			177,375	21,987·18	269,010	12,055·25	109,298	5,009·21
15 Oak wainscot.....	846	197·30						
16 Oak scantling.....								
17 Oaks.....			23,409	5,500·00	5,914	608·23		
18 Sawn lumber for export.....					965,205	24,130·05	696,967	17,424·07
19 Sidings.....								
	4,273,865	271,433·25	5,563,934	363,031·22	9,992,065	565,299·17	4,064,077	222,809·02

5 (a).

Mont

Pieccs

4,2

8

12·02

29·27

12·02

0·38

46

1,23

1,23

2,95

10,23

3,89

56

65

38

33

15

5,60

3,587,80

1,023,26

104,558

19,878

95,077

577,981

1,400,620

40,000

6,849,180

TABLE  
of Quebec,

5 (a).—Continued.

Montreal, Lachine, Sorel and Three Rivers.—Continued.

1880.		1885.		1890.		1891.		1892.		1893.		
Pieces.	Tons, 40 ft.	Pieces.	Tons, 40 ft.	Pieces.	Tons, 40 ft.	Pieces.	Tons, 40 ft.	Pieces.	Tons, 40 ft.	Pieces.	Tons, 40 ft.	
4,445	2,043·34	4,257	3,787·35	12,712	7,644·11	4,791	3,336·12	2,067	1,379·19	997	638·28	1
58	52·02	81	58·04									2
36	29·27											3
15	12·02											4
1	0·38											5
												6
												7
		468	374·09	3,020	2,378·14	2,432	1,497·00					8
90	51·12	5	2·39									9
		1,230	641·05			8,447	3,754·23					10
												11
649	446·19	1,238	571·15									12
		2,952	2,229·05	3,443	1,949·32	4,815	2,901·18	2,635	1,400·17	5,800	3,087·19	13
294	2,636·14											14
		10,231	7,664·32	19,175	11,972·17	20,485	11,489·13	4,702	2,779·36	6,797	3,726·00	
		3,899	3,350·24	142	125·27	3,910	3,138·16	331	218·08	5,708	4,705·12	1
170	155·29	563	508·02									2
												3
		657	680·14	1,290	920·28	5,896	4,537·22	1,173	783·33			4
												5
										30	33·30	6
												7
		330	109·32									8
		159	132·12									9
177	156·27									2,385	1,553·19	10
		5,608	4,856·04	1,432	1,046·15	9,806	7,675·38	1,504	1,002·01	8,123	6,292·21	
652	151,412·06	3,587,805	214,959·30	35,000	2,005·08			6,850	392·18	17,900	1,025·21	1
498	40,711·07	1,023,261	58,444·24	75,348	4,055·30			3,546	197·14	18,000	1,031·10	2
												3
								3,920	230·26			4
474	2,148·15											5
968	2,749·20	104,558	4,792·13					7,300	418·09			6
		19,878	911·02									7
888	11·07											8
												9
337	3,342·39	95,077	4,244·22									10
												11
298	5,009·21											12
		577,981	16,448·04									13
												14
												15
												16
67	17,424·07											17
		1,400,620	35,280·16									18
		40,000	2,151·23									19
77	222,809·02	6,849,180	337,232·14	110,348	6,060·38			21,616	1,238·27	35,900	2,056·31	



TABLE  
STATEMENT of Timber, &c., Measured at the Ports of Quebec,

Description.	1865.		1870.		1875.		1880.	
	Pieces.	Tons, 40 ft.	Pieces.	Tons, 40 ft.	Pieces.	Tons, 40 ft.	Pieces.	Tons, 40 ft.
<i>Spars and Masts.</i>								
1 Masts, white pine do not specified.....	1,039	7,013·10	56	378·00				
3 Spars, red pine... do spruce... do tamarack do not specified.....	6,767 53 3 365	10,150·20 108·26 6·36 375·11	331 4	496·20 8·08	163	1,100·10	23	34·20
	8,227	17,054·23	391	882·28	426	852·00	683	1,350·16
<i>Staves &amp; Laths.</i>								
1 Staves, standard do West India do barrel... Lathwood (cords)	1,934 1,425 3 3,609	16,588·29 12,223·08 22·12 11,548·00	1,266 3,485 7 1,263	10,855·00 29,883·08 57·09 4,141·16	1,479 563 3 1,113	12,683·11 4,832·25 24·12 3,560·00	147 127 ..... 107	1,261·06 1,091·14 ..... 340·30
	6,971	40,382·09	6,021	44,836·33	3,158	21,100·08	381	2,693·10

RECAPITU

1 Waney timber..	17,656	33,329·07	46,984	61,820·17	44,809	61,958·02	31,590	46,556·16
2 Square timber..	531,355	755,762·30	482,849	595,457·07	448,851	502,229·09	135,936	149,366·07
3 Flatted timber..	26,402	22,242·27	29,613	25,069·06	14,899	12,508·36	3,294	2,636·14
4 Round timber..	25,563	7,668·36	3,534	1,229·00	5,986	8,588·08	177	156·27
5 Lumber*..	4,273,865	271,433·25	5,565,934	363,031·22	9,992,065	565,299·17	4,064,077	222,809·02
6 Spars and masts	8,227	17,654·23	391	882·28	589	1,952·10	706	1,384·36
7 Staves and laths	6,971	40,382·09	6,021	44,836·33	3,158	21,100·08	381	2,693·10
Totals....	4,890,039	1,148,473·37	6,135,326	1,092,326·33	10,510,387	1,173,636·10	4,236,161	425,602·34

\* See Act, Cap. 18, 1889.—Measurements not compulsory for lumber.

TABLE  
AVERAGE contents of Saw-logs and Square  
Province of Ontario—From Provincial Returns.

Years.	SAW-LOGS.		SQUARE TIMBER.		
	Pine.	Other.	White Pine.	Red Pine.	Other.
	Feet, B.M.	Feet, B.M.	Cubic feet.	Cubic feet.	Cubic feet.
1887 .....	122½	79	53	40	34½
1888 .....	110	78	55	37½	37½
1889 .....	106½	81½	53½	36½	33½
1890 .....	103	76½	51½	39	30½
1891 .....	96	45½	49½	41	42½
1892 .....	94	50½	52	40½	37½
1893 .....	98½	57	50½	43½	37

TABLE  
Ports of Quebec,

1880.	
Pieces.	Tons, 40 ft.
23	34 20
683	1,350 16
706	1,384 36
147	1,261 06
127	1,091 14
107	340 30
381	2,693 10

ECAPITU

590	46,556 16
936	149,366 07
294	2,636 14
177	156 27
4,077	222,809 02
706	1,384 36
381	2,693 10
5,161	425,602 34

5 (a)—Concluded.

Montreal, Lachine, Sorel and Three Rivers—Concluded.

1885.		1890.		1891.		1892.		1893.	
Pieces.	Tons, 40 ft.	Pieces.	Tons, 40 ft.	Pieces.	Tons, 40 ft.	Pieces.	Tons, 40 ft.	Pieces.	Tons, 40 ft.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	33	49 20	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	86	124 14	.....	.....
.....	.....	.....	.....	.....	.....	86	124 14	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
116	995 05	60	514 28	18	154 39	3	23 31	1	4 28
279	2,393 02	125	1,070 06	8	66 01	4	30 09	16	134 16
58	493 27	2	13 11	.....	.....	.....	.....	3	25 37
200	640 00	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
653	4,521 34	187	1,598 05	26	221 00	7	54 00	20	165 01

LATION.

53,425	64,244 32	68,826	95,723 20	93,456	134,202 17	48,990	60,515 33	42,593	55,951 01
135,444	160,424 18	149,315	160,308 27	153,083	167,865 08	64,583	71,513 34	93,469	105,881 05
10,231	7,664 32	19,175	11,972 17	20,485	11,489 13	4,702	2,779 36	6,797	3,726 07
5,638	4,856 04	1,432	1,046 15	9,806	7,675 38	1,504	1,002 01	8,123	6,292 21
6,849,180	337,232 14	110,348	6,060 38	.....	.....	21,616	1,238 27	35,900	2,056 31
.....	.....	33	49 20	.....	.....	86	124 14	.....	.....
.....	.....	.....	.....	.....	.....	7	54 00	20	165 01
7,054,550	578,962 14	394,316	276,759 22	276,856	321,453 36	141,488	137,228 25	186,902	174,072 36

TABLE  
and Square

Other.
Cubic feet.
34 3/4
37 1/2
33 1/2
39 3/4
42 1/2
37 1/2
37

5 (b).

Timber showing reduction in size.

Province of Quebec—From Provincial Returns.

Years.	SAW-LOGS.		SQUARE TIMBER.		
	Pine.	Other.	White Pine.	Red Pine.	Other.
	Feet, B.M.	Feet, B.M.	Cubic feet.	Cubic feet.	Cubic feet.
1887.....	138	78 3/4	47	41	103 1/2
1888.....	135	79 1/2	44 1/2	31	31 1/2
1889.....	137 1/2	79 1/2	53 1/2	34 1/2	20
1890.....	138 1/2	78 1/2	47 1/2	36	30 1/2
1891.....	141	71 1/2	50 1/2	25 1/2	25 1/2
1892.....	163 1/2	59	75 1/2	34	31 1/2
1893.....	127 1/2	91 1/2	26 1/2	43	22

TABLE 6 (a).—(From United Kingdom Trade Returns.)  
UNITED KINGDOM Imports of Wood and Timber—Value.

	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.
Wood and Timber.												
Hewn.....	\$ 22,586,779	\$ 22,731,333	\$ 25,354,370	\$ 32,717,087	\$ 38,369,817	\$ 23,648,700	\$ 30,648,398	\$ 28,224,753	\$ 20,115,539	\$ 14,159,469	\$ 25,590,458	\$ 23,494,136
Sawn or split.....	36,912,884	31,681,241	37,023,070	51,417,842	60,875,445	44,839,463	56,160,384	64,133,771	43,993,995	34,378,742	51,810,280	44,778,492
Staves.....	3,206,072	2,942,005	3,034,984	4,166,271	4,552,158	2,988,377	4,169,531	3,396,116	2,093,061	2,000,439	2,286,589	2,855,792
Totals.....	62,705,735	57,355,209	65,412,424	88,301,200	103,797,420	71,476,480	90,978,308	96,259,640	66,203,595	50,538,659	79,657,327	71,638,330
Wood and Timber.												
Hewn.....	\$ 25,782,982	\$ 27,327,253	\$ 22,744,294	\$ 22,566,719	\$ 16,654,882	\$ 15,817,076	\$ 19,751,902	\$ 27,432,251	\$ 24,355,593	\$ 21,903,246	\$ 23,777,809	\$ 19,703,883
Sawn or split.....	52,750,798	50,867,499	44,947,492	46,710,271	39,933,394	38,416,347	47,648,062	63,966,888	53,086,805	45,673,258	54,370,011	49,965,784
Staves.....	3,180,649	3,120,098	2,700,367	2,624,277	2,589,636	2,749,496	2,869,761	3,377,944	3,256,983	2,868,228	2,884,556	2,495,690
Totals.....	81,714,429	81,114,850	70,392,153	71,901,267	59,177,912	56,982,919	69,669,725	94,777,083	81,599,381	70,444,732	81,036,370	72,165,347

QUA

1872.  
1873.  
1874.  
1875.  
1876.  
1877.

1885.  
1886.  
1887.  
1888.  
1889.  
1890.  
1891.  
1892.  
1893.

TABLE 6 (b)—(From United Kingdom Trade Returns.)

QUANTITIES of Wood of all kinds imported by United Kingdom from all Countries and amount and percentage from Canada.

Year.	HEWN.			SAWN.		
	From all Countries.	From Canada.	Canada.	From all Countries.	From Canada.	Canada.
	50 cub. ft. loads.	50 cub. ft. loads.	Per-centage.	50 cub. ft. loads.	50 cub. ft. loads.	Per-centage.
1872.....	1,782,633	443,484	24.87	3,083,349	788,288	25.57
1873.....	2,071,390	365,875	17.66	3,415,723	954,356	27.94
1874.....	2,147,394	476,375	19.46	3,805,247	1,076,188	28.28
1875.....	1,687,939	336,867	19.96	3,207,830	953,228	28.90
1876.....	2,158,295	470,549	21.80	4,102,618	1,107,347	26.99
1877.....	2,079,613	485,720	23.36	4,572,748	1,256,212	27.47
Total.....	12,227,264	2,578,870	.....	22,277,515	6,135,619	.....
Average.....	2,037,877	429,812	21.91	3,712,919	1,022,603	27.54
1885.....	1,935,854	256,280	13.24	4,235,508	999,775	23.60
1886.....	1,582,762	161,733	10.21	3,785,786	953,440	25.85
1887.....	1,718,465	165,240	9.62	3,797,747	872,406	22.97
1888.....	1,989,851	191,374	9.62	4,357,064	930,523	21.36
1889.....	2,392,223	228,005	9.53	5,319,326	1,235,258	23.22
1890.....	2,278,171	180,066	7.90	4,778,676	1,185,569	24.81
1891.....	2,250,392	151,828	6.75	4,379,060	891,694	20.49
1892.....	2,469,139	194,654	7.88	5,090,798	1,204,838	23.67
1893.....	2,124,888	136,364	6.41	4,761,717	1,115,674	23.43
Total.....	18,743,746	1,065,544	.....	40,505,682	9,388,577	.....
Average.....	2,082,638	185,060	8.89	4,500,631	1,043,175	23.18

TABLE  
CENSUS Returns—Southern

Counties.	Year.	SQUARE PINE— NUMBER OF CUBIC FEET.		Cubic Feet of Squre Oak.	Cubic Feet of Square or Sided Tamar- ack.	Cubic Feet of Square or Sided Birch and Maple.	Cubic Feet of Square Elm.	CUBIC FEET OF WALNUT.		Cubic Feet of Hick- ory.	Cubic Feet of all other Square or Sided Timber.
		White.	Red.					Black	Other Spec- ies.		
1 Bagot .....	1891	21,210	4,208	2,300	10,924	3,200	4,380	6,700	843,461		
do .....	1881	10,850	4,200	.....	149,930	340	1,624	.....	150,238		
2 Beauce .....	1891	7,448	338	.....	22,716	400	.....	200	483,702		
do .....	1881	480	.....	.....	42,231	16,152	.....	630	577,207		
3 Beauharnois .....	1891	7,020	1,500	6,870	10,511	8,900	17,555	2,508	7,510	20,708	
do .....	1881	.....	.....	.....	650	194	302	.....	.....	27,496	
4 Bellechasse .....	1891	928	.....	342	925	434	376	2,682	2,415	113,139	
do .....	1881	156	.....	36	2,123	.....	.....	.....	358	62,229	
5 Bonaventure .....	1891	2,386	300	15	19,713	10,289	.....	.....	.....	124,622	
do .....	1881	38,884	.....	.....	3,260	97,374	1,844	500	240	106,376	
6 Brome .....	1891	217	268	.....	.....	50,047	1,844	.....	.....	35,727	
do .....	1881	.....	.....	.....	.....	30,895	250	.....	.....	150,238	
7 Chambly .....	1891	22,167	500	4,122	19,089	39,310	5,602	1,270	.....	9,046	
do .....	1881	17,765	1,300	8,501	39,310	2,364	2,384	144	200	25,409	
8 Chateauguay .....	1891	32,762	19,150	2,910	82,965	57,710	34,175	125	20	1,804,760	
do .....	1881	5,536	.....	.....	6,606	.....	.....	.....	100	90,824	
9 Compton .....	1891	600	7,000	.....	57,890	73,245	112	.....	.....	178,794	
do .....	1881	4,812	300	25	99,411	77,152	1,735	.....	44	1,216,095	
10 Dorchester .....	1891	90	.....	.....	31,411	7,890	500	.....	.....	192,494	
do .....	1881	2,608	2,600	.....	5,891	10,550	.....	.....	239	187,841	
11 Drummond and Arthabaska .....	1891	40,032	48	.....	70,707	3,804	507	480	150	221,844	
do .....	1881	7,305	6,425	.....	161,524	45,023	2,043	1,203	.....	593,968	
12 Gaspé .....	1891	10,225	515	.....	2,500	3,365	.....	.....	.....	281,382	
do .....	1881	1,171	.....	.....	2,598	7,158	.....	128	.....	201,644	
13 Huntingdon .....	1891	14	.....	.....	2,480	9,694	2,394	45	90	45,125	
do .....	1881	180	.....	36	1,752	.....	1,802	.....	800	32,125	
14 Iberville .....	1891	4,046	5,615	1,500	2,872	200	1,933	400	400	32,507	
do .....	1881	41,738	14,040	12,139	15,197	15,350	20,070	900	.....	189,994	
15 Kamouraska .....	1891	.....	.....	.....	1,482	48	.....	.....	.....	22,450	
do .....	1881	.....	.....	.....	1,185	50	6,005	24	1,350	70,888	
16 Laprairie .....	1891	2,087	10,190	5,767	19,185	232	898	11	20	54,884	
do .....	1881	6,123	400	716	23,546	1,018	.....	.....	35	18,525	
17 Lévis .....	1891	3,570	.....	30	16,519	1,018	.....	.....	95	56,176	
do .....	1881	2,849	30	165	9,773	1,000	.....	.....	.....	105,104	
18 L'Islet .....	1891	2,000	.....	.....	15	232	.....	.....	.....	11,405	
do .....	1881	.....	.....	.....	.....	40	.....	.....	.....	9,600	
19 Lotbinière .....	1891	168	400	.....	51,084	800	125	.....	.....	198,133	
do .....	1881	1,321	83	.....	32,414	350	100	40	.....	214,694	
20 Mégantic .....	1891	.....	.....	.....	240	17,767	.....	760	410	110,561	
do .....	1881	925	120	.....	4,038	27,291	626	7,790	750	117,239	
21 Missisquoi .....	1891	3,050	4,523	600	36,369	11,400	800	400	7,000	106,337	
do .....	1881	8,435	200	1,659	4,545	2,126	1,174	10	.....	290,127	
22 Montmagny .....	1891	1,050	.....	803	8,619	.....	.....	.....	.....	56,247	
do .....	1881	.....	45	66	1,547	1,752	.....	.....	.....	106,385	
23 Napierville .....	1891	24,332	2,500	790	19,716	760	8,870	600	.....	80,327	
do .....	1881	16,028	.....	.....	40,327	76	330	1,000	.....	292,988	
24 Nicolet .....	1891	1,549	200	1,000	36,492	130	190	.....	800	363,213	
do .....	1881	9,317	.....	1,500	401,184	1,300	.....	1,020	.....	50,590	
25 Richelieu .....	1891	2,755	.....	315	60,249	445	13,012	500	.....	14,576	
do .....	1881	6,622	3,060	1,102	27,316	12	60	.....	.....	190,155	
26 Richmond & Wolfe do .....	1891	1,679	75	.....	149,826	142,692	4,925	5,240	.....	1,088,205	
do .....	1881	884	20	.....	15,565	19,575	24,000	1,313	1,500	533,254	
27 Rimouski .....	1891	107	.....	41	6,727	54,984	.....	450	.....	38,075	
do .....	1881	382	1,142	.....	60,002	2,183,724	.....	.....	.....	187,491	
28 Rouville .....	1891	57,790	3,250	5,400	6,305	3,050	10,009	6,010	32,449	61,703	
do .....	1881	27,184	7,100	1,180	33,197	2,300	2,240	2,200	.....	192,020	
29 St. Hyacinthe .....	1891	42,828	4,900	3,100	87,596	4,214	2,800	1,600	240	50,318	
do .....	1881	34,100	100	8,224	128,455	87,968	57,280	70	180	479,414	
30 St. Jean .....	1891	12,664	3,300	505	5,200	600	3,406	1,050	.....	15,202	
do .....	1881	4,619	960	20	32,756	1,504	835	240	400	108,805	

TABLE

7 (a).

Quebec, by Counties.

turns—Southern

Counties	Cubic Feet of Hickory.	Cubic Feet of all other Square or Sided Timber.	Number of Census Standard Pine Logs.	Number of Census Standard Spruce and other Logs.	Number of Spars and Masts	Thousands of Staves	Cords of Lath-wood.	Cords of Tun-bark.	Cords of Fire-wood.	Number of Fence Posts.	Number of Railway Ties.	Number of Telegraph Posts.	Cords of Pulp-wood.	Thousands of Shingles					
700	843,461	11,346	68,107	154	2	57,078	1,032	55,366	157,610	5,120	5,360	80	2,711	1					
200	150,238	4,039	230,873	75	1	42	13,588	104,456	229,396	47,915	1,995	49,763	3,804	2					
430	483,792	15,978	290,761	314	430	541	524	161,032	146,679	20,641	53,565	1,550	521	3					
226	577,207	97,309	397,315	215	28	401	143	146,679	20,641	11,906	46,489	160,948	1,100	4					
7,510	20,708	2,571	4,238	1	1	1	19	20,641	11,906	46,489	160,948	1,100	1,460	4					
27,496	116,139	178	3,610	90	70	69	241	42,519	71,029	353,051	257,901	1,927	9,988	5					
62,229	124,622	35,384	141,615	119	1,501	5	1	93,215	83,472	26,839	7,727	1,035	1,790	6					
240	106,376	6,496	95,933	6,996	441	397	5,866	104,456	8,900	9,350	10,804	28,444	61,571	222	8				
35,727	150,238	913	213,313	89	30	30	13,588	104,456	8,900	9,350	10,804	28,444	61,571	222	8				
150,238	9,046	4,059	239,873	75	1	42	13,588	104,456	8,900	9,350	10,804	28,444	61,571	222	8				
25,409	1,804,760	2,675	8,359	11	11	11	432	28,444	61,571	10,804	28,444	61,571	222	8					
200	90,824	7,266	35,362	707	28	20	173	109,512	69,252	147,048	18,820	15,098	3,840	9					
100	178,794	93,847	324,002	9,942	7	7	1,751	86,005	460	73,129	190,253	6,078	6,096	10					
192,494	187,841	3,934	144,024	20	12	12	460	73,129	190,253	6,078	19,013	224,368	839,775	295,264	14,725	6,791	10,116	11	
239	187,841	2,486	78,929	20	12	12	88	73,848	69,286	215,849	30	80,760	471,165	16,864	2	5,633	1,922	12	
221,844	593,998	172,561	921,141	9,986	11	7,832	69,286	215,849	30	80,760	471,165	16,864	2	5,633	1,922	12			
150	281,362	36,511	94,321	594	626	21	566	48,144	73,211	2,381	3,585	521	1,672	13					
281,362	291,644	4,405	34,965	80	8	240	902	38,773	31	11,840	33,465	183	14						
30	23,271	2,491	38,988	205	8	240	902	38,773	31	11,840	33,465	183	14						
800	45,125	635	1,945	603	89	200	985	17,981	3	34,788	62,520	937	7,485	15					
32,567	189,094	635	1,945	603	89	200	985	17,981	3	34,788	62,520	937	7,485	15					
22,450	70,888	57,293	109,769	813	63	200	985	17,981	3	34,788	62,520	937	7,485	15					
30	54,884	45,144	89,453	13	22	22	45	45,048	1	10,371	16,052	75	20	2					
18,525	54,884	3,504	2,322	671	1	1	10,371	16,052	75	20	12,961	35,414	117,271	2,631	508	17			
54,884	110,561	5,411	45,564	241	1,379	43,237	1,379	43,237	23,064	108,425	450	156	814	18					
110,561	11,405	6,610	156,369	36	5	29,737	38	23,064	108,425	450	156	814	18						
9,600	198,133	1,859	150,640	4,737	23	2	2,017	64,002	198,917	14,218	143	2,357	19						
198,133	110,561	5,989	76,734	1,980	3	21	2,017	64,002	198,917	14,218	143	2,357	19						
40	214,694	2,119	43,603	255	100	101	2,519	85,749	127,359	49,431	1,132	411	4,792	20					
410	117,239	3,226	98,462	10	100	101	13,528	91,736	127,359	49,431	1,132	411	4,792	20					
750	106,437	10,767	50,234	3,220	41	1,106	7,587	75,730	1,064	48,993	77,240	400	149	6					
106,437	290,127	1,515	24,568	7	7	26	7,601	56,824	126	16,818	127,642	100	818	22					
56,247	106,385	3,994	157,483	303	24	300	126	16,818	127,642	100	818	22							
80,327	80,327	5,333	35,197	113	34	11,278	34	11,278	46,535	850	140	411	157	23					
75,027	292,988	103,827	48,233	6,874	337	41,588	113	15,493	116,233	390,441	149,413	5,162	8,328	7,775	24				
292,988	363,213	120,625	552,112	6,874	337	41,588	113	15,493	116,233	390,441	149,413	5,162	8,328	7,775	24				
363,213	50,590	115,285	386,466	4,242	207	396	46,160	122,005	579	22,352	149,437	1,000	1,554	25					
50,590	14,576	2,201	14,914	14	1	1	275	27,645	275	27,645	275	27,645	275	27,645	275	27,645	275	27,645	275
14,576	190,155	3,000	14,914	14	1	1	275	27,645	275	27,645	275	27,645	275	27,645	275	27,645	275	27,645	275
1,088,205	533,254	26,951	784,633	83	34,000	69	6,599	110,923	129,514	162,204	2,491	16,994	5,205	26					
533,254	637,875	19,816	481,745	161	184	2,025	32,228	105,088	105,088	105,088	105,088	105,088	105,088	105,088	105,088	105,088	105,088	105,088	105,088
637,875	187,461	2,521	214,839	1,173	5	11	19	81,599	487,630	263,898	117	1,831	6,806	27					
187,461	192,020	31,737	40,884	6	6	6	613	29,157	49,052	3,444	1,250	28							
192,020	50,318	2,776	35,048	1	1	1	3,013	21,839	22,347	320,050	471	27,236	1,472	29					
50,318	479,414	39,805	90,136	26	1	1	167	22,347	320,050	471	27,236	1,472	29						
479,414	15,202	22,142	133,919	26	1	1	471	27,236	320,050	471	27,236	1,472	29						
15,202	108,805	1,284	651	22	22	22	32	7,593	12,662	10	103	30							
108,805	108,805	593	4,730	22	22	22	32	13,786	12,662	10	103	30							

TABLE  
CENSUS Returns—Southern

Counties.	Year.	SQUARE PINE— NUMBER OF CUBIC FEET.		Cubic Feet of Square Oak.	Cubic Feet of Square or Sided Tamar- ack.	Cubic Feet of Square or Sided Birch and Maple.	Cubic Feet of Square Elm.	CUBIC FEET OF WALNUT.		Cubic Feet of Hick- ory.	Cubic Feet of all other Square or Sided Timber.
		White.	Red.					Black	Other Spec- ies.		
31 Shefford . . . . .	1891	27,270	1,000	.....	9,759	123,950	2,660	.....	2,000	.....	279,375
do . . . . .	1881	2,290	.....	800	20,156	7,556	10	.....	500	.....	1,097,690
32 Sherbrooke . . . . .	1891	.....	.....	.....	320	25	.....	.....	.....	.....	28,275
do . . . . .	1881	.....	.....	.....	.....	26	.....	.....	.....	.....	7,073
33 Soulanges . . . . .	1891	514	.....	130	1,352	15	1,250	.....	20	.....	4,063
do . . . . .	1881	29,865	9,160	1,790	30,953	1,590	1,788	.....	1,640	.....	42,410
34 Stanstead . . . . .	1891	.....	7	.....	32,005	17,299	6	.....	.....	.....	70,257
do . . . . .	1881	15	.....	.....	24,553	93,942	.....	.....	.....	.....	134,766
35 Temiscouata . . . . .	1891	340	200	.....	6,263	3,544	.....	.....	.....	.....	223,973
do . . . . .	1881	440	34	.....	25,416	1,261	.....	.....	.....	.....	128,260
36 Vaudrenil . . . . .	1891	3,969	.....	56	4,450	2,022	13,133	2,000	14,816	955	89,833
do . . . . .	1881	15,650	200	1,800	6,530	6,100	.....	.....	3,400	.....	43,640
37 Verchères . . . . .	1891	153,491	5,000	11,379	120,299	8,750	4,923	.....	1,342	510	138,564
do . . . . .	1881	22,655	278	3,410	40,277	5,581	3,933	.....	.....	1	54,979
38 Yamaska . . . . .	1891	34,471	350	.....	288,495	1,246	332	.....	55	.....	32,495
do . . . . .	1881	68,875	5,370	.....	113,357	1,390	25	.....	.....	.....	57,901





TABLE 7 (b).  
CENSUS Returns—Southern Quebec—Pine, Spruce, &c.

