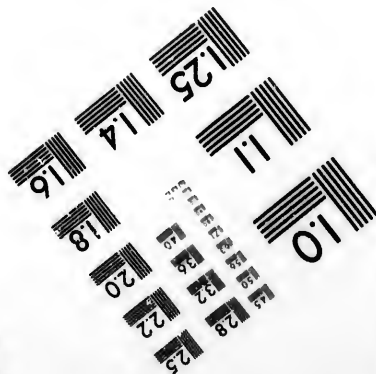
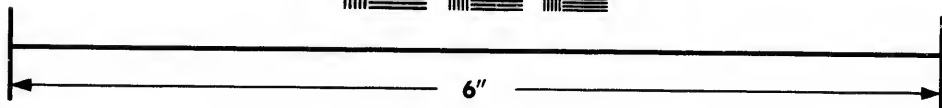
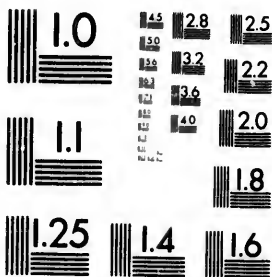


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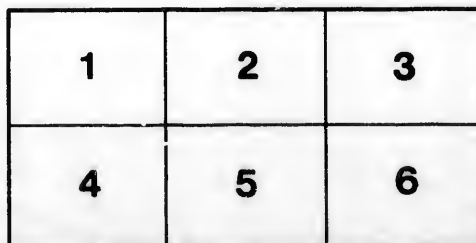
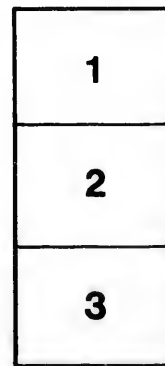
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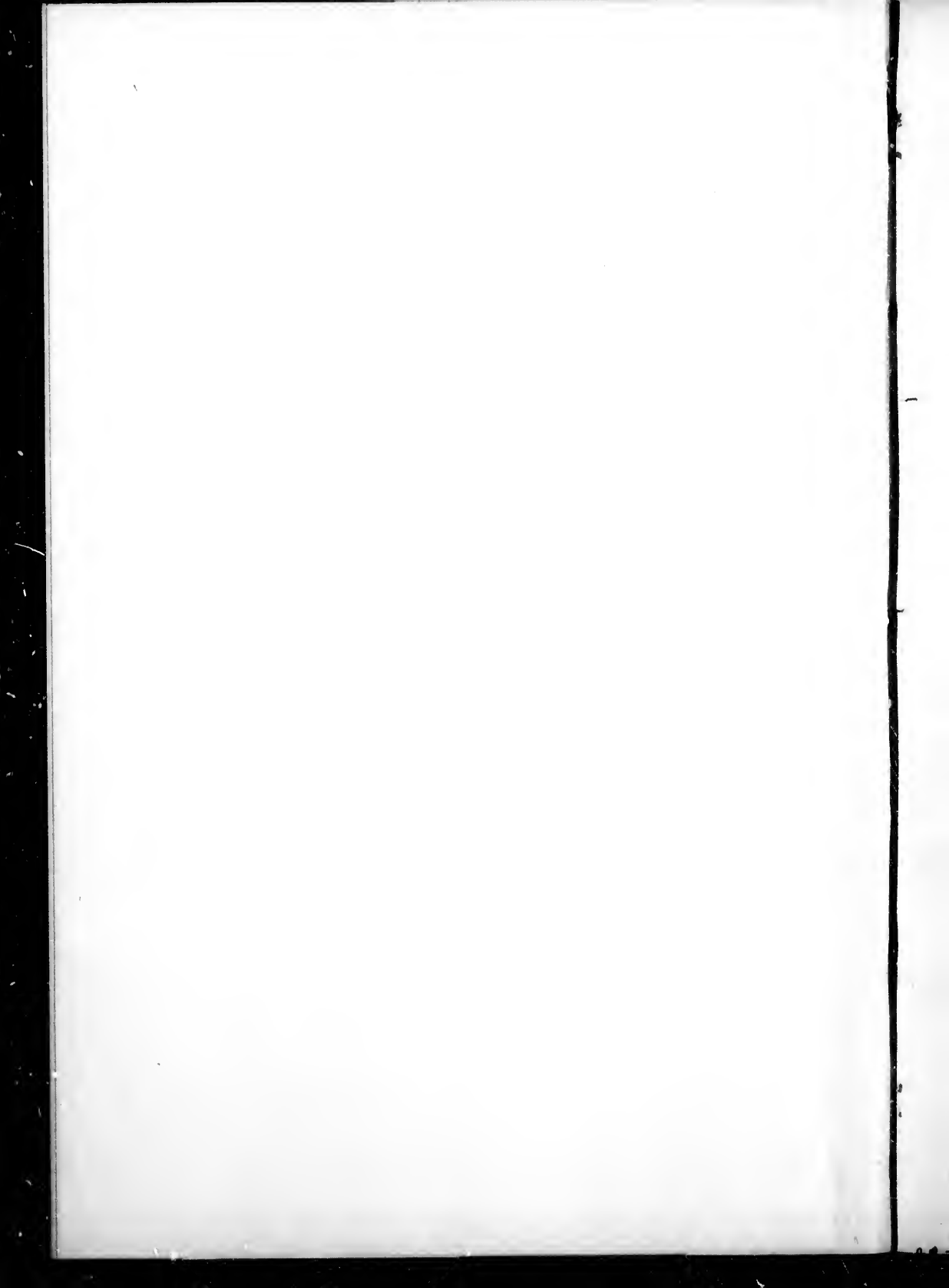
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COMPILED AND ISSUED UNDER THE AUSPICES OF THE

