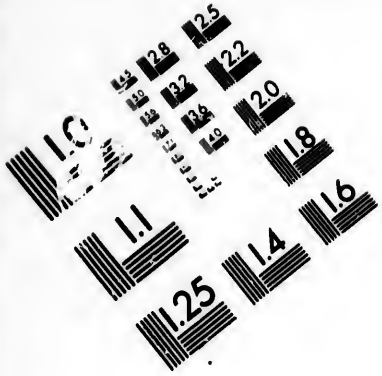

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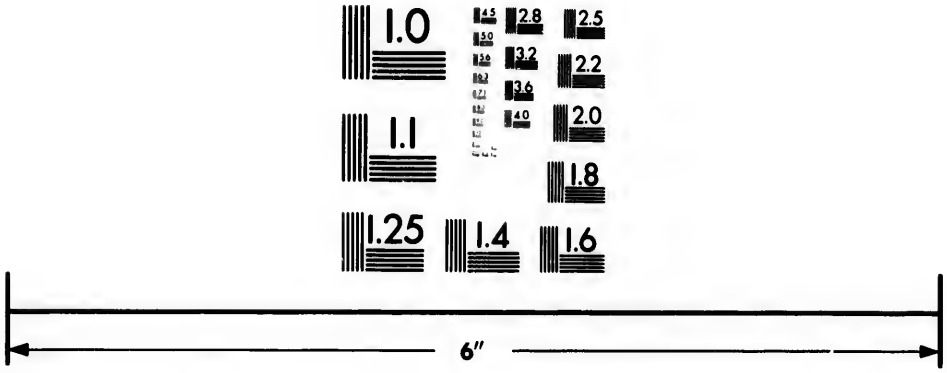

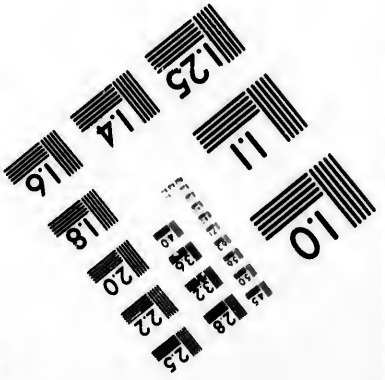

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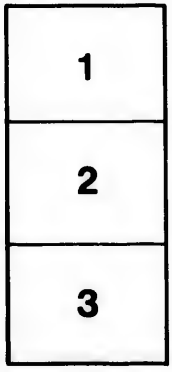

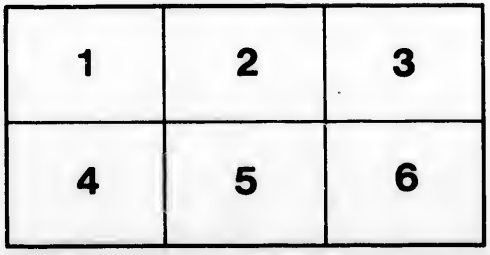

THE FOREST WEALTH OF Canada.

PARIS INTERNATIONAL EXHIBITION, 1900

THE FOREST WEALTH OF CANADA

BY

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PRINTED BY DIRECTION OF
THE CANADIAN COMMISSION FOR THE EXHIBITION,
1900.

The Forest Wealth of Canada

Since the date of its first settlement, the products of the forest have been among Canada's chief exports, and at no time has the value of these products been greater than to-day. Their character has changed, indeed, from year to year, but always to the advantage of the country at large. While in the early years of the lumber business, hewn timber and split staves were the chief articles exported, followed by logs, deals, boards, etc., industries in which large quantities of wood are required have increased from year to year, especially during the last decade, and a great variety of articles which were formerly imported are now manufactured at home. Manufacturies, primarily established to fill the home demand, have increased their output and become competitors in foreign markets while many new factories have been built of which the entire product goes abroad. During the season of 1899 the whole output of many of the large factories was required for home consumption. These, and those manufacturing for export, were run at their fullest capacity during the whole season, nearly all of them running at night as well as in the day time. This increase in production has been far slower than the natural resources of the country warranted, but capital has not always been available, and competition in foreign markets was so keen that Canadian manufacturers were slow in entering a field in which success seemed doubtful. The result has been that while excessive production went on in the United States and other countries, and their forests were depleted, those of Canada have not been drawn upon to relatively so great an extent, and "as regards raw material the future is with us." No other country affords so good a field for the profitable investment of capital in the manufacture of wood products; abundant raw material, cheap power and an unfailing market insure success.

In the province of Ontario the export of pine, spruce and other soft woods in the log, when derived from lands leased from the province, is prohibited; and in the province of Quebec $1.50 per cord rebate on stumpage dues

is allowed on wood from which pulp is manufactured in the province, and similar legislation is proposed in other provinces. The immediate result of this legislation will of course be a decrease in the quantity of raw material exported, but it is equally certain that there will be increased production by existing factories and that many new ones will be established.

Elsewhere in this pamphlet a table is given, which shows the value of the chief products of the forest exported during the past ten years. These do not include farming implements, pianos and organs and other articles, in the manufacture of which large quantities of wood are required. The figures explain themselves, except for the years 1897 and 1898. In 1897 the export of lumber was abnormally large, and the decrease in 1898 was due chiefly to the fact that in anticipation of the import tax proposed by the United States, an immense quantity of lumber was sent into that country in 1897, which under normal conditions would have remained in Canada until the following year. As the figures given for each year include six months of that year and six months of the preceding year, the effect of this disorganization of the lumber business is also seen in the figures for 1899. These do not show the increase in the second half of 1899, which in the six months ending Dec. 31st. amounted to $21,246.871, as compared with $19,191,907 during the same period in 1898.

Wise laws have been made by the provincial and federal governments, having for their object the preservation of our forests, and the owners and lessees of timber limits now exercise greater care than formerly in the prevention of fires, supplementing to a very considerable extent the efforts of the government to lessen the destruction of valuable timber from this cause. The various governments are taking steps towards the re-foresting of the denuded areas under their control, and though the actual work so far done in this direction is not great, preliminary investigations are being made which will enable them to apply the methods best suited to each district.

A detailed account of the lumber business in Canada does not come within the scope of this pamphlet. It is

intended simply, as its title indicates, to draw attention to the vast timber resources of the country, and it has seemed that this could be best done by giving a brief account of the distribution and more important uses of the chief forest trees, followed by such information regarding the conditions prevailing in the several provinces as seemed of greatest interest or value. All available sources of information have been drawn upon, and to these the reader is referred for further details. The most important for statistical purposes are the reports issued by the Department of Trade and Commerce, and by the Dominion Statistician, while the Crown Lands reports of the different provinces supply very full information relating to their timber lands, the regulations governing their use, etc. The limits given for the principal trees refer to their commercial distribution only. For further details as to their geographical distribution, the reader is referred to the annual reports of the Geological Survey of Canada, and of the Department of Dominion Lands, to special papers on this subject by Dr. G. M. Dawson, Dr. Robt. Bell and Prof. John Macoun and to the Catalogue of Canadian Plants, by Prof. Macoun, all of which have been consulted for the information contained in this pamphlet.

No reference has been made to prices, as these are subject to constant variation, and those interested may find them in trade journals. The "Canadian Lumberman," published at Toronto, Ont., gives, in its weekly edition the current local prices at the principal lumber centres.

Under each species, the nature of the specimens in the Canadian Forestry Exhibit has been briefly given. The space allotted to Canada for this purpose was not large and it was thought advisable to devote the greater part of it to raw products. While many manufactured articles are shown, the number and variety has been curtailed to as great an extent as possible, to afford space for raw material. In other departments, however, Canada's woods are exhibited, in a manufactured form, and those interested in the finished product will find it in the groups devoted to Ornamental joinery, farming implements, vehicles, and household furniture.

The character of the information published in the reports

issued by the Crown Lands Departments of the several provinces, varies greatly, which accounts for the want of uniformity in the statistics given where the timber resources of each province are dealt with. The figures showing the value of each article exported from the different provinces are from the reports of the Department of Trade and Commerce, but the publication of these details was discontinued in 1897, so that while the total exports of the Dominion are given elsewhere for 1898 and 1899, for the present purpose the year 1897 must be used for all provinces. The reason for discontinuing the publication of these figures was that as shipments were frequently from provinces other than those n which the articles were produced they were misleading.

NOVA SCOTIA.

Though Nova Scotia continues to export a large amount of lumber and other products of the forest, the best of the timber lands in that province have already been granted by the Crown to individuals or corporations and from these lands most of the lumber for export will continue to be taken. The greater part of the timber growing on lands still held by the Crown, is either at present inaccessible or is of two small size to be cut into lumber. Of the million and a half acres of ungranted Crown lands about one half is covered with forest, mostly small spruce and other woods suitable for the manufacture of pulp. Little pine has been left in Nova Scotia, spruce being the chief coniferous wood exported. On much of the land from which the best of the lumber has already been taken there is a large quantity of pulp-wood and every year adds to this supply, as in both Nova Scotia and New Brunswick the climatic conditions are such that when re-foresting is left to nature coniferous trees as a rule replace the hard woods on cleared lands. With care, there should, in the future, be no falling off in the annual output of either lumber or pulp, indeed new pulp mills are being built every year and the output will consequently increase rapidly for some years to come.

Until 1899 timber lands were granted outright to purchasers, but the Provincial Government in that year adopted

a policy of leasing such lands instead of selling them. Leases are issued for twenty years, the chief conditions being that the lessee shall pay to the Crown in advance a rental of forty cents per acre and shall not transfer the lease to any person or corporation without the consent of the Attorney General. The lessee is under the lease entitled to cut all timber of not less than ten inches in diameter and may erect upon the leased land such buildings as are necessary for the prosecution of his business, which if not removed at the expiration of the lease, become vested in the Crown.