Counties.	Square Pine.		Pine Logs.		Spruce Logs, &c.		Other Square Timber.	
	1891.	1881.	1891.	1881.	1891.	1881.	1891.	1881.
<i>1st Division.</i>								
Bonaventure.....	2,686	38,884	35,384	6,496	141,615	95,933	151,629	267,250
Gaspé.....	16,740	1,171	7,024	2,521	36,511	63,405	94,321	287,247
Rimouski.....	107	2,074	19,816		404,421	214,830	616,956	2,881,491
Témiscouata.....	540	474	558,760	51,069	1,226,926	85,019	233,780	154,937
Kamouraska.....			57,293	45,144	109,769	89,453	22,450	72,413
L'Islet.....	2,000		6,610	1,859	159,369	150,640	11,420	9,832
Bellechasse.....	928	156	1,245	586	99,687	103,296	123,314	64,776
Montmagny.....	1,050	45	1,013	3,994	242,251	157,483	65,669	109,770
<i>2nd Division.</i>								
Lévis.....	3,570	2,879	5,411	28,537	45,564	79,714	76,838	116,162
Lotbinière.....	568	1,404	5,089	2,119	76,734	43,603	250,182	143,476
Nicolet.....	1,749	9,317	120,625	115,285	552,112	386,466	331,600	708,217
Yamaska.....	34,821	74,245	85,639	36,311	59,405	12,404	322,623	172,673
Richelieu.....	22,755	9,682	2,201	3,000	9,159	14,914	125,111	43,126
Verchères.....	160,491	22,933	3,126	12,650	21,110	48,225	285,767	168,182
Chambly.....	22,667	10,065	2,675	14,228	8,359	28,220	39,139	78,312
Laprairie.....	12,277	6,523	3,504	439	2,322	671	87,295	43,953
Beauharnois.....	8,520		2,571	178	4,238	3,640	74,562	28,642
Huntingdon.....	14	180	4,405	2,991	34,965	38,900	37,974	49,515
<i>3rd Division.</i>								
Mégantic.....		925	3,226	10,767	198,462	169,234	233,871	157,854
Beauce.....	7,786	480	15,978	97,309	260,761	397,315	507,018	636,446
Drummond and Arthabaska.....	40,080	13,730	105,385	172,561	478,689	931,141	297,342	863,911
Richmond and Wolfe.....	1,754	904	26,951	14,091	784,693	481,745	492,838	1,148,661
Compton.....	7,600	5,112	12,265	93,847	1,657,132	324,002	310,041	1,594,462
Sherbrooke.....			798	300	34,633	107,902	23,620	7,119
Stanstead.....	7	15	388	6,634	398,458	369,051	119,567	252,361
Bagot.....	25,418	15,650	4,059	15,978	239,873	260,761	870,965	302,132
St. Hyacinthe.....	47,728	34,200	39,805	22,142	90,136	153,019	149,868	771,591
Shefford.....	28,270	2,290	4,428	52,195	225,529	438,829	417,744	1,116,882
Brome.....	485		913	4,059	213,313	239,873	88,118	181,383
Missisquoi.....	7,573	8,635	1,515	3,008	24,568	91,296	163,006	299,641
Iberville.....	9,661	55,778	616	635	1,945	11,621	39,872	253,650
Rouville.....	15,864	5,579	31,737	2,776	40,884	35,648	250,684	233,137
St. Jean.....	61,040		1,284	593	651	4,730	25,963	144,590
Napierville.....	15,864	5,579	31,737	2,776	40,884	35,648	250,684	233,137
Chateauguy.....	26,832	16,028	5,333	163,827	35,197	48,233	111,063	116,769
Dorchester.....	51,912	5,536	7,266	26,995	35,362	41,193	1,985,675	97,553
Châteauguay.....	90	5,208	3,934	2,486	144,024	78,929	242,295	204,521
Soulanges.....	514	39,025	861	28,731	4,398	66,481	6,810	80,171
Vaudreuil.....	3,969	15,850	1,375	2,613	20,782	16,316	127,265	61,370

TABLE 7 (c).

CENSUS RETURNS—Southern Quebec—Square Pine and Pine Logs.

Other Square Timber.		Counties.			Cubic feet of Square Pine.			No. of Pine Logs.		
1891.	1881.				1891.	1881.	1871.	1891.	1881.	1871.
151,629	207,250	<i>1st Division.</i>								
287,247	211,528	Bonaventure.....	2,686	38,884	119,792	35,384	6,496	11,857		
516,956	2,891,401	Gaspé.....	16,740	1,171	3,813	7,024	36,511	20,466		
233,780	154,437	Rimouski.....	107	2,074	507	19,816	2,521	3,960		
22,450	72,411	Temiscouata.....	540	474	12,944	558,760	51,060	6,802		
11,420	9,832	Kamouraska.....			21,116	57,293	45,144	16,085		
123,314	64,776	L'Islet.....	2,000			6,610	1,859	29,577		
65,669	109,770	Bellechasse.....	928	156		1,245	580	15,351		
		Montmagny.....	1,050	45	80	1,013	3,994	919		
		<i>2nd Division.</i>								
70,838	110,102	Lévis.....	3,570	2,879	93,962	5,411	28,537	101,822		
59,182	143,470	Lothbinière.....	568	1,404	3,520	5,089	2,119	13,154		
31,690	768,217	Nicolet.....	1,740	9,317	34,306	120,625	115,285	131,604		
22,623	172,673	Yamaska.....	34,821	74,245	271,306	85,639	36,311	72,580		
25,111	43,126	Richelieu.....	22,755	9,682	15,042	2,201	3,000	3,635		
85,797	108,182	Verchères.....	160,491	22,933	13,443	3,126	12,650	3,480		
39,189	78,312	Chambly.....	22,667	19,065	14,466	2,675	14,228	1,606		
47,295	43,053	Chamblé.....	12,977	6,523	29,352	3,504	439	660		
44,562	28,642	Laprairie.....	8,520		28,324	2,571	178	11,642		
97,974	49,515	Beauharnois.....	14	180	4,102	4,405	2,991	6,734		
		Huntingdon.....								
		<i>3rd Division.</i>								
3,871	157,854	Mégantic.....		925	968	3,226	10,767	9,492		
7,018	636,446	Beauce.....	7,786	480	5,290	15,978	97,399	50,836		
7,342	803,911	Drummond and Arthabaska.....	40,080	13,730	18,497	105,385	172,561	208,913		
2,838	1,148,661	Richmond and Wolfe.....	1,754	904	252	26,951	14,091	10,253		
0,041	1,594,462	Compton.....	7,600	5,112	24,522	12,265	93,847	9,100		
3,620	7,119	Sherbrooke.....					798	302		
9,367	252,361	Stanstead.....	7	15	8,500	388	6,634	11,566		
4,965	302,132	Bagot.....	25,418	15,050	1,969	4,059	15,978	12,271		
1,868	771,591	St. Hyacinthe.....	47,728	34,200	6,490	39,805	22,142	3,272		
4,118	1,115,882	Shefford.....	28,270	2,290	18,571	4,428	52,195	9,614		
181,383	181,383	Brome.....	483			913	4,059	3,751		
290,641	290,641	Missisquoi.....	7,573	8,635	575	1,515	3,008	5,621		
4,006	253,050	Iberville.....	9,661	55,778	32,345	616	635	1,048		
4,684	233,137	Rouville.....	61,040	34,284	24,944	31,737	2,776	3,531		
963	144,599	St. Jean.....	15,864	5,579	300	1,284	593	734		
9,013	116,769	Napierville.....	26,832	16,028	6,990	5,333	103,827	9,866		
5,675	97,553	Châteauguay.....	51,912	5,536	3,256	7,266	26,995	3,685		
295	204,521	Dorchester.....	90	5,208	306	3,934	2,486	1,534		
810	80,171	Soulanges.....	514	39,025	68,839	861	28,731	8,362		
2,265	61,370	Vaudreuil.....	3,969	15,850	34,043	1,375	2,613	8,741		

## DEPARTMENT OF AGRICULTURE.

## ANALYSIS of Table 7 (c).

Counties.	1891.	1881.	1871.
<i>1st Division.</i>			
Square pine.....			
Pine logs.....			
	24,061	42,804	158,252
	687,145	148,165	105,417
<i>2nd Division.</i>			
Square pine.....			
Pine logs.....			
	267,432	146,228	508,023
	235,246	215,738	346,920
<i>3rd Division.</i>			
Square pine.....			
Pine logs.....			
	336,583	258,029	208,551
	268,118	661,546	372,492
<i>1st Division.</i>			
Pine.....			
	5,727,354	1,272,573	1,033,213
<i>2nd Division.</i>			
Pine.....			
	2,219,973	1,936,853	3,387,459
<i>3rd Division.</i>			
Pine.....			
	2,561,962	5,749,460	3,360,234
<i>1st, 2nd and 3rd Divisions together.</i>			
Pine.....			
	10,509,289	8,958,886	7,780,906

TABLE 7 (d).  
TIMBER Agencies South of St. Lawrence, Que.

Year.	Pino Logs.	Spruce Logs.	Square White Pine.		Square Red Pine.	
	Pieces.	Pieces.	Pieces.	Cub. ft.	Pieces.	Cub. ft.
1881.....	42,910	626,311	266	7,055	380	6,400
1882.....	44,372	671,798	56	4,045	15	332
1883.....	32,087	661,411	27	1,840	8	240
1884.....	9,331	272,407	121	4,521	.....	.....
1885.....	44,208	623,366	21	1,885	.....	.....
1886.....	39,870	760,232	78	1,939	25	875
1887.....	11,901	58,289	359	4,218	.....	.....
1888.....	31,874	882,512	10	560	.....	.....
1889.....	26,047	573,054	812	7,854	.....	.....
1890.....	31,704	1,044,603	48	1,853	.....	.....
1891.....	29,129	1,083,418	4	199	.....	.....
Ten years.....	300,423	7,131,990	1,536	28,917	48	1,447
Average.....	30,042	713,199	153	2,891	5	145

1871.	
158,252	
105,417	
508,023	
346,920	
268,531	
372,492	
1,033,213	
3,387,459	
3,360,234	
7,780,906	

TABLE 8 (a).—(From Trade  
AVERAGE of Total Exports of the Products of Canadian Forest in three-year

ARTICLES.	AVERAGE EXPORTS FOR					
	1877-79.		1880-82.		1883-85.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
<i>Great Britain.</i>						
1 Ashes, pot and pearl . . . Brls.	13,510	\$ 310,771	10,287	\$ 289,464	6,566	\$ 199,781
2 " other . . . . .						
3 Tanner's bark . . . . . Cords	371	5,656	55	100		
4 Basswood, butternut and hickory . . . . . M. ft.	679	18,134	782	21,915	760	22,326
5 Firewood . . . . . Cords	33	123	293	1,093	32	88
6 Hop, hoop, telegraph and other poles . . . . .						
7 Knees and futtocks . . . . . Pes.	393	418		1,220		256
8 Lathwood . . . . . Cords	1,603	13,694	761	6,111	391	588
9 Logs—						
10 Oak . . . . . M. ft.	296	4,443	48	2,397		
11 Spruce . . . . . " "	14	540				
12 All other . . . . . " "	480	7,458	78	432	174	1,132
13 Lumber—						
14 Batts . . . . . Pes.	52,575	10,709	48,435	11,496	13,100	6,543
15 Deals . . . . . Std. H.	222,940	6,719,581	214,599	6,619,568	224,450	6,854,271
16 Deal ends . . . . . " "	12,433	279,602	9,037	244,819	10,699	287,224
17 Laths, &c. . . . . M.	11,969	41,497	5,910	23,943	5,982	33,347
18 Boards &c. . . . . M. ft.	20,115	279,869	19,389	243,493	18,438	229,949
19 Scantlings, &c. . . . . " "	11,530	76,839	10,666	72,659	7,431	51,779
20 Staves, standard . . . . . M.	916	238,371	442	108,694	384	134,088
21 " other & headings. " "	1,662	109,390	758	48,616	733	59,563
22 Nails and spurs . . . . . Pes.	3,945	17,572	3,694	11,024		10,937
23 Oars . . . . . Prs.	91	104	38	11,838	3,406	15,149
24 Shingles . . . . . M.	232	685	5	34	583	1,440
25 Shingle bolts . . . . . Cords						2
26 Sleepers . . . . . Pes.	7,746	34,491	28,116	36,697	44,342	63,145
27 Stave bolts . . . . . Cords						
28 Shooks . . . . . No.	2,128	1,333	35	12	4,845	2,795
29 Timber, square—						
30 Ash . . . . . Tons	5,918	58,165	6,955	80,302	8,619	110,198
31 Birch . . . . . " "	31,183	211,029	31,902	215,864	32,745	244,373
32 Elm . . . . . " "	18,426	214,417	19,698	243,084	19,018	231,175
33 Maple . . . . . " "	296	2,692	371	4,878	530	6,480
34 Oak . . . . . " "	59,164	969,112	46,449	827,607	44,797	896,224
35 Pine, white . . . . . " "	273,243	2,715,914	220,731	2,304,937	216,210	2,752,456
36 " red . . . . . " "	37,901	270,367	22,856	213,438	22,162	177,546
37 All other . . . . . " "	4,171	56,676	4,466	86,657	5,285	91,462
38 Pulpwood . . . . .						
39 Other wood . . . . .		2,795		13,112		21,373
40 Total . . . . .		12,692,13		11,745,053		12,528,898
<i>United States.</i>						
41 Ashes, leached and other . . . . .						
42 " pot and pearl . . . . . Brls.	2,163	4,656		14,306		31,645
43 Tanner's bark . . . . . Cords	82,549	26,735	702	17,769	2,481	19,570
44 Basswood, butternut and hickory . . . . . M. ft.		200,092	101,579	449,724	71,449	359,230
45 Firewood . . . . . Cords	453	4,314	1,076	7,406	669	8,655
46 Hop, hoop, telegraph and other poles . . . . .	163,145	317,227	155,923	323,462	156,182	352,843
47 Knees and futtocks . . . . . Pes.		36,641		176,486		164,017
48 Lathwood . . . . . Cords	26,643	11,703	17,263	22,263	21,664	18,977
	9	44		171	83	91

(From Trade  
t in three-year

and Navigation Returns.)

periods, 1877-1891, inclusive, together with Exports for the years 1892 and 1893.

AGE EXPORTS FOR

1883-85.

Quantity. Value.

\$

6,566	199,781
700	22,326
32	88
789	256
391	588
	3,008
174	1,182
3,100	6,543
1,450	6,854,271
0,609	287,224
5,982	33,347
4,438	229,949
4,431	51,779
384	134,088
733	59,593
384	10,937
406	15,149
583	1,440
1	2
342	63,145
845	2,795
619	110,198
745	244,373
018	251,175
570	6,480
637	896,224
210	2,752,456
102	177,946
285	91,462
	21,573
12,528,898	
	31,645
81	19,570
19	359,230
39	8,655
32	352,843
34	164,017
4	18,977
	91

THE PERIODS OF

1886-88. 1889-91. 1892. 1893.

Quantity. Value. Quantity. Value. Quantity. Value. Quantity. Value.

\$ \$ \$ \$ \$ \$ \$ \$

4,266	112,598	2,511	71,142	2,056	61,581	1,651	50,106
							3,455
431	11,619	630	19,107	510	20,782	485	17,602
5	19					1	3
	267		159		440		200
22	21			4	6		
98	861	5	66				
9	252						
8	47						
113	6,117	182	5,215	14	1,640	437	7,581
	8,019		5,089		7,918		2,781
219,477	6,502,662	250,613	7,517,355	211,209	6,116,237	236,965	7,368,126
10,172	262,701	10,244	278,332	11,542	281,018	11,895	289,697
3,439	17,216	2,890	19,026	1,088	5,820	5,628	32,524
13,573	177,319	17,972	206,850	17,192	169,352	27,127	288,244
5,325	36,883	6,041	43,048	4,791	33,072	6,211	43,198
161	30,864	51	6,786	17	1,065	2	108
2,359	33,133	11,393	60,043	7,330	34,800		39,867
	103,085		159,523		82,134		270,772
646	10,377	102	3,592	1,407	1,965	59	797
7	8	2,807	5,556	3,211	7,536		
20,782	75,462	10,124	32,126	377	1,569	7,226	2,247
95,700	11,198	336,735	26,281	633,739	42,784	441,971	3,334
	5,455	67,062	6,055	78,378	3,446	42,940	5,569
	24,092	177,352	24,071	198,378	29,354	235,241	25,976
	13,269	168,085	16,008	215,813	16,148	219,569	15,468
	161	1,761	587	7,848	364	4,103	253
	29,976	574,314	31,835	668,420	22,940	472,792	27,052
	137,894	1,694,621	156,265	2,239,090	123,820	1,644,031	1,479,255
	12,311	103,575	10,008	98,276	7,131	62,041	7,827
	3,288	86,740	3,875	69,795	3,961	54,305	998
	1,127		13,729		36,146		13,361
			2,274				2,647
	10,185,565		12,051,724		9,645,319		11,105,482
	35,843		31,322		40,164		55,651
	275		7,601	470	11,917	432	11,203
	52,738	234,723	37,859	169,766	217,552	41,872	265,495
	179	2,058	1,172	16,459	2,067	39,593	3,779
	154,626	320,912	146,128	311,902	179,103	370,152	354,392
		115,239		110,616		83,141	113,763
		10,773		23,836	16,204	14,113	13,984
		160	797	1,633		2,590	6,491

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## DEPARTMENT OF AGRICULTURE.

TABLE 8 (a)—(From Trade and  
AVERAGE of Total Exports of the Products of

ARTICLES.	AVERAGE EXPORTS FOR THE					
	1877-79.		1880-82.		1883-85.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
<i>United States—Con.</i>						
Logs—		\$		\$		\$
1 Hemlock.....M. ft.	1,065	4,104	4,425	13,093	4,257	18,181
2 Oak....."	826	7,703	3,788	49,619	1,727	25,255
3 Elm....."						
4 Spruce....."	3,513	12,454	5,449	19,179	8,080	37,367
5 Pine....."	223	1,212	2,009	16,683	1,406	9,708
6 Tamarack....."	9	52	133	1,247	5	48
7 All other....."	10,854	54,245	23,581	101,319	30,322	147,513
Lumber—						
8 Battens.....Pcs.	47	211			2	4
9 Deals.....Std.H.	3,149	80,448	9,385	270,511	17,373	521,126
10 Deal ends....."	19	227	33	696	42	704
11 Laths, &c.....M.	140,588	134,940	199,469	210,099	233,279	343,340
12 Boards, &c.....M. ft.	336,374	3,162,347	603,197	6,198,325	582,355	7,265,254
13 Scantlings, &c.....M.	11,594	91,241	14,832	121,289	8,531	64,329
14 Staves, standard.....M.	216	9,995	301	3,281	266	1,851
15 do other and headings....."	2,593	14,772	16,173	72,946	52,950	256,476
16 All other....."		25,709		42,975		136,171
17 Masts and spars.....Pcs.	15,114	11,950	40,770	23,994	18,264	16,075
18 Posts, cedar, tamarack and other....."						
19 Shingles.....M.	51,967	100,023	96,998	203,982	92,674	233,863
20 Shingle bolts.....Cords.	381	953	1,134	3,747	705	2,816
21 Sleepers.....Pcs.	996,237	182,397	2,396,535	342,009	1,394,638	325,197
22 Stave bolts.....Cords.	13,824	28,032	76,593	114,922	51,242	147,177
23 Shooks.....No.		14,747		29,289	15,965	6,576
Timber, square—						
24 Ash.....Tons.			49	199	154	1,301
25 Birch....."	43	262	44	430	75	655
26 Elm....."	92	740	494	1,826	122	373
27 Oak....."	950	6,484	1,462	9,797	527	4,644
28 Maple....."			356	2,549	64	660
29 Pine, white....."	1,059	5,413	5,359	19,477	2,544	13,388
30 do red....."	42	333	475	2,176	29	242
31 All other....."	946	5,332	3,011	10,432	1,470	8,763
32 Pulpwood....."						
33 Other wood....."		67,676		142,554		128,808
34 Totals.....		4,716,314		9,040,202		10,665,893
<i>Labrador.</i>						
Lumber—						
35 Deals.....Std.H.			1		1	39
36 Boards, &c.....M. ft.	3	40	5	49	4	57
37 Scantlings....."				97		
38 Staves, other & headings.....M.				6		
39 Staves, all other....."		17				
40 Shingles.....M.	32	70				
41 Timber, square, elm.....Tons.		64	10	25	3	6
42 Totals.....		191		192		102

\* Includes \$63,957 of Piles and Pile Lumber.