BOARDS OF TRADE OF PICTOU AND CAPE BRETON

ON

THE COAL AND IRON INDUSTRIES

AND THEIR RELATION TO THE

SHIPPING

AND

CARRYING TRADE OF THE DOMINION.

BY GEO. H. DOBSON,

SECRETARY, CAPE BRETON BOARD OF TRADE.

PRESENTED TO THE MEMBERS OF PARLIAMENT,
MARCH, 1879.

OTTAWA:

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CONTENTS.

Importance of Coal.....	5
The Coal Trade.....	7
Dominion Collieries	12
Nova Scotia	12
Cape Breton.....	14
British Columbia.....	19
Coal Deposits of the North-West.....	22
Canada for Canadians.....	23
Countries that impose Duty on Coal.....	23, 24
American Coal Duty since 1824.....	24
Comparative qualities of American and Canadian Coals.....	25
Capacity of Nova Scotia Collieries.....	26
Nova Scotia Coal sales since 1785.....	27
do Exports, Home and Foreign, since 1860.....	28
do Exports to United States since 1850.....	29
Coal Imports into Canada, from the United States, since 1860 ..	29
do do from all Countries	30
Iron Production of the Globe, 1866-76	32
Coal do do 1866-76.....	33
Table showing Value and Properties of Canadian, English and American Coal.	34
Statement showing Cost of Different Grades of Soft Coal coming into Toronto Market, from 1874 to 1878-inclusive.....	35
Prices of American Bituminous Coal, 1853-78.....	36
Estimated area of Coal Deposits in different Countries	37
Cost of Producing Coal in Great Britain.....	37
do United States.....	37
do Nova Scotia	38
Cost of American Anthracite.....	38
Cost of Producing Pig and Bar Iron.....	39
Coal Exports of Great Britain, 1877.....	40
do United States, 1877.....	41
Price of Coal in Toronto, March, 1879.....	41
Budden's Letter on Canadian Coal Fields.....	42
Inter-Provincial Coal Trade.....	43
Steam Power of Nova Scotia Coal (from Canal Commission Report) ..	45

Extracts from Evidence given before the Coal Committee of 1877—(S. N. Robinson).....	46
(J. M. Vernon) Development of Coal and Iron Trade of Dominion	47
F. Clemow on American and Canadian Coal.....	49
G. H. Dobson on Inter-Provincial Coal Trade....	49
Effect of the Coal Duty on Prices and Production, 1869-70-71.....	52
Table of Distances from Sydney to Canadian and American Ports.....	52
The Iron Industry	53
Iron Deposits of Dominion.....	53
do British Columbia.....	53
do Ontario	54
do Quebec	57
do New Brunswick.....	59
do Nova Scotia.....	60
do Cape Breton.....	63
Important Statement of the Steel Company of Canada	64
Total Imports of Iron and Coal into Canada, 1872 to 1878	66, 67
Comparison of the Coal and Iron Production of Great Britain, United States, Belgium and Canada	68
American Production of Pig Iron.....	69
American Importations and Exportation of Iron	70
Belgium Iron and Coal Trade.....	72
Inter-Provincial Trade or Shipments of Flour, &c., to Lower Provinces by St. Lawrence, Grand Trunk, Portland, Intercolonial and Boston.....	72
Total Shipments to Lower Provinces, 1872 to 1878.....	73
Coal Shipments from Nova Scotia to Upper Provinces.....	73
Coal Freight from Sydney to Montreal, Quebec and New York, 1873 to 1878..	73
Amount of Employment Transportation of Coal furnishes Railway Lines :—	
Great Britain.....	74
Germany	74
United States.....	74
Canada	75
Coal Freights from Cleveland to Lake Ports for '879.....	75
Relation of the Coal Exports of Great Britain to the increase of her Shipping	75
Home and Foreign Vessels engaged in the Canadian, American and English Carrying Trade.....	75
Canadian Transportation Routes.....	77
Size and kind of Propellers suited to carrying between Toronto, Pictou and Sydney ...	78
Concluding Remarks	79