The value of the lumber and other wood products exported from Nova Scotia in 1897 was $2,781,356, of which $3,382, was foreign produce. The details are as follows:

ARTICLE.	VALUE.
Bark for tanning	$ 2,680
Firewood	48,363
Logs of all kinds	44,432
Lumber:—	
Spruce deals and other	1,370,828
Deal ends	47,732
Planks and boards	781,084
Laths, palings, pickets, joists and scantlings	3,064
Staves and headings	6,189
All other not otherwise stated	14,189
Shingles	6,865
Sleepers and railway ties	11,1892
Shooks, box and other	6,865
Timber, square, all kinds	16,746
Wood for wood pulp	800
Wood and manufactures of:	
Household furniture	2.407
Doors, sashes and blinds	9,8+5
Matches and match splints	23,751
Wood pulp	193,853
Not otherwise stated	96,905
	$2,781,356

NEW BRUNSWICK.

Of the twenty-nine indigenous trees of New Brunswick the spruce, hemlock, cedar, tamarac, fir, birch and maple are economically the most important. In the vicinity of the coast coniferous trees predominate, while the uplands of the

interior are clothed with beech, maple, ash and birch and in the river valleys elm is abundant. A very considerable part of the timber lands of New Brunswick is in the hands of private individuals and of the 12,000 square miles still in possession of the Crown over 9,000 square miles are under license to lumbermen. About 2,700 square miles are still vacant and unlicensed. Great quantities of pine were formerly exported from this province, but very little of merchantable size remains. In New Brunswick as in Nova Scotia the demand for pulp-wood has made valuable large areas from which the best timber has already been taken and others on which the average size of the trees was too small to make it profitable to cut them for lumber.

The right to cut timber on ungranted Crown lands or on lands for which the licenses already granted have expired is in New Brunswick acquired by public auction, subject to stumpage regulations and restrictions, so framed as to admirably safeguard the interests of the Crown and prevent waste of any kind. The stumpage dues for the more important products of the forest are:

For Spruce, Pine, Tamarac or hardwood saw-logs, per 1000 superficial feet	$1.00
" Hardwood timber up to an average of 14 inches square, per ton	.90
" Hardwood timber above 14 inches, additional, per inch per ton	.10
" Pine timber up to 14 inches square, per ton	1.00
" Pine timber, additional per inch, per ton	.25
" Tamarac timber, per ton	.50
" Spruce timber, per ton	.50
" Cedar logs, per 1000 superficial feet	.80
" Hemlock, per 1000 superficial feet	.40
" White Birch logs, for spool-wood, per 1000 superficial feet	.65

The stumpage dues on railway-ties and boom-poles are two cents each and on brackets and spars one cent each.

No statistics of the amount of timber cut on land owned by private individuals are available, but it is almost as great as that cut on Crown lands, of which details are published by the Crown Lands Department of the province. These show the relative quantities of the different kinds of

wood cut, and the proportion of each taken from private lands is doubtless very much the same. Omitting the less important products, the following are the figures for the year ending Oct. 31, 1898:

Spruce and Pine saw-logs	80,856,347 sq. ft
Hemlock logs	3,726,756 "
Cedar logs	7,669,293 "
Hardwood logs	1,828,734 "
Spool-wood, White Birch	2,784,000 "
Fir logs	648,126 "

In 1897 New Brunswick exported timber and products of the forest valued at $6,599,697, practically all of which was produced in the province.

ARTICLE.	VALUE.
Bark for tanning	$ 48,409
Firewood	33,042
Logs, all kinds	860
Lumber:—	
Pine deals	23,231
Deals, spruce and other	4,016,700
Deal ends	124,461
Planks and boards	817,190
Laths, palings, pickets, joists and scantlings	502,613
Staves and headings	3,430
Not elsewhere specified	68,926
Shingles	604,663
Sleepers and railway ties	10,944
Shooks, box and other	17,664
Timber, square:—	
White pine	2,569
All other	79,846
Wood, manufactures of:	
Household furniture	2,650
Doors, sashes and blinds	885
Matches and match splints	1,186
Wood-pulp	145,405
Not elsewhere specified	95,050
	$6,599,697

QUEBEC.

The territory recently acquired by the province of Quebec to the north, northwest and northeast of its old boundaries, has added so much to the forest-covered area in that province that it now ranks first in that respect. Of the 844,450 square miles comprised within its boundaries much is yet unsurveyed—some of it unexplored. In 1898 there was about 47,000 square miles under licence for the cutting of timber, but vast tracts remain unlicensed. These are chiefly north of the Ottawa and St. Lawrence rivers and are for the most part covered with spruce, fir, poplar and birch, the characteristic trees of the sub-arctic forest. No very accurate figures can be given for the quantity of standing timber in the province of Quebec, but according to a very moderate estimate recently made by the Crown Land Department, the standing timber, exclusive of pulp-wood and undersize trees will produce at least sixty thousand million feet of lumber and in the opinion of the writer this estimate is below the true one. Some idea of the immense timber resources of this province may be gathered from a consideration of a single district—Lake St. John—which has recently been reported upon by the Superintendent of Forest Rangers. The area of the Lake St. John basin is about 30,000 square miles or 19,200,000 acres, of which only about 500,000 acres have been cleared; the remainder is covered with trees of which about 75 per cent. is spruce. A large proportion of these trees are of sufficient size to manufacture into lumber, but the spruce can be used with greater profit for making pulp. At the extremely low estimate of five cords of pulp-wood per acre there is growing at present on this area 100,000,000 cords of pulp-wood. 500,000 tons of pulp could be made there annually for an indefinite period. If the whole province were included in this estimate, and an average nearer the true one used, the result would be beyond belief, yet it is hardly possible to make an exaggerated estimate.

The forests of Anticosti and the Gaspé peninsula are of the same general character as those described above, but elsewhere, on the south side of the St. Lawrence and on the north side from the Saguenay River westward, and so up the

Ottawa, there is for many miles back from these rivers a large proportion of hard woods. Except in the case of white birch, which has been extensively cut for spool-wood, the hard woods of this province are not used to anything like so great an extent for manufacturing purposes as they are in Ontario, but there is abundant maple, birch and beech, and industries in which they will be used must soon be established.

The timber lands of Quebec are worked under licenses from the Crown, at a yearly rental of three dollars per square mile, in addition to which stumpage dues are charged. The dues for the principal articles are:—

Square Timber per cubic foot	$0.02
Logs and dimension timber, except Spruce, Hemlock, Banksian Pine, Cedar and Fir, per thousand feet, board measure	1.30
Spruce, Hemlock, Banksian Pine, Cedar and Fir, per thousand feet, board measure	.65
Small logs for shingles, spools, or paper pulp, per cord.	.25

Perhaps the most careful estimate of the average number of trees suitable for lumber or pulp-wood, growing on the heavily wooded areas of Quebec, is that made by the surveyors and engineers in the employ of M. Henri Menier, the owner of the island of Anticosti. It has been estimated that there is on that island about 1,800,000 acres of forest land, and from the reports made by Mr. Menier's employees, the average number of trees over the whole area is about 900 per acre. The forests of Anticosti differ in no essential particular from those of northern Quebec and northern Ontario, and Mr. Menier's figures, which are the result of an actual count on many measured acres, afford a good basis for estimating the number of trees on other areas.

The following is a summary of the forest products exported from Quebec in 1897, with their value :

ARTICLE.	VALUE.
Bark for tanning	$ 58,313
Firewood	20,747
Logs of all kinds	151,348

Lumber :—	
Deals, pine	3,280,126
Deals, other than pine	1,706,692
Deal ends	465,000
Planks and boards	2,310,480
Laths, palings, pickets, joists and scantlings	160,957
Staves and headings	38,288
Not elsewhere specified	154,261
Shingles	267,799
Sleepers and railway ties	135,739
Stave bolts	1,524
Shooks, box and other	54,193
Timber, square :—	
Oak	539,088
White pine	1,348,655
All other	380,755
Wood for pulp	536,622
Wood and manufactures of:	
Household furniture	35,331
Doors, sashes and blinds	59,520
Matches and match splints	91,167
Wood pulp	270,136
Not elsewhere specified	204,349
	$12,276,082

ONTARIO.

A much greater variety of trees is found in Ontario than in any other province, and, as a natural consequence, the number of wood-employing industries is much larger there than elsewhere in Canada. In the southwestern part of the province coniferous trees are almost wholly wanting, the forests being made up of hard woods of which oak, hickory, basswood, maple, elm, ash and beech are the most valuable. The forests of northern and northwestern Ontario resemble those of Quebec ; pine, spruce, birch and poplar being economically of most importance. Pine has long been the chief wood exported from Ontario, and though it exists in nothing like its former abundance great quantities remain uncut. Nearly all the lands upon which it grows have already been sold or licensed by the Crown. Not nearly so much hard wood is exported now as formerly, partly because of the diminished supply and partly because the available wood is nearly all in the hands of those who own or are interested

in manufacturies and who prefer to hold it for their own use. Scarce as many of our hard woods are doubtless becoming, the amount yet standing is much larger than is generally supposed and the greatly increased value of some species makes it now worth the farmer's while to haul timber to mills or railway stations which he formerly would have used for fire-wood.

The increase in Canadian exports of articles manufactured from wood is in great measure in the province of Ontario, where long established concerns have enlarged their plant and new industries have been established. Recent legislation regulating or prohibiting the export of unmanufactured material from the province of Ontario has given a great impetus to home industries, the result of which is seen in the increased quantity of wood products exported. No trustworthy estimate has been made of the timber still standing in this province, but the amount is very large and in Ontario as in Quebec one of the largest provincial assets is the growing wood suitable for the manufacture of pulp. Great as has for many years been the annual value of the timber cut in Ontario it will increase in the future.

In 1898 there was taken from the Ontario Crown lands 544,457,139 feet, board measure, of pine saw-logs, and 8,224,442 feet of other logs; 26,977,461 feet of boom and dimension timber, and 1,478,387 cubic feet of square timber, besides a large quantity of cord-wood, railway-ties, pulp-wood, etc. No figures are available for the quantities cut on private lands.