TABLE 8 (a)—(From Trade and  
AVERAGE of Total Exports of the Products of

ARTICLES.	AVERAGE EXPORTS FOR					
	1877-79.		1880-82.		1883-85.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
<i>Newfoundland.</i>						
1 Ashes, pot and pearl . . . . . Brls.			17	404	26	878
2 Tanner's bark . . . . . Cords		4	452	1,736	540	2,638
3 Basswood, butternut and hickory . . . . . M. ft.	22	244	8	500	5	97
4 Firewood . . . . . Cords	5	12	50	67	14	28
5 Hop, hoop, telegraph and other poles . . . . .		189				
6 Knees and futtocks . . . . . Pes.	43	35	23	26	807	135
7 Logs—						
8 Hemlock . . . . . M. ft.	305	648	2	11	4	30
9 Oak . . . . . "			4	177		
10 Spruce . . . . . "			1	25		
11 All other . . . . . "	26	59				
12 Lumber—						
13 Battens . . . . . Pes.	123	18				
14 Deals . . . . . Std. H.	194	4,294	115	2,529	128	5,086
15 Deal ends . . . . . "			5	116		
16 Laths, &c. . . . . M.	813	1,196	1,059	1,309	781	1,158
17 Boards, &c. . . . . M. ft.	8,486	57,278	4,535	37,734	8,736	83,754
18 Scantlings . . . . . "	658	5,660	361	3,322	320	3,002
19 Staves, standard . . . . . M.	70	1,654	1,112	1,802	101	1,952
20 Staves, other & headings. . . . . "	929	13,726	986	6,137	198	2,843
21 All other . . . . . "		728		2,372		2,798
22 Nests and spars . . . . . Pes.	985	2,772	137	1,336	452	3,028
23 Oars . . . . . Prs.	21	12				
24 Shingles . . . . . M.	7,661	12,102	4,871	6,973	7,026	10,541
25 Stave bolts . . . . . Cords.						
26 Shooks . . . . . No.	317	1,112		201	1,080	633
27 Timber, square—						
28 Birch . . . . . Tons.	138	751	105	633	153	708
29 Elm . . . . . "	2	24	1	12	5	90
30 Maple . . . . . "			1	18		
31 Oak . . . . . "	7	133	4	98	11	210
32 Pine, white . . . . . "	43	343	183	1,011	68	331
33 do red . . . . . "	4	71	18	387	8	91
34 All other . . . . . "	179	966	18	56	210	988
35 Sleepers . . . . . Pes.	230	46	14,408	3,973	2,700	401
36 Other wood . . . . . "		386		215		1,488
37 Total . . . . .		104,493		72,581		122,908
<i>Belgium.</i>						
38 Ashes, pot and pearl . . . . . Brls.			4	90		
39 Basswood, butternut and hickory . . . . . M. ft.			28	872	13	407
40 Lumber—						
41 Deals . . . . . Std. H.	216	5,284	221	6,193	39	1,161
42 Deal ends . . . . . "	10	202	19	427	64	2,049
43 Laths, &c. . . . . M.	8	111				86
44 Boards, &c. . . . . M. ft.	188	6,581	40	647	3	27
45 Staves, standard . . . . . M.	1	273		71		
46 do other & headings. . . . . "	2	101				
47 All other . . . . . "						
48 Timber, square—						
49 Ash . . . . . Tons.	8	67	63	595	17	208
50 Birch . . . . . "					1	10
51 Pulpwood . . . . . "						



## DEPARTMENT OF AGRICULTURE.

TABLE 8 (a)—(From Trade and  
AVERAGE of Total Exports of the Products of

ARTICLES.	AVERAGE EXPORT FOR					
	1877-79.		1880-82.		1883-85.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
<i>Belgium—Concluded.</i>						
Timber, square—		8		8		8
1 Elm..... Tons.						
2 Oak..... " "	2,109	34,440	42	500		
3 Maple..... " "			607	11,063	250	4,455
4 Pine, white..... " "			14	152		
5 do red..... " "	723	5,289	348	3,290	153	1,385
6 All other..... " "			65	525		
7 Logs..... M. ft.			7	102		
8 Total.....		52,346		24,529		9,788
<i>Italy.</i>						
Lumber—						
9 Deals..... Std.H.			97	2,424	145	4,403
10 Deal ends..... " "			5	98	9	158
11 Boards, &c..... M. ft.						731
12 Scantlings..... " "			1	8	13	93
13 Staves, other & headings M.						
14 Total.....				2,530		5,385
<i>Holland.</i>						
15 Ashes, pot and pearl..... Brls.						
16 Basswood, butternut and hickory..... M. ft.	2	42	13	159		
17 Knees and futtocks..... Pcs.						
Lumber—						
18 Deals..... Std.H.	614	16,591	1,458	31,347	345	8,345
19 Deal ends..... " "	28	509	37	798	8	146
20 Laths, &c..... M.	4	53				
21 Boards, &c..... M. ft.	23	535	18	212		
22 Scantlings..... " "			61	366		
23 Staves, standard..... M.		104				
24 All other..... " "						
Timber, square—						
25 Ash..... Tons	23	156				
26 Oak..... " "	1,350	21,401	228	3,060	135	2,749
27 Pine, white..... " "	294	3,164	139	1,211	141	1,626
28 do red..... " "					19	79
29 Total.....		42,553		37,103		12,945
<i>Germany.</i>						
30 Ashes, pot and pearl..... Brls.	3	64				
31 Basswood, butternut and hickory..... M. ft.	12	350			2	64
Lumber—						
32 Deals..... Std.H.	40	1,445	88	2,535	3	309
33 Deal ends..... " "	3	71	3	51	3	266
34 Boards, &c..... M. ft.	514	5,315	550	4,873	24	372
35 Battens..... " "			197	111		
36 Scantlings..... " "			23	135		
37 Staves, standard..... M.			17	507		
38 All other..... " "						
39 Knees and futtocks..... Pcs.	138	467				



TABLE 8 (a).—(From Trade and  
AVERAGE of Total Exports of the Products of

ARTICLES.	AVERAGE EXPORTS FOR					
	1877-79.		1880-82.		1883-85.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
<i>Germany—Concluded.</i>						
		\$		\$		\$
1 Timber, square—						
2 Ash..... Tons.....					11	122
3 Elm..... ".....	46	1,083			30	416
4 Oak..... ".....		5				
5 Maple..... ".....	148	1,470				
6 Pine, white..... ".....	51	1,487				
7 All other..... ".....					5	272
8 Logs..... M ft.....						
9 Other wood.....		3				
9 Total.....		11,760		8,214		1,826
<i>France.</i>						
10 Ashes, pot and pearl..... Brls.....			10	221	159	5,043
11 Basswood, butternut and hickory..... M ft.....	26	633	6	142		
12 Logs, hemlock..... ".....				1		
<i>Lumber—</i>						
13 Deals..... Std. H.....	9,505	235,150	19,850	502,324	12,286	318,013
14 Deal ends..... ".....	414	6,852	767	13,626	317	8,394
15 Laths, &c..... M.....	19	168	26	171	1	10
16 Boards, &c..... M ft.....	249	5,078	834	6,804	281	2,208
17 Scantlings..... ".....	49	294	865	5,344	216	1,466
18 Staves, standard..... M.....	4	792	1	162	1	467
19 do other and headings..... ".....	5	369	3	219		
20 All other..... ".....						
21 Masts and spars..... Pes.....	42	1,485				120
22 Shingles..... M.....	17	42				
23 Sleepers..... Pes.....						
<i>Timber, square—</i>						
24 Ash..... Tons.....	99	896	111	878		
25 Birch..... ".....	36	358	5	17	65	551
26 Elm..... ".....	84	979	149	1,275	87	673
27 Maple..... ".....		3				
28 Oak..... ".....	1,985	31,838	1,358	17,428		
29 Pine, white..... ".....	733	5,343	698	4,454	221	2,749
30 do red..... ".....	8	55	1	6	216	3,195
31 All other..... ".....	27	392	83	552	23	315
32 Other wood.....		7				
33 Total.....		290,934		553,624		342,604
<i>Spain.</i>						
34 Basswood, butternut and hickory..... M ft.....			1	20		
35 Hop, hoop, telegraph and other poles.....		1				
<i>Lumber—</i>						
36 Battens..... Pes.....						
37 Deals..... Std. H.....	1,139	26,443	2,372	60,136	3,074	611
38 Deal ends..... ".....	50	770	113	1,824	4,048	121,587
39 Laths, &c..... M.....				199	5	3,485
40 Boards, &c..... M ft.....	387	6,041	18	142		36
41 Scantlings..... ".....	27	267	50	204	265	6,213
42 Staves, standard..... M.....	3	576			323	2,279
43 Masts and spars..... Pes.....	64	1,150	80	582		168
44 Oars..... Pes.....	165	243				
45 Shingles..... M.....	9	9				

\* Pulp wood.

from Trade and  
the Products of

Navigation Returns)—Continued.

the Canadian Forests in three-year periods—Continued.

AGE EXPORTS FOR

1883-85.

Quantity.	Value.
	\$
11	122
30	416
5	272
	1,826
159	5,043
286	318,013
317	8,334
1	10
281	2,208
210	1,466
1	467
	120
65	551
87	673
221	2,149
116	3,195
23	315
	342,604
4	611
8	121,587
19	3,485
5	36
5	6,213
3	2,279
	168

THE PERIODS OF				EXPORTS FOR YEARS			
1886-88.		1889-91.		1892.		1893.	
Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	\$		\$		\$		\$
		21	337				
		245	5,104				
		5	167				
11	220	36	1,074	47	1,331		
	1,001		12,461		2,449		1,708
376	7,469	309	8,859				
		32	1,830	38	2,646	67	4,407
7,363	177,863	3,609	100,221	6,894	178,560	3,408	95,515
436	7,433	186	3,730	240	4,692	160	2,985
32	47	23	284			128	6,696
124	1,066	4	26	12	72		
42	316	7	1,549				
	33						
11	130	4	33				
44	270	30	305				
167	1,917	176	2,410				
1	9	82	2,281				
205	2,344	433	6,091				
60	695	20	169				
1	23		20				
			67				645
	199,615		127,875		185,970		110,248
1,998	52,907	1,194	29,911	981	24,728	1,622	40,235
139	1,826	58	1,380	61	1,065	67	1,264
17	25	34	578	59	412		
7	67		2				
36	328						

TABLE 8 (a).—From Trade and  
AVERAGE of Total Exports of the Products of

ARTICLES.	AVERAGE EXPORTS FOR					
	1877-79.		1880-82.		1883-85.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
<i>Spain—Concluded.</i>						
		\$		\$		\$
Timber, square—						
1 Ash..... Tons.						
2 Birch.....						
3 Elm.....			112	818	36	281
4 Maple.....				5		
5 Oak.....			15	194	33	840
6 Pine, white.....	63	1,129	25	508		
7 " red.....	5	54	1	3	16	97
8 All other.....	142	1,030			1	12
			1	9	4	17
9 Total.....		37,713		64,445		135,596
<i>Portugal.</i>						
Lumber—						
10 Deals..... Std. H.	612	19,381	961	28,051	1,305	42,173
11 Deal ends.....	23	471	33	879	57	1,523
12 Laths, &c..... M.	11	52				
13 Boards, &c..... M. ft.	309	4,702	119	3,738	187	2,509
14 Scantlings.....	20	122				
15 Staves, standard..... M.	63	20,322	78	24,206	35	13,235
16 " other, and head-ings.....						
17 All other.....	34	5,007	21	1,871	17	1,658
18 Masts and spars.....						
19 Shingles..... Pes.	31	102	14	193	40	21
Timber, square—						
20 Ash..... Tons.						
21 Birch.....			16	230		
22 Elm.....	53	298	40	352	69	418
23 Maple.....	39	407	7	100		
24 Oak.....		2				
25 Pine, white.....	124	1,983	214	3,604		
26 " red.....			17	100		
27 All other.....	82	427	25	212		
28 Other wood.....	7	173	4	168		25
		70		7		
29 Total.....		53,519		63,711		61,662
<i>Gibraltar.</i>						
Lumber—						
30 Deals..... Std. H.	76	2,775	261	7,259	236	6,769
31 Deal ends.....	3	72	16	405	8	220
32 Boards, &c..... M. ft.	6	89				
33 Staves, other, and head-ings..... M.	7	567	2	173		
34 Laths, &c.....						
35 Masts and spars..... Pes.	2	155				
36 Staves, standard..... M.	1	198				
Timber, square—						
37 Birch..... Tons.			25	315		
38 Elm.....	12	160				
39 Oak.....	24	439				
40 Pine, white.....	1	3	142	933		
41 " red.....	56	735	1	41		
42 Total.....		5,193		9,126		6,989

from Trade and  
the Products of

Navigation Returns)—Continued.

the Canadian Forest in three-year periods—Continued.

AGE EXPORTS FOR

1883-85.

Quantity.	Value.
	\$
36	281
33	840
16	67
1	12
4	17
	135,596
1,305	42,173
57	1,523
187	2,509
35	13,235
17	1,558
40	21
115	200
69	418
4	
4	
52	1,070
4	83
	25
	61,662
236	6,769
8	220
	6,989

THE PERIODS OF		EXPORTS FOR YEARS					
1886-88.		1889-91.		1892.		1893.	
Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	\$		\$		\$		\$
8	101	42	614				
		50	1,143				
		378	6,785				
				166	796		
	55,314		40,413		27,001		41,499
1,048	31,832	1,373	35,320	1,296	37,072	951	20,301
57	1,343	64	1,512	65	1,430	29	670
37	97			67	119		
135	1,757	16	929	259	2,907		
2	482	2	645				
12	2,470						
5	9		1,221		165		
67	100			50	69		
13	175			17	258		
4	57						
4	67						
52	1,070	8	174	187	4,112		
4	83	1	21				
					6		
	39,543		39,822		46,138		20,971
238	6,415	80	2,082	150	3,706	157	4,696
15	356	7	118	5	96		
3	28						
	6,799		2,200		3,802		4,696



TABLE 8 (a)—(From Trade and  
AVERAGE OF Total Exports of the Products of

ARTICLES.	AVERAGE OF EXPORTS FOR					
	1877-79.		1880-82.		1883-85.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
<i>Madeira.</i>						
Lumber—		8		8		8
1 Deals..... Std. H.	2	50	1	17		
2 Laths, &c..... M.	3	3				
3 Boards, &c..... M. ft.	647	9,177	797	10,623	1,123	16,708
4 Scantlings..... "	11	154	5	48	45	605
5 Masts and spars..... Pes.	12	32	18	50	6	6
6 Shingles..... M.						
7 Timber, all other..... Tons.	92	398				
8 Total.....		10,014		10,738		17,366
<i>French West Indies.</i>						
9 Hop, hoop, telegraph and other poles.....		13				
Lumber—						
10 Deals..... Std. H.			188	4,653		
11 Deal ends..... M. ft.			8	130		
12 Boards, &c..... M. ft.	1,313	13,272	1,417	15,404	1,008	10,525
13 Masts and spars..... Pes.	35	52	51	87	13	31
14 Oars..... M.	10	14	383	29		
15 Shingles..... Pes.	627	908	532	758	457	088
16 Steepers..... No.			2,449	600		
17 Shooks.....						
18 Other wood.....		93				8
19 Total.....		14,352		21,661		11,444
<i>Spanish West Indies.</i>						
20 Hop, hoop, telegraph and other poles.....		177		14		
Lumber—						
21 Deals..... Std. H.						
22 Laths, &c..... M.	3	3	20	65	5	57
23 Boards, &c..... M. ft.	7,425	92,253	7,155	87,196	5,371	63,414
24 Scantlings..... M.	19	264		1	3	67
25 Staves, standard..... "	1	14				
26 Staves, other & headings..... M.		173				
27 All other.....						
28 Masts and spars..... Pes.	40	239	34	26		4
29 Shingles..... M.	2,143	3,744	1,062	65	25	80
30 Shooks.....		101,805		43,447	364	736
31 Spruce logs..... M. ft.						22,381
32 Other wood.....				529		
33 Total.....		198,672		133,354		86,759
<i>British West Indies.</i>						
34 Firewood..... Cords.	15	46	81	271	40	143
35 Hop, hoop, telegraph and other poles.....						
36 Knees and futtocks..... Pes.	42	378		138		13
37 Logs—		60	3	3	53	7
37 Hemlock..... M. ft.						
38 Spruce.....					9	39



DEPARTMENT OF AGRICULTURE.

TABLE 8 (a)—(From Trade and  
AVERAGE of Total Exports of the Products of

ARTICLES.	AVERAGE EXPORTS FOR					
	1877-79.		1880-82.		1883-85.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
<i>British West Indies—Concluded.</i>						
Lumber—		\$		\$		\$
1 Deals..... Std. H.	16	386	9	226	37	850
2 Deal ends..... "					2	30
3 Laths, &c..... M.	242	480	287	628	311	607
4 Boards, &c..... M. ft.	30,529	292,429	25,012	268,818	18,615	211,479
5 Scantlings..... "	24	333	46	390	118	1,122
6 Staves, standard..... M.	73	1,678	29	824	43	974
7 Staves, other & headings..... "	118	1,998	36	367	31	292
8 All other..... "		101		4		748
9 Masts and spars..... Pcs.	321	1,780	647	1,193	622	1,362
10 Oars..... Prs.	537	985	889	634	232	560
11 Shingles..... M.	15,417	38,334	12,408	28,651	14,481	30,391
12 Shooks..... "		31		358		2,467
Timber—						
13 Birch..... Tons.	6	29				
14 All other..... "	1	5				
15 Other wood..... "		902		384		193
16 Total.....		339,955		302,889		251,277
<i>Canary Islands.</i>						
Lumber—						
17 Laths, &c..... M.	74	191	48	111		
18 Boards, &c..... M. ft.	301	4,176	299	4,351	36	569
19 Scantlings..... "	58	661	203	2,395	5	221
20 Masts and spars..... Pcs.	30	98				
21 Hop, hoop, telegraph and other poles.....				14		
22 Total.....		5,126		6,871		790
<i>St. Pierre.</i>						
23 Ashes, pot, pearl and other		8		7		19
24 Firewood..... Cords.	63	152	30	52	10	23
25 Hop, hoop, telegraph and other poles.....						
26 Knees and futtocks..... Pcs.	90	93	41	21	1,762	949
27 Logs—						
27 Hemlock..... M. ft.	18	121	2	12	13	71
28 Oak..... "				247	13	127
29 All other..... "			35	7	1	8
Lumber—						
30 Battens..... Pcs.			1			
31 Deals..... Std. H.	43	829	283	34		
32 Deal ends..... "			195	4,996	15	566
33 Laths, &c..... M.	250	358	5	86		
34 Boards, &c..... M. ft.	1,029	8,738	252	381	82	105
35 Scantlings..... "	62	611	1,526	11,688	4,726	14,693
36 Staves, standard..... M.	29	402	89	607	46	381
37 Staves, other & headings..... "	10	50	67	638	144	1,024
38 All other..... "		279	198	995	208	1,548
39 Masts and spars..... Pcs.	325	549		22		25
40 Sleepers..... "			54	397	337	1,062
41 Shingles..... M.	1,484	2,267	1,312	1	42	18
42 Shooks..... No.	668	871		1,797	1,502	2,328



TABLE 8 (a)—(From Trade and  
AVERAGE of Total Exports of the Products of

ARTICLES.	AVERAGE EXPORTS FOR					
	1877-79.		1880-82.		1883-85.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
<i>St. Pierre—Concluded.</i>						
Timber, square—		\$		\$		\$
1 Birch..... Tons.	125	630	27	109	40	196
2 Elm..... "	3	38				
3 Oak..... "	18	155	9	169	40	733
4 Pine, white..... "		1	53	187		
5 do red..... "			2	28		
6 All other..... "		4	15	363	3	92
7 Other wood..... "		468		219		59
8 Total.....		16,716		23,087		33
<i>Danish West Indies.</i>						
Lumber—						
9 Laths, &c..... M.			8	22		
10 Deals..... Std. H.					1	28
11 Boards..... M. ft.	204	2,118	288	2,914	106	1,327
12 Scantlings..... "					57	617
13 All other..... "						31
14 Masts and spars..... Pes.	10	396				12
15 Shingles..... M.	37	83	2	23	8	169
16 Shooks..... "					61	
17 Total.....		2,597		2,959		2,184
<i>St. Domingo and Hayti.</i>						
Lumber—						
18 Boards, &c..... M. ft.	665	8,206	687	9,252	262	3,383
19 Scantlings..... "	27	324	15	129	22	265
20 Masts and spars..... Pes.	17	170	13	41	5	25
21 Oars..... "						
22 Shingles..... M.	349	929	60	98		
23 Other wood..... "		200	276	444	175	312
24 Total.....		9,820		9,964		3,985
<i>*South America.</i>						
25 Ashes..... Brls.	17	449				
Lumber—						
26 Deals..... Std. H.	61	2,135	2,561	139,189		
27 Deal ends..... "	4	66	1	13		
28 Laths, &c..... M.	279	1,846	154	1,592		
29 Boards, &c..... M. ft.	17,496	256,268	14,756	190,680		
30 Scantlings..... "	225	2,202	591	6,684		
31 Staves, other and head- ings..... M.			1	50		
32 Masts and spars..... Pes.	192	902	109	169		
33 Shooks..... "		108		43		
Timber, square—						
34 Oak..... Tons.	22	551				
35 All other..... "			50	183		
36 Total.....		264,527		338,603		

\* Details of the countries which formed South America up to 1882 are given separately after that year.

Navigation Returns)—Continued.  
 the Canadian Forest in three-year periods—Continued.

from Trade and  
 the Products of  
 AGE EXPORTS FOR

1883-85.

Quantity.	Value.
	\$
40	196
40	733
7	92
3	59
	33
	24,060
1	28
106	1,327
57	617
	31
8	12
61	169
	2,184
262	3,383
22	265
5	25
175	312
	3,985

that year.

THE PERIODS OF				EXPORTS FOR YEARS			
1886-88.		1889-91.		1892.		1893.	
Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	\$		\$		\$		\$
26	185	27	140	9	36	29	116
18	220		7				
		3	55				
		4	113				
	47		164				
	28,352		24,477		21,056		16,811
3	5						
88	939	210	3,082	226	3,532	28	378
1	4						
174	416	331	857	395	755	266	\$ 104
	635		873		300		610
	1,999		4,812		4,587		867
							1,959
47	653	44	576				
		7	73				
36	54						
	707		649				

§ Staves, other and headings.

TABLE 8 (a)—(From Trade and  
AVERAGE of Total Exports of the Products of

ARTICLES.	AVERAGE EXPORTS FOR					
	1877-79.		1880-82.		1883-85.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
<i>Chili.</i>						
1 Firewood . . . . . Cords.						
Lumber—						
2 Boards, &c. . . . . M. ft.					2	4
3 Deals . . . . . Std. H.					3,174	41,636
4 Laths, &c. . . . . M.						
5 Masts and spars . . . . . Pcs.					17	48
					19	66
6 Total . . . . .						41,754
<i>Brazil.</i>						
Lumber—						
7 Deals . . . . . Std. H.						
8 Deal ends . . . . . "					311	13,889
9 Boards, &c. . . . . M. ft.						
10 Laths, &c. . . . . M.					521	7,387
11 Scantling . . . . . M. ft.					5	52
12 All other . . . . .					38	397
13 Masts and spars . . . . . Pcs.						
14 Oars . . . . . Pcs.					17	54
15 Shingles . . . . . M.					11	15
16 Shooks . . . . . No.					104	208
17 Timber, square— Pine, white . . . . . Tons.						
18 Total . . . . .						22,002
<i>Argentine Republic.</i>						
Lumber—						
19 Deals . . . . . Std. H.						
20 Deal ends . . . . . "					5,294	318,175
21 Laths, &c. . . . . M.					7	247
22 Boards, &c. . . . . M. ft.					169	1,056
23 Scantlings, &c. . . . . "					4,550	56,171
24 All other . . . . .					201	2,200
25 Masts and spars . . . . . Pcs.						5
26 Shooks . . . . . No.					329	1,234
27 Total . . . . .						379,088
<i>Uruguay.</i>						
28 Hop, hoop, telegraph and other poles . . . . .						25
Lumber—						
29 Deals . . . . . Std. H.						
30 Laths, &c. . . . . M.					1,884	104,879
31 Boards, &c. . . . . M. ft.					322	3,502
32 Scantlings, &c. . . . . "					4,602	54,229
33 All other . . . . .					693	7,966
34 Masts and spars . . . . . Pcs.						
35 Shingles . . . . . M.					87	415
36 Shooks . . . . . No.						
37 Timber, square, all other . . . . .					11	77
38 Total . . . . .						171,033

FOREST WEALTH OF CANADA.

Navigation Returns)—Continued.  
the Canadian Forest in three-year periods—Continued.

from Trade and  
the Products of  
EXPORTS FOR

Quantity.	Value.
	\$
2	4
3,174	41,636
17	48
10	66
....	41,754
311	13,889
521	7,387
5	52
38	397
17	54
11	15
104	208
....	22,002
294	318,175
7	247
169	1,056
550	56,171
201	2,200
5	5
329	1,234
....	379,088
....	25
84	494,879
22	3,502
02	54,229
93	7,906
37	415
11	77
....	171,033

THE PERIODS OF				EXPORTS FOR YEARS			
1886-88.		1889-91.		1892.		1893.	
Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	\$		\$		\$		\$
4,882	51,136	6,814	77,643	14,295	134,181	11,652	117,199
67	5,000	.....	.....	.....	.....	.....	.....
129	46	128	256	870	1,185	912	1,017
19	88	21	128	47	539	.....	.....
.....	56,270	.....	78,027	.....	135,905	.....	118,216
76	3,675	348	9,782	408	11,191	416	11,730
232	2,616	5	124	.....	.....	.....	.....
.....	.....	301	4,305	2,198	21,588	1,375	12,896
.....	.....	80	72	40	142	48	243
.....	.....	121	1,327	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	6,286
.....	.....	.....	.....	31,200	2,771	.....	.....
.....	.....	84	780	12	138	.....	.....
.....	6,291	.....	16,390	.....	35,830	.....	31,155
5,360	336,453	478	25,937	.....	.....	.....	.....
803	8,586	389	6,478	16	124	132	1,194
3,365	35,723	9,914	111,531	5,578	53,304	13,247	133,562
947	11,771	1,616	17,489	1,383	15,063	2,697	27,210
.....	178,976	.....	294,644	.....	29,381	.....	194,802
313	2,175	17	175	.....	.....	.....	.....
13,848	1,395	210,644	11,878	6,590	2,678	14,000	1,151
.....	575,082	.....	468,132	.....	100,550	.....	357,919
769	33,781	.....	.....	.....	.....	.....	.....
229	1,936	105	543	.....	.....	.....	.....
1,681	18,498	3,782	43,152	118	1,274	107	749
977	10,459	.....	.....	.....	.....	882	9,189
.....	18,962	.....	.....	.....	.....	555	4,457
.....	.....	12	13	.....	.....	.....	7,602
.....	.....	.....	.....	95,799	8,503	14,200	1,300
.....	85,636	.....	43,708	.....	9,777	.....	23,297



TABLE 8 (a).—(From Trade and  
AVERAGE of the Total Exports of the Produce of

ARTICLES.	AVERAGE EXPORTS FOR					
	1877-79.		1880-82.		1883-85.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
<i>Peru.</i>						
Lumber—		8		8		8
1 Deals . . . . . Std. H.						
2 Boards, &c. . . . . M. ft.					5	143
3 Scantlings . . . . . "					3,286	51,399
4 Laths, &c. . . . . M.					13	133
5 All other . . . . . "						
6 Total . . . . .						51,675
<i>British Guiana.</i>						
7 Hop, hoop, telegraph and other poles . . . . .		186				
Lumber—						
8 Laths, &c. . . . . M.						
9 Deals . . . . . Std. H.			1	6	4	30
10 Boards, &c. . . . . M. ft.	2,328	26,164	3,668	42,218	6,736	143
11 Scantlings . . . . . "					3	81,721
12 Staves, standard . . . . . M.	1	8	1	7	17	26
13 " other, and head-ings . . . . . "						393
14 All other . . . . . "	10	84		6	15	341
15 Logs, spruce . . . . . M. ft.		54				
16 Masts and spars . . . . . Pcs.	169	37	65	72	137	361
17 Oars . . . . . Prs.			13	30	154	331
18 Shingles . . . . . M.	461	980	45	83	288	565
19 Shooks . . . . . "		10		1,047		2,239
20 Other wood . . . . . "		32		52		290
21 Total . . . . .		27,555		43,527		86,350
<i>Australia.</i>						
Lumber—						
22 Laths, &c. . . . . M.	943	3,076	944	3,336	4,427	15,738
23 Deals . . . . . Std. H.	1,016	35,254	923	29,163	1,318	30,705
24 Deal ends . . . . . "	40	671	39	859	49	711
25 Boards, &c. . . . . M. ft.	10,501	113,432	14,929	130,465	16,442	207,252
26 Scantlings . . . . . "	2	10	30	206	14	144
27 Staves, standard . . . . . M.	1	124				
28 " other, and head-ings . . . . . "						
29 All other . . . . . "						
30 Masts and spars . . . . . Pcs.	381	1,781	2	18		544
31 Shingles . . . . . M.	25	73	39	77	12	262
32 Shooks . . . . . "						
33 Timber, square, all other . . . . . Tons.						
34 Other wood . . . . . "		67		51		13
35 Total . . . . .		154,488		164,115		255,009
<i>China.</i>						
36 Knees and futtocks . . . . . Pcs.	11	72				
Lumber—						
37 Boards . . . . . M. ft.	4,558	54,940	2,620	32,354	2,789	38,964
38 Laths . . . . . M.	166	566	194	658	215	1,064

FOREST WEALTH OF CANADA.