IMPORTANCE OF COAL.

“Coal is entitled to be considered as the mainspring of our civilization. By the power developed in its combustion all the wheels of industry are kept in motion ; commerce is carried with rapidity and certainty over all portions of the earth's surface ; the useful metals are brought from the deep caves in which they have hidden themselves, and are purified and wrought to serve the purposes of man. By coal, night is, in one sense, converted into day ; winter into summer ; and the life of man, measured by its fruits, greatly prolonged. Wealth, with all the comforts, the luxuries and the triumphs it brings, are its gifts. Though black, sooty, and often repulsive in its aspects, it is the embodiment of a power more potent than that attributed to the Genii in Oriental tales. Its possession is, therefore, the highest material boon that can be craved by a community or nation.—*Prof. J. T. Newberry.*”

“Maritime Provinces.”

Says Charles Marshall, in his work, the “*Canadian Dominion*” :—

“The Maritime Provinces in confederating with Canada, have augmented its power in a degree immensely exceeding the mere proportion of their population, or extent of their territory.

“They have given her an ample seaboard, thickly studded with excellent harbours, coal-fields nearly as extensive as those of Great Britain, a merchant marine capable of commanding the North American carrying trade, and many thousands of hardy, skilful seafaring men, who, to use the language of Governor Andrews, in his report to Congress on the British North American Provinces, ‘from their superior intelligence and bodily vigor, and their experience in the navigation of the cold and stormy coasts, are the best of seamen and well qualified to maintain the honour of their flag on every sea.’”

“Coal-fields of immense extent occur on the very seaboard (Nova Scotia) to aid the natural advantages of position possessed by the Province for securing the direct trade between the old world and the new.”

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COAL AND IRON INDUSTRIES OF THE DOMINION

The value of coal, to countries possessing and utilizing it, is made manifest by their prosperity, and by the wealth and power of communities and nations whose economy is influenced by its trade or dynamic powers. Of this England furnishes a most prominent illustration. To what can we attribute the astonishing growth of her manufactories, shipping, carrying trade and commerce, but to the development of her immense stores of Coal and Iron? The out-put of her collieries exceeds 130,000,000 tons annually. The 30,000,000 tons used for steam power alone, have enabled her to increase her productive ability to equal the work of about 800,000,000 of people, which surpasses in extent, as well as in the multiplicity of its industries, all other countries. This acquisition of mechanical power has enabled her to manufacture for the world and gather wealth from every quarter of the globe.

The out-put of coal for the year 1876 amounted to 135,611,788 tons, which was divided about as follows:—

Purposes for which Used.	Tons.	Percentage of Total Production.
For the iron industry.....	38,000,000	28-02
Manufacturing purposes.....	30,000,000	22-11
Domestic use.....	20,000,000	14-74
Colliery use.....	9,500,000	7-00
Gas manufacture.....	7,000,000	5-16
Export.....	13,000,000	9-58
Railway use.....	3,750,000	2-76
Steam and navigation.....	3,650,000	2-68
Lime, cement and salt works.....	3,400,000	2-57
Chemical works.....	3,000,000	2-21
Melting metals other than iron.....	1,000,000	.73
Other purposes.....	3,311,788	2-44
Total.....	135,611,788	100 00.

The number of hands directly engaged in the mining of this coal was 422,000. Indirectly, however, a very much larger number was employed, inasmuch as the enormous transportation by railways, canals and vessels must be added. At present English coal finds its way to nearly 900 foreign ports; it crosses all seas and commands nearly every coast, and is used in the interior of countries rich with that mineral.

The stimulating effect of these exports on the commerce of Great Britain is well understood by the nations which attempt to compete with her carrying trade in Europe, America and Australasia.