The regulations governing the use of Crown timber lands in Ontario are, in brief, that when berths or limits are explored, surveyed and valued, they shall be offered for sale by public auction, at the upset price of such valuation, and sold to the highest bidder for cash at the time of sale. All timber berths and limits are subject to an annual ground rent of $3 per square mile, in addition to which the following Crown dues must be paid:

Black Walnut and Oak, per cubic foot	.03
Elm, Ash, Tamarac and Maple	.02
Birch, Basswood, Cedar, Buttonwood and Cottonwood, and all boom timber, per cubic foot	.0.1½
Red and White Pine timber, per cubic foot	.02

All other woods	.01
Basswood, Buttonwood and Cottonwood saw-logs, per standard of 200 ft. board measure	.15
Red and White Pine saw-logs and boom-timber, per standard of 200 ft. board measure	.20
Walnut, Oak and Maple saw-logs, per standard of 200 ft. board measure	.25
Hemlock, Spruce and other woods, per standard of 200 ft. board measure	.10

The dues on other forest products will be found in the Crown Timber regulations of the province.

Ontario exported in 1897 wood products to the value of $10,602,364, of which $12,124, was foreign produce. The following are the details :

ARTICLE.	VALUE.
Bark for tanning	$ 2,752
Firewood	71,592
Logs of all kinds	1,927,480
Lumber :—	
Planks and boards	6,254,737
Laths, palings and pickets, joists and scantlings	169,910
Staves and headings	651,509
Not elsewhere specified	90,531
Shingles	303,674
Sleepers and railway ties	71,908
Stave bolts	37,110
Shooks, box and others	1,914
Timber, square :—	
Oak	1,200
Pine, white	1,205
All other	24,029
Wood, for wood pulp	173,730
Wood and manufactures of :	
Household furniture	79,873
Doors, sashes and blinds	217,813
Matches and match splints	35,172
Wood pulp	132,565
Not elsewhere specified	353,669
	$10,602,364

MANITOBA AND THE NORTH WEST TERRITORIES.

As is well known, the greater part of the settled portions of Manitoba and the North West Territories is made up of prairie lands, but even in western Manitoba, Assiniboia and southern Alberta trees grow in damp situations and in river valleys, so that the settler is nowhere very widely separated from wood suitable for house-logs, firewood and fencing, and in these districts the timber regulations are especially favourable to settlers. Northern Manitoba, Alberta and Saskatchewan and practically the whole of Keewatin, Athabasca and Mackenzie are covered by the sub-arctic forest, and these districts, although at present but sparsely settled, will eventually become almost, if not quite, as valuable as the prairie region. In much of this vast area the soil and climate are good and though many years must elapse before the timber growing on it will be required for home consumption, there will very soon be such a demand for wood-pulp in Minnesota and Dakota that the wood growing in Manitoba and Keewatin will be drawn upon, indeed the consumption of paper made from wood-pulp is already so great in the northern United States and in Manitoba that were advantage to be taken of the raw material which is to be had in such abundance near the chief points of consumption, the manufacture of wood-pulp would at once become one of the chief industries of southern Keewatin and eastern and northern Manitoba, and the time is not far distant when the bulk of the wood-pulp used in the United States north and north westerly from Chicago will come from Manitoba and North West Canada.

Railways and natural waterways afford at the present time adequate transport facilities towards the south and when the Hudson Bay route to Europe has been opened Keewatin and northern Manitoba will be the chief producers of wood-pulp with which Newfoundland and the Eastern Provinces will have to compete in European markets. The area of Keewatin alone is 498,000 square miles, much of which is covered with spruce, poplar and other woods suitable for the manufacture of pulp of the best quality.

Though the wooded area in this district is greater than in the province of Quebec the average size of the trees is

not so large but it is probable that the actual amount of the wood suitable for the manufacture of pulp, is almost if not quite as great in Keewatin as in Quebec.

The timber lands in Manitoba, the North West Territories and within twenty miles on either side of the Canadian Pacific Railway in British Columbia, are still held by the Dominion Government, and licenses to cut timber can be obtained only by public competition. The licensee must pay an annual ground rent of $5 per square mile, except west of the Eagle Pass in British Columbia, where the yearly ground rent is five cents per acre. In addition to the rent the following crown dues must be paid :

Sawn lumber 50 cents per 1000 ft. board measure.
Railway ties 8 feet long.....1½ cents each.
" " 9 " " .....1¾ " "

Shingle bolts 25 cents per cord, and 5 per cent. on the sales of all other products of the berth, but in British Columbia a rebate of 40 cents per 1000 feet is allowed on all lumber exported.

Permits to cut timber from Crown lands are also granted at public competition. For timber so cut the following dues are payable : $2 to $3 per 1000 ft. B. M. for square timber and ½ to 1½ per lineal foot for building logs ; from 12½ to 25 cents per cord for firewood, 3 cents a piece for railway ties and 20 cents per 1000 for shingles. Homesteaders who may have no timber of their own are entitled to a permit free of dues for 3000 lineal feet of building logs, 400 roof poles, 500 fence posts, and 2000 fence rails.

In the Yukon territory a license to cut timber on an area of not more than five square miles may be granted to the first applicant, upon payment of a bonus of not less than $250 per square mile, and the licensee must also pay a stumpage of $2 per 1,000 square feet B. M. on the timber cut. Permits to cut firewood and railway ties are granted upon easy terms.

During the year ending June 30th, 1898, the following quantities of building material were taken from Dominion lands :

Sawn lumber.....	39,696,407 feet.
Shingles.....	1,584,500 "
Laths.....	24,200 "

Nearly all of that cut in Manitoba and the North West Territories was for home consumption, the amount exported being very small.

There is under license from the Dominion, the following areas of timber lands :

Manitoba.....	659.84	square miles.
Alberta.....	1,134.74	" "
Saskatchewan.....	256.54	" "
British Columbia.....	304.63	" "

BRITISH COLUMBIA.

The character of the forests of British Columbia is very different from that of the other provinces. The trees are much larger, and all the more valuable species are peculiar to the Pacific coast. These are the douglas fir, the giant arbor-vitæ, Menzies' or Sitka spruce, yellow cypress and the western hemlock, all of which attain a great size on Vancouver Island and the mainland in the vicinity of the coast, and, with the exception of the yellow cypress, in the river valleys of the interior. The abundance of standing timber near the sea, and the fact that most of the lumber cut at the mills was to fill large orders for particular sizes, led to very wasteful methods of making lumber, immense quantities of the smaller trees (small for British Columbia) being left in the woods to be destroyed by fire, while at the mills themselves huge slabs of great length were cut from the logs, sawn into easily-handled lengths and burnt. Better methods now prevail, but nothing like the economy which characterizes lumbering operations in Eastern Canada, is yet practiced in British Columbia.

The nature of the country makes it impossible to estimate with accuracy the area of unlicensed timber lands in British Columbia, but it is probable that more than one-third has been taken up. The number of acres held under lease in 1899 was 491,649, and under special license 43,500, so that if the above estimate be correct, there is yet unlicensed in this province nearly one million acres of timber lands, and the average amount which can be cut has been estimated at 75,000 feet per acre, though this is probably in excess of the actual figure.

There is no trustworthy information from which any-

thing approaching an accurate estimate of the amount of standing timber in British Columbia could be made. The timber sawn in that province in 1898 was:

On Crown lands and leaseholds.....	112,948,044	ft. B.M.
On private property.....	11,598,614	"
On railway belts (estimated).....	21,000,000	"
Imported, but sawn in B.C.....	5,200,000	"
Total.....	120,746,658	feet

of this the amount exported is about 97,000,000 feet, including laths, shingles, etc.

In 1899:

On Crown lands and leaseholds	166,409,483	ft. B.M.
On private property.....	23,115,400	"
On railway belts (Vancouver Island)..	24,880,504	"
" " C.P.Ry., am't small		
Imported, but sawn in B.C.....	4,532,684	"
Total	219,027,971	feet

of this the amount exported up to Feb. 1st, 1900, was 116,000,000 feet. From these figures it will be seen that the amount of lumber cut in 1899 was greatly in excess of what was cut in 1898.

The British Columbia timber regulations differ materially from those of the other provinces. Licenses are not acquired by public auction or by tender, but the person desiring to procure a license must stake out the land sought to be included in his license, and, after filing his application, must publish a notice of it for thirty days in the British Columbia Gazette, and in some newspaper circulating in the district in which the desired lands lie. No such special license is granted for a larger area than one thousand acres nor for a longer period than one year. For each such license the sum of $50 must be paid, the licenses being renewable at the discretion of the Chief Commissioner. In addition to these special licenses, general licenses to cut timber on Crown lands, other than timber limits may be issued by the Chief Commissioner; for such licenses $10 is charged. In addition to the above license fees, five cents per acre ground-rent is charged, and a royalty of 50 cents per thousand feet board measure upon all timber suitable for spars, piles, saw-logs, railway ties, mining props and shingle bolts, and

twenty-five cents per cord for other wood must be paid to the Crown. Heavy penalties are attached to illegal cutting of timber.

The lumber trade of this province with South America, Australia and Eastern Asia will certainly increase with the demand for coniferous woods in these countries, and though the following analsisy of the character of the material exported shows that the bulk of it was in a semi-manufaced form, the establishment of new factories will in the near future greatly augment the quantity of furniture, ashes, doors, etc., that will be exported, while the manufacture of wood-pulp is certain to become one of the chief industries of the province.

Wood products to the value of $766.202 were exported from British Columbia in 1897.

ARTI	VALUE.
Firewood	$ 88
Logs of all kinds	6,270
Lumber:—	
Planks and boards	665,617
Laths, palings, pickets, joists and scantlings	5,579
Staves and headings	1,015
Not elsewhere specified	27,913
Shingles	15,524
Wood and manufactures of:	
Household furniture	6,173
Doors, sashes and blinds	1,998
Not elsewhere specified	36,067
	$ 766,202

List of Principal Commercial Woods of Canada, with the Distribution, Economic Value and Relative Abundance.