(From Trade and  
of the Produce of

Navigation Returns)—Continued.

Canadian Forest in three-year periods—Continued.

VERAGE EXPORTS FOR

1883-85.		THE PERIODS OF							
		1886-88.		1889-91.		EXPORTS FOR YEARS			
Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	\$		\$		\$		\$		\$
5	143	1,913	20,377	4,050	41,115	1,818	19,792	4,095	34,767
3,296	51,399			25	17,997				
13	133								
	51,675		20,377		45,129		19,792		34,767
4	30								
5	143								
6,736	81,721	3,189	36,701	3,342	39,454	50	80		
3	26	11	73			476	9,104	1,216	16,229
17	393	3	69	3	69				
	341		7		50				
					155		40		
137	361	22	88	4	89	19			
154	331						320	14	90
288	505								
	2,239	383	644	376	923				
	260		293		475	275	318	249	477
	86,350		127		115				160
			38,002		41,330		9,862		16,956
4,427	15,738	1,701	7,181	3,884	11,307	5,438	20,785	1,964	4,591
1,318	30,705	295	8,597	1,200	42,086	1,176	33,926	508	14,355
49	711	12	212	48	1,474	40	820	29	685
16,442	207,252	13,626	135,486	16,474	176,800	18,809	172,966	14,665	114,211
14	144	10	77	23	273				
				60	888	26	230	60	480
	544	20	206						
12	262				3,353		22,768		14,243
		36	75					34	61
	13			187	355				
			8		1,867				
	255,009		151,842		238,425		251,495		148,626
2,789	38,964	4,031	46,423	3,086	38,323	747	7,656	963	9,184
215	1,064	310	1,066	116	492				

TABLE 8 (a).—From Trade and  
AVERAGE of the Total Exports of the Products of

ARTICLES.	AVERAGE EXPORTS FOR					
	1877-79.		1880-82.		1883-85.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
<i>China—Concluded.</i>						
		\$		\$		\$
1 Masts and spars..... Pcs.	270	3,458	67	757		
2 Shingles..... M.	143	426	19	453		
3 Other wood.....				12		
4 Total.....		59,462		34,234		40,028
<i>Africa.</i>						
Lumber—						
5 Deals..... Std. H.	482	12,916	941	26,253	1,282	36,176
6 Deal ends..... "	21	448	40	672	32	617
7 Boards, &c..... M. ft.	1,213	14,204	1,625	19,204	1,133	13,962
8 Scantlings..... "	42	423	5	279	97	699
9 Laths, &c..... M.	29	154	5	68	29	296
10 Staves, standard..... "	6	489			1	533
11 Staves, other & headings..... "	19	1,224	16	1,260	77	7,365
12 Masts and spars..... Pcs.	50	702	12	345	50	318
13 Shingles..... M.	3	7				
Timber, square—						
14 Ash..... Tons.			8	120		
15 Elm..... "			6	91		
16 Maple..... "			8	211		
17 Other timber..... "						
18 Other wood.....		20				
19 Total.....		30,587		48,513		59,966
20 Other Countries.....		28,620		17,995		39,811
EXPORTS of the						
21 Ontario.....		3,396,393		6,543,924		7,605,820
22 Quebec.....		10,031,968		9,849,690		10,835,735
23 Nova Scotia.....		930,571		1,291,381		1,483,311
24 New Brunswick.....		4,453,057		4,802,164		5,116,381
25 Manitoba.....						121
26 British Columbia.....		295,716		261,474		376,090
27 Prince Edward Island.....		55,847		31,089		21,819
28 The Territories.....						

From Trade and  
the Products of

Navigation Returns)—Continued.

the Canadian Forest in three-year periods—Continued.

EXPORTS FOR

1883-85.		THE PERIODS OF							
		1886-88.		1889-91.		1892.		1893.	
Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	\$		\$		\$		\$		\$
.....	.....	3	.....	7	305	68	601	44	614
.....	.....	.....	.....	.....	585	.....	265	.....	150
.....	40,928	.....	47,496	.....	39,705	.....	8,522	.....	9,948
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1,282	36,176	610	15,644	139	5,015	142	3,613	295	7,986
32	617	26	442	6	152	.....	.....	.....	.....
1,133	13,962	1,030	15,949	839	13,706	1,748	19,086	217	5,518
97	699	134	1,455	13	172	.....	.....	.....	.....
29	296	173	408	416	648	515	1,113	.....	.....
1	533	1	311	.....	.....	.....	.....	.....	.....
77	7,365	29	2,417	.....	.....	.....	.....	.....	.....
50	318	30	129	5	12	.....	.....	.....	.....
.....	.....	98	140	17	17	.....	.....	16	889
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	24	367
.....	.....	.....	.....	.....	.....	.....	.....	64	1,068
.....	59,966	.....	36,946	.....	19,722	.....	23,812	.....	15,828
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	39,811	.....	33,775	.....	16,061	.....	17,260	.....	40,891

EXPORTS of the

Forest by Provinces.

7,605,820	7,052,752	8,474,251	8,340,915	9,947,925
10,835,735	9,149,048	10,087,240	8,610,849	9,832,543
1,483,311	1,504,866	1,730,981	1,664,778	1,823,960
5,116,381	4,651,451	5,174,245	4,582,520	5,539,666
121	337	22	184	1,670
376,090	290,773	389,970	425,278	454,994
21,819	15,394	9,041	8,785	12,033
.....	.....	45	367	.....

## DEPARTMENT OF AGRICULTURE.

TABLE 8 (a)—(From Trade and  
AVERAGE of the Total Exports of the Products of

ARTICLES.	AVERAGE EXPORTS FOR					
	1877-79.		1880-82.		1883-85.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
		\$		\$		\$
1 Ashes, leached and other.....		4,656		14,312		31,664
2 do pot and pearl..... Bbls.	15,700	338,010	11,100	307,949	7,069	216,616
3 Basswood, butternut and hickory..... M. ft.	82,820	296,648	102,052	451,560	71,991	361,881
5 Firewood..... cords.	1,263	23,718	1,746	31,014	1,438	31,206
6 Hop, hoop, telegraph and other poles.....	163,261	318,894	156,376	324,947	156,281	353,129
7 Knees and futtocks.....		38,096		177,872		164,342
8 Lathwood..... Cords.	27,360	12,455	17,480	22,685	24,475	20,657
9 Handspikes..... Pes.	1,613	13,738	932	6,282	474	3,068
Logs—		1,095		1,247		1,406
10 Hemlock..... M. ft.	1,813					
11 Elm.....	1,392	4,874	4,430	13,118	4,295	18,448
12 Oak.....						
13 Spruce.....	1,122	12,146	3,875	52,440	1,732	25,296
14 Pine.....	3,527	12,994	5,449	19,179	8,081	37,375
15 Tamarac.....	223	1,212	2,009	16,683	1,406	9,708
16 All other.....	9	52	133	1,247	5	48
Lumber—	14,749	56,625	23,675	101,762	30,499	148,658
17 Battens..... Pes.	53,078	10,938	49,011	11,584	16,179	7,158
18 Deals..... Std.H.	240,150	7,164,123	254,234	7,737,472	271,307	8,394,861
19 Deal ends.....	13,052	290,042	10,164	265,468	11,583	303,949
20 Laths, &c..... M.	153,449	184,851	208,074	242,403	245,906	402,636
21 Boards, &c..... M. ft.	447,255	4,450,201	704,859	7,336,048	683,558	8,491,621
22 Scantlings, &c.....	24,352	179,497	27,975	214,651	18,200	137,667
23 Staves, standard..... M.	1,309	277,552	1,056	146,1-2	918	152,987
24 Staves, other & headings.....	5,373	144,707	18,094	132,641	54,306	331,750
25 All other.....		50,862		56,424		152,363
26 Masts and spars..... Pes.	22,414	46,297	45,709	41,284	24,427	44,239
27 Oars..... Prs.	824	1,365	1,391	828	422	954
28 Shingles..... M.	80,957	161,585	117,997	245,458	117,836	281,567
29 Shingle bolts..... Cords.	381	953	1,134	3,747	705	2,816
30 Sleepers..... Pes.	1,004,212	216,934	2,448,314	384,031	1,448,374	391,049
31 Stave bolts..... Cords.	13,824	28,032	76,597	114,934	51,242	147,177
32 Shooks.....		120,485		74,419		37,059
Timber, square—						
33 Ash..... Tons.	6,049	59,284	7,202	82,314	8,783	111,622
34 Birch.....	31,615	213,357	32,236	218,233	33,185	247,193
35 Elm.....	18,657	216,766	20,330	247,222	19,254	252,656
36 Oak.....	65,863	1,068,749	50,721	876,084	45,832	911,409
37 Maple.....	297	2,702	389	5,293	594	7,140
38 Pine, white.....	282,250	2,737,194	227,705	2,335,604	219,379	2,771,776
39 do red.....	38,218	273,019	26,449	216,812	22,442	181,257
40 All other.....	5,475	65,666	7,655	98,522	7,001	101,901
41 Posts, cedar, tamarack, &c.....						
42 Pulp wood.....						
43 Other wood.....		71,683		157,082		152,334
44 Average of Total Exports.....		19,172,557		22,779,730		25,439,276
45 *Foreign produce.....		578,131		814,540		1,048,746

\* Included in above totals. † Including piles and pile timber, valued at \$63,957.

Navigation Returns)—Concluded.

the Canadian Forest in three-year periods—Concluded.

from Trade and  
the Products of

AGE EXPORTS FOR

1883-85.

Quantity.	Value.
.....	31,664
7,000	216,616
1,901	361,981
.....	.....
1,438	31,206
6,281	353,129
.....	.....
.....	164,342
4,475	20,657
474	3,098
.....	.....
1,295	18,448
.....	.....
7,732	25,296
4,081	37,375
4,406	9,708
5	48
9,499	148,658
.....	.....
1,179	7,158
307	8,304,861
583	303,949
906	462,636
558	288,761
200	8,491,621
918	137,607
306	152,987
906	331,759
.....	.....
127	152,363
427	44,239
422	954
896	281,567
705	2,816
374	391,049
242	147,177
.....	.....
37,059	.....
.....	.....
783	111,622
185	247,193
254	252,656
882	911,400
.....	.....
.....	7,140
.....	2,771,776
442	181,257
901	101,901
.....	.....
.....	152,334
.....	.....
.....	25,430,276
.....	.....
.....	1,048,746

THE PERIODS OF				EXPORTS FOR YEARS			
1886-88.		1889-91.		1892.		1893.	
Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
.....	.....	.....	.....	.....	.....	.....	.....
.....	35,049	.....	31,541	.....	40,169	.....	59,126
.....	127,001	3,163	89,195	.....	2,556	.....	61,760
4,934	234,723	37,759	169,766	.....	74,480	2,007	354,429
52,738	.....	.....	.....	43,856	217,552	41,872	205,495
.....	.....	.....	.....	.....	.....	.....	.....
.....	14,256	1,878	39,023	.....	54,906	.....	26,150
635	321,138	146,185	312,066	.....	370,301	801	354,429
154,711	.....	.....	.....	179,158	.....	181,417	.....
.....	115,647	.....	111,419	.....	.....	.....	.....
.....	11,043	27,613	23,906	.....	83,581	.....	114,030
19,134	1,021	802	1,609	.....	14,169	22,195	14,056
152	.....	.....	.....	16,308	.....	2,500	6,491
.....	.....	.....	.....	.....	.....	.....	.....
.....	21,646	3,890	15,605	.....	5,084	6,042	27,496
5,250	35,506	27,726	145,731	.....	21,505	6,042	27,496
7,305	1,148	2,037	37,683	.....	298,709	33,615	219,065
1,481	90,080	24,990	151,403	.....	21,297	1,348	21,087
18,602	25,856	26,561	223,065	.....	23,434	21,103	123,254
3,229	.....	.....	.....	.....	73,963	127,101	1,057,345
.....	.....	.....	.....	.....	651,540	.....	.....
32,940	163,594	15,746	89,793	.....	12,132	71,704	9,422
.....	.....	.....	.....	.....	.....	.....	69,307
.....	10,209	.....	5,089	.....	.....	7,918	3,095
.....	7,935,427	282,326	8,436,418	.....	244,688	7,034,633	8,180,602
264,393	280,539	10,654	288,148	.....	12,051	290,708	295,478
11,128	288,761	332,075	465,597	.....	318,153	474,717	608,336
288,761	7,433,189	756,024	8,562,106	.....	740,786	8,353,055	9,904,491
629,032	39,756	21,095	171,049	.....	17,561	138,478	191,127
629,032	190,629	279	11,752	.....	103	2,365	5,387
23,184	632	87,210	401,765	.....	93,688	460,546	609,677
632	294,702	.....	792,703	.....	.....	390,249	902,363
61,997	770,182	23,085	19,563	.....	11,198	12,688	7,933
.....	27,624	.....	.....	.....	.....	.....	.....
.....	286,807	242,961	511,880	.....	347,867	719,548	849,471
137,563	1,605	204	1,759	.....	.....	417,116	1,786
285	445,952	1,905,291	390,256	.....	1,467,839	261,036	241
1,933,979	118,955	46,801	122,007	.....	33,292	91,784	37,567
49,700	158,828	.....	283,804	.....	.....	189,309	136,252
.....	.....	.....	.....	.....	.....	.....	.....
.....	67,559	6,060	78,425	.....	3,511	43,937	64,126
5,496	178,309	24,450	199,847	.....	29,363	235,277	212,090
25,130	170,109	16,361	219,525	.....	16,213	219,762	208,011
13,444	581,113	32,135	674,749	.....	23,298	480,216	580,745
30,385	1,820	651	9,151	.....	364	4,103	4,319
165	1,609,295	157,245	2,260,517	.....	123,994	1,645,711	1,481,155
.....	105,498	10,655	98,804	.....	7,131	62,041	78,130
138,329	89,044	4,343	74,446	.....	5,123	8,044	36,248
12,507	.....	.....	37,326	.....	.....	105,772	70,485
3,649	.....	.....	89,668	.....	.....	19,458	386,092
.....	.....	.....	196,444	.....	.....	158,941	+ 137,786
.....	204,069	.....	.....	.....	.....	.....	.....
.....	.....	25,874,783	.....	.....	23,633,675	.....	27,632,791
.....	22,664,620	.....	.....	.....	.....	.....	.....
.....	1,723,897	1,373,410	.....	.....	1,351,931	.....	1,272,881

TABLE 8 (b).—(From Trade  
AVERAGE of Total Export by Canada of Manufactures of Wood for the periods

ARTICLES.	AVERAGE OF TOTAL EXPORTS					
	1877-79.		1880-82.		1883-85.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
<i>Great Britain.</i>						
1 Ships..... Tons.	23,887	837,242	9,687	277,355	6,516	156,274
2 Barrels, empty..... No.		8		8		8
3 Furniture, household.....		8,474		4,332		3,000
4 Doors, sashes and blinds.....		8,248		10,120		11,090
5 Matches and match splints.....						36,888
6 Mouldings, trimmings, &c.....						
7 Pails, tubs, churns, &c.....						927
8 Spool wood and spools.....						
9 Wood pulp.....		86,240		152,983		208,341
10 Other articles.....						
11 Total.....		94,204		453,996		413,529
<i>United States.</i>						
12 Charcoal.....			1			
13 Ships..... Tons.	377	10,250	1,201	14,143	226	4,073
14 Barrels, empty..... No.						
15 Furniture, household.....		97,934		106,026		134,221
16 Doors, sashes and blinds.....		12,809		8,139		2,052
17 Matches and match splints.....						1,417
18 Mouldings, trimmings, &c.....						
19 Pails, tubs, churns, &c.....						
20 Spool wood and spools.....						
21 Wood pulp.....						
22 Other articles.....		60,891		141,700		190,762
23 Total.....		181,884		270,098		332,525
<i>Newfoundland.</i>						
24 Ships..... Tons.	812	24,933	873	23,720	481	17,363
25 Barrels, empty..... No.						
26 Furniture, household.....		1,049		452		479
27 Doors, sashes and blinds.....		256		113		342
28 Matches and match splints.....						
29 Mouldings, trimmings, &c.....						
30 Pails, tubs, churns, &c.....						
31 Wood pulp.....						115
32 Other articles.....		20,016		9,417		11,613
33 Total.....		46,254		33,702		29,912
<i>British West Indies.</i>						
34 Ships..... Tons.	444	12,989	263	7,855	148	5,217
35 Furniture, household.....		138		963		357
36 Doors, sashes and blinds.....		4				
37 Matches and match splints.....						
38 Mouldings, trimmings, &c.....						
39 Pails, tubs and churns.....						
40 Other articles.....		2,832		6,042		8,250
41 Barrels, empty..... No.						
42 Total.....		15,963		14,860		13,824

and N.

1877-9

FOR THE

Quantit

40

17,90

442

3,881

181

8a-1

FOREST WEALTH OF CANADA.

and Navigation Returns.)

1877-91, inclusive, together with Exports for the years 1892 and 1893.

From Trade  
for the periods  
TOTAL EXPORTS

1883-85.

Quantity.	Value.
	\$
156,274	
11,690	
36,888	
927	
308,341	
413,529	
4,073	
134,221	
2,052	
1,417	
190,762	
332,525	
17,363	
479	
342	
115	
11,613	
29,912	
5,217	
357	
8,250	
13,824	

FOR THE PERIODS OF				EXPORTS FOR YEARS			
1886-88.		1889-91.		1892.		1893.	
Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	\$		\$		\$		\$
3,091	80,045	3,208	31,769	8,165	92,500	8,479	115,633
3,771	1,564	6,725	1,938			14,615	3,512
	22,355		31,635		10,057		33,662
	38,770		59,567		115,907		109,099
	5,047		78,349		162,028		159,224
			4,465		3,339		15,122
			7,895		7,058		10,811
			54,840		92,982		67,939
			153				1,640
	123,613		98,572		87,621		88,571
	271,400		369,180		581,512		605,213
404	3,250	388	29,777		46,817		48,700
17,901	7,479	75,182	6,986	699	8,000		
	200,196		39,187	83,488	63,711	76,390	49,534
	1,890		138,591		45,830		126,136
			7,312		2,697		1,441
			11,867		28,159		35,818
	4,654		2,429		1,419		2,060
			3,873		365		605
			8,340		18,352		15,184
			142,588		356,303		454,253
			162,763		110,952		59,230
	438,318		553,706		681,605		792,961
442	15,763	178	4,733		1,200		
3,881	1,571	8,085	3,961	60	2,434	5,937	2,145
	443		1,093	6,151	1,634		14,983
	158		25		12		12,148
			3,498		3,678		7,619
			420		339		3,424
	671		2,829		54		60
			6,874		7,074		33,151
	15,134		12,651		16,425		72,930
	33,740		36,084				
181	5,100	489	14,587				
	598		1,046		1,381	354	14,450
			29		286		2,073
			62		2,098		500
			317		25		2,270
	1		31		3,404		189
	2,224		3,693				2,893
		92	44				
	7,923		20,319		7,254		22,375



TABLE 8 (b).—(From Trade and  
AVERAGE of Total Export of Manufactures of Wood, 1877-91,

ARTICLES.	AVERAGE OF TOTAL EXPORTS					
	1877-79.		1880-82.		1883-85.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
<i>Spanish West Indies.</i>						
1 Ships . . . . . Tons.	299	7,267				
2 Furniture, household. . . . .				13		63
3 Other articles. . . . .		146		615		909
4 Total . . . . .		7,413		628		1,032
<i>Danish West Indies.</i>						
5 Ships . . . . . Tons.			162	1,167		
6 Furniture, household. . . . .		25				
7 Pails, tubs, churns, &c. . . . .						
8 Other articles. . . . .		11		22		48
9 Total . . . . .		36		1,189		48
<i>French West Indies.</i>						
10 Ships . . . . . Tons.	58	3,967	78	2,945		
11 Other articles. . . . .				4		
12 Total . . . . .		3,967		2,949		33
<i>Dutch West Indies.</i>						
13 Ships . . . . . Tons.						
<i>British East Indies.</i>						
14 Ships . . . . . Tons.			326	1,667	116	4,056
15 Furniture. . . . .						
16 Total . . . . .				1,667		4,056
<i>Norway and Sweden.</i>						
17 Ships . . . . . Tons.	1,068	23,921	1,885	37,963	5,617	87,091
18 Other articles. . . . .						
19 Total . . . . .		23,921		37,963		87,091
<i>Denmark.</i>						
20 Ships . . . . . Tons.	228	4,920	377	4,373	148	1,000
21 Other articles. . . . .						
22 Total . . . . .		4,920		4,373		1,000
<i>St. Pierre.</i>						
23 Ships . . . . . Tons.	160	3,862	111	2,725	247	8,153
24 Barrels, empty. . . . . No.						
25 Furniture, household. . . . .		123		7		10
26 Doors, sashes and blinds. . . . .						

FOREST WEALTH OF CANADA.

(From Trade and  
of Wood, 1877-91,

Navigation Returns)—Continued.

inclusive, together with Exports for years 1892-93—Continued.

OF TOTAL EXPORTS

1883-85.	
Quantity.	Value.
	\$
63	969
1,082	
48	
48	
33	
116	4,056
	4,056
5,617	87,091
	87,091
148	1,000
	1,000
247	8,153
	10

FOR THE PERIODS OF				EXPORTS FOR YEARS				
1886-88.		1889-91.		1892.		1893.		
Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	
	\$		\$		\$		\$	
220	2,876					109	5,600	1
	1,279		3,947		306		1,074	2
	4,155		3,947		308		7,274	3
								4
18	300							5
	32		94					6
	470		55				50	7
	802		149				50	8
								9
		128	3,467					10
			3,467				200	11
							200	12
				85	2,500			13
								14
	87		68					15
	87		68					16
5,337	65,979	12,188	220,769	17,731	253,609	18,639	179,168	17
	65,979		220,769		253,609		353	18
							179,521	19
126	3,333							20
	3,333				86			21
					86			22
584	23,150	348	12,300	814	25,930	215	14,100	23
218	71	409	122	9	8	2,082	649	24
	291				98		12	25
			26		50			26

TABLE 8 (b).—(From Trade and  
AVERAGE of Total Export of Manufactures of Wood, 1877-91,

ARTICLES.	AVERAGE OF TOTAL EXPORTS					
	1877-79.		1880-82.		1883-85.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
<i>St. Pierre—Concluded.</i>						
1 Matches and match splints.....		\$		\$		\$
2 Pails, tubs and churns.....		1,360		1,230		640
3 Other articles.....						
4 Total.....		5,345		3,902		8,803
<i>Australia.</i>						
5 Ships..... Tons.	517					
6 Furniture, household.....		15,661	54	2,000	808	15,733
7 Doors, sashes and blinds.....		252				53
8 Mouldings and trimmings.....		1,800		893		6,749
9 Pails, tubs, churns, &c.....						
10 Other articles.....		1,662		787		1,580
11 Total.....		19,375		3,680		24,115
<i>British Guiana.</i>						
12 Ships..... Tons.	44					
13 Barrels, empty..... No.		2,833	40	1,450		
14 Furniture.....						
15 Doors, sashes, blinds.....						21
16 Mouldings and trimmings.....						
17 Other articles.....		79		105		685
18 Total.....		2,912		1,555		902
<i>Labrador.</i>						
19 Other articles.....		2,977		249		268
<i>South America.</i>						
20 Ships..... Tons.	170		60	2,050		
21 Other articles.....		6,477		1,057		
22 Total.....		6,477		3,107		
<i>Uruguay.</i>						
23 Ships..... Tons.						
24 Other articles.....				94		4,208
25 Total.....				94		4,208
<i>U. S. of Colombia</i>						
26 Ships..... Tons.						
27 Other articles.....				1,175		16,023
28 Total.....				1,175		16,023
<i>Chili.</i>						
29 Ships..... Tons.					435	2,700

FOREST WEALTH OF CANADA.

(From Trade and Navigation Returns)—Continued.

inclusive, together with Exports for years 1892-93—Continued.