Prof. Jevons writing on the duration of the English coal supply, remarks: "Coal, in truth, stands not beside, but entirely above all other commodities. It is the material energy of the country, the universal aid, the factor in every thing we do. With coal almost any feat is possible or easy; without it we are thrown back into the laborious poverty of early times." "England's manufacturing, and commercial greatness, at least, is at stake in this question. * * * * * To an Englishman who knows the grand and steadfast course his country has pursued to its present point, its future must be a matter of almost personal solicitude and affection."

Next to England in coal production come the United States and Germany.

A writer on American commerce attributes the rapid development of the manufactures and commerce of that country to their immense supply of coal and iron, and a fiscal policy which has led to their development. Since 1824, the coal industry of the United States has enjoyed a protective tariff of from 75 cents to \$1.70, and although the coal basins are remote from the sea and not convenient to water or cheap transportation, yet the protective tariff has so secured the home market and increased the out-put of the collieries that the cost of coal mining has been reduced to a minimum. This policy has not only enabled the American coal-owners to compete successfully in foreign markets, but to supply their own consumers as well, with cheap coal.

The present out-put of the United States collieries aggregates 50,000,000 tons annually, and gives employment to a working population of over 100,000 people. Prof. James Macfarlane, in his treatise on the American coal trade, remarks: "But unprofitable as it is sometimes to the producer, the public are always benefited by coal-mining. Without following it out in its more remote bearings, its more immediate results are, the distribution among the people, for labor and provisions, of an amount of money equal to the cost of raising and transporting the coal to market, thus affecting the general prosperity of the country. The formation of a home market for all the produce of the country, the employment of numerous tradesmen, merchants, farmers and their families, and the general improvement of all the surrounding country in value and property, are the results. The Anthracite coal alone, mined in 1872, did not cost less than \$70,000,000 by the time it was delivered to the customers. All of this money is the result of productive industry, and that sum was added to the wealth of the people. But it would be impossible to describe the vast number of persons, who, directly and indirectly, are indebted to this great interest, not only for the comforts, but the very necessaries of life—food, fuel, raiment and shelter."

The coal fields of the Dominion are said to cover an area of 60,000 square miles, an area more than five times greater than that of the coal fields of Great Britain.

These deposits comprise the anthracite basins of Queen Charlotte Island, British Columbia; the bituminous coal fields of Vancouver, New Brunswick and Nova Scotia, and the lignite deposits in the Saskatchewan, Pembina, Arthabasca and Fraser Rivers.

The coal fields of British Columbia are extensive and rich, their actual area is yet unknown. The coal mines in operation are in the immediate neighbourhood of Nanaimo, Vancouver Island. These collieries are all close to the seaboard, and have every convenience for over sea conveyance, which is the cheapest of all commercial highways for the transportation of bulky articles. The lignite deposits of the interior are situated along navigable streams of great length, affording ready and cheap means of transportation.

But the richest and most important coal fields and collieries of the Dominion, are on the Atlantic seaboard, and their development is destined to augment our commerce and carrying trade. The Nova Scotia and Cape Breton coal basins stretch out, under the very water lanes trod by keels in the Canadian and American trans-atlantic trade. The seaboard is ample and studded with excellent harbours, the strata are regular, the coal seams are numerous and easily worked, lying at a moderate angle; each company has its own loading pier and possesses all the conveniences most conducive to working and trading in coal. The annual capacity of the collieries is over 2,000,000 tons or 500,000 tons more than the present consumption of the Dominion, and by reference to the tables annexed, it will be seen that the cost of production in Canada is no greater than it is in England or the United States, while the analysis shows, that for gas, steam and domestic purposes, our coal is equal to any bituminous coal imported from the United States.

The situation of our mines on the seaboard is pre-eminently adapted for facilitating the carrying trade of the Dominion. Situated on the line of communication between the principal European and North American ports and at the confluence of the St. Lawrence, affording several thousand miles of cheap inland navigation, the development of these collieries will afford return freight for the St. Lawrence, cheapen transportation and vastly expand our commerce.