The arrangement of the species in the following list, though not scientifically correct, is that which is most familiar to those who will see this pamphlet, and has been adopted for that reason. The space devoted to each species bears small relation to the importance of the wood economically, the most valuable species being those which are best

known, and of these little more than their distribution is given.

BASSWOOD—*Tilia Americana*, Linn.

The Basswood grows sparingly in New Brunswick, more abundantly in Quebec and attains its greatest size and is most abundant in the province of Ontario. It is also found in eastern Manitoba. For commercial purposes, the greatest quantity is cut in that part of Ontario which lies between lakes Ontario and Erie on the south and the main line of the Canadian Pacific Railway on the north, where it is often more than three feet in diameter and 100 feet in height. Basswood is used for a great variety of purposes, but the consumption of raw material is comparatively small when the vast number of articles into which it is manufactured is considered, as many of these are made from very thin veneers. The wood is white in colour, very light and soft and easily worked, but, though tough, it is not strong. It warps very little, not at all if well seasoned, and is on that account much used for sounding boards in pianos, and for organ stock. It enters largely into the manufacture of cheap furniture, the light parts of farming implements, carriage panels and bodies, boxes and coffins, where a light easily-worked wood is needed. Cut as veneer, it is used for fruit baskets and boxes, cloth-boards, band-boxes, cheese-boxes, and for a variety of similar purposes, and as "three-ply" for boxes and chair seats. It is the principal wood used in the manufacture of "wooden ware," and, turning easily, it is made into bowls, toys, etc. For building purposes it is not much used, except as clapboards and for light interior work. When drawn directly from the stump to the saw, the wood is very white, and if well seasoned after being cut, it takes a very high polish

EXHIBITS :—Sections of logs, deals, box-shooks, fruit boxes and baskets, cloth-boards, veneers, polished panels.

BROAD-LEAVED MAPLE—*Acer macrophyllum*, Pursh.

The Broad-leaved Maple is common on Vancouver Island and along the coast in the southern part of British Columbia. It is the most valuable of the deciduous trees of the west coast. Though not as hard or as strong as the

hard maple of the east, the wood is much better than that of the eastern soft maple. Much of it is "curly," which adds greatly to its value as cabinet-making material. It is used in the manufacture of furniture, mantles and handles and for interior finishing.

EXHIBITS:—Section of tree, boards, and polished panels.

HARD MAPLE—SUGAR MAPLE—*Acer saccharinum*, Wang.

The Hard Maple is a common tree from Nova Scotia westward to Lake Superior, always on good soil. It reaches its greatest size in southwestern Ontario. Throughout its range it has always been esteemed the best material for firewood, and vast quantities of valuable timber are every year consumed in this way. In recent years small mills have been built in the settled portions of Canada in which it grows, and much of what was formally used as firewood is now being cut into lumber for home consumption and for export. Where it is most abundant large factories have been established, and an annually increasing quantity of this and other hard woods is being made into furniture and other manufactured articles. The wood is very hard, close grained, tough and strong, and as it exhibits a great variety of colour and fibre arrangement, it is one of our best woods for veenering, panelling and high class furniture.

The "Bird's Eye" and "Curly" forms are found in infinite variety, and are greatly valued by the cabinet-maker. Hard maple is used in Canada in the making of furniture and in cabinet work of all kinds, as flooring and for interior finishing, and in the manufacture of domestic utensils, handles, butchers' skewers, dumb-bells and Indian clubs, shoe-lasts and pegs, saddle-trees, mangle rollers, and in many industries in which a hard, tough wood is desirable. It is also used for the keels of boats and ships, and is made into charcoal for smelting purposes. By the lumbermen it is used for handspikes and other implements used in river driving, and by the millwright for boxes and bearings, and for the teeth of gearing wheels. It is exported in the log as square timber, deals and boards, and

in the form of blocks and squares, as chair parts and in other semi-manufactured forms. It is from this tree that maple sugar is generally made.

EXHIBITS :—Sections of log, square timber, boards and polished panelling, blocks and squares, chair parts, kitchen utensils, butchers' skewers and other specialties.

SOFT MAPLE—RED MAPLE—*Acer rubrum*, Linn.

The Red Maple is common from the Atlantic to Lake Superior ranging a little farther north than the hard maple. The silver maple, *Acer dasycarpum* Ehrh. is not in this paper separated from *Acer rubrum* as these woods are commercially classed together as soft maple. The wood of the soft maple is soft and brittle, not comparable with that of the hard maple nor is it used for anything like so great a variety of purposes. Being soft and turning easily, many articles of domestic use, such as butter-making utensils, kitchen ware, etc., are made of this wood. It is also used for cabinet work and flooring.

EXHIBITS :—Section of tree, deals, boards and polished panels, butter-making and kitchen utensils.

BLACK CHERRY—*Prunus serotina*, Ehrh.

Not very abundant nor of large size in the Maritime Provinces nor Quebec but many fine trees are still standing in Ontario, in the southern part of which province it attains its greatest size in Canada. The quantity cut there, is however, not sufficient for home consumption and a good deal is imported for use in furniture factories and for interior finishing for which purpose it is largely employed.

EXHIBITS :—Section of tree, square and dimension timber and polished panels.

WHITE ASH—*Fraxinus Americana*, Linn.

The White Ash ranges from Nova Scotia to western Ontario increasing in abundance and size until its western limit is reached. This is the finest and most useful of the ashes, being frequently found 100 feet in height and over three feet in diameter. Its wood is both strong and elastic, bending easily, which fits it for a great variety of uses. It enters largely into the manufacture of agricultural implements of all kinds as well as wagons, carriages, and sleighs.

Though not as good as some other woods for that purpose, very fine handles of all kinds, whiffletrees, neck-yokes, etc., are made from white ash, second growth wood being generally used. It is the principal wood used for oars. Like all other hard woods it is employed for flooring, furniture, and cabinet work. It is one of the most valuable Canadian woods, but is no longer abundant.

EXHIBIT :—Sections of trees, square timber, deals, boards and polished panels, chair parts, handles and specialties.

BLACK ASH—*Fraxinus sambucifolia.* Lam.

The Black Ash is more widely distributed than the white ash and is more abundant than the latter throughout its range. It is found from Anticosti west to eastern Manitoba in swamps and river bottoms. The wood is not so hard as that of the white ash but it is tough and elastic and is, on that account, well suited for cooperage work and basket making. It is darker in color than the white ash and though used for the same purposes is not so highly valued.

The red ash and the green ash are not separated commercially from the two preceding species ; the wood of the latter resembles that of the white ash while that of the former is more like the black ash. Both range further west than the other species, growing along the Assiniboine River and tributaries of lakes Manitoba and Winnipegoosis.

EXHIBITS :—Section of tree, boards, polished panels and cooperage stock.

WHITE ELM—*Ulmus Americana.* Linn.

The American or White Elm is of wide distribution in Canada being found from the Maritime Provinces westward to rivers falling into Lake Winnipegoosis in Manitoba. It increases in size and abundance until western Ontario is reached where it is often found six feet in diameter and over 100 feet in height. It also grows to a large size in the valleys of the Winnipeg and the Red rivers. The wood of the white elm is very tough and difficult to split and on this account it is much used for wagon hubs, blocks for all kinds of tackle and for gunwales, as the driving of bolts is

less likely to split it than any of our other woods. It is heavy and strong but not durable. It is much employed in barrel, chair and wheel making and for a great variety of purposes when veneer-cut. As lumber it is rather coarse but is very largely used in the manufacture of furniture, coffins and as flooring. Varying greatly in color and grain, it is employed to imitate other woods, nearly all the cigar boxes used in Canada being made of elm while practically all coffins are made of either elm or basswood stained and polished to imitate other woods.

EXHIBITS :—Sections of logs, square timber, deals, boards, and polished panels, cooperage and chair stock, hubs, butter-dishes, lathes, strips and cigar boxes.

RED ELM—SLIPPERY ELM—*Ulmus fulva*, Michx.

The Red Elm is not of much importance commercially in Canada and is not found anywhere in great quantity. It is more durable than the other elms, and is better suited than them for use as railway ties, fence-posts and rails. It is employed for much the same purposes as the other elms. The inner bark possesses valuable medicinal qualities and is frequently prescribed in bad dysentry and diarrhœa cases ; it is also used in the form of poultices.

EXHIBITS :—Section of tree.

ROCK ELM—CORK ELM—*Ulmus racemosa*, Thomas.

The Rock Elm grows in southern Quebec and west to Lake Superior, being best developed in southern Ontario, to which part of Canada it is, as a commercial wood, now confined. It is much superior to the other elms, and for many purposes is unequalled by any other wood. It is tough, strong, elastic and very heavy. Its chief use is in the manufacture of agricultural implements, bicycle rims and wheel stock, and it is well suited for any purpose for which a wood that does not split easily is requisite. It is largely used in bridge and ship-building, and for heavy furniture. When highly polished the wood is very beautiful, and repays a greater expenditure of time in polishing than is usualiy given to elm.

EXHIBITS :—Section of tree, square timber, deals and wagon hubs.

SYCAMORE-BUTTONWOOD.—*Platanus occidentalis*, Linn.

Confined in Canada to southwestern Ontario, where trees three and four feet in diameter and 80 feet in height, are still numerous. The wood is heavy and hard, but not very strong. It is not a good wood for out-door work, but is extensively used in the manufacture of various specialties, such as bowls, butter trays, etc., as well as cigar boxes and barrel headings. Like other woods of inferior quality, it is also employed for a variety of purposes for which bett material is not available.

EXHIBITS:—Sections of trees, deals, and polished panels.

HICKORY.—*Carya alba*, Nutt.