AGE OF TOTAL EXPORTS

1883-85.		FOR THE PERIODS OF				EXPORTS FOR YEARS			
Quantity.	Value.	1886-88.		1889-91.		1892.		1893.	
	\$	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	\$		\$		\$		\$		\$
	640		7		44		221		79
	8,873		3,479		1,584		741		438
			26,998		14,076		27,048		15,278
808	15,733								
	53	50	1,333						
	6,749		559		991		82		60
			3,476		993				
	1,580		59		834				
	24,115		214		25		65		
			5,641		301				
					3,144		147		60
	21	6	3	26	1,500				
	685			124	32				
	902				39				
			762		177		45		
			765		1,051		935		778
					2,819		980		778
	268				64				
	4,208	35	1,380						
	4,208		102						
			1,482						
	16,023								
	16,023			33	1,667				
					527		44		410
					2,194		44		410
435	2,700	861	9,498	2	300				

TABLE 8 (b)—(From Trade and  
AVERAGE of Total Export of Manufactures of Wood, 1877-91,

ARTICLES.	AVERAGE OF TOTAL EXPORTS					
	1877-79.		1880-82.		1883-85.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
<i>Argentine Republic.</i>						
1 Ships .....	Tons.					
2 Other articles.....					636	15,163
3 Total .....						1,739
<i>Brazil.</i>						
4 Ships .....	Tons.					
5 Other articles.....			169	4,333	289	5,760
6 Total .....				128		33
<i>Central American States.</i>						
7 Ships .....	Tons.					
8 Furniture .....		55	233			
9 Other articles.....						
10 Total .....						7
<i>British Honduras.</i>						
11 Ships .....	Tons.					
<i>Portuguese Poss. in Africa.</i>						
12 Ships .....	Tons.					
13 Other articles.....						
14 Total .....						
<i>France.</i>						
15 Ships .....	Tons.					
16 Furniture .....			14	133	581	25,821
17 Mouldings and Trimmings.....		289				
18 Other articles.....		146		33		31
19 Total .....		435		166		25,892
<i>Germany.</i>						
20 Ships .....	Tons.					
21 Charcoal.....			399	2,211	815	20,583
22 Furniture .....						
23 Pails, tubs and churns .....						
24 Other articles.....						
25 Total .....				102		2
<i>Spain.</i>						
26 Ships .....	Tons.	142	6,067	30	1,333	
27 Furniture .....						
28 Other articles.....			180			
29 Total .....			6,247		1,333	



TABLE 8 (b).—(From Trade and  
AVERAGE of Total Export of Manufactures of Wood, 1877-91,

ARTICLES.	AVERAGE OF TOTAL EXPORTS						
	1877-79.		1880-92.		1893-94.		
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	
<i>Holland.</i>							
1 Ships .....	Tons.	886	\$ 9,833	24	\$ 500	173	\$ 1,579
<i>China.</i>							
2 Ships .....	Tons.			105	3,000		
3 Furniture .....							
4 Doors, sashes and blinds .....							
5 Other articles .....							
6 Total .....					3,000		
<i>Japan.</i>							
7 Ships .....	Tons.			61	1,900		
8 Furniture .....							
9 Doors, sashes and blinds .....							
10 Other articles .....							
11 Total .....					1,900		
<i>Italy.</i>							
12 Ships .....	Tons.					66	2,267
<i>Belgium.</i>							
13 Ships .....	Tons.						
14 Furniture .....						329	1,667
15 Pails, tubs and churns .....							
16 Other articles .....							
17 Total .....							1,667
<i>New Zealand.</i>							
18 Ships .....	Tons.	248	8,433	213	5,500	354	14,467
19 Furniture .....			83				
20 Other articles .....							
21 Total .....			8,516		5,500		14,467
<i>Russia.</i>							
22 Ships .....	Tons.	163	1,833	222	2,027		
<i>Africa.</i>							
23 Furniture .....					49		
24 Doors, sashes and blinds .....					83		692
25 Mouldings and trimmings .....							
26 Other articles .....					598		814
27 Total .....					730		1,506





TABLE 8 (b).—(From Trade and  
AVERAGE of Total Export of Manufactures of Wood, 1877-91,

ARTICLES.	AVERAGE OF TOTAL EXPORTS					
	1877-79.		1880-82.		1883-85.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
<i>Portugal.</i>						
1 Ships . . . . . Tons.	47	283			36	833
2 Furniture . . . . .						
3 Other articles . . . . .		3		133		19
4 Total . . . . .		286		133		852
<i>Hayti.</i>						
5 Ships . . . . . Tons.	74	2,270	130	3,033		
6 Barrels, empty . . . . . No.						
7 Other articles . . . . .		133				
8 Total . . . . .		2,403		3,033		
<i>Greece.</i>						
9 Ships . . . . . Tons.			77	2,333		
<i>Sandwich Islands.</i>						
10 Ships . . . . . Tons.						
11 Other articles . . . . .						
12 Total . . . . .						
13 Other countries . . . . .		169				
SUM						
14 Charcoal . . . . .						
15 Ships . . . . . Tons.	33,616	1,114,071	16,572	495,885	18,147	389,857
16 Barrels, empty . . . . . No.						
17 Furniture, household . . . . .		108,369		112,209		146,490
18 Doors, sashes and blinds . . . . .		23,192		28,355		42,823
19 Matches and match splints . . . . .						
20 Mouldings and trimmings . . . . .						
21 Pails, tubs and churns . . . . .						2,450
22 Spool wood and spools . . . . .						
23 Wood pulp . . . . .						
24 Other articles . . . . .		176,780		316,600		446,368
25 * Total produce . . . . .		1,422,418		863,109		1,028,006
26 Not produce . . . . .		11,858		16,572		21,626

\* Foreign produce included.

Navigation Returns)—*Concluded.*

inclusive, together with Exports for 1892-93—*Concluded.*

FOR THE PERIODS OF				EXPORTS FOR YEARS				
1886-88.		1889-91.		1892.		1893.		
Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	
	\$				\$		\$	
833								1
19								2
852			17					3
								4
								5
		10	3					6
								7
		10	3					8
								9
						393	7,000	10
83	2,000							11
			5					12
	2,000		5					13
	760		1		874		5,125	14
S U M								

M A R Y .

389,857			30,986		46,817		48,700	14
146,499	12,695	233,368	356,070	36,399	506,747	31,317	363,916	15
42,823	25,777	10,688	45,308	89,648	66,153	98,083	55,840	16
		225,315	173,733		68,162		177,197	17
		44,145	69,604		123,144		130,349	18
2,450			94,316		196,184		204,479	19
			8,852		7,083		23,161	20
		10,550	14,796		7,477		11,476	21
			63,186		111,314		83,123	22
			149,616		355,303		455,893	23
		370,576	286,890		213,063		187,724	24
								25
	894,642		1,293,327		1,701,447		1,741,792	26
	40,105		68,332		61,460		48,186	27

TABLE 8 (c)—(From Trade and  
AVERAGE of Total Imports by Canada of certain Articles of Wood, and Manufac-

ARTICLES.	AVERAGE OF TOTAL			
	1877-79.		1880-82.	
	Quantity.	Value.	Quantity.	Value.
<i>Great Britain.</i>				
1 Barrels containing petroleum or its products. . . . . No.		\$		\$
2 do linseed oil . . . . . "				
3 do salted meats . . . . . "				
4 Furniture, all kinds . . . . . "				
5 Mouldings, plain and gilded . . . . . "				
6 Woodenware, pails, tubs and churns, &c. . . . . "		9,119		9,291
7 Wood manufactures, n.e.s. . . . . "				820
8 Lumber and timber, n.e.s. . . . . "		17,989		40,365
Lumber—				
9 Cherry, chestnut, mahogany, walnut, whitewood, &c. M. ft.		164		191
10 Oak . . . . . "				
11 Pitch pine . . . . . "		668		128
12 African teak . . . . . "			11	329
13 Redwood . . . . . "			76	1,328
14 White ash . . . . . "				14
15 Spanish cedar . . . . . "				
16 Planks and boards . . . . . "				
17 Logs and round unmanufactured timber . . . . . "				
18 Pulp wood . . . . . "		158		165
19 Veneers . . . . . "				
20 Total . . . . . "		28,098		52,631
<i>United States.</i>				
21 Barrels containing petroleum or its products. . . . . No.				
22 do linseed oil . . . . . "				
23 do salted meats . . . . . "				
24 Furniture, all kinds . . . . . "				
25 Coffins and caskets of any material . . . . . "				
26 Hubs, spokes, felloes and parts of wheels rough hewn and sawn only . . . . . "		300,486		128,006
27 Mouldings, plain and gilded . . . . . "				99
28 Shingles . . . . . "		31,413		10,858
29 Woodenware, pails, churns, tubs, &c. . . . . M.		1,807		28,215
30 Wood manufactures, n.e.s. . . . . "		3,403	14,206	20,878
31 Lumber and timber, n.e.s. . . . . "				13,992
32 Veneers of wood . . . . . "		329,729		513,258
33 Wood pulp . . . . . "		370,626		302,206
34 Felloes, hickory, rough—sawn to shape . . . . . "		7,134		
35 Hickory billets, when imported for the manufacture of tool handles . . . . . "				
36 Logs and round unmanufactured timber, n.e.s. . . . . "		127,738		418,612
Lumber—				
37 Boxwood . . . . . "				
38 Cherry, chestnut, gumwood, hickory and whitewood . . . . . M. ft.		168	41	2,057
39 Mahogany . . . . . "				135
40 Oak . . . . . "				
41 Pitch pine . . . . . "			40	4,517
42 Redwood . . . . . "			1,590	49,061
43 Rosewood . . . . . "			3,434	4,355
44 Spanish cedar . . . . . "				69,439
45 Sycamore . . . . . "				5,415
46 Amaranth and cocobora . . . . . "				8
47 Walnut . . . . . "			122	330
48 Ash, white . . . . . "				4,149
49 Hickory, sawn to shape for spokes of wheels . . . . . "			3,790	8
50 African teak, black heart ebony, lignum vite, &c. . . . . M. ft.			189,275	4,622
* Included in boxwood.				
† Whitewood included.				33

Navig  
tures  
IMPORT  
Quantit  
4,116  
13,992  
123  
4,355  
5,415  
8  
249  
4,622  
24



TABLE 8 (c).—(From Trade and  
AVERAGE of Total Imports by Canada of certain

Articles.	AVERAGE OF TOTAL			
	1877-79.		1880-82.	
	Quantity.	Value.	Quantity.	Value.
<i>United States.—Concluded.</i>				
Lumber—		\$		\$
1 Hickory spokes, rough turned. ....				
2 Staves .....				
3 Firewood .....		19,511		
4 Wood of the persimmon and dogwood trees. .... cords.	3,326	9,036	122	307
5 Total .....		1,397,376		1,743,100
<i>France.</i>				
6 Furniture, all kinds .....				
7 Woodenware .....		588		546
8 Manufactures of wood, N.E.S. ....				230
9 Lumber and timber .....		2,640		8,378
10 Mouldings .....				
11 Veneers of wood .....				
12 Total .....		3,228		9,154
<i>Germany.</i>				
13 Furniture, all kinds .....				
14 Mouldings .....		77		259
15 Woodenware .....				
16 Manufactures of wood, N.E.S. ....				126
17 Veneers of wood .....		1,095		14,223
18 Wood pulp .....				
19 Total .....		1,172		14,608
<i>Belgium.</i>				
20 Furniture, all kinds .....				
21 Mouldings .....		43		52
22 Manufactures of wood, N.E.S. ....				418
23 Total .....		43		470
<i>China.</i>				
24 Furniture .....				
25 African teak, &c. .... M. ft.		129		51
26 Woodenware .....				
27 Manufactures of wood, N.E.S. ....				2
28 Lumber and timber, N.E.S. ....		342		450
29 Total .....		471		518
<i>Japan.</i>				
30 Furniture .....				
31 Woodenware .....				26
32 Manufactures of wood, N.E.S. ....		319		48
33 Total .....		319		74

FOREST WEALTH OF CANADA.

(From Trade and  
Canada of certain

Navigation Returns.)

articles of Wood and Manufactures, &c.—Continued.

AVERAGE OF TOTAL

1880-82.

Quantity.	Value.
	\$
122	307
	1,743,100
	546
	230
	8,378
	9,154
	259
	126
	14,223
	14,608
	52
	418
	470
	51
	2
	450
	15
	518
	26
	48
	74

IMPORTS FOR THE PERIODS OF						IMPORTS.			
1883-85.		1886-88.		1889-91.		1892.		1893.	
Quantity	Value.	Quantity	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	\$		\$		\$		\$		\$
					18,575		57,190		64,027
2,482	13,810	1,332	4,264	6,243	22,076	3,557	14,016	5,355	20,680
			60		373		51		451
	2,588,437		2,030,297		2,503,673		2,006,715		1,944,715
	647		1,036		1,390		8,924		2,528
	21,624		5,258		3,333		19		3,385
					3		2,117		27
							116		172
	22,271		6,294		4,732		11,176		6,112
	1,407		1,676		3,018		3,610		16,908
	230		21		13		14		15
	27,297		13,911		8,349		7,635		9,578
							11		882
	28,034		15,608		11,380		11,270		27,458
	10		544		29		285		125
	111		100		23				166
			1,152		240		316		201
	121		1,796		292		601		624
	282		1,182		719		1,052		505
	3							3	714
	1,209		1,237		964		631		1,843
			3						
	1,494		2,422		1,683		1,683		
	299		3,182		3,098		3,345		2,946
	582		5,847		53				20
					1,429		1,760		568
	881		9,029		4,580		5,114		3,534

## DEPARTMENT OF AGRICULTURE.

TABLE 8 (c)—(Trade and  
AVERAGE of Total Imports by Canada of certain

ARTICLES.	AVERAGE OF TOTAL			
	1877-79.		1880-82.	
	Quantity.	Value.	Quantity.	Value.
<i>Italy.</i>				
1 Furniture.....		\$		\$
2 Manufactures of wood, N.E.S.....		28		41
		21		27
3 Total.....		49		68
<i>Austria.</i>				
4 Furniture.....				
5 Manufactures of wood, N.E.S.....		591		200
6 Total.....		591		251
				451
<i>British West Indies.</i>				
7 Furniture.....				
8 Manufactures of wood, N.E.S.....		2		1
9 Lumber and timber.....		1		13
10 " pitch pine..... M. ft.		350		
11 " African teak, &c.....			1	20
12 " Spanish cedar.....				
13 Logs and round unmanufactured timber.....				1
14 Total.....		353		4,039
				4,074
<i>British East Indies.</i>				
15 Furniture.....				
16 Manufactures of wood, N.E.S.....				195
17 Total.....				195
<i>Danish West Indies.</i>				
18 Logs and round unmanufactured timber.....				
<i>Dutch East Indies.</i>				
19 Manufactures of wood, N.E.S.....				
20 Logs and round unmanufactured timber.....				
21 Total.....				
<i>Spanish West Indies.</i>				
22 Manufactures of wood, N.E.S.....				4
23 Logs and round unmanufactured timber.....				28
24 Spanish cedar..... M. ft.			1	88
25 Total.....				120
<i>Newfoundland.</i>				
26 Furniture.....				
27 Manufactures of wood, N.E.S.....		4		6
28 Woodenware.....		21		28
29 Lumber and timber, N.E.S.....		1,934		93
30 African teak, &c.....				
31 Logs and round unmanufactured timber.....				7
32 Total.....		1,959		134

(c)—(Trade and  
Canada of certain

Navigation Returns)—Continued.  
articles of Wood and Manufactures, &c.—Continued.

AVERAGE OF TOTAL

1880-82.

Quantity.	Value.
	\$
	41
	27
	68
	200
	251
	451
	1
	13
1	20
	1
	4,039
	4,074
	195
	195
	4
	28
1	88
	120
	6
	28
	93
	7
	134

IMPORTS FOR THE PERIODS OF						IMPORTS.			
1883-85.		1886-88.		1889-91.		1892.		1893.	
Quantity	Value.	Quantity	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	\$		\$		\$		\$		\$
	125		275		164		292		117
	279		1		32				63
	404		276		196		202		180
	165		688		1,912		1,107		549
	3,076		491		2,034		2,995		1,307
	3,241		1,179		3,946		4,102		1,856
	4		3		4				55
	1		46		456		565		85
	7		25		16				8
	175		53		19			89	1,500
	49	1	4		178		761	1	50
	229		131		673		1,326		558
			2						2,248
	41				92				3
	41		2		92				16
									3
			565				371		18
					300				19
					435				20
					735				21
			13		13				22
			13		13				20
									24
			6						20
	12		233		148		15		26
	1		333		135		197		4
	33								28
	159								199
	205		572		283		142		30
									31
									203
									32



TABLE 8 (c) —(From Trade and  
AVERAGE of Total Imports by Canada of certain

ARTICLES.	AVERAGE OF TOTAL			
	1877-79.		1880-82.	
	Quantity.	Value.	Quantity.	Value.
<i>Egypt.</i>				
1 Furniture.....		8		8
2 Manufactures of wood, N.E.S.....				
3 Total.....				
<i>St. Pierre.</i>				
4 Furniture.....				
5 Manufactures of wood, N.E.S.....		7		3
6 Shingles.....		30		
7 Lumber and timber, N.E.S..... M.				
8 Logs and round unmanufactured timber.....				3
9 Total.....		37		6
<i>Norway and Sweden.</i>				
10 Barrels containing linseed oil..... No.				
11 Furniture.....				
12 Manufactures of wood, N.E.S.....				15
13 Lumber and timber.....		2,491		105
14 Total.....				
		2,491		120
<i>Portuguese Poss. in Africa.</i>				
15 Furniture.....				36
<i>Switzerland.</i>				
16 Furniture.....				
17 Woodenware.....				22
18 Manufactures of wood, N.E.S.....		17		8
19 Total.....				300
		17		330
<i>British Guiana.</i>				
20 Lumber and timber, N.E.S.....				
21 Redwood.....				54
22 Logs and round unmanufactured timber..... M. ft.				
23 Total.....				13
				67
<i>Madeira.</i>				
24 Furniture.....				
25 Manufactures of wood, N.E.S.....		3		4
26 Total.....				
		3		4
<i>Australia.</i>				
27 Boxwood.....				
28 Manufactures of wood, N.E.S.....				
29 Total.....				



TABLE 8 (c)—From Trade and  
AVERAGE of Total Imports by Canada of certain

ARTICLES.	AVERAGE OF TOTAL			
	1877-79.		1880-82.	
	Quantity.	Value.	Quantity.	Value.
<i>Spain.</i>				
1 Furniture.....		\$		\$
2 Woodenware.....				4
3 Manufactures of wood, N.E.S.....				32
4 Total.....				36
<i>Holland.</i>				
5 Furniture.....				
6 Manufactures of wood, N.E.S.....		32		
7 Total.....		32		
<i>Turkey.</i>				
8 Furniture.....				
9 Manufactures of wood, N.E.S.....				
10 Total.....				
<i>Other Countries.</i>				
11 Furniture.....				
12 Woodenware.....				27
13 Manufactures of wood, N.E.S.....				1
14 Boxwood.....				92
15 African teak, &c.....				
16 Logs and round unmanufactured timber.....				50
17 Total.....				170

S U M

18	Barrels containing petroleum or its products.....	No.			
19	“ linseed oil.....	“			
20	“ salted meats.....	“			
21	Furniture.....				
22	Coffins and caskets of any material.....		310,518		139,685
23	Hubs, spokes, fellos and parts of wheels, rough hewn or sawn only.....				99
24	Mouldings, plain and gilded.....		31,413		10,858
25	Shingles.....				28,210
26	Woodenware, pails, tubs, churns, &c.....	M.	1,807	3,403	14,206
27	Wood manufactures, N.E.S.....				22,007
28	Lumber and timber.....		355,256		577,960
	Lumber—		313,074		302,562
29	Boxwood.....	M. ft.			
30	Cherry, chestnut, &c.....	“	168,300	41	2,057
31	Mahogany.....	“	* 668		* 128
32	Oak.....	“		40	4,517
33	Pitch pine.....	“		1,601	50,290
34	Redwood.....	“		3,511	70,787
35	Rosewood.....	“			
					330

\* Included in boxwood, except cherry, chestnut, &c., from Great Britain.

from Trade and  
Canada of certain

Navigation Returns—Continued.

articles of Wood and Manufactures, &c.—Continued.

AVERAGE OF TOTAL

1880-82.

Quantity.	Value.
	\$
.....	4
.....	32
.....	36
.....	27
.....	1
.....	92
.....	50
.....	170

IMPORTS FOR THE PERIODS OF						IMPORTS.			
1883-85.		1886-88		1889-91.		1892.		1893.	
Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	\$		\$		\$		\$		\$
.....		.....	98	.....		.....		.....	
.....		.....	10	.....		.....		.....	
.....		.....	108	.....		.....		.....	
.....	1	.....	1	.....		.....		.....	
.....	12	.....	152	.....	10	.....		.....	
.....	13	.....	153	.....	10	.....		.....	
.....	55	.....		.....		.....		.....	
.....	15	.....	12	.....	4	.....		.....	21
.....	70	.....	12	.....	4	.....		.....	21
.....		.....	36	.....		.....	3	.....	7
.....		.....	13	.....	15	.....	60	.....	
.....		.....	15	.....		.....		.....	
.....		.....	15	.....	80	.....	815	.....	
.....		.....		.....		.....		.....	
.....		.....	64	.....	95	.....	978	.....	7

SUM

.....	.....
.....	139,685
.....	99
.....	10,858
.....	28,210
4,206	22,097
.....	577,960
.....	302,562
41	2,057
.....	* 128
.....	4,517
40	50,290
5,511	70,787
.....	330

MARY.

.....	4,116	5,529	110,187	164,646	122,149	191,865	136,314	212,152	145,480	227,934	18
.....	.....	.....	.....	.....	10,587	10,897	19,115	24,194	13,726	16,515	19
.....	.....	22,299	21,681	65,911	64,940	321,241	.....	390,513	.....	312,986	20
.....	.....	214,149	215,353	.....	.....	2,850	.....	5,559	.....	7,883	21
.....	.....	4,598	.....	.....	.....	.....	.....	.....	.....	.....	22
.....	.....	12,135	8,715	.....	2,590	.....	.....	716	.....	877	23
.....	.....	1,438	29,556	.....	43,444	.....	.....	52,580	.....	43,764	24
.....	13,992	30,877	8,229	2,172	2,527	.....	962	855	982	1,631	25
.....	.....	25,256	35,973	.....	21,251	.....	.....	5,793	.....	5,499	26
.....	.....	906,888	490,452	.....	429,056	.....	.....	352,747	.....	307,335	27
.....	.....	390,262	317,643	.....	319,523	.....	.....	98,151	.....	104,915	28
.....	135	5,697	1,229	37,500	55	2,169	6	231	.....	4	29
.....	.....	* 13	.....	* 25	3,666	102,281	4,121	119,237	5,983	190,622	30
.....	123	14,561	156	21,267	241	24,226	.....	33,533	155	22,004	31
.....	4,256	109,245	2,542	71,294	7,199	143,875	10,636	243,993	9,859	125,742	32
.....	5,429	119,792	2,513	54,624	6,645	155,537	6,569	120,448	3,056	59,591	33
.....	.....	.....	1	95	286	8,425	58	1,565	220	6,208	34
.....	8	554	14	552	3	333	.....	131	.....	150	35

## DEPARTMENT OF AGRICULTURE.

TABLE 8 (c)—(From Trade and  
AVERAGE of Total Imports by Canada of certain

ARTICLES.	AVERAGE OF TOTAL			
	1877-79.		1880-82.	
	Quantity.	Value.	Quantity.	Value.
<i>Summary—Continued.</i>				
Lumber—		\$		\$
1 Spanish cedar .....	M. ft.			
2 Sycamore .....	"		123	4,238
3 Walnut .....	"			
4 White ash .....	"	*	3,790	189,275
5 African teak, black-heart ebony, &c. ....	"			
6 Veneers of wood .....				47
7 Wood pulp .....		7,134		
8 Logs and round unmanufactured timber .....				
9 Felices, hickory, rough sawn to shape .....		127,896		822,914
10 Hickory billets, when imported for the manufacture of tool handles .....				
11 Hickory, sawn to shape for spokes of wheels .....				
12 Hickory spokes, rough turned .....				
13 Staves .....				
14 Firewood .....		19,511		
15 Planks and boards .....	Cords.	3,326	9,036	122
16 Amaranth and cocoboral .....				307
17 Wood of the persimmon and dogwood trees .....	M. ft.			
18 Total .....		1,346,209		2,206,366

\* Included in boxwood, except cherry, chestnut, &amp;c., from Great Britain.

FOREST WEALTH OF CANADA.

Navigation Returns)—*Concluded.*

articles of Wood and Manufactures, &c.—*Concluded.*

m Trade and  
ada of certain

PERCENTAGE OF TOTAL

1880-82.

Quantity.	Value.
	\$
123	4,238
3,790	189,275
	47
	822,914
122	307
	2,206,266

IMPORTS FOR THE PERIODS OF						IMPORTS.			
1883-85.		1886-88.		1889-91.		1892.		1893.	
Quantity	Value.	Quantity	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	\$		\$		\$		\$		\$
240	8,653	319	9,238	497	10,768	977	50,085	466	11,710
4,622	216,207	4,566	233,241	3,525	99	60	2,350	55	1,366
26	2,426	106	2,741	43	1,078	2,749	134,700	2,152	110,412
			13,773	95	4,052	138	5,168	315	8,757
					47,714		4,652	64	2,533
	653,553		370,265		665		54,945		48,155
					492,237		361		2,663
					12,356		232,723		266,990
			795		4,000		7,377		14,220
	5,052		21,920		35,255		1,704		4,297
					18,575		12,873		14,427
2,482	13,810	1,232	4,264	6,243	22,976		57,190		64,027
			84		3	3,557	14,016	5,355	20,680
			66		373	20	273	15	277
							51		451
	2,731,694		2,137,006		2,593,240		2,136,016		2,084,225

## DEPARTMENT OF AGRICULTURE.

TABLE 9.—Canada—Wood.

EXPORTS and Imports by Canada, by Countries—Produce and not Produce.—(As given in the Canadian Trade and Navigation Returns.)