Our coal and iron deposits extend from the Atlantic to the Pacific; our soil naturally rich can furnish food to almost any extent; our manufactories have a capacity for double their present production; with railways, water routes and shipping which afford every facility for cheap transportation; why are we buying from the United States and England at this moment, five times the quantity of coal that we are exporting? Why do we go to England for iron, while our iron

resources are more than equal in comparison? Why do we send from eighteen to twenty millions of dollars out of the country annually to pay for foreign labour and transportation, increasing foreign markets for foreign commodities, and building up foreign routes of transportation, while our factories are allowed to be idle? Why do we employ foreigners to do fifty per cent of our carrying trade, while we have a merchant marine only second to that of England and the United States, and a magnificent water course penetrating into the very heart of the Continent, affording every means for cheap transit? Simply because the products from developed mines and iron factories of other countries are allowed to come in free of duty and crush out our struggling infant industries. The coal mines and iron factories of the Dominion can now supply the demand with as cheap coal and iron as comes from abroad by protecting and securing the home market so as to admit of a large production. Since 1871 we have paid out nearly one* hundred and thirty-three million dollars for imported coal and iron, including transportation, while our own mines and vessels lie idle and our workmen are unemployed. Contrast the apathy of our people in reference to these important industries with the energy and interest taken in them by the peoples of the United States, Great Britain, Germany and France, and mark the splendid results to them.

Had we produced the coal and manufactured the iron, we would not alone have kept that immense sum of money in the country and experienced the benefit its possession would imply, but would have used it to develop our own mining and manufacturing industries, increased our home market, cheapened the cost of production, placed our mining and manufacturing industries on a sound foundation, developed our carrying trade, and be in position to-day, to compete with others in the markets of the world; but sent to Europe and the United States our capital is lost to us, goes to enrich foreign merchants who receive the benefit, while we experience but the transient heat of the coal and the temporary wearing of the rail.

The money placed in circulation or productive industry added to the wealth of our people by the production of coal and iron, is about as follows, per ton, see tables:

Money placed in circulation by production per ton	\$1 00	
Average [cost of transportation from mines to market	2 25	
		————— \$3 25
Cost of production of pig iron	16 88	
Transportation.....	2 00	
		————— 18 88
Cost of bar iron	43 83	
Transportation.....	2 25	
		————— 46 08

* In the first issue the amount given was estimated from the imports of 1878, but this amount is from the blue books. See Tables.

It is obvious that every ton of coal imported is \$3 lost to our capital, every ton of pig iron \$16, and every ton of bar iron is \$45 lost to the productive labor of the country.

A fiscal policy is required that will secure to the East and West the home market for their respective industries, and cause the development of an inter-provincial trade.

The securing of the carrying trade of the West has been the ambition of Canada for many years. To accomplish it, millions have been spent in the improvement of the St. Lawrence navigation, which route affords the shortest and most ready means of transit between the granaries of the West and the markets of Europe. Yet with all our natural advantages, the American lines are not only holding their own trade, but absorbing ours. The large amount of coal tonnage moving west furnishes their routes with return freight, which cheapens transportation and enables them to monopolize the western trade. To compete successfully with the American highways, the St. Lawrence requires return freights which can only be afforded by Ontario drawing its supply of coal from our own collieries through the St. Lawrence, instead of from American collieries through United States channels.

To acquire the Western carrying trade is to acquire wealth and power, and even should the means necessary for its development cause a temporary advance in our markets, the feeder that the inland commerce would be to maritime trade, and the markets and commerce that would result from its development throughout Canada, would more than compensate for any temporary inconvenience the necessary tariff legislation might incur.

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DOMINION COLLIERIES.

Description and capacity in tons of the various collieries in the Dominion of Canada, with statistics and evidence given before the Parliamentary Coal Committee, in 1877, on the coal and interprovincial trades.

NOVA SCOTIA MINES.

The following collieries are situated in Pictou County, N.S., are all connected with the interior by the Intercolonial Railway, or can ship from their own wharves in Pictou Harbour or from the Intercolonial wharf at Halifax to any points attainable by water.

ALBION MINES.

JAMES HUDSON, Manager, Stellarton, N.S.

Wharf situate four miles from the town of Pictou, on East River, connecting with the mines by private railway. Depth of water at low tide 18 feet. Capacity 180,000 tons per annum.

Analysis :—

Moisture	1.48
Volatile combustible matter.....	26.28
Fixed carbon.....	66.50
Ash.....	7.74
	<hr style="width: 10%; margin: 0 auto;"/> 100.00

Cokes well and is largely used for house and steam purposes.

ACADIA MINES.

HENRY POOLE, Manager, Stellarton, N.S.

Wharf on Pictou harbour connecting with mines by private railway, 13 miles in length, connecting with the Intercolonial Railway. Depth of water at low tide 22 feet. Capacity 150,000 tons per annum.

Analysis :—

Moisture	2·10
Volatile combustible matter.....	32·27
Fixed carbon.....	57·57
Ash	7·50
Sulphur.....	0·50
	————— 100·00

Principally used for domestic and steam purposes, considered specially adapted for the latter purpose.