The Hickory is for commercial purposes, confined to Ontario, and it is only in the southwestern part of that province that it is found in any considerable quantity. The wood is very heavy, hard, tough, strong and elastic, though it is not durable when exposed to the weather, or when in contact with the soil. As fuel, it excels even hard maple. "Second growth" hickory possesses in ever greater degree than the ordinary wood the qualities that make it so valuable for fishing-rods, handles of all kinds, axles for light but strong vehicles, and for farming implements. The nuts of the hickory are the best grown in Canada. *Carya tomentosa*, Nutt., the white-heart hickory is included with the above species commercially, and possesses the same qualities. The Bitternut, *Carya amara*, Nutt, is not quite so valuable as hickory, but is used for the same purposes.

EXHIBITS:—Section of tree, square timber, deals, axe and other handles.

RED BIRCH—CHERRY BIRCH—*Betula lenta*, Linn.

The Red Birch is an abundant tree from Nova Scotia westward to Lake Superior, the finest trees growing in the province of Quebec north of the Ottawa and St. Lawrence rivers, and in central Ontario in the counties of Huron, Grey and Bruce, and in the districts of Nipissing, Algoma and Parry Sound, where it is often more than four feet in diameter. It is the best of the birches for cabinet work

and furniture, and is exported in great quantity for that purpose in the log, as square timber, deals, blocks and squares, and as chair and other furniture stock. The wood is very hard, heavy and strong. The yellow birch, *Betula lutea*, Michx, is seldom separated, commercially, from the red birch, and is employed for the same purposes. The wood of the red birch is, however, rose-colored, often as dark as that of the cherry, in imitation of which it is frequently used. Good hubs are made from birch, and in the Maritime Provinces, where other suitable woods are not abundant, it is employed in the construction of wagon and cart frames. Turned boxes and similar articles are also made of this wood, as well as button-moulds. Red birch is very durable under water, and is used for piles and sluice work, and being little liable to the attacks of insects is valuable wood for ship-building purposes.

EXHIBITS :—Sections of trees, square timber, boards, deals, polished panels, chair parts and turned work.

WHITE BIRCH—CANOE BIRCH—*Betula papyrifera*, Marsh.

The White Birch ranges from the Atlantic to the Pacific and in the north almost to the Barren Grounds. The finest trees are found in the valley of the St. Lawrence River and its western tributaries. The white birch is not so large as either the red or yellow birch nor is the wood so heavy. It is white, very hard and close-grained and is the principal wood used for spools, bobbins, turned boxes, bowls and other wooden-ware, shoe-lasts and pegs. It is also employed in the manufacture of furniture and for interior finishing. In the more settled parts of Canada where good transport facilities are available the best white birch has already been utilized, but vast areas remote from railways yet remain to be exploited.

EXHIBITS :—Sections of trees, deals, boards and polished panels, spools, bobbins, turned boxes and specialties.

WHITE OAK—*Quercus alba*, Linn.

Though the true White Oak is *Quercus alba*, several other species are so classified commercially. The most

important among these is the bur oak, *Quercus macrocarpa* Mich. The true white oak is found in western Quebec and in Ontario as far west as Lake Huron. The bur oak has the same range as *Quercus alba* but is also found in the Maritime Provinces and in the west throughout the wooded portions of Manitoba. The wood of both species is very heavy, hard, tough and durable, that of the bur oak being the most durable of any American oak when in contact with the soil which makes it very valuable for use as fence posts, railway ties and piles. The wood of the white oak is also largely employed in ship-building, carriage and wagon-making and cooperage, the manufacture of agricultural implements and for cabinet and furniture work, flooring and interior finishing. Quarter-cut it exhibits a great variety of grain and coloring.

EXHIBITS :—Sections of trees, square timber, railway ties, deals, boards, polished panels and flooring. The office screen in the Canadian Forestry Exhibit is made of this wood.

WESTERN WHITE OAK—*Quercus Garryana*, Douglas.

Though a few trees of this species grow on the mainland of British Columbia, it is practically confined to the southern part of Vancouver Island, the finest trees growing in the vicinity of the city of Victoria, where trees three or four feet in diameter from which logs from ten to twenty feet long can be obtained are not uncommon. The wood resembles that of English oak and is very beautiful when made up into furniture and cabinet work.

EXHIBITS:—Sections of trees.

RED OAK—*Quercus rubra*, Linn.

The Red Oak extends from the Maritime Provinces westward to Lake Superior reaching the greatest size in the Province of Ontario. The wood is inferior in quality to that of the white oak but is almost as hard, heavy and strong. It enters more largely than the white oak into cooperage work and as with white oak, second growth wood is much used for handles of all kinds, wheel stock, axles, whiffletrees, etc. For furniture, cabinet making,

and interior finishing it is almost as valuable as the white oak. The bark is rich in tannin.

EXHIBITS :—Sections of trees, square timber, deals, polished panels, hubs and spokes.

CHESTNUT—*Castanea dentata*, Marsh.

The Chestnut is confined to the southwestern part of the province of Ontario, and is not even there in sufficient quantity to be of great importance commercially. The wood is neither strong nor flexible, but is durable and easily worked. In Canada it is employed chiefly in cabinet work, but is also well suited for use as railway ties and in heavy construction work.

EXHIBITS :—Section of tree and deal.

BEECH—*Fagus ferruginea*, Aiton.

The Beech grows in the Maritime Provinces, Quebec and Ontario, the finest trees being found in the vicinity of Lake Huron and Georgian Bay. The wood varies greatly in colour and grain, and is much employed in the manufacture of furniture and for flooring. The white-colored wood is said to be more tough and lasting than that of red color. Quarter-cut it is very beautiful. Its principal use is for tool handles, carpenters' planes, shoe-lasts, mallets and for various turned articles.

EXHIBITS :—Sections of trees, deals and chair parts.

ASPEN POPLAR—*Populus tremuloides*, Michx.

The Aspen is the most widely distributed of Canadian trees ranging from the Atlantic to the Pacific and north to the Barren Grounds. In some parts of Canada it is the only wood available for fence rails and firewood, and it furnishes the material for settlers' log houses in many parts of the prairie region. Commercially the aspen is used chiefly in the manufacture of pulp, for which purpose it, like all the poplars, is well suited. At present spruce has, to some extent, driven poplar out of the market as a pulpwood, but the immense quantity growing throughout the Canadian sub-arctic forest will some day be utilized. The wood of the aspen is light and easily worked, and is used for woodenware, light barrels, such as those used for sugar

and flour, and for crates and light boxes. It is also employed in the manufacture of furniture. The large-toothed aspen, *Populus grandidentata*, Michx., is employed for the same purposes as the aspen.

EXHIBITS:--Sections of trees, deals, boards and pulp-wood.

BALM OF GILEAD--BALSAM POPLAR--*Populus balsamifera*, Linn.

The range of the Balsam Poplar is much the same as that of the aspen. In the North West Territories it attains a great size, being there generally found in river valleys, where it is sometimes 150 feet in height and seven in diameter. On the islands and banks of the Peace and Athabasca rivers it grows to a greater size than elsewhere in Canada, and large trees are found down the Mackenzie River as far north as the Arctic Circle. The wood is soft and not strong, but, with the cottonwood, (*Populus monilifera*, Aiton,) it is being used in increasing quantities instead of Whitewood, *Liriodendron Tulipifera*, Linn. It is employed in the manufacture of pulp, and for the same purpose as the other poplars. *Populus trichocarpa*, T. & G., an abundant tree in British Columbia, differs but little from the balsam poplar.

EXHIBITS:—Sections of trees, deals, dimension lumber and pulp-wood.

BLACK WALNUT.—*Juglans nigra*, Linn.

Though once so abundant is southwestern Ontario the old Black Walnut trees have almost all been cut down, though a few still remain and younger trees which have been planted or preserved will soon augment the available supply for economic purposes, as the black walnut is a rapid grower. Plantations of this tree have been made in various parts of Ontario and western Quebec, one of the finest being that owned by Sir Henri Joly de Lotbinière. Walnut is not at present as popular as formerly as a cabinet wood and for interior finishing, lighter-coloured material being now in vogue, but veneering made from the dark heart-wood is still used in considerable quantity, and the falling off of the supply is doubtless the principal reason for the change in

fashion. Walnut is too beautiful and valuable a wood to remain long unpopular, and the money and time invested in walnut plantations will be amply repaid in the future.

EXHIBITS: Section of tree, boards, veneers and polished panels.

BUTTERNUT—*Juglans cinerea*, Linn.

The Butternut grows in southern New Brunswick and westward to the Georgian Bay. The wood is much lighter in color than the walnut and is not so heavy, hard or strong, but is very durable. It is easily worked and is chiefly used for cabinet work and interior finishing. The grain is somewhat like that of walnut, so that when stained a very good imitation of walnut may be made from butternut. It is a tree of rapid growth.

EXHIBITS:—Section of tree, boards and polished panels.

ARBOR VITAE—WHITE CEDAR—*Thuya occidentalis*, Linn.

Very rare in Nova Scotia, but abundant throughout New Brunswick, Quebec and Ontario. It grows to a considerable height, but seldom exceeds two feet in diameter. The wood is soft and not strong and has never been much used as lumber, but is unexcelled for shingles. The white cedar is chiefly used for fence-rails and posts, railway ties and telegraph and telephone poles. No other wood is used in any quantity for telephone poles in Ontario and Quebec. It is very durable in contact with the soil or when exposed to the weather.

EXHIBITS:—Section of tree, square timber, polished panels.

GIANT ARBOR VITAE, RED CEDAR, *Thuya gigantea*, Nutt.

The Giant Arbor Vitae is next to the Douglas Fir in importance in British Columbia, where it attains its greatest size on Vancouver Island, along the coast and in the lower parts of the rivers of the Coast Range. It is rarely found in the dry interior of British Columbia, but is abundant in the river valleys on the slopes of the Selkirk and Coast

ranges. Though seldom found more than 150 feet in height, in circumference it rivals the Douglas fir, trees of from eight to ten feet in diameter not being rare, and they are occasionally found much larger.