COUNTRIES.	YEAR.	EXPORTS.		IMPORTS.
		Total Product.	Manufactures.	
		\$	\$	\$
<i>Great Britain</i> .....	1877-79	12,692,139	94,204	28,098
	1880-82	11,745,053	453,096	52,631
	1883-85	12,582,898	413,529	85,123
	1886-88	10,185,565	271,400	59,041
	1889-91	12,051,724	369,189	60,835
	1892	9,645,319	581,512	91,972
	1893	11,105,482	605,213	85,499
<i>United States</i> .....	1877-79	4,716,314	181,884	1,307,376
	1880-82	9,090,202	270,098	1,743,100
	1883-85	10,665,893	332,525	2,588,437
	1886-88	10,706,086	438,318	2,039,297
	1889-91	12,149,704	553,706	2,503,673
	1892	12,032,643	681,605	2,006,715
	1893	14,841,455	792,961	1,944,715
<i>Newfoundland</i> .....	1877-79	104,493	46,254	1,945
	1880-82	73,581	33,702	134
	1883-85	122,908	29,912	205
	1886-88	50,394	33,740	572
	1889-91	45,826	36,084	283
	1892	34,131	16,425	142
	1893	255,455	72,930	203
<i>St. Pierre</i> .....	1877-79	16,716	5,345	37
	1880-82	23,087	3,962	6
	1883-85	24,060	8,803	90
	1886-88	28,352	26,098	124
	1889-91	24,477	14,076	8
	1892	21,056	27,048	.....
	1893	16,811	15,278	.....
<i>British West Indies</i> .....	1877-79	339,955	15,963	353
	1880-82	302,889	14,860	4,074
	1883-85	251,277	13,824	229
	1886-88	168,713	7,923	131
	1889-91	218,092	20,319	673
	1892	150,819	7,254	1,326
	1893	198,330	22,375	2,248
<i>Danish West Indies</i> .....	1877-79	2,597	36	.....
	1880-82	2,959	1,189	.....
	1883-85	2,184	48	.....
	1886-88	1,909	802	.....
	1889-91	4,812	149	735
	1892	4,587	.....	.....
	1893	1,959	50	.....
<i>Spanish West Indies</i> .....	1877-79	198,672	7,413	.....
	1880-82	135,354	628	120
	1883-85	86,750	1,032	13
	1886-88	64,484	4,155	13
	1889-91	116,926	3,947	.....
	1892	188,520	303	20
	1893	185,766	7,274	.....

TABLE 9.—Canada—Wood—Continued.  
Exports and Imports by Canada, by Countries—Produce and not Produce.—(As given in the Canadian Trade and Navigation Returns)—Continued.

IMPORTS.	COUNTRIES.	YEAR.	EXPORTS.		IMPORTS.
			Total Product.	Manufactures.	
\$			\$	\$	\$
28,008	<i>French West Indies</i> .....	1877-79	14,352	3,967	.....
52,631		1880-82	21,661	2,949	.....
85,123		1883-85	11,444	3	.....
59,041		1886-88	2,884	.....	.....
60,835		1889-91	3,153	3,467	.....
91,972		1892	6,403	.....	.....
85,499		1893	5,056	200	.....
1,307,376	<i>St. Domingo and Hayti</i> .....	1877-79	9,829	2,403	.....
1,743,100		1880-82	9,964	3,033	.....
2,588,437		1883-85	3,985	.....	.....
2,039,297		1886-88	707	.....	.....
2,503,673		1889-91	649	3	.....
2,006,715		1892	.....	.....	.....
1,944,715		1893	.....	.....	.....
1,945	<i>Chili</i> .....	1877-79	.....	.....	.....
134		1880-82	.....	.....	.....
205		1883-85	41,754	2,700	.....
572		1886-88	56,270	9,498	.....
283		1889-91	78,027	300	.....
142		1892	135,905	.....	.....
203		1893	118,226	.....	.....
37	<i>Brazil</i> .....	1877-79	.....	.....	.....
6		1880-82	.....	4,461	.....
90		1883-85	22,002	5,793	.....
124		1886-88	6,291	.....	.....
8		1889-91	16,390	.....	.....
.....		1892	35,830	15,392	.....
.....		1893	31,155	5,000	.....
353	<i>Argentine Republic</i> .....	1877-79	.....	.....	.....
4,074		1880-82	.....	.....	.....
229		1883-85	379,088	16,902	.....
131		1886-88	375,082	10,329	.....
673		1889-91	468,132	22,304	.....
1,326		1892	100,550	19,680	.....
2,248		1893	387,919	.....	.....
.....	<i>Uruguay</i> .....	1877-79	.....	.....	.....
.....		1880-82	.....	94	.....
795		1883-85	171,033	4,208	.....
.....		1886-88	85,636	1,482	.....
.....		1889-91	43,708	.....	.....
.....		1892	9,777	.....	.....
.....		1893	23,297	.....	.....
120	<i>Peru</i> .....	1877-79	.....	.....	.....
13		1880-82	.....	.....	.....
13		1883-85	51,675	.....	.....
20		1886-88	20,377	.....	.....
.....		1889-91	45,429	.....	.....
.....		1892	10,792	.....	.....
.....		1893	34,767	.....	.....

\* Possibly included in "Other Countries."



## DEPARTMENT OF AGRICULTURE.

TABLE No. 9.—Canada—Wood—Continued.  
Exports and Imports by Canada, by Countries—Produce and not Produce.—(As given  
in the Canadian Trade and Navigation Returns)—Continued.

COUNTRIES.	YEAR.	EXPORTS.		IMPORTS.
		Total Product.	Manufactures.	
		\$	\$	\$
<i>British Guiana</i> .....	1877-79	27,555	2,912	.....
	1880-82	43,527	1,555	67
	1883-85	86,350	902	176
	1886-88	38,002	765	10
	1889-91	41,330	2,819	101
	1892	9,862	980	.....
	1893	16,956	778	130
<i>Germany</i> .....	1877-79	11,700	17	1,172
	1880-82	8,214	2,313	14,608
	1883-85	1,526	20,585	28,934
	1886-88	1,001	4,987	15,608
	1889-91	12,461	21,942	11,380
	1892	2,449	834	11,270
	1893	1,708	134	27,458
<i>Belgium</i> .....	1877-79	52,346	.....	43
	1880-82	24,529	.....	470
	1883-85	9,788	1,607	121
	1886-88	2,605	173	1,796
	1889-91	4,619	170	292
	1892	1,171	.....	601
	1893	12,241	.....	291
<i>Italy</i> .....	1877-79	.....	.....	49
	1880-82	2,530	.....	68
	1883-85	5,385	2,267	404
	1886-88	9,853	.....	276
	1889-91	6,469	2,733	196
	1892	20,331	2,200	292
	1893	.....	.....	180
<i>Holland</i> .....	1877-79	42,555	9,833	32
	1880-82	37,103	500	.....
	1883-85	12,945	1,579	13
	1886-88	7,051	.....	153
	1889-91	4,175	.....	10
	1892	34,530	.....	.....
	1893	22,030	5,840	.....
<i>France</i> .....	1877-79	290,034	485	3,228
	1880-82	553,624	166	9,154
	1883-85	342,604	25,852	22,271
	1886-88	199,615	97	6,294
	1889-91	127,875	4,329	4,732
	1892	186,970	715	11,176
	1893	110,248	.....	6,112
<i>Portugal</i> .....	1877-79	53,519	288	.....
	1880-82	63,711	133	.....
	1883-85	61,662	852	.....
	1886-88	39,543	8	.....
	1889-91	39,822	17	.....
	1892	46,138	.....	.....
	1893	20,971	.....	.....
<i>Spain</i> .....	1877-79	37,713	9,833	.....
	1880-82	64,445	500	36
	1883-85	135,596	1,579	.....
	1886-88	55,314	.....	199
	1889-91	40,413	.....	.....
	1892	27,001	.....	.....
	1893	41,499	5,840	.....

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TABLE No. 9.—Canada—Wood—Continued.  
Exports and Imports by Canada, by Countries.—Produce and not Produce—(As given in the Canadian Trade and Navigation Returns)—Continued.

—(As given

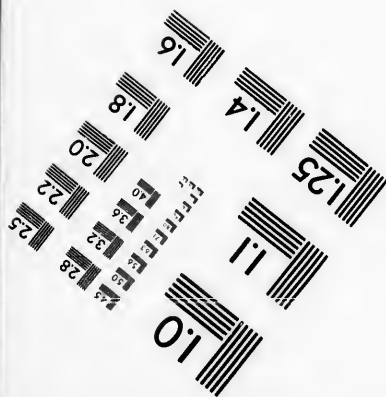
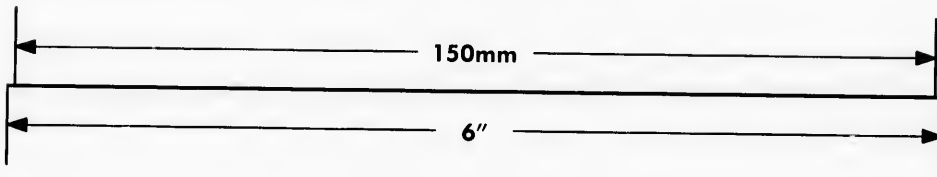
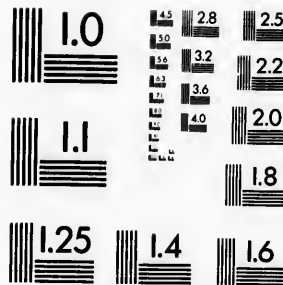
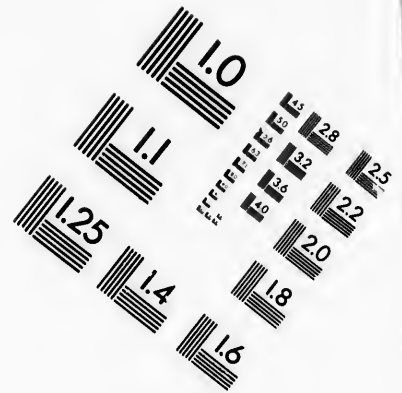
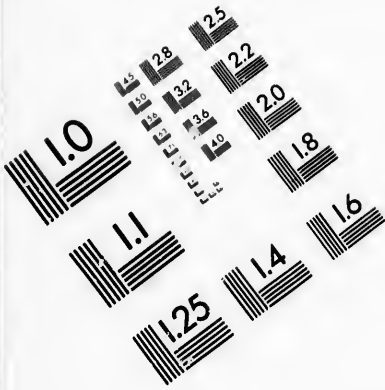
IMPORTS.	COUNTRIES.	YEAR.	EXPORTS.		IMPORTS.
			Total Product.	Manufactures.	
\$			\$	\$	\$
67	<i>Gibraltar</i> .....	1877-79	5,126		
176		1880-82	9,126		
10		1883-85	6,989		
101		1886-88	6,799		
130		1889-91	2,200		
1,172		1892	3,802		
14,603	<i>Madeira</i> .....	1893	4,696		
28,934		1877-79	10,014		3
15,608		1880-82	10,738		4
11,380		1883-85	17,366		82
11,270		1886-88	14,393		
27,458		1889-91	15,358		
43	<i>Canary Islands</i> .....	1892	16,000		
470		1893	14,476		
121		1877-79	5,126		
1,796		1880-82	6,871		
292		1883-85	790		
601		1886-88			
291	1889-91				
49	<i>Australia</i> .....	1892			
68		1893			
404		1877-79	154,488	19,375	
276		1880-82	104,115	3,680	
196		1883-85	255,009	24,115	
292		1886-88	151,842	5,641	7
180	1889-91	238,425	3,144	27	
32	<i>China</i> .....	1892	251,465	147	
13		1893	148,026	60	
153		1877-79	59,462		471
10		1880-82	34,244	3,000	518
		1883-85	40,028		1,494
		1886-88	47,496	2,077	2,422
	1889-91	39,705	7	1,683	
3,223	<i>Africa</i> .....	1892	8,522		1,683
9,154		1893	9,948	50	1,843
22,271		1877-79	30,587		
6,294		1880-82	48,513	730	
4,732		1883-85	59,966	1,506	* 95
11,176		1886-88	36,946		* 92
6,112	1889-91	19,722			
	<i>Labrador</i> .....	1892	23,812	4,373	
		1893	15,828	9,330	
		1877-79	191	2,977	
		1880-82	192	249	
		1883-85	102	268	
		1886-88	27		
	1889-91		64		
	<i>South America</i> .....	1892			
		1893			
36		1877-79	264,527	6,477	
199		1880-82	333,603	3,107	
		1883-85			
	1886-88				
	1889-91				
	1892				
	1893				

(Details of the countries forming South America are given separately after 1882.)

\* Egypt.



# IMAGE EVALUATION TEST TARGET (MT-3)



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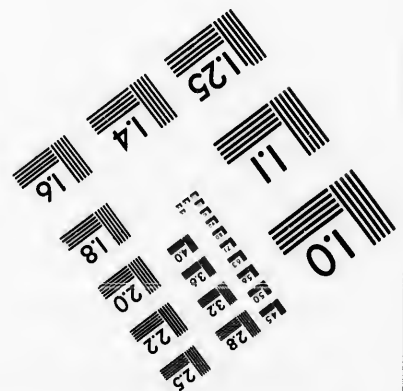




TABLE No. 9.—Canada—Wood—Continued.

EXPORTS and Imports by Canada, by Countries—Produce and not Produce.—(As given in the Canadian Trade and Navigation Returns)—Continued.

COUNTRIES.	YEAR.	EXPORTS.		IMPORTS.
		Total Product.	Manufactures.	
		\$	\$	
<i>Turkey</i> .....	1883-85			70
	1886-88			12
	1889-91			4
	1893			21
<i>Dutch West Indies</i> .....	1877-79			
	1880-82			
	1883-85			
	1886-88			
	1889-91			
	1892		308	
<i>British East Indies</i> .....	1893		7,274	
	1877-79			
	1880-82		1,667	195
	1883-85		4,056	41
<i>Norway and Sweden</i> ..	1886-88		87	2
	1889-91		68	92
	1892			
	1893			
<i>Denmark</i> .....	1877-79			
	1880-82		23,291	2,491
	1883-85		37,963	120
	1886-88		87,091	11
	1889-91		65,979	153
	1892		220,769	5
	1893		253,609	12
<i>United States of Colombia</i> .....			179,521	102
	1877-79			
	1880-82		4,920	
	1883-85		4,373	
	1886-88		1,090	
	1889-91		3,333	
<i>Central America States</i> .....	1892			
	1893		86	
	1877-79			
	1880-82		1,175	
	1883-85		16,023	
<i>Austria</i> .....	1886-88			
	1889-91		2,194	
	1892		44	
	1893		410	
<i>Other</i> .....	1877-79			
	1880-82		233	
	1883-85		7	
	1886-88		17	
	1889-91			
	1892			
	1893			
<i>Other</i> .....	1877-79			591
	1880-82			451
	1883-85			3,241
	1886-88			1,179
	1889-91			3,946
	1892			4,162
	1893			1,856



## DEPARTMENT OF AGRICULTURE.

TABLE 10.—Exports by Canada to the United Kingdom.  
 PRODUCTS of the Forest, the Factory and the Shipyard—Produce of Canada.—(From  
 Canadian Trade and Navigation Returns.)

YEAR.	Total Exports to United Kingdom.	WOOD EXPORTS BY CANADA TO UNITED KINGDOM.		
		From the forest.	From the factory.	From the shipyard.
1868.	\$ 10,150,469	\$ 4,034,471	\$ 5,326,668	\$ 789,330
1869.	12,170,836	4,462,827	6,704,929	1,003,080
1870.	11,219,181	4,412,296	6,204,405	602,480
1871.	12,197,571	5,467,811	6,200,078	529,682
1872.	13,129,142	6,214,292	6,582,588	332,262
1873.	14,615,316	6,046,922	7,711,044	757,350
1874.	15,741,523	5,364,422	9,580,426	796,675
1875.	17,102,568	6,505,733	9,717,385	789,450
1876.	15,532,196	4,984,999	9,063,912	1,483,285
1877.	17,895,570	7,048,837	9,734,887	1,111,846
1878.	14,397,898	4,671,947	8,725,306	1,060,645
1879.	7,857,538	1,815,726	5,642,576	399,236
1880.	9,243,438	2,363,576	6,748,882	310,980
1881.	14,110,499	5,923,757	8,977,842	205,900
1882.	11,378,075	3,704,028	7,553,861	315,186
1883.	13,510,734	4,779,953	8,494,879	245,902
1884.	14,141,202	5,118,497	8,878,085	144,620
1885.	9,924,164	3,443,270	6,492,588	78,300
1886.	11,190,149	3,408,628	7,681,913	99,608
1887.	9,640,456	2,208,620	7,396,702	35,134
1888.	9,146,272	2,469,758	6,571,121	105,393
1889.	10,500,669	3,144,588	7,298,801	57,220
1890.	14,455,264	4,342,963	10,112,301	22,006
1891.	11,616,858	3,105,676	8,488,576	2,500
1892.	10,031,738	2,639,169	7,300,069	32,500
1893.	11,425,223	2,469,436	8,840,154	115,633

From the forest includes square timber, logs, railway ties, firewood, &c. From the factory includes all products upon which labour has placed by its exertions an increase in the value beyond the work of cutting and squaring. From the shipyard includes all ships new or old sold.

## PRODUCE of Canada.—(From Canadian Trade and Navigation Returns.)

YEAR.	Total Exports to United States.	WOOD EXPORTS TO UNITED STATES.		
		From the forest.	From the factory.	From the shipyard.
1868.	\$ 7,875,379	\$ 1,303,034	\$ 6,572,345	\$
1869.	7,542,774	1,147,104	6,396,670	
1870.	8,967,590	1,232,643	7,734,947	
1871.	9,208,493	1,405,739	7,802,754	
1872.	9,325,008	1,343,613	7,981,995	
1873.	12,088,527	2,400,693	10,287,834	
1874.	9,766,804	1,897,310	7,869,494	
1875.	6,483,996	1,294,098	5,191,898	
1876.	4,962,764	981,709	3,985,905	22,150
1877.	5,593,254	1,052,548	4,536,716	4,000
1878.	4,632,688	1,076,992	3,549,696	6,000
1879.	4,382,557	983,192	3,396,615	2,750
1880.	6,771,299	1,488,974	5,289,625	21,700
1881.	8,609,093	1,746,838	6,849,425	12,830
1882.	10,466,739	2,312,572	8,147,267	6,900
1883.	10,182,787	2,084,713	8,085,954	12,120
1884.	10,180,935	1,854,281	8,326,354	
1885.	9,728,032	1,428,409	8,299,523	100
1886.	8,964,962	1,502,792	7,459,820	2,350
1887.	9,740,757	1,332,092	8,408,265	400
1888.	10,742,904	2,155,539	8,580,365	7,000
1889.	11,469,035	2,020,117	9,433,418	15,500
1890.	10,734,212	1,956,883	8,776,629	709
1891.	7,396,060	2,304,035	10,086,768	5,257
1892.	12,050,906	2,627,312	9,415,654	8,000
1893.	14,558,085	3,094,593	11,463,492	





TABLE 12.

## EXPORTS AND IMPORTS OF LOGS.

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 feet B.M., \$274,033 value; in 1893 to 198,021,000 feet B.M., \$1,507,000 value.

The bulk of this increase was in pine logs from 1,313,000 feet B.M., \$16,001 value in 1882, to 127,062,000 feet B.M., \$1,056,355 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.	Feet B.M.		Average ft.	
1882-5.....	4,335,000	\$ 37,943	1,083,750	\$ 9,483
1886-9.....	20,526,000	171,856	5,131,500	42,964
1890-3.....	269,868,000	2,282,802	67,467,000	570,700

Thus the yearly average of about one million feet in the first four years grew to five million in the next period and to nearly sixty-seven and a half million 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. (*see* Table 12a.)

The United States returns of "unmanufactured wood" imported from Canada are given for comparison. They include much besides sawlogs. (*See* Table 12b.)

The imports of logs from the United States were far smaller than the exports to that country. As is shown in Table 12c, the imports reported by our Customs Department are much less than the exports reported by the United States, which gave only their own produce, while the Canadian figures include logs imported through the United States from elsewhere.

These imported logs are not pine except in the case of those floated down from the tributaries in the United States of the Rainy River, to the mills at Rat Portage, &c. This is the result of natural position. In the evidence before the Committee on Immigration, &c., in 1878-79, Mr Hugh Sutherland said of this timber: "It must go out by our route as the water goes" (*Jour.* vol. XII., page 169), and Mr. Dawson, M.P., said: "It must go that way as there is no other way of getting it out." (*Jour.* vol. XIII., page 86).

The abnormal amount of United States' exports of logs to us in 1883, may be partly due to the facts mentioned in the report of Mr. E. F. Stephenson, Crown Timber Agent, Winnipeg, who says: "There has existed an unusual depression in the lumber trade of Minnesota from which cause a very large quantity of building material has been forced into Canada to find a market here at whatever prices could be obtained for it." (*Dept. of Interior Report*, page 25, I.)

In this and other instances there is an apparent discrepancy between the Canadian and United States returns; though the fiscal year in both countries ends with June, transportation may easily begin in one year in one country and end the next year in the other country.

Some logs are brought from the United States into Canada which are not reported as logs in the returns of exports and imports of either country; they are the logs (chiefly spruce) cut in the State of Maine, on the tributaries of the St. Croix and St. John rivers, floated freely by treaty into New Brunswick and there manufactured. The products of

these logs, however, appear in our returns in the forest exports from New Brunswick "not the produce of Canada," and in the United States returns there is a special report of the imports from New Brunswick of the produce from Maine logs. The amounts are rather larger than in the Canadian export returns, but the variation may easily be due to difference of valuation by the Customs authorities. (See Table 12*d*.)

Appended are the following tables, covering twelve years:—

- Table (a.) Exports of logs to United States, quantities and value.  
 (b.) United States imports from Canada—"wood unmanufactured."  
 (c.) Imports of logs from United States, and export of logs from United States to Canada.  
 (d.) Exports from New Brunswick—products of Maine logs and United States returns of such imports.

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TABLE  
EXPORT of Logs to United States.—(From

YEARS.	a PINE LOGS.			b SPRUCE LOGS.			c HEMLOCK LOGS.	
	Feet, B.M.	Value.	Duty collected.	Feet, B.M.	Value.	Duty collected.	Feet, B.M.	Value.
		\$	\$ cts.		\$	\$ cts.		\$
1882 .....	1,313,000	16,001	.....	5,980,000	22,681	.....	3,757,000	13,106
1883 .....	1,006,000	d11,630	.....	6,255,000	30,858	.....	4,323,000	20,622
1884 .....	974,000	8,012	.....	6,820,000	31,793	.....	4,818,000	19,168
1885 .....	382,000	2,300	.....	11,165,000	49,449	.....	3,629,000	14,752
1886 .....	2,869,000	24,452	.....	17,541,000	81,874	.....	6,881,000	28,076
1887 .....	6,350,000	49,242	13,107 02	17,526,000	88,773	17,535 58	4,206,000	17,447
1888 .....	468,000	3,875	935 80	20,714,500	99,450	20,715 11	4,512,000	18,383
1889 .....	10,839,000	94,287	21,811 27	20,360,000	137,298	20,393 90	6,420,000	24,261
1890 .....	32,144,000	261,626	66,863 23	26,073,000	156,898	26,082 47	2,952,000	12,288
1891 .....	36,699,000	313,281	60,756 91	28,494,000	158,334	3,851 50	2,210,000	9,802
1892 .....	73,963,000	651,540	.....	23,434,000	141,168	108 00	5,057,000	21,426
1893 .....	127,062,000	1,056,355	.....	21,103,000	123,254	.....	5,880,000	26,036
Totals ..	294,729,000	2,492,601	163,474 23	205,465,500	1,121,830	88,686 56	54,645,000	225,367
Douglas fir ..	1,197,000	7,182	.....	.....	.....	.....	.....	.....

a. Pine logs, almost wholly from Ontario; very few from Quebec; none from other provinces.

b. Spruce logs, chiefly from Quebec; a few from New Brunswick, Nova Scotia and British Columbia; very few from Ontario.

c. Hemlock logs, almost wholly from Quebec; very few from New Brunswick and Nova Scotia.

d. In addition to these 1,197,000 feet B.M., \$7,182, value of pine logs, are attributed to British Columbia; probably Douglas fir.

e. Collected, December, 1890.

f. Tamarack logs, chiefly from Quebec; a few from Nova Scotia and Ontario.

g. Oak logs, almost wholly from Ontario; very few from Quebec; none from other provinces.

h. Elm logs,

"Other Logs" till 1888, do do do do With

i. Other logs, the largest portion from Ontario; considerable from Quebec; less from Nova Scotia and New Brunswick.

12 (a).

Canadian Trade and Navigation Returns.)

TABLE  
ates.—(From

TAMARACK LOGS.		OAK LOGS.		ELM LOGS.		OTHER LOGS.		TOTAL LOGS AND VALUE	
B.M.	Value.	Feet, B.M.	Value.	Feet, B.M.	Value.	Feet, B.M.	Value.	Feet, B.M.	Value.
	\$		\$		\$		\$		\$
757,000	13,106	387,000	3,651	15,000	145	30,198,000	151,782	46,450,000	274,083
323,000	20,622	1,820,000	66,802	28,536,000	139,528	36,880,000	139,207	43,812,000	259,784
518,000	19,168	2,225,000	29,819	28,536,000	139,528	36,880,000	139,207	43,812,000	259,784
329,000	14,752	1,137,000	30,399	31,479,000	143,483	31,479,000	143,483	45,717,000	228,579
381,000	28,076	1,163,000	15,548	37,581,000	161,385	37,581,000	161,385	47,792,000	225,532
206,000	17,447	388,000	7,755	38,137,000	177,866	38,137,000	177,866	66,035,000	309,447
112,000	17,447	1,862,000	34,922	22,577,000	121,277	22,577,000	121,277	66,007,000	341,083
20,000	24,261	2,890,000	52,295	27,294,000	136,754	25,698,000	119,752	72,049,500	383,526
52,000	12,288	2,124,000	39,445	28,415,000	144,935	11,710,000	66,073	93,507,000	564,620
10,000	9,802	1,095,000	21,400	27,470,000	155,508	9,157,000	64,525	103,416,000	681,275
57,000	21,426	1,153,000	21,297	34,116,000	208,799	12,062,000	68,553	105,126,000	722,845
80,000	26,036	1,347,000	21,030	33,615,000	219,065	9,014,000	62,040	149,785,000	1,112,693
45,000	225,367	408,000	3,859	22,020,000	353,442	172,824,000	971,485	198,021,000	1,507,780
						287,029,000	1,435,471	1,038,317,500	6,611,247

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## DEPARTMENT OF AGRICULTURE.