INTERCOLONIAL MINES.

ROBERT SIMPSON, Manager, Westville, N. S.

Wharf situate at Middle River, connected to pit by railway seven and a half miles long; distance from wharf to Town of Pictou, three miles; depth of water at low tide, 19 feet; capacity, 150,000 tons per annum.

Analysis.

Total volatile matter.....	28·0
Fixed carbon.....	64·0
Ash (grey).....	8·0
Sulphur.....	.....
	————— 100·0

Good for steam and house use. Tried at Pictou Gas Works with following result:—8,500 cubic feet of gas per ton, with 36 bushels of good coke.

VALE COLLIERY.

W. B. MOORE, New Glasgow, N. S.

Wharf situate in Pictou harbour, connecting by private railway seven miles in length, with Intercolonial Railway at New Glasgow, thence eight and a half miles to wharf; depth of water at low tide, 26 feet; capacity, 150,000 tons per annum.

Analysis.

Water.....	2·22
Volatile combustible matter.....	30·23
Fixed carbon.....	59·70
Ash (white).....	7·85
	————— 100·000

For a heavy steam coal this mine is unsurpassed, principally used for house and steam purposes. The nut coal from this mine is specially adapted for base burning stoves, &c., being very hard and free from sulphur.

BLACK DIAMOND COLLIERY.

W. W. WHITE, Westville.

Wharf situate on Middle River, connecting with mine by private railway seven and a half miles long; depth of water at low tide, 18 feet; wharf three miles from Town of Pictou; capacity, 80,000 tons per annum. This is the only colliery that does not connect with the Intercolonial Railway. Coal chiefly used for domestic and steam purposes.

SPRING HILL MINES.

WM. HALL, Manager, Springhill, N.S.

Situate in Cumberland Co., N.S., connecting by private railway five miles in length, with the Intercolonial Railway but have no facilities for water shipments except from railway docks at Halifax 100 miles away or own wharf at Parsboro on the Bay of Fundy 25 miles away, and Dorchester 40 miles; capacity, 150,000 tons per annum.

Analysis:—

Hygroscopic.....	1.02
Volatile, combustible matter.....	34.38
Fixed carbon.....	60.82
Ash, white.....	3.78
	<hr/>
	100.00

This coal is admirably fitted for the manufacture of gas, yields a compact coke containing but little ash and is well adapted for iron smelting; it is also largely used for domestic and steam purposes.

CAPE BRETON MINES.

The following collieries are situate on the Island of Cape Breton, have at present no railway connection with the mainland but from their location on the Gulf of St. Lawrence command a large supply of seeking ocean tonnage, and have every convenience for cheap transportation to the St. Lawrence, American and West Indian ports.

 SYDNEY MINES, C.B.

R. H. BROWN, Manager, Sydney Mines, C.B.

Wharves (2 in number) situate on North Sydney Harbour connected with mines by railway $4\frac{1}{2}$ miles in length. Depth of water at low tide 25 feet, capacity 200,000 tons per annum.

Analysis :—

Moisture.....	3·04
Volatile combustible matter	31·14
Fixed carbon	61·50
Ash (reddish brown.).....	4·32

 100·00

This is a superior domestic coal; it is also used for steam purposes.

 VICTORIA MINES.

WM. ROUTLEDGE, Lessee.

Situated at the entrance of Sydney Harbour. Connected with their wharf by a railway, three miles in length. Depth of water at low tide, 26 feet. Capacity 75,000 tons per annum.

Analysis :—

Volatile matter.....	38·70
Fixed Carbon.....	58·40
Ash.....	2·90

Considered an excellent domestic coal; is also used for steam.

 INTERNATIONAL MINES

INTERNATIONAL MINE, Dodd and Gillies, Lessees, Sydney, C.B.

Wharf situate on Sydney Harbour connected with mines by private railway, 14 miles in length, depth of water at low tide 30 feet, capacity 150,000 tons per annum.

Analysis :—

Volatile matter.....	34·09
Fixed carbon.....	62·92
Ash	2·99

 100·00

Admirably adapted for the manufacture of gas, yielding 10,000 cubic feet and 1,470 lbs. of coke per ton; also used for steam and house purposes.

GARDINER MINE.

Wm. ROUTLEDGE, Manager, Bridgeport, C.B.

Situate 10 miles from Sydney Harbour, with which it is connected by the International Coal Co.'s railway, loading vessels also at the latter Co.'s wharf. Depth of water at low tide, 30 feet; capacity, 80,000 tons per annum.

Analysis:—

GARDINER.