It is chiefly used in the manufacture of shingles, for which purpose it is unequalled by any other wood. Formerly the shingles were made by hand, the wood splitting easily, but improved machinery has so lowered the cost of production, that comparatively few hand-made shingles are now used, though they are still in demand when a shingle of superior quality is desired. The wood of this tree takes a very brilliant polish and is well adapted for interior finishing of all kinds. So great is the variety of shading in the color of the wood that a large house may be finished in it without two rooms being alike. It is not only largely exported but is now being shipped in increasing quantities to Eastern Canada. In British Columbia it enters largely into the manufacture of doors and cabinet work of all kinds. Like all the cedars it lasts well underground and on this account is much used in the form of telegraph poles and fence-posts. The immense canoes made by west coast Indians are with very few exceptions made of this wood.

EXHIBITS:—Sections of logs, deals, boards, shingles, polished flooring and wainscotting.

YELLOW CEDAR, YELLOW CYPRESS—

Thuya excelsa, Bong.

The Yellow Cypress is not nearly so abundant in British Columbia as the arbor vitæ nor is its circumference so great. Its height is about the same as the arbor vitæ — 150 feet—and its average diameter about 4 feet, though occasional trees attain 5 feet. The yellow cypress is confined to the coast and the adjacent islands. In the southern parts of British Columbia it is not found at sea-level, the finest trees growing at altitudes of from 1000 feet to 2500 feet. Though valuable for many purposes, the wood of the yellow cypress is not extensively used at present, the cost of transportation to the sea-board being too great. On the Queen Charlotte Islands it descends to the coast. When lower levels have been cleared of other trees the yellow cypress will be

utilized. Its wood is very durable and on account of its pungent odour it is credited with resisting the Teredo. Its grain is very close and as the wood takes a very high polish it is greatly valued for interior finishing and for the manufacture of furniture. It commands a higher price than either Douglas fir or arbor vitæ. The natives along the northern coast of British Columbia make many articles for domestic use from this wood.

EXHIBITS:—Section of tree, boards and polished panelling.

WHITE PINE—*Pinus strobus*, Linn.

The White Pine is by far the most valuable of Canadian trees, and notwithstanding the reckless waste that characterized lumbering operations until very recently, there still remains in Canada an immense quantity of growing timber from which vast quantities of lumber will be made.

The white pine ranges from the Maritime Provinces westward through Ontario and Quebec to the extreme eastern edge of Manitoba. On the north but a few trees are found beyond the height-of-land separating the Hudson Bay and St. Lawrence watersheds. Large trees are not common in the eastern provinces, from two to two and one half feet diameter being there considered a good sized tree. In the Ottawa valley, however, and on streams running into Lake Huron, trees three and four feet in diameter are common, while larger trees are not rare. White pine is exported principally in the form of square timber, deals and boards. Its chief uses are in construction work of all kinds, and as the slabs and edgings are made into shingles and laths there is now little waste of material. The wood is light, soft and not strong, but it is suited for a great variety of purposes as it is easily worked and free from resin.

EXHIBIT;—Sections of trees, square timber, deals, polished panels, box-shooks and interior finishing.

WESTERN WHITE PINE—*Pinus monticola*, Dougl.

None of the western pines are found in quantity near the coast and so far they have been utilized for local purposes only. The best of these is *Pinus monticola*, Dougl.

which is little inferior to the white pine of the east. It is found in the interior of Vancouver Island and is abundant in the southern parts of the Coast Range where there is heavy rain-fall. In the Selkirk Mountains it is not very common but attains a considerable size on the mountain slopes. The wood is used for the same purposes as the eastern white pine.

RED PINE—*Pinus resinosa*, Aiton.

The Red Pine is not so widely distributed as the white pine, nor is it so abundant in the areas on which it grows. It is neither so tall nor so large a tree as the white pine. Commercially it is frequently not separated from it, though the wood of the two trees differs materially, the red pine being harder and stronger than the white pine, much more elastic and containing a great deal of resin. The red pine has very wide sap-wood which adds to its value as material for heavy construction work, piles, etc. It is used for the same purposes as white pine, to which it was formerly preferred and has again in recent years reached a value more nearly approaching that of white pine.

EXHIBITS:—Section of tree, square timber, deals, boards, dimension lumber and polished panels.

SCRUB PINE—JACK PINE.—*Pinus banksiana*, Lam.

Jack Pine is found from the Maritime Provinces northwesterly to the foot-hills of the Rocky Mountains, where it is replaced by *P. Murrayana*,. It increases in height and girth as one travels westward, the finest trees being found between northern Manitoba and the Athabasca River, in which district great areas are covered with large trees. In Nova Scotia and New Brunswick it is small and of no value. Elsewhere in Canada it is not much used at present except for railway ties and locally where other pine is not to be had. As a timber for use in mines and for heavy construction work generally its good qualities are not yet appreciated. Recent experiments have proved that good pulp can be made from it.

EXHIBITS:—Sections of trees, deals, pulp-wood and railway ties.

BLACK PINE—*Pinus Murrayana*, Balfour.

The Black Pine replaces the preceeding species on the eastern slopes of the Rocky Mountains. It is abundant in the northern part of the interior plateau of British Columbia, where it covers great areas. In the southern part of the province it is most abundant at altitudes ranging between 3000 feet and 4000 feet. Though esteemed of little value where other conifers grow, except for railway ties and firewood, it is much used for mine props and other construction work in the mining districts of British Columbia. It is admirably suited for this purpose, as the wood is very tough and when not exposed to the weather does not easily decay. It is said to make excellent charcoal.

EXHIBITS :—Sections of trees and deals.

NOTE.—The other Canadian pines are of small economic value and are only used locally.

BLACK SPRUCE—*Picea nigra*, Link.

The range of the Black Spruce is much the same as that of the white spruce, the former as a rule growing in damp situations while the latter prefers drier well drained soil. The two trees are not separated commercially and with them is included the red spruce of eastern Canada. The characteristics of these spruces are almost identical and the woods are used for the same purposes. The black spruce, to which the red spruce is nearly allied, is perhaps best suited for use as spars and masts. In the eastern krovinces spruce is the chief wood used in house-building and for flooring. Both black and white spruce have been found to increase in value as pulp-woods the further north they grow.

EXHIBITS:—Sections of trees, square timber, deals, boards, polished panels, box-shooks and pulp-wood.

WHITE SPRUCE—*Picea alba*, Link.

Within the past few years the demand for pulp-wood has so increased that the spruces are rapidly becoming the most important trees in Canada. The value of the growing timber is probably already as great as that of all other trees combined. The white spruce ranges from Nova Scotia, northwestward to within twenty miles of the Arctic Ocean

near the mouth of the Mackenzie River, and with the black spruce it forms a great part of the sub-arctic forest which extends from Labrador across the continent. The wood is tougher, stronger and more elastic than that of the pine. It is now more used than formerly as lumber as well as very largely as railway ties, fence posts, piles and telegraph poles.

EXHIBITS:—Sections of trees, square timber, deals, boards, polished panels, box-shooks and pulp-wood.

ENGELMANN SPRUCE—*Picea Engelmanni*, Engel.

This characteristic spruce of the Rocky and Selkirk mountains is the most useful tree growing in the interior of British Columbia and is there largely used in brdige and trestle work and for heavy construction work generally. In the valley of the Columbia it is often more than 150 feet in height and four in diameter. The wood is very like that of the Black and White spruces and may be used for the same purposes. This was the chief wood used in the construction of the Canadian Pacific Railway from the Rocky Mountains westward.

EXHIBITS:—Sections of trees.

MENZIE'S SPRUCE—SITKA SPRUCE—*Picea Sitchensis*, Carr.

This spruce grows chiefly in the immediate vicinity of the coast, ranging in British Columbia from the International Boundary north to Alaska. In the southern part of the province it grows scattered among other trees, but in the north it is relatively much more abundant, growing sometimes in large clumps. Though averaging less in diameter than the Douglas fir occasional trees of great size are found; those cut for lumber are, however, seldom more than five or six feet in diameter. No other tree on the West Coast is used for such varied purposes and as it is easily worked up by machinery there is a great demand for it in the manufacture of doors, window sashes, boxes, shelving and interior finishing. The wood is very white, is elastic and bends with the grain without splitting so that it is much used in boat building, the making of light oars, staves, wooden-

ware etc. It resists decay for a long time and like the Douglas fir is not attacked by insects. The chief value of the Sitka spruce will in the near future be in the manufacture of pulp for which purpose it is not excelled by any other tree. As soon as pulp mills are established in the vicinity of the large saw mills the immense waste entailed by the present method of sawing dimension lumber in British Columbia will be obviated.

EXHIBITS :—Sections of logs, rough and dressed lumber, box-shooks, and polished panelling.

HEMLOCK—*Tsuga Canadensis*, Carr.

The Hemlock grows in the Maritime Provinces, Quebec and Ontario. Though little inferior to white pine as rough lumber, a prejudice has for a long time existed against this wood which is only now dying out. As coarse lumber, it today commands almost as high a price as pine. It is one of our best woods for wharves and docks and great quantities are used annually for piles. The bark of the hemlock is that chiefly used in Canada and the eastern United States for tanning purposes.

EXHIBITS :—Section of tree, railway ties and tan bark.

WESTERN HEMLOCK—*Tsuga Mertensiana*, Carr.

The hemlock is abundant along the whole coast of British Columbia and in the interior of the province, wherever there is sufficient rainfall. Along the line of the Canadian Pacific Railway, in the Selkirk Mountains, it is very abundant, but seldom over 150 feet in height and three in diameter. On the coast it is much larger, averaging from 4 to 6 feet in diameter. The abundance of other wood of better quality has prevented the hemlock from coming into general use, and the same prejudice exists in British Columbia against the western tree, that prevailed until very recently against Hemlock in eastern Canada. Though its grain is coarse, western hemlock is, for many purposes, just as serviceable as other woods which cost more. Its bark is rich in tannin, but it is too thin to be extensively used while there is such an abundance of Douglas Fir in the same region.

EXHIBITS :—Sections of trees, deals and boards.