TABLE 12 (b).—(From United States Returns.)

UNITED STATES IMPORTS FROM CANADA OF UNMANUFACTURED WOOD.

Years.	Wood, Unmanufactured —Free.	Wood, Unmanufactured —Dutiable.	Total.
	\$	\$	\$
1882.....	1,980,029		1,980,029
1883.....	1,903,594		1,903,594
1884.....	1,573,217	80,845	1,654,062
1885.....	1,062,983	57,087	1,120,070
1886.....	1,362,237	54,304	1,416,541
1887.....	1,600,456	17,404	1,617,860
1888.....	2,029,537	10,350	2,039,887
1889.....	2,145,214	13,129	2,158,343
1890.....	1,948,334	9,416	1,957,750
1891.....	2,347,659	10,022	2,357,681
1892.....	2,059,043	50,724	2,109,767
1893.....	2,992,797	60,912	3,053,709
Totals.....	23,005,160	364,193	23,369,353

TABLE 12 (c).

IMPORTS OF LOGS FROM UNITED STATES.

Years.	*Imports from United States— Logs and round unmanufactured Timber, N. E. S.	†United States Exports of Domestic Mer- chandise to Canada—Logs and other Timber (round).
	Value.	
	\$	\$
1882.....	691,547	173,749
1883.....	658,406	1,035,703
1884.....	692,958	213,806
1885.....	604,403	442,957
1886.....	493,196	101,498
1887.....	335,179	165,449
1888.....	279,872	161,829
1889.....	358,797	348,839
1890.....	256,100	323,320
1891.....	859,578	597,403
1892.....	231,591	396,509
1893.....	274,811	342,079
Totals.....	5,736,438	4,225,141

\* From Canadian Trade and Navigation Returns; they include imports from other countries *via* United States.

† From United States Commerce and Navigation Returns; limited to produce of United States forests.

TABLE 12 (d).

EXPORTS from New Brunswick to United States, &c., not Produce of Canada:—Spruce deals, boards, scantling, laths, palings, staves, shingles, shooks, &c.

Years.	Exports from New Brunswick (not Canadian).			United States Imports from New Brunswick of produce from Maine Logs, &c.
	To United States.	To other Countries.	Totals.	
	\$	\$	\$	\$
1882. ....	709,596	6,549	716,145	961,693
1883. ....	768,598	14,061	782,659	927,101
1884. ....	962,902	4,966	967,868	1,156,100
1885. ....	762,449	4,800	767,249	1,177,892
1886. ....	1,230,532	13,115	1,243,647	1,329,105
1887. ....	1,270,979	2,990	1,273,969	1,334,031
1888. ....	1,209,538	.....	1,209,538	1,464,865
1889. ....	1,164,367	1,203	1,165,570	1,462,525
1890. ....	916,446	.....	916,446	333,708
1891. ....	1,314,327	4,800	1,319,127	1,747,900
1892. ....	1,152,071	5,595	1,157,666	1,459,892
1893. ....	963,043	.....	968,548	1,702,563
Totals.....	12,463,848	57,989	12,521,837	14,988,240

Total.
\$
1,980,029
1,903,594
1,654,062
1,120,070
1,416,541
1,017,860
2,039,947
2,158,343
1,957,750
2,357,681
2,109,767
3,053,709
23,369,353

United States Exports of Domestic Merchandise to Canada—Logs and other timber (round).

\$
173,749
1,035,703
213,806
442,957
101,498
165,449
161,829
348,839
325,320
557,403
356,509
342,079
4,225,141

countries *via* States forests.

TABLE 13.—(From Canadian Trade and Navigation Returns.)

QUANTITIES and Value of Exports of Logs on which export Duties were levied, 1868-91.  
(Export Dutiable.)

Year ended 30th June.	Shingle Bolts.		Stave Bolts.		Oak Logs.		Spruce Logs.		Pine Logs.		Total Value.
	Cords.	Value.	Cords.	Value.	M. Ft.	Value.	M. Ft.	Value.	M. Ft.	Value.	
	§	§	§	§	§	§	§	§	§	§	
1868											
1869	8,546	27,372	883	3,303	331	5,380					*78,524
1870	11,638	39,889	1,615	5,248	876	9,165	With pine logs	†4,281	†17,037		53,692
1871	15,667	54,472	2,098	5,954	1,173	12,173	"	†22,258	†102,950		157,252
1872	8,374	31,408	2,507	7,440	725	8,028	2,751	11,660	13,204	60,626	144,891
1873	4,923	18,372	731	2,626	1,328	22,767	6,812	27,556	5,663	28,763	103,195
1874	2,987	11,634	1,038	3,908	691	9,625	6,998	30,323	4,839	33,693	107,693
1875	1,112	3,871	534	2,478	66	626	4,706	18,855	3,852	21,792	65,814
1876	1,236	3,499					4,041	17,523	1,423	6,165	30,663
1877	719	1,727					2,937	12,047	425	1,857	17,413
1878	304	747					2,791	11,844	455	1,891	15,462
1879	121	385					3,748	12,750	166	673	14,176
1880	717	2,202	Export duty abolished.				4,611	14,382	168	1,071	15,838
1881	1,198	3,386					6,036	19,272	2,075	13,771	35,245
1882	1,516	5,653	do	do	do	do	4,332	13,584	2,640	20,276	39,246
1883	637	2,685					5,980	22,681	1,313	16,091	44,335
1884	721	2,857					6,255	30,858	2,863	18,812	62,355
1885	750	2,906					6,820	31,793	974	8,012	42,602
1886	271	936					11,168	49,474	380	2,300	54,680
1887	593	3,410					17,566	82,016	2,869	24,452	107,494
1888	81	738					17,526	88,773	6,350	49,242	141,425
1889							20,714	99,450	468	3,875	104,693
1890	480	4,975					20,393	138,763	10,839	94,287	233,050
1891	130	295					26,082	157,112	32,144	261,626	423,713
1892							28,494	158,334	36,669	313,281	471,910
							†23,434	141,168	73,963	651,540	.....

\* No. of pieces, 17,985. † Spruce and pine together. ‡ \$108 duty collected in December, 1890, charged in 1892.



TABLE 14.

AMOUNTS paid as Export Duties on Logs, &c.—(From Canadian Trade and Navigation Returns.)

logs.	Total Value.
Value.	Value.
\$	\$
17,037	78,524
62,950	53,092
60,626	157,252
28,763	144,891
33,995	103,195
21,792	107,693
6,165	65,811
1,857	30,693
1,891	17,413
673	15,462
1,071	11,176
13,771	15,838
20,276	35,245
16,001	39,216
8,012	44,335
2,300	52,355
24,432	8,012
49,242	2,300
3,875	54,680
11,626	107,404
3,281	141,425
11,540	104,033
	233,650
	423,713
	471,910

Year ended 30th June.	Shingle Bolts.	Stave Bolts.	Oak Logs.	Spruce Logs.	Pine Logs.	Total Duty.	Remarks.
\$	\$	\$	\$	\$	\$	\$	
1868.....							Duty first imposed in 1868, as follows:
1869.....	8,581	868	663	4,290	17,495	17,495	Shingle bolts per cord of 128 cub. ft., \$1
1870.....	11,681	1,659	1,754	23,411	14,492	37,912	do do do
1871.....	13,607	2,098	2,345	2,751	13,201	36,066	Oak logs per M., B.M., \$2.
1872.....	8,374	2,508	1,451	6,812	5,663	24,800	Pine do do
1873.....	4,024	734	2,656	6,998	4,810	20,152	do do do
1874.....	2,986	1,037	1,982	4,707	3,852	14,565	
1875.....	1,112	534	131	4,012	1,423	7,242	Export duty on staves and oak logs:
1876.....	1,236			2,838	426	4,500	repealed, chap. 35, Acts 1875; as-
1877.....	718			2,929	455	4,103	sent to 8th April, 1875.
1878.....	305			3,750	196	4,160	
1879.....	122			4,043	107	4,272	
1880.....	718			6,037	2,076	8,831	
1881.....	1,166			4,332	2,640	8,140	
1882.....	1,516			5,981	1,313	8,810	
1883.....	637			6,255	2,863	9,756	
1884.....	722			6,820	973	8,515	
1885.....	756			11,168	381	12,305	Shingle bolts, spruce and pine logs, \$1.
*1886.....	272			17,585	2,869	20,726	
1887.....	755			17,535	13,107	31,397	Shingle bolts, \$1.50, pine logs, \$2.
†1889.....	121			20,716	436	21,772	do do
†1890.....				20,394	21,812	42,206	Pine logs, \$3. See note.
1891.....	720			26,082	66,863	93,674	do do
1892.....	193			3,851	60,757	64,803	do do
1893.....				108		108	do do

ber, 1890, charged

\* Chap. 37, Acts of 1886, and chap. 33, sec. 6, Revised Statutes of Canada, 1886 (both assented to 2nd June, 1886), the duty on exported pine logs was increased to \$2, and on shingle bolts to \$1.50, power being given to the Governor in Council to remove the duty altogether or to increase it on pine logs to \$3 per M. feet in case public exigencies required a change.

† During the fiscal year ended 30th June, 1889, the duty on exported pine logs was raised to \$3 from the 13th November, 1888.

‡ During the fiscal year ended the 30th June, 1890, the duty was \$2, and during the fiscal year ended 30th June, 1891, it was \$2 till 13th October, 1890, when the export duty was altogether abolished and has not since (December, 1894) been reimposed.

§ Not separated.

TABLE  
SHIPMENTS of Forest Products to United

No.	ARTICLES.	Measures.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.
1	Bark for tanning.....											
2	Basswood, butternut, hickory..	Cords									3 95	3 78
3	Cedar fit for shingle bolts.....	M. ft.	10 61	5 89	7 97	10 52	9 20	7 79	6 24	12 95	10 01	10 69
4	Firewood.....	Cords										
5	Hop and other poles.....	Pieces	2 19	2 16	2 21	2 24	2 49	2 74	2 75	2 41	1 98	2 46
6	Knees and futtocks.....	Pieces										
7	Lathwood.....	Cords	0 76	0 69	0 83	0 89	1 13	1 00	0 89	1 07	1 09	0 72
8	Logs—		5 67	8 37	0 68			1 37	6 23	9 06		5 04
9	Elm.....	M. ft.										
10	Hemlock.....	"									1 41	4 02
11	Oak.....	"						4 33			12 49	9 54
12	Pine.....	"	16 25	14 62	10 38	11 07	17 13	9 71	9 48		4 37	4 16
13	Spruce.....	"	3 97	4 73	4 59	5 08	6 94	5 66	4 33		4 10	3 72
14	Tamarack.....	"			3 36	4 21	4 05	0 55		4 34		
15	All other.....	"									3 06	2 92
16	Lumber—											
17	Battens.....	"	0 21	0 01		0 12		0 06	0 01	0 21		1 24
18	Deals, pine.....	St. hd	18 26	26 51	16 99	20 29	16 86	28 04	17 75	19 99	24 59	38 33
19	Do spruce and other.....	"										
20	Dead ends.....	"			15 88	22 73		16 67	6 09	1 63	14 65	2 76
21	Laths, palings and pickets.....	M.			1 07	1 01	1 10	1 13	1 13	0 95	1 06	0 89
22	Planks and boards.....	M. ft.	9 76	9 63	9 42	11 13	9 12	11 12	9 17	9 93	10 69	10 04
23	Joists.....	"										
24	Scantling.....	"										
25	Staves, standard.....	& pcs.	0 08	0 10	0 06	0 04	0 11	0 04	0 07			7 83
26	Other and headugs.....	M.	75 39	76 87	23 08	43 65	87 00	85 06	86 04	13 94	68 93	45 85
27	Masts and spars.....	"	15 41	13 64	16 98	13 73	14 81	20 12	19 13	11 33	15 22	4 94
28	Piles and pile timber.....	Pieces	2 52	0 77	1 24	1 42	0 76	1 51	1 12	1 70	0 61	1 02
29	Posts—cedar, tamarack, &c.....	"										
30	Shingles.....	M.	2 13	1 99	1 99	2 00	2 16	2 46	2 32	2 01	2 24	2 02
31	Shingle bolts.....	Cords										
32	Sleepers and railway ties.....	Pieces	3 20	3 61	3 41	3 75	3 73	3 89	3 48		2 83	2 40
33	Stave bolts.....	Cords	0 16	0 17	0 18	0 19	0 22	0 24	0 25	0 22	0 20	0 18
34	Shooks, box.....	No.			3 23	2 83	2 97	3 47	3 67	4 64	2 99	2 00
35	Other.....	"										0 41
36	Timber, square—											
37	Ash.....	Tons.	5 21	4 89	0 58	2 52	3 14	4 27	4 06	5 06	7 69	
38	Birch.....	"	3 06	3 20	2 50	6 42	11 44	7 64	4 00	7 10	8 88	10 00
39	Elm.....	"	9 60	3 42	1 80	3 93	4 23	4 45	3 00	11 59		
40	Maple.....	"	3 17	2 29	0 12	1 32	1 70	6 13	1 29	1 81		
41	Oak.....	"	5 74	5 48	3 96	6 08	6 26	7 29	5 26	8 98	5 33	6 38
42	Pine, red.....	"	6 52	3 98	2 79	4 64	6 00	6 70	14 00	6 48		
43	White.....	"	2 78	3 89	2 77	3 19	3 08	5 24	14 41	5 99	4 71	5 56
44	Other.....	"									4 52	5 2
45	Hemlock.....	"										
46	Tamarack.....	"										
47	Walnut.....	M. ft.	2 49	6 61		1 80	1 88	3 84	7 29	4 08		2
48			24 50	25 00	6 82	37 00	15 00	26 64	58 82	33 68		

a. Laths are included with "lathwood" in 1868 and 1869.

b. Elm logs are apparently included in "all other logs" till 1888. In 1868 no logs are specified, but

c. To 1884 all deals are classed together.

d. Till 1874 palings and pickets were not included with laths.

e. Till 1875 no "joists" were recorded; from 1876 to 1888 "joists" were included with "planks and joists" and "scantling" were returned separately. "Scantling" was recorded by "pieces" till 1875,



TABLE 16.—Logs Rafted to Michigan.  
SAGINAW CITY BOARD OF TRADE REPORT, 1892.

*Rafted by Lake.*

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 bag-boom 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 feet each are brought to the Saginaw river. The picture on page 30 represents one of Sibley & Bearinger's rafts on Lake Huron, containing 5,000,000 feet of logs. 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 the last two years. In 1891 no less than 80,000,000 feet 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 Salt Co. ....	27,000,000
" Spanish River Lumber Co. ....	22,000,000
" Sage & Emery. ....	12,000,000
" J. W. Howry & Sons. ....	22,000,000
" Sibley & Bearinger. ....	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. ....	<u>184,500,000</u>
" 1891. ....	<u>80,000,000</u>

*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. ....	<u>63,500,000</u>

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.

TABLE 17.—(Lumber Department of Customs.)

STATEMENT showing number of logs, and quantity in feet, of Pine exported from Georgian Bay district during the fiscal years 1892 and 1893.

Date.	Shippers.	No. of Logs.	Feet.
1891.			
July 16	Geo. Avis		
do 9	Howey & Sons		33,000
do 13	do		1,000,000
do 24	do		1,000,000
do 24	do		1,000,000
do 24	do		1,000,000
Aug. 6	do		500,000
do 7	do		1,000,000
do 14	do		1,000,000
do 19	do		500,000
July 13	J. & P. Charlton		1,000,000
Aug. 3	do		1,000,000
July 11	Nugent & Co.		1,000,000
do 28	R. Reid		3,000,000
Aug. 24	Adams & Wigg		700,000
do 21	W. D. Fremlin		80,000
do 20	Michigan Pipe Co	4,500	300,000
		5,322	673,128
1892.			
June 8	Saginaw Lumber Co.		
do 2	Island Cedar Co.		3,000,000
May 9	Geo. Avis	3,000	300,000
do 21	Emery Lumber Co.		282,801
do 23	do	30,000	a 2,250,000
June 3	do	25,000	a 1,875,000
do 8	do	28,000	a 2,100,000
do 10	do	25,000	a 1,875,000
do 23	do	25,000	a 1,875,000
do 27	do	25,000	a 1,875,000
do 28	Moore Lumber Co.	25,000	a 1,875,000
do 22	Saginaw Lumber Co.	20,000	a 1,520,000
May 21	Howey & Sons	28,000	a 2,100,000
June 13	do		1,000,000
do 22	do		1,000,000
do 7	E. D. Wall		1,000,000
do 25	Saginaw L. & S. Co.		20,000
do 2	Sibley & Bearinger	61,201	3,500,000
do 1	Turner & Fisher	43,000	2,500,000
do 13	do	23,950	2,385,080
do 25	do	26,607	2,883,290
do 25	do	26,798	2,856,950
1891.			
June 16	Jos. Turner		
do 29	do	20,025	2,513,280
		20,693	2,468,440
	Total for 1891-92		57,840,978
1892.			
July 30	H. A. Emery		
Aug. 2	do		3,000,000
do 22	do		3,000,000
do 23	do		3,000,000
July 17	Shead & Allan		5,000,000
do 2	W. D. Hitchcock		450,000
Aug. 2	Geo. Avis		245,183
Oct. 25	Pentley & Reid		50,000
Aug. 16	Emery Lumber Co.		1,700,000
do 19	do	25,000	a 1,875,000
July 14	Moore Lumber Co.	25,000	a 1,875,000
do 25	do	20,000	a 1,520,000
do 27	do	28,000	a 2,100,000
Aug. 13	do	28,000	a 2,100,000
July 16	H. R. Hoffeld	30,000	a 2,250,000
do 4	Howey & Sons	6,285	471,375
do 9	do		1,000,000
			1,000,000

a These figures represent the estimated number of feet, where only number of logs was given, each log being taken to contain 75 feet.

TABLE 17.—(From Department of Customs.)—*Concluded*,  
STATEMENT showing number of logs, and quantity in feet, of Pine exported from Georgian  
Bay district during the fiscal years 1892 and 1893.

Date.	Shippers.	No. of Logs.	Feet.
1892.			
July 11.....	Howey & Sons.....		
do 28.....	do.....		1,000,000
Aug. 1.....	do.....		1,000,000
do 15.....	do.....		1,000,000
do 1.....	J. T. Charlton.....		1,000,000
Sept. 16.....	J. G. Saxe.....		1,000,000
do 3.....	Howey & Sons.....		2,500,000
July 20.....	Hollester, Jewell & Co.....		1,000,000
Aug. 1.....	do.....		1,000,000
do 15.....	do.....	15,000	2,000,000
do 17.....	do.....	25,876	1,975,000
do 19.....	John Dunn.....		975,000
do 2.....	W. H. Jostin.....		127,000
do 17.....	E. D. Johnston.....		800,000
July 30.....	Howey & Sons.....		80,000
do 8.....	Saginaw L. & S. Co.....		4,000,000
Aug. 3.....	do.....	40,000	2,500,000
do 18.....	do.....	30,000	1,800,000
Sept. 8.....	do.....	40,000	2,500,000
July 28.....	Sibley & Bearinger.....	60,000	3,700,000
Sept. 19.....	do.....	90,000	4,250,000
Oct. 22.....	do.....	45,000	2,700,000
July 8.....	Turner & Fisher.....	32,000	3,000,000
do 21.....	do.....	23,129	2,859,330
Aug. 6.....	do.....	26,165	2,811,040
Sept. 7.....	do.....	27,085	2,909,570
Oct. 12.....	T. W. Burrell.....	24,819	2,730,400
Sept. 10.....	E. Hall.....	10,000	1,000,000
July 16.....	E. Nelson & Co.....	19,000	1,728,000
Aug. 24.....	do.....	14,000	1,750,000
1893.			
June 6.....	Blind River Lumber Co.....	17,500	1,700,000
May 19.....	Chew Bros.....		700,000
June 7.....	do.....		1,500,000
May 27.....	A. T. Bliss.....		2,750,000
do 19.....	Eddy, Bros. & Co.....	25,000	3,000,000
do 24.....	do.....	26,000	3,000,000
June 6.....	do.....	22,500	2,500,000
do 8.....	do.....	22,500	2,500,000
do 13.....	Ed. Hall.....	20,000	2,000,000
do 19.....	Holland & Emery Lumber Co.....	14,630	3,000,000
do 9.....	Alb. Pack.....	30,000	2,250,000
do 2.....	Turner & Fisher.....	25,000	2,000,000
do 15.....	do.....	24,000	2,000,000
do 19.....	do.....	24,000	2,000,000
do 10.....	Rarburn Lumber Co.....	20,000	2,000,000
do 15.....	Howey & Sons.....		150,000
do 26.....	do.....		1,000,000
May 26.....	J. P. Charlton.....		1,000,000
June 6.....	do.....		1,250,000
do 28.....	Wm. Peter.....		1,000,000
do 10.....	Perry Lumber Co.....		3,500,000
do 20.....	Nelson & Co.....		25,000
May 30.....	Alb. Pack.....	18,500	2,000,000
June 27.....	do.....	40,000	2,000,500
do 18.....	Turner & Fisher.....	15,000	999,500
May 2.....	Saginaw Lumber Co.....	22,297	2,661,760
do 26.....	do.....	30,000	2,000,000
June 23.....	do.....		2,000,000
do 13.....	Spanish River Lumber Co.....	20,000	1,500,000
do 15.....	George Avis.....	42,000	4,200,000
Total for 1892-93.....			282,000
			143,788,158

<sup>a</sup> These figures represent the estimated number of feet, where only number of logs was given, each log being taken to contain 75 feet.

ded,  
ted from Georgian

5s.  
Feet.  
1,000,000  
1,000,000  
1,000,000  
1,000,000  
1,000,000  
2,500,000  
1,000,000  
1,000,000  
2,000,000  
1,975,000  
975,000  
127,000  
800,000  
80,000  
4,000,000  
2,500,000  
1,800,000  
2,500,000  
3,700,000  
4,250,000  
2,700,000  
3,000,000  
2,859,330  
2,811,040  
2,909,570  
2,730,400  
1,000,000  
1,728,000  
1,750,000  
1,700,000  
700,000  
1,500,000  
1,500,000  
2,750,000  
3,000,000  
3,000,000  
α 1,687,500  
2,500,000  
3,000,000  
α 2,250,000  
2,000,000  
α 1,800,000  
2,500,000  
2,000,000  
150,000  
1,000,000  
1,000,000  
1,250,000  
1,000,000  
3,500,000  
25,000  
2,000,000  
2,000,500  
999,500  
2,661,760  
2,000,000  
2,000,000  
1,500,000  
4,200,000  
282,000  
143,788,158

FOREST WEALTH OF CANADA.

TABLE 18.

CONSUMPTION OF WOOD IN CANADA.

CENSUS, 1891—Product of the Forest.

Square timber.....	865,896 tons.	43,294,800 cubic ft.
Logs, masts and spars.....	48,852,225 pcs.	407,101,875 "
Staves.....	92,260 M.	791,128 "
Railroad ties and fence poles.....	39,048,162 pcs.	117,144,486 "
Telegraph poles.....	303,861 "	3,282,175 "
Fire, lath and pulpwood and bark.....	11,439,541 cords.	1,464,061,248 "
Shingles.....	939,736 M.	9,397,360 "
Total.....		<u>2,045,073,072</u> "

VALUE of Product and of amount consumed.

Product, 1890-91.....	880,071,415
Net export, 1890-91.....	24,075,031
Balance left for consumption.....	<u>855,996,384</u> or \$11.59 per capita, 70 p.c. of product.

QUANTITY consumed.

70 p.c. of 2,045,073,072 cubic feet, total product.  
1,431,551,150 " consumption in year.  
296'2 " per capita.

given, each log

TABLE 19.

SHIPMENTS of Lumber from the River St. Lawrence to the River Plate, during the Season of 1894.—(Supplied by the Export Lumber Co.)

FROM MONTREAL.			Loaded by.	FROM OTHER PORTS ON THE ST. LAWRENCE.		
Date.	Vessel.	Pine.		Date.	*Vessel.	Spruce.
		Ft.			Ft.	
Sept. 21..	Bqt. Argentina.	628,896	Shepard & Morse	July 6..	Bk. Ariemore ....	850,000
" 29..	Bk. Runnymede.	558,830	Lumber Co.	" 10..	" Giovanni.....	650,000
Oct. 6..	" Louis.....	820,514	Export Lumber Co., Ltd.	" 12..	" Ophelia.....	1,040,000
" 15..	" H. B. Cann.	1,192,958	" "	Aug. 25..	" Allegro M.....	483,000
" 16..	" Strathmuir.	1,024,012	" "	" 29..	" Kriemhild....	600,000
" 27..	Bqt. C. W. James.	671,465	" "	Sept. 17..	" China.....	574,000
" 31..	St. Albania.....	1,165,753	" "	" 26..	" Gotha.....	636,000
" 31..	SS. Doris.....	1,289,053	" "	" 27..	" Jas. L. Harway	775,000
Nov. 8..	" Turret Bay.	1,530,434	" "	" 29..	" Magdala.....	905,000
" 14..	" Turret Age.	1,585,315	" "	Oct. 26..	" Silenzio.....	504,000
		10,467,230		" 29..	" Leviathan....	810,000
						7,827,000

\* The other ports are Three Rivers, Quebec, Bersimis, Chicoutimi, the latter generally the largest.