Volatile matter.....	31 37
Fixed carbon	64 63
Ash.....	2 82
Sulphur	1 18
	100 00

Is a good house and steam coal specially adapted for the latter purpose.

RESERVE MINES.

Situated 10 miles from Sydney Harbour and 16 miles from Louisburg; connected with both those ports by railway. Depth of water at loading pier at Sydney at low tide, 25 feet. Depth of water at Louisburg pier, 26 feet at low tide.

Capacity 120,000 tons per annum. Regarded an excellent steam and domestic coal.

Analysis:—

Volatile matter	34 50
Fixed Carbon.....	59 50
Ash.....	6 00
	100 00

Yield of gas per ton, 9,950 cubic feet; illuminating power, 13.17 candles.

EMERY MINES.

Situate near the last named mines; possessing the same railway connection and loading piers at Sydney and Louisburg respectively. The coal of this mine is considered a superior article for steam and smelting purposes. Capacity 80,000 tons per annum.

LINGAN MINE.

R. H. BROWN, Manager, Sydney Mines, C.B.

Wharf in Lingan Bay connected with mines by railway three-fourths mi in length. Depth of water at low tide 15 feet, capacity 90,000 tons per annum.

Analysis:—

Volatile matter.....	33.84
Fixed carbon.....	63.60
Sulphur.....	0.77
Ash.....	1.79
	100.00

Yields 9,700 cubic feet of gas per ton, is also used for steam and house purposes.

LITTLE GLACE BAY MINES.

CHARLES RIGBY, Manager, Little Glace Bay, C.B.

Have excellent harbour for safety at Little Glace Bay. Ship direct from the pit. Depth of water at low tide 18 feet, capacity 120,000 tons per annum.

Analysis:—

Volatile matter.....	30.21
Fixed carbon.....	67.78
Ash (reddish brown).....	4.32

Yields nearly 10,000 cubic feet of gas per ton, is also largely used for steam and house purposes. Chiefly used for gas.

CALEDONIA MINES.

DAVID MACKEEEN, Manager, Little Glace Bay, C.B.

Have a good harbour at Port Caledonia, depth of water, 18 feet, connected with the mines by 1 mile of railway, capacity 120,000 tons per annum.

Analysis:—

Volatile matter.....	33.00
Fixed carbon.....	57.37
Ash.....	9.63

Is well adapted for the manufacture of gas, yielding 9,700 cubic feet per ton; also used for house and steam purposes.

ONTARIO MINE.

JOHN SUTHERLAND, Manager, Port Caledonia, C.B.

Ships from the wharf of the Caledonia Mine. Depth of water at low tide 18 feet, capacity 40,000 tons per annum.

Analysis:—

Volatile matter	32.82
Fixed carbon.....	64.33
Ash.....	2.85
	100.00

Principally used for steam and house purposes.

BLOCK HOUSE MINING COMPANY.

ROBERT BELLONI, Manager, Cow Bay, C.B.

Situate immediately on the shore of Cow Bay, no railway, depth of water at low tide, 19 feet; capacity, 120,000 tons per annum.

Analysis:—

Volatile	35.37
Fixed carbon.....	59.30
Ash, purplish red.....	5.33
	100.00

This coal is peculiarly well adapted for the manufacture of gas, yielding 10,500 cubic feet per ton, is also a good steam and house coal, extensively used by the New York Gas Works.

GOWRIE MINES.

CHAS. ARCHIBALD, Manager, Cow Bay, C.B.

Wharf Situate on Cow Bay, connecting with mines by railway 1 mile in length, depth of water at low tide, 19 feet; capacity, 75,000 tons per annum.

Analysis:—

Volatile matter.....	30.64
Fixed carbon.....	63.00
Ash.....	3.50
Sulphur.....	2.86
	100.00

This coal is highly recommended for steam purposes, is a fair domestic coal and produces a superior quality of coke.

TORONTO COAL COMPANY—S. NAPIER ROBINSON, MANAGER.

NORTH SYDNEY, C.B.

Mine situated on little Bras d'Or Gut. Shipment made direct from pit to vessel. No railway. Depth of water at low tide 20 feet. Capacity 45,000 tons per annum.

Moisture.....	1.63
Volatile combustible matter.....	35.12
Fixed Carbon.....	57.19
Sulphur.....	trace
Ash.....	6.06

100.00

Considered a good domestic and steam coal, used principally for the former purpose. Vessels loading at this mine for southern ports can proceed to sea through the Bras d'Or Lake, *via* St. Peter's Canal, saving by so doing some eighty miles distance.