DOUGLAS FIR, "OREGON PINE," RED PINE, YELLOW FIR—*Pseudotsuga Douglasii*, Carr.

This is the most abundant, as it is the most valuable, tree in British Columbia. Its range on the mainland is from the International Boundary north to the Skeena River, in Latitude 54° on the coast, and in the Rocky Mountains from the International Boundary north to Latitude 55°, though its northern and northeastern limits are not well defined. It is not found in the Queen Charlotte Islands. It attains its greatest size on Vancouver Island or along the shores and in river valleys near the coast on the mainland. There, trees 300 feet in height are not rare, the average height of those felled for lumber being over 150 feet. Trees of a greater diameter than seven feet are rarely cut, though those of eight, ten or even eleven feet in diameter are not rare.

The fact that the largest trees are found near the coast greatly facilitates the transport of the logs from the woods to the mill, and as the majority of the mills are so situated that the largest ships may load within a few yards of the saws. The cost per 1,000 feet of handling Douglas fir and other west-coast lumber is small.

The average cut of Douglas fir in British Columbia is over 50,000 feet per acre, though in some instances more than 500,000 feet have been cut on a single acre, no trees of less than two feet or more than five feet in diameter, being used. Douglas fir is chiefly valuable for structural purposes, being largely employed in ship-building, bridge-work and the construction of wharves. It is exported as dimension timber, lumber, spars, masts and piles. Locally it is used for construction work of all kinds; fencing and railway ties, and in the manufacture of furniture. Its durability, when excluded from the air, adds greatly to its value for pile-work in the construction of bridges and wharves. The bark of the Douglas fir is largely employed in tanning.

EXHIBITS:—Sections of logs, square timber, railway ties, deals, boards, box-shooks, and dressed and polished material for interior finishing.

BALSAM—*Abies balsamea*, Miller.

The Balsam is a common tree in the Eastern Provinces, Ontario and Quebec, and is found in the sub-arctic forest northwesterly to the Athabasca River. The wood is very light and soft and is not durable in contact with the soil. It is to some extent used as common lumber and on account of its lightness is frequently made into box-shooks. Though not one of the best pulp-woods, it is and will continue to be cut with other trees and used for that purpose.

EXHIBITS:—Sections of trees, deals and pulp-wood.

WESTERN WHITE FIR—*Abies grandis*, Loud.

The Western White Fir is confined to the vicinity of the Pacific Coast and though it grows to great size the wood is very soft and not suited for any purpose for which strength is requisite. It is now used to some extent for boxes and light barrels and will in the future be utilized in the manufacture of pulp.

EXHIBIT:—Section of tree.

TAMARAC—BLACK LARCH—*Larix Americana*, Michx.

The Larch ranges from Nova Scotia northwesterly to the Peace River. The wood is hard, heavy and very strong. It is not much used as lumber, but is largely employed as railway ties, fence posts, telegraph poles and as knees for ships, and in fact for ship-building purposes generally. It is well adapted for use as joists, scaffold poles and rafters as comparatively small timber is capable of supporting a great weight. The Western Larch, *Larix occidentalis*, and the Mountain Larch, *Larix Lyallii*, replace *L. Americana* in the Rocky Mountains and British Columbia, where they are used for lumber, telegraph poles, railway ties and mine props.

EXHIBITS:—Sections of trees and deals.

LIST OF CANADIAN FOREST TREES WITH THEIR DISTRIBUTION IN THE VARIOUS PROVINCES AND DISTRICTS.

Few other countries produce so great a variety of trees as Canada. Of the 121 indigenous species, a few are of small economic value, while others are so restricted in their distribution that commercially they cannot be taken into account. The various uses of the more important trees, with their distribution, have been given in another part of this paper, but the following list of the fifty most valuable trees, with their range, will serve for convenience of reference. The provinces or districts in which they are found are indicated by an asterisk.

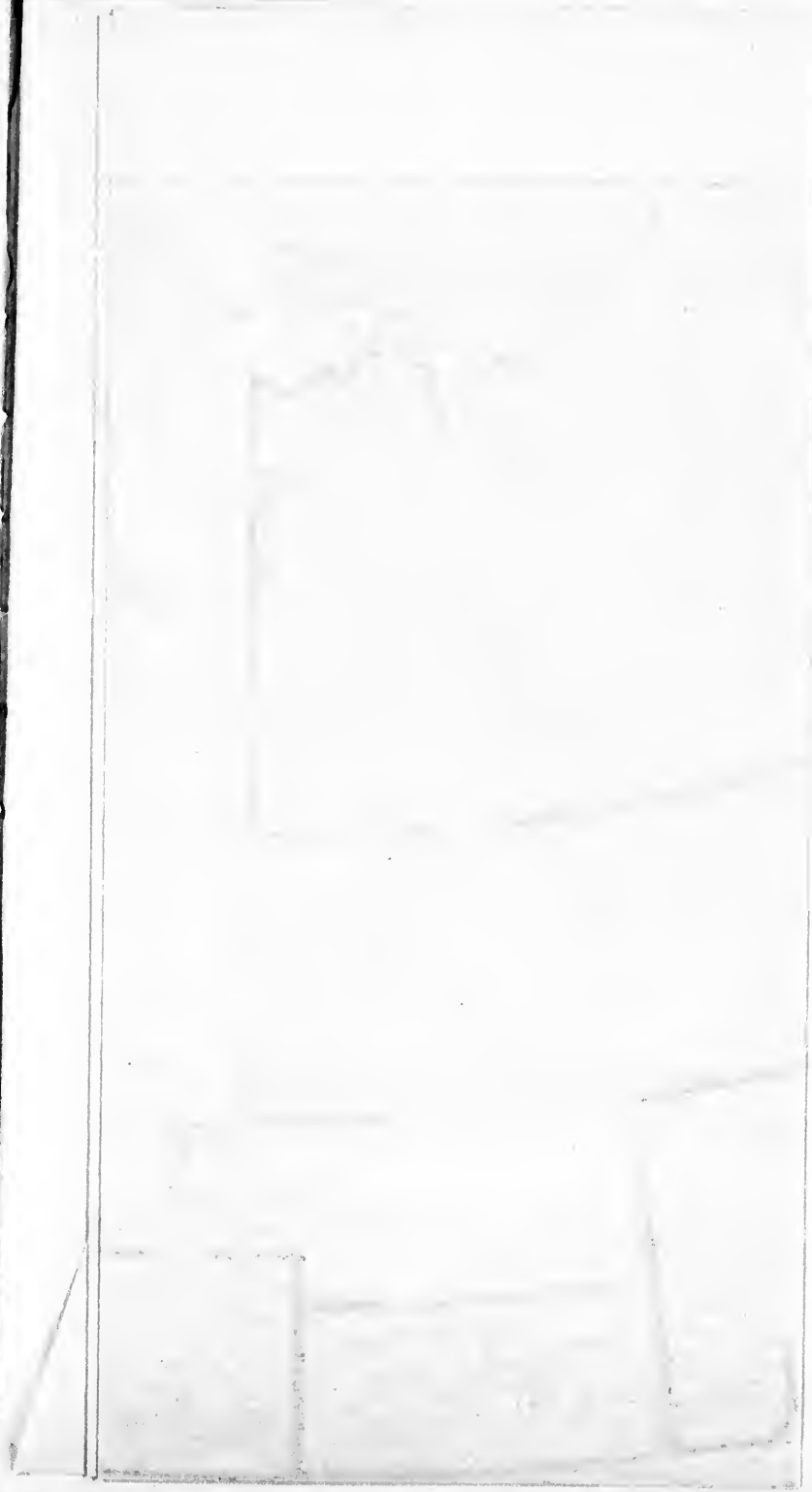
No.	NAME OF TREE.	P. E. I.	N. S.	N. B.	Que.	Ont.	Man.	N.W.T.	R. M.	B. C.
1	Tilia Americana, L. (Basswood)			*	*	*	*			
2	Acer macrophyllum, Pursh. (Broad-leaved Maple)									*
3	Acer saccharinum, Wang. (Hard Maple)	*	*	*	*	*				
4	Acer dasycarpum, Ehrh. (Silver Maple)			*	*	*				
5	Acer rubrum, L. (Soft Maple)	*	*	*	*	*				
6	Negundo aceroides, Mœnch, (Manitoba Maple)						*			
7	Prunus serotina Ehrh, (Black Cherry)	*	*	*	*	*				
8	Fraxinus Americana, L. (White Ash)	*	*	*	*	*				
9	" pubescens, Lam. (Red Ash)		*	*	*	*	*			
10	" viridis, Mx. (Green Ash)				*	*	*			
11	" sambucifolia, Lam. (Black Ash)	*	*	*	*	*				
12	Ulmus fulva, Mx. (Red Elm)				*	*				
13	" Americana, L. (White Elm)	*	*	*	*	*	*			
14	" racemosa, Thomas, (Rock Elm)				*	*				
15	Platanus occidentalis, L. (Buttonwood)					*				
16	Carya alba, Nutt. (Shell-bark Hickory)				*	*				
17	Betula lenta, L. (Cherry Birch, Black Birch)		*	*	*	*				
18	Betula lutea, Mx. f. (Yellow Birch)	*	*	*	*	*				
19	" papyrifera, Marsh. (White Birch)	*	*	*	*	*	*	*	*	*
20	Ostrya Virginica, Willd. (Iron-wood)		*	*	*	*				
21	Quercus alba, L. (White Oak)				*					
22	" Garryana, Dougl. (Western White Oak)									*
23	Quercus macrocarpa, Mx. (Overcup Oak)		*	*	*	*	*			
24	Quercus rubra, L. (Red Oak)	*	*	*	*	*				
25	" palustris, Du Roi. (Pin Oak)					*				
26	Castanea dentata, Marsh. (Chestnut)					*				
27	Fagus ferruginea, Ait. (American Beech)	*	*	*	*	*				
28	Populus tremuloides, Mx. (Aspen Poplar)	*	*	*	*	*	*	*	*	*