TOTAL Shipments from the St. Lawrence.

Pine.....	10,467,230 feet.
Spruce.....	7,827,000 "
	<u>18,294,230 "</u>

PREVIOUS Shipments.

	Ft.		Ft.
1893.....	17,625,507	1881.....	16,147,941
1892.....	19,141,826	1880.....	10,420,080
1891.....	2,428,625	1879.....	12,476,150
1890.....	7,660,669	1878.....	10,855,246
1889.....	35,313,573	1877.....	8,787,928
1888.....	18,089,716	1876.....	3,437,000
1887.....	34,036,076	1875.....	10,123,000
1886.....	20,088,204	1874.....	16,262,393
1885.....	31,344,643	1873.....	36,037,919
1884.....	36,938,548	1872.....	28,234,968
1883.....	18,768,652	1871.....	15,005,935
1882.....	24,419,827	1870.....	25,145,183



TABLE 20.

FIFTY YEARS' EXPORTS OF TIMBER AND DEALS, &C., FROM THE PORT OF QUEBEC, 1845 TO 1894.

The following table shows a great shrinkage in the past fifty years in the wood trade of the port of Quebec. As regards square and waney white and red pine, the diminution practically coincides with the falling off in the cut in Ontario and Quebec, which is nearly all shipped from this port. This is not so much the case with the square hardwood timber, some of which is shipped elsewhere, and some, especially the oak, shipped from Quebec, comes from the United States. In respect to deals and staves, the decrease chiefly indicates a loss of business to the port of Quebec, large quantities being shipped from other ports. The great rise in the prices of timber, deals, &c., is as remarkable as the falling off in the quantities. This table is the compilation of Mr. W. A. Schwartz, the Swedish Consul at Quebec, who acknowledges his indebtedness to the firm of J. Bell Forsyth & Co., whose trade reports have great authority. The table is included in a special number of "Timber and Woodworking Machinery," London, in January, 1895, which gives to its readers much information concerning the forests and industries connected therewith, of Canada and the United States.

Plate, during the

THE ST. LAWRENCE.

	Spruce.
	Ft.
e ....	850,000
i.....	650,000
.....	1,040,000
M.....	483,000
id.....	600,000
.....	574,000
.....	636,000
arway	775,000
.....	905,000
.....	504,000
n.....	810,000
	7,827,000

ly the largest.

feet.

"

"

	Ft.
....	16,147,941
....	10,420,080
....	12,476,150
....	10,855,246
....	8,787,928
....	3,437,000
....	10,123,000
....	16,262,293
....	36,037,919
....	28,234,968
....	15,005,335
....	25,145,183

FIFTY Years' Exports of Timber and Deals, &c., from

YEAR.	White Pine.		AVERAGE FAIR PRICE AT CLOSE OF SEASON.		Red Pine.	Average Fair Price at Close of Season		Oak.
	Cub. ft.	Cub. ft. d.	Square.	Waney.		Cub. ft. d.	Cub. ft. d.	
			Cub. ft. d.	Cub. ft. d.				
1845.....	15,828,880							
1846.....	14,392,220				5,182,320			1,307,440
1847.....	9,626,640				5,206,040			1,742,680
1848.....	10,709,680	3 to 5			4,466,520	6 to 9½		1,804,080
1849.....	11,621,920	3 " 5			4,365,440	4½ " 8		1,879,040
1850.....	13,040,520	4 " 5½			4,070,601	4½ " 8		1,128,320
1851.....	15,941,600	6 " 8½			3,586,840	8 " 10½		1,116,240
1852.....	15,695,920	3½ " 7			3,482,200	7 " 9		1,124,200
1853.....	17,399,480	6 " 8½			2,502,840	8 " 9		1,036,480
1854.....	19,612,320	6½ " 10			2,315,160	14 " 15		1,068,320
1855.....	10,843,226	6½ " 9½			2,689,080	9 " 12		1,335,920
1856.....	13,992,420	5 " 9½			2,305,280	9 " 13		946,708
1857.....	19,246,480	4 " 9½			2,463,246	7 " 10		1,062,360
1858.....	13,388,380	4 " 9½			2,444,940	8 " 10		1,507,030
1859.....	14,822,240	4½ " 9½			2,119,720	9 " 12		1,011,580
1860.....	18,252,600	5½ " 10			2,502,880	8 " 12		1,066,280
1861.....	19,447,920	5½ " 9½	8 to 11		2,855,240	8½ " 13		1,485,400
1862.....	15,493,080	3½ " 10	9 " 11		2,491,120	7½ " 11		1,725,160
1863.....	23,147,520	3½ " 10½	10 " 13		4,049,600	7 " 10		1,463,680
1864.....	20,032,520	3½ " 10½	10 " 13		3,999,440	7 " 13		2,085,280
1865.....	19,007,880	5½ " 12	No record.....		3,916,560	8 " 15		2,463,560
1866.....	15,541,320	6 " 12	13 to 16		3,199,960	6 " 12		2,699,800
1867.....	14,773,880	5 " 10½	14 " 16		2,664,960	7 " 10		1,897,480
1868.....	15,278,720	7½ " 13	14 " 16		2,292,440	8 " 12		1,793,880
1869.....	14,973,200	7½ " 15	14 " 16		1,785,560	8 " 11		2,358,480
1870.....	14,141,920	8½ " 18	19 " 21		2,207,160	8½ " 12½		2,048,000
1871.....	14,673,000	7 " 18	18 " 21		1,577,760	8 " 13		3,282,700
1872.....	15,514,680	10 " 19	17 " 21½		1,941,160	12 " 18		2,952,040
1873.....	10,580,240	10 " 18	16 " 20		987,840	15 " 21		3,085,160
1874.....	14,513,920	cts. cts.	cts. cts.		1,413,280	cts. cts.		
1875.....	10,699,000	16 " 27	24 " 32		1,519,240	16 " 25		3,433,280
1876.....	13,883,600	13 " 30	28 " 32		1,831,360	13 " 20		2,208,040
1877.....	14,897,800	12 " 25	29 " 34		1,961,360	13 " 18		3,243,520
1878.....	8,149,120	10 " 25	26 " 32		1,961,360	13 " 23		3,632,200
1879.....	5,300,440	9 " 30	22 " 27		1,249,840	13 " 22		1,667,360
1880.....	11,552,560	14 " 36	25 " 31		813,800	12 " 20		1,681,000
1881.....	9,101,180	20 " 49	37 " 39		1,433,200	16 " 27		2,316,840
1882.....	7,912,160	20 " 40	35 " 42		922,000	13 " 24		1,883,360
1883.....	10,427,000	18 " 38	31 " 36		1,024,080	13 " 24		1,957,320
1884.....	6,047,680	15 " 38	32 " 37		1,048,960	12 " 22		2,132,880
1885.....	6,758,240	15 " 38	33 " 39		614,280	12 " 22		1,212,520
1886.....	4,524,760	14 " 35	31 " 38		644,160	12 " 24		1,526,400
1887.....	5,127,080	16 " 38	31 " 38		405,520	14 " 35		1,051,360
1888.....	6,020,060	22 " 42	37 " 44		405,720	16 " 27		1,912,160
1889.....	6,872,960	20 " 44	38 " 45		465,360	20 " 35		1,178,920
1890.....	5,498,380	18 " 35	32 " 40		397,680	18 " 35		1,538,080
1891.....	4,715,120	16 " 35	28 " 37		355,520	16 " 30		1,119,160
1892.....	5,300,440	14 " 35	30 " 40		249,350	14 " 30		897,280
1893.....	4,092,280	14 " 35	30 " 43		379,680	14 " 30		1,127,580
1894.....	3,468,600	16 " 42	36 " 45		312,640	14 " 30		1,013,160
					146,120	14 " 30		937,840

1874  
1875  
1876  
1877  
1878  
1879  
1880  
1881  
1882  
1883  
1884  
1885  
1886  
1887  
1888  
1889  
1890  
1891  
1892  
1893  
1894

Deals, &c., from

FOREST WEALTH OF CANADA.

the Port of Quebec, 1845 to 1894 (inclusive).

TIMBER.

YEAR.	Average Fair Price at Close of Season.		Elm.	Average Fair Price at Close of Season.		Ash.	Average Fair Price at Close of Season.	
	Cub. ft. d.	d.		Cub. ft. d.	d.		Cub. ft. d.	d.
1845			1,123,920			207,080		
1846			1,793,320			188,960		
1847	14	00	1,591,520	5	to 8	91,040		
1848	14	00	1,171,760	3	" 6	59,680	4	to 6
1849	12	" 14	1,413,600	4	" 8	66,600	3	" 6
1850	13	" 14	1,526,640	7	" 10	47,280	3	" 6
1851	14	" 16	1,423,880	7 1/2	" 10 1/2	102,720	No record.	
1852	12	" 15	893,880	8	" 9	86,440		
1853	20	" 24	1,520,600	12	" 14	82,200		
1854	20	" 27	1,463,600	12	" 22	106,160		
1855	15	" 16	1,028,750	5	" 18	49,140		
1856	15	" 18	1,354,030	7	" 18	102,730		
1857	18	" 20	1,319,380	10	" 18	128,610		
1858	16	" 19	785,840	10	" 15	95,560		
1859	13	" 16	1,050,760	7 1/2	" 14	170,160		
1860	14	" 17	1,021,560	7 1/2	" 14	88,440		
1861	15	" 18	1,269,320	9	" 14	96,560		
1862	14	" 15	1,099,200	9 1/2	" 13	99,840		
1863	24	" 30	2,128,840	12	" 15	306,760		
1864	18	" 22	1,957,060	8	" 14	121,800		
1865	16	" 17	1,217,240	8 1/2	" 12	114,800		
1866	19	" 20	1,332,360	10	" 16	158,000		
1867	18	" 00	1,229,400	12	" 16	146,320		
1868	18	" 20	1,324,200	12	" 17	141,920		
1869	18	" 20	1,276,200	12	" 17	185,686		
1870	19	" 23	1,297,760	10	" 15 1/2	200,720		
1871	19	" 23 1/2	1,219,560	9	" 15	279,040		
1872	27	" 30	1,061,400	21	" 22	265,080		
1873	27	" 30	1,062,680	22	" 25 1/2	245,280		
1874	cts. 34	cts. 42	1,171,280	cts. 28	cts. 30		cts. 26	to 27
1875	34	" 42	619,800	21	" 27	365,560		
1876	31	" 43	947,360	20	" 30	248,080	24	" 26
1877	32	" 40	1,013,200	20	" 26	341,480	24	" 26
1878	28	" 36	539,760	20	" 26	390,040	25	" 27
1879	32	" 42	544,040	22	" 30	139,880	25	" 26
1880	43	" 52	1,041,800	23	" 30	172,480	27	" 28
1881	43	" 50	797,160	23	" 28	293,520	28	" 32
1882	42	" 52	778,360	23	" 30	353,680	28	" 32
1883	40	" 49	739,920	34	" 35	297,040	28	" 30
1884	40	" 49	678,000	28	" 35	346,320	32	" 35
1885	40	" 48	884,160	28	" 34	360,080	28	" 32
1886	38	" 47	407,120	25	" 29	262,480	27	" 30
1887	42	" 49	465,040	25	" 29	174,360	26	" 29
1888	43	" 52	504,080	27	" 35	194,840	26	" 29
1889	43	" 52	791,800	27	" 33	217,720	27	" 30
1890	42	" 49	539,260	25	" 30	335,360	27	" 30
1891	43	" 47	657,800	23	" 30	15,280	25	" 28
1892	45	" 51	637,800	25	" 32	130,320	25	" 28
1893	45	" 51	421,840	25	" 32	177,880	30	" 34
1894	45	" 51	528,880	25	" 32	168,840	39	" 32
						134,920	28	" 32

DEPARTMENT OF AGRICULTURE.

FIFTY Years' Exports of Timber and Deals, &c., from

YEAR.	TIMBER.				STAVES.			
	Birch.	Average Fair Price at Close of Season	Tamarack.	Average Fair Price at Close of Season	All kinds.	Average Fair Price at Close of Season		Pine.
	Cub. ft.	Cub. ft. cts. ets.	Cub. ft.	Cub. ft. d. d.	Mill.	Mer. £	Std. £	* Quo. Std.
1845.....	183,360				5,181			3,260,015
1846.....	147,880				3,440			2,081,260
1847.....	108,560		771,480		2,563			2,714,225
1848.....	92,360		1,372,520	6 to 7½	3,043	8 to 30		2,480,628
1849.....	134,120		124,400	9 " 5	4,074	8 " 32½		2,282,390
1850.....	180,200		146,400	6 " 7	3,933	8 " 45		2,297,086
1851.....	122,800		36,600	8 " 9	4,017	7½ " 35		1,418,584
1852.....	94,360		12,680	7 " 8	3,213	8 " 45		1,342,301
1853.....	101,760		51,440	7½ " 0	3,428	10½ " 45		2,425,369
1854.....	51,160		9,600	15 " 8	4,287	14 " 60		2,604,656
1855.....	118,770		78,760	5 " 12	3,580	13 " 52½		1,867,119
1856.....	161,856		37,000	5 " 11	3,462	15 " 57½		2,790,772
1857.....	175,580		72,010	5 " 12	4,523	15½ " 50		4,591,000
1858.....	131,920		163,740	4 " 7	4,122	13 " 45		4,433,662
1859.....	272,200		60,160	4 " 9	4,355	10 " 42½		4,054,514
1860.....	462,160		60,240	5 " 9	5,014	12 " 42½		4,608,850
1861.....	253,320		50,240	No record.	3,861	13 " 47½		3,492,817
1862.....	165,480		57,120	5 " 11	3,473	14 " 47½		3,493,299
1863.....	490,720		243,680	4½ " 11	5,775	13½ " 50		5,297,158
1864.....	358,280		190,120	4½ " 10	4,537	12 " 57		3,686,000
1865.....	374,680		280,000	5 " 12	4,463	14 " 50		4,888,348
1866.....	402,000		221,880	6 " 13	5,128	18 " 67½		4,778,822
1867.....	381,560		87,360	5 " 10	4,416	17½ " 52½		3,613,234
1868.....	409,000		72,280	7 " 12	4,452	16½ " 52½		4,632,019
1869.....	562,720		70,720	7 " 10	3,327	15 " 52½		4,544,666
1870.....	341,160		24,440	6 " 10	4,864	16½ " 62½		5,191,306
1871.....	292,800		17,800	7 " 10	4,660	19 " 67		4,166,834
1872.....	399,760		6,200	8 " 15	4,322	24 " 75		5,267,422
1873.....	737,880		2,480	12 " 18	4,276	20 " 75		4,650,238
1874.....	749,760	cts. ets.		cts. ets.		8 " 8		
1875.....	238,360	24 to 00	1,960	15 " 20	3,149	64 " 290		5,170,441
1876.....	466,800	15 " 22	600	15 " 17	2,360	66 " 260		4,618,444
1877.....	507,320	18 " 19	2,960	9 " 16	3,237	70 " 280		5,632,474
1878.....	202,760	16 " 18	2,640	10 " 16	3,998	70 " 260		5,341,320
1879.....	196,480	18 " 19	1,040	9 " 12	1,750	62 " 230		3,692,996
1880.....	558,840	18 " 19		9 " 12	1,503	65 " 220		4,202,219
1881.....	273,880	18 " 19		10 " 14	1,213	75 " 320		5,823,263
1882.....	213,680	22 " 24		10 " 15	1,082	85 " 335		3,876,187
1883.....	233,040	23 " 26		10 " 13	1,300	90 " 385		3,148,688
1884.....	241,120	22 " 24		10 " 15	1,482	80 " 360		3,033,672
1885.....	457,160	22 " 24		10 " 15	883	75 " 320		2,442,946
1886.....	236,680	20 " 21		10 " 15	621	75 " 300		2,376,737
1887.....	192,680	20 " 22		10 " 15	450	65 " 220		2,271,069
1888.....	165,760	21 " 23		12 " 18	526	70 " 260		1,365,510
1889.....	479,280	20 " 23		15 " 20	157	80 " 325		1,189,490
1890.....	493,740	21 " 23		15 " 18	188	85 " 330		1,367,842
1891.....	148,320	20 " 23		17 " 20	219	85 " 330		1,075,992
1892.....	345,840	20 " 23		15 " 20	90	80 " 320		704,472
1893.....	121,480	20 " 23		15 " 19	4	90 " 350		861,945
1894.....	189,920	21 " 23		15 " 19		90 " 350		728,300
						90 " 350		479,700

FOREST WEALTH OF CANADA.

the Port of Quebec, &c., 1845 to 1894 (inclusive)—Concluded.

DEALS.

Pine.

\*Que. Std.

3,200,015  
2,081,260  
2,714,225  
2,480,628  
2,282,300  
2,207,086  
1,418,584  
1,312,301  
2,425,309  
2,604,656  
1,867,119  
2,709,772  
4,591,000  
4,433,662  
4,054,514  
4,668,850  
4,927,817  
3,493,299  
5,207,158  
3,686,000  
4,888,348  
4,778,822  
3,613,234  
4,632,019  
4,544,666  
5,191,306  
4,166,834  
5,207,422  
4,650,238

5,170,441  
4,618,944  
5,632,474  
5,341,329  
3,692,496  
4,202,219  
5,823,263  
3,876,187  
3,148,688  
3,933,072  
2,442,946  
2,376,737  
2,271,069  
1,365,510  
1,189,490  
1,307,842  
1,075,992  
704,472  
861,945  
728,300  
479,700

YEAR.	AVERAGE FAIR PRICE AT CLOSE OF SEASON.								
	1st Quality.		Michigan.		Floated.		Spruce.	Average Fair Price at Close of Season.	
	Pt. &	Std. H. £	Pt. &	Std. H. \$	Pt. &	Std. H. £		*Que. Std.	Pt. &
1845									
1846									
1847	10½	to 11					527,250		
1848	9	" 9½			9	" 9½	389,807		
1849	9	" 9½			8	" 8½	380,614	6	to 7
1850	10	" 11			8	" 8½	361,881	5	" 6
1851	11	" 00			9	" 00	618,881	7	" 7½
1852	13	" 00			11	" 00	614,277	7	" 7½
1853	14½	" 15½			No record.		548,163	7	" 7½
1854	15	" 00			14	to 15½	655,115	6½	" 7
1855	12	" 00			13	" 00	653,106	8	" 0
1856	12	" 00			10	" 00	871,835	9	" 0
1857	13½	" 14½			10	" 11	451,063	9	" 0
1858	13½	" 14			12	" 13	533,191	7	" 7½
1859	15	" 00			12	" 13	No record.	8½	" 9
1860	15	" 00			13	" 14		8	" 0
1861	14½	" 15			14	" 15		8	" 0
1862	14	" 15			13	" 13½		7½	" 0
1863	16½	" 17			13	" 00		6½	" 7
1864	16½	" 00			13½	" 14		7½	" 0
1865	15½	" 16½			13½	" 13½	711,237	7½	" 0
1866	18½	" 00			14½	" 15	982,232	8	" 0
1867	16½	" 17			15	" 15½	771,485	8½	" 9
1868	18	" 18½			17	" 00	869,908	8	" 8½
1869	18	" 18½			17	" 17½	1,210,778	8	" 0
1870	20	" 21			17	" 17½	849,025	7	" 7½
1871	20	" 21			18½	" 19	1,184,135	7½	" 8
1872	24	" 00			19½	" 22	885,240	8	" 0
1873	27	" 00			23	" 00	1,753,850	9	" 0
					26½	" 00	1,567,049	10½	" 11
1874	8	" 8	8	8	8	" 8		8	" 8
1875	90	" 92			No record.		2,660,714	38	" 0
1876	95	" 100			90	to 00	1,715,238	34	" 36
1877	90	" 98	100	to 120	90	" 94	2,046,650	32	" 36
1878	90	" 94	98	" 104	88	" 90	2,978,237	32	" 33
1879	96	" 100	94	" 100	84	" 00	2,889,661	32	" 0
1880	108	" 100	104	" 120	88	" 00	2,852,500	34	" 36
1881	108	" 112	000	" 120	92	" 96	3,200,130	40	" 44
1882	108	" 112	000	" 120	92	" 104	3,097,529	40	" 44
1883	108	" 110	125	" 130	98	" 104	2,787,300	39	" 40
1884	115	" 118	130	" 140	104	" 106	2,729,635	36	" 38
1885	120	" 125	135	" 140			2,636,465	38	" 40
1886	112	" 120	120	" 130			2,473,529	42	" 44
1887	115	" 120	120	" 130			2,318,835	39	" 42
1888	115	" 120	120	" 130			2,399,489	40	" 42
1889	115	" 120	125	" 135			2,448,156	42	" 45
1890	115	" 120	125	" 130			3,584,468	42	" 45
1891	115	" 120	120	" 130			3,975,576	40	" 42
1892	115	" 123					2,280,049	40	" 42
1893	115	" 123					3,629,783	40	" 43
1894	115	" 123					3,540,000	40	" 43
							3,462,800	40	" 43

\* 72 Que. Std. = 1 Ptg. Std.

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## ADDENDA.

Since the foregoing report and appendices were prepared various additional items of information have come to hand.

### SMALL LOGS FROM TREE TOPS.

The Lieutenant-Governor in Council for the province of Quebec has issued the following order:—

“Whereas, by Order in Council No. 562 of the 10th of October, 1892, 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 eighty cents instead of one dollar and thirty cents per thousand feet, board measure, for the year 1892-93, because the greater part of the license holders leave on the ground the tops of the pine trees cut on their limits, because the rates of dues which they would have to pay on small logs made out of these tops is too high to allow them to float them down with profit to the mill, and the fact of leaving this small part of trees on the ground constitutes a danger of spreading forest fires, besides the deprivation of revenue resulting from the loss of this unused small part of the trees; Whereas, the same reasons exist to apply the same reduction to the wood of the same kind cut during the seasons of 1893-94 and 1894-95; It is ordered that the rates of dues chargeable on pine logs of eleven inches in diameter or of less dimension made of the top of trees cut on timber limits during the seasons of one thousand eight hundred and ninety-three, one thousand eight hundred and ninety-four (1893-94), and one thousand eight hundred and ninety-four, one thousand eight hundred and ninety-five (1894-95), be fixed at eighty cents per thousand feet, board measure.”

### QUEBEC TIMBER RESOURCES.

The Quebec authorities are taking evidence from experts on the subject of the timber resources of the province.

### CHARCOAL FOR IRON SMELTING.

At the annual session of the Mining Association of the province of Quebec, a paper by Mr. T. J. Drummond was read on “Charcoal, its bearing on the utilization of our forests.” The writer pointed out that as charcoal was the only known fuel natural to this province for the smelting of iron ore, this important product of the mine must be governed by the product of the forest. If we could not produce cheap charcoal and see a supply ahead, any attempt to establish an iron industry in this province on anything like an extensive scale would mean failure. Consequently every care and thought should be given as to how our forests could be conserved and utilized. To preserve these forests and utilize them to the best advantage for the country should be both a national and provincial care, and, if necessary, vast districts should be set aside for this purpose, over which the Government should exercise full control. He referred to the large quantities of unmerchantable wood left by the timber merchants in the various lumber districts of the province, and pointed out that it was a menace to the greater forest wealth, by reason of the fires that were frequently brought about through farmers clearing their lands by burning this waste material. He suggested that the Legislature should set aside large areas of land from which the merchantable timber had been cut, and preserve it for the building up of the iron industry. This would give constant

and remunerative employment to colonists in clearing the land, and would give them another crop of wood that was as valuable in its way as any crop in the wheat fields of the West. In Sweden, he pointed out, the Government had long ago realized the importance of conserving their forests, and had established national schools for teaching the people the scientific manufacture of charcoal. The charcoal and iron industry was and must always be, if successful, a settlers', farmers' and people's home industry, and for this reason it was especially deserving of national support and encouragement. Our farmers should be taught and enabled to use for their own and the nation's profit everything useful that the land had to give. Here were mighty crops rotting, wasting and burning which might be made, as in Sweden, the mainstay of the nation.

#### WOOD PULP, UNITED STATES DUTIES, &c.

In consequence of seizures of wood pulp from Canada by the customs at Detroit for undervaluation, an appeal was made to the United States General Board of Appraisers. Several hearings were given the matter, and the board handed down a decision to the Treasury Department ruling against the Collector and in favour of the Laurentides Pulp Company, fixing the valuation of the wood pulp at 60 cents a hundred pounds or \$13.44 a long ton of 2,240 pounds.

The United States consular report for December, 1894, described a new use for wood pulp, under a German patent—the making of wood mosaic for floors. The Consul-General at Frankfort reports that pergumene, or imitation parchment paper, used for wrapping butter and other oily substances, as a damp proof covering, &c., is being manufactured from cellulose or wood fibre. The consul at Bradford described the manufacture of artificial silk from cellulose, for which a company is being formed.

#### FOREST RESERVATIONS IN THE UNITED STATES.

The Philadelphia "Times" publishes the following: "The Pennsylvania State Forestry Commission has decided to ask the Legislature for an appropriation for the purchase of 120,000 acres of land in order that it may create a public forest reservation and very much can be looked for from a beginning like this. The State of New York has a forest reservation of 3,000,000 acres, and proposes to increase its size. The State of Pennsylvania, through the Forestry Commission, may see the way to a start towards forest parks that will in the future maintain the watersheds and give to the rivers and runs their volume in the dry seasons. The periods of drought have been serious and costly enough in the last fifteen years to establish a dozen reservations of the character outlined by the commission."

#### EXPORTS FROM PORT OF QUEBEC.

The exports of timber, deals, &c., from the Port of Quebec for the last fifty years, with their prices, have been added to the statistical tables, as "Table 20."



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