No.	NAME OF TREE.	P. E. I.	N. S.	N. B.	Que.	Ont.	Man.	N. W. T.	R. M.	B. C.
29	Populus balsamifera, L. (Balsam Poplar)	*	*	*	*	*	*	*	*	*
30	Populus monilifera, Ait. (Cotton-wood)				*	*	*	*		
31	Juglans cinerea, L. (Butternut)			*	*	*				
32	" nigra, L. (Black Walnut)					*				
33	Thuya occidentalis, L. (Arbor Vitæ)	*	*	*	*	*	*			
34	" gigantea, Nutt. (Giant Arbor Vitæ)								*	*
35	Thuya excelsa, Bong. (Yellow Cypress)									*
36	Pinus strobus, L. (White Pine)	*	*	*	*	*	*			
37	" monticola, Dougl. (W. White Pine)								*	*
38	Pinus resinosa, Ait. (Red Pine)	*	*	*	*	*	*			
39	" Banksiana, Lamb. (Scrub Pine)	*	*	*	*	*	*	*		
40	" Murrayana, Balfour. (Black Pine)							*	*	
41	Picea nigra, Link. (Black Spruce)	*	*	*	*	*	*	*	*	
42	" alba, Link. (White Spruce)	*	*	*	*	*	*	*	*	*
43	" Engelmanni, Engelm. (Engelmann Spruce)								*	*
44	Picea Sitchensis, Carr. (Sitka Spruce)								*	*
45	Tsuga Canadensis, Carr. (Hemlock)	*	*	*	*	*				
46	" Mertensiana, Carr. (Western Hemlock)								*	*
47	Pseudotsuga Douglasii, Carr. (Douglas Fir)							*	*	*
48	Abies balsamea, Miller. (Balsam Fir)	*	*	*	*	*	*			
49	" grandis, Lindl. (W. Balsam Fir)							*	*	*
50	Larix Americana, Mx. (Tamarac)	*	*	*	*	*	*	*	*	*

P. E. I.—Prince Edward Island.
N. S.—Nova Scotia.
N. B.—New Brunswick.
Que.—Quebec.
Ont.—Ontario.
Man.—Manitoba.
N. W. T.—North-West Territories..
R. M.—Rocky Mountains.
B. C.—British Columbia.

STATEMENT of the Value of Lumber and other Wood Products Exported from Canada between 1890 and 1899.

PRINCIPAL ARTICLES.	VALUES.									
	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.
Wood unmanufactured :—										
Firewood	281,298	314,870	370.301	354,429	287,036	222,189	222,389	173,921	140,897	123,711
Hop, telegraph and other poles	92,326	144,396	83,581	114,03	71,789	39,730	50,503	61,2.2	36,126	55,182
Logs :—										
Elm	144,935	155,503	208,709	219,065	152,221	205,084	124,988	77,978	53,784	44,687
Pine	261,626	313,281	651,540	1,05 ,345	2,459,354	1,860,725	1,423.989	1,832,352	1,616.671	1,398,454
Spruce	157,112	158,331	141,168	123,254	107,282	90,990	86,077	107 073	33,885	49,769
Other	118,856	103,098	114,506	117,890	142,990	76,616	96,269	108,699	95,977	76,792
Lumber :—										
Deals, pine	3,803,539	2,923,107	2,431,714	3,116,924	2,768,238	2,369,027	3,061,537	3,313,357	3,885,448	4,193,628
" spruce and other	5,871,470	5,497,590	4,602,919	5,063,678	5,567,739	5,271,898	5,579,746	7,094,485	7,918,366	7,848 437
" ends	338,973	281,098	290,708	295.478	484,324	464,260	520.646	637 193	641,068	770 458
Laths, palings and pickets	477.009	520.045	474,717	608,336	552.171	495,860	528,395	515,276	376,281	432,323
Planks and boards	8,104 577	8,963,434	8,353,055	9,904,491	7,964,970	7,441,256	8,513,710	10,832,185	5,625,391	6,885,762
Joists and scantlings	170,424	174,882	138,478	191,127	187,438	184,680	402,454	437 974	246,273	234,968
Staves and headings	410,769	419 586	462,911	615,064	641,460	638,272	701,983	699,431	401,583	527 131
Shingles	460,742	578,083	719,548	849,471	754,743	689,613	899,547	1,201,562	994,438	976,361
Sleepers and railway ties	346,401	339,685	261,036	215,150	131,765	132,208	213,622	229,780	101,191	84,305
Timber, square :—										
Birch	234,634	204,577	235,277	212,090	127,591	111,305	228,876	194,080	143.623	204,186
Elm	256,165	204,236	219,762	208,011	143,809	163,866	209,409	170.689	222 529	221,663
Oak	869,130	553,272	480,216	580,745	579,557	411,476	614,028	540,288	740,562	557 592
Pine, red	105,549	83,340	62,041	78,130	74.458	34,688	108,436	52,459	62,011	61.061
" white	2,698,965	2,052.060	1,645,711	1,481,155	1,571,731	4,125,837	1,570,652	1,352,669	1,764,074	1,356 654
Other	208,682	143,638	108,280	104,693	152,696	93,603	120,999	83,948	76,343	80.584
Wood for pulp	80,005	188,998	219,458	386,092	393,260	468,359	627,865	711,152	912,041	842,086
Wood Manufactures :—										
Household furniture	182,462	140,188	68,162	177,197	144,702	99,150	78,607	127,752	248,317	376,490
Doors sashes and blinds	69,474	86,450	123,141	130,349	158,196	139,402	190,004	285,161	324.610	378,206
Matches and match splints	114,712	168,237	196,184	204,410	216,038	172,159	195,987	151,276	195,779	257,981
Wood pulp	168,228	280.619	355,303	455,893	547.836	590,874	675,777	741,959	1,210,923	1,274,376
All other wood and manufactures of	2,083,204	1,820,158	1,648,471	1,976,584	1,396,958	1,743,009	1,760,306	1,312,418	1,294,956	1,587,783
Totals	$ 28,102,267	26,812,765	24,666,900	28,841,081	27,780,352	25,334,136	28,806,799	33,046,329	29,363,087	30,880,630



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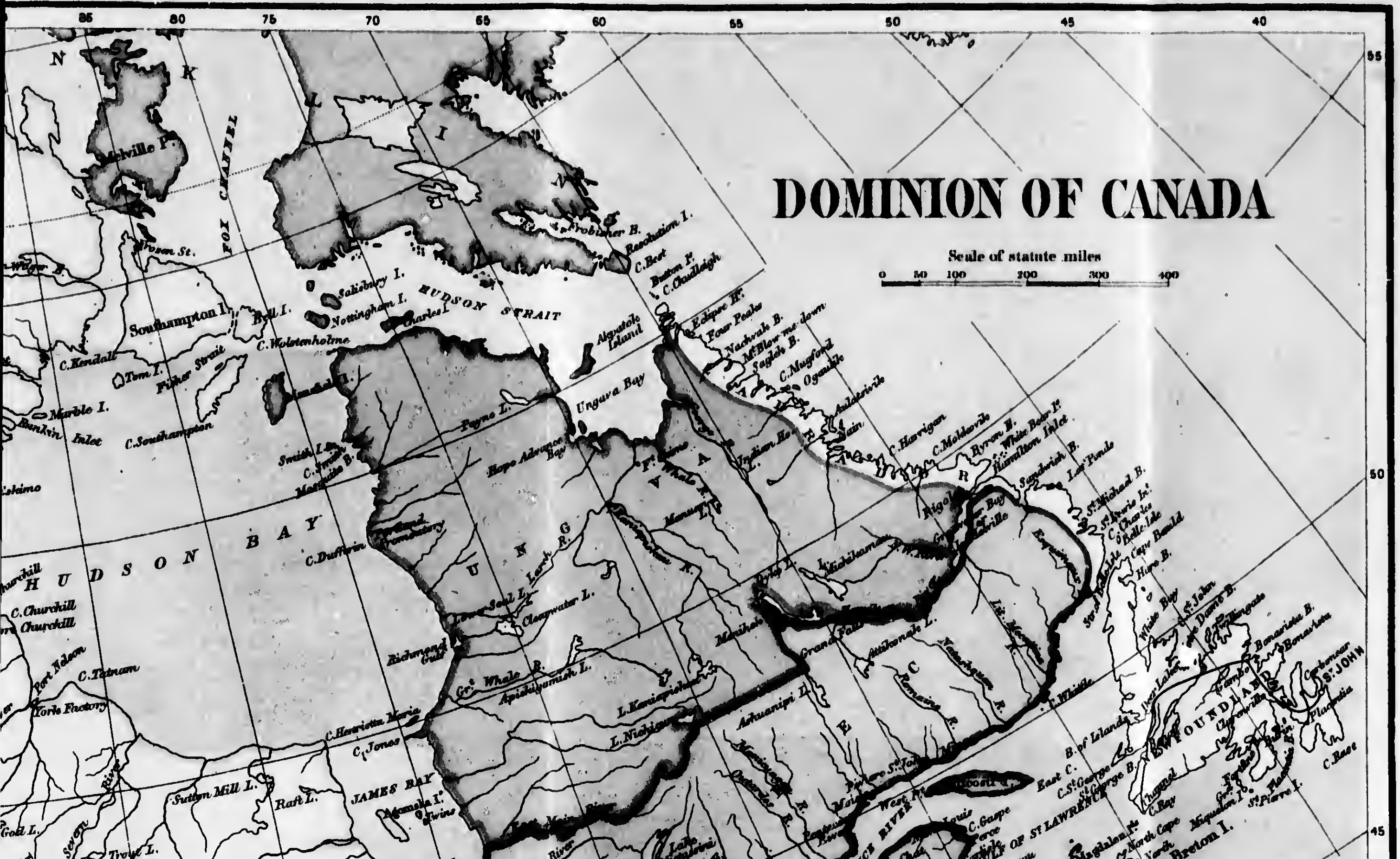

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