NEW CAMPBELLTON MINES.—HON. C. J. CAMPBELL.

BADDECK, C.B.

Wharf situated one-half mile from mouth of great Bras d'Or, connected with mine by one mile of railway. Depth of water at low tide 23 feet. Capacity, 30,000 tons per annum.

Used for house and steam purposes. Vessels loading here for southern ports can proceed to sea through Bras d'Or Lake and St. Peter's Canal, saving by so doing a considerable distance.

PORT HOOD MINING COMPANY.—J. P. LAWSON, Agent.

PORT HOOD.

This company ships at Broad Cove. The seam is 16 feet thick; capacity, 20,000 tons. This coal is highly recommended for domestic and steam purposes.

THE BRITISH COLUMBIA COAL MINES.

It has long been known that rich coal deposits exist in British Columbia, and casual statements respecting them have been published from time to time. The latest and most authoritative information is contained in a report of the coal-fields of Vancouver Island, embodied in the recent "Progress Report" and Geological Survey of Canada.

The production of coal in British Columbia was 154,052 tons in 1877, against 139,181 tons in 1876, an increase of nearly 15,000 tons. The mines are on Vancouver

Island. The coal of this island is held in high esteem for gas, steam and household purposes. San Francisco is the principal market for its sale.

The following extract is from the report on British Columbia, by Hon. H. L. Langevin, C. B.:—

"The coal-mines of Columbia are very valuable and numerous. The mines of Nanaimo, which yield bituminous coal, are those which, at the present time, are the most worked. They are very easy of access, and vessels can be loaded from them without difficulty. This coal abounds on the eastern coast of Vancouver Island, not only at Nanaimo, but also at Departure Bay, Bayno's Sound, Isquash, and at Moskeeno, near the north end of the Island. This coal is, in fact, the only good coal found on the Pacific coast. Mr. Dilke had probably this in his mind when he remarked as follows, in his 'Great Britain': 'The position of the various stores of coal on the Pacific is of extreme importance as an index to the future distribution of power in that part of the world; but it is not enough to know where coal is to be found, without looking also to the quantity, quality and cheapness of labor, and facility of transport. In China, and in Borneo, there are extensive coal fields, but they lie the wrong way for trade. On the other hand, the California coal at Monte Diablo, San Diego, and Monterey, lies well, but is bad in quality.'"

The yield of coal in 1869 to 1871, from the Vancouver Coal Mining Company, in British Columbia, was 110,645 tons. The production was 154,052 tons in 1877, against 139,191 in 1876, an increase of nearly 15,000 tons. The coal is held in high esteem for gas, steam, and household purpose. San Francisco is the principal market for its sale.

WELLINGTON MINE.

DUNSMUIR, DIGGLE & Co., Departure Bay, B.C.

Wharves situate on Departure Bay connecting with mines by railway, 3 miles in length; depth of water at low tide, 18 and 25 feet; capacity, 150,000 tons per annum.

Analysis:—

Fixed carbon	55.50
Volatile matter	34.70
Ash	9.80
	100.00

This coal is used principally for steam and domestic purposes.

NANAIMO COLLIERY.

VANCOUVER COAL MINING Co., Nanaimo. B.C.

Situate at Nanaimo close to the harbour. Depth of water at low tide 24 feet.
Capacity 220,000 tons per annum.

Analysis :—

Volatile matter.....	38.05
Fixed carbon.....	51.45
Ash.....	10.50

Largely used for gas manufacture, also used for steam and domestic purposes.

Anthracite :—

Graham Island, (one of the Queen Charlotte Islands) B.C., Mechanics Institute, New Westminster, B.C.

The deposits of anthracite on the Queen Charlotte Islands are, so far as examined, of very irregular character. The locality best known is on Skidegate Channel, at the southern end of Graham Island. Here the coal has been worked in several places, and found in one instance to be as much as six feet thick. In the direction of its strike, however, it appeared to thin out altogether, or to be represented by coal of very inferior quality mixed with shale and clay iron stone. The seams are vertical, and the rocks containing them are flanked to the north-west by escarpments of volcanic rock.

Analysis of two specimens of the anthracite by fast coking gave (see Report of the Geological Survey of Canada, 1872-73, p. 81) :

Water.....	1.89	1.60
Volatile combustible matter.....	4.77	5.02
Fixed carbon.....	85.76	83.09
Sulphur.....	0.89	1.53
Ash.....	6.69	8.76

THE COAL DEPOSITS OF THE NORTH-WEST.

COAL AND PEAT.

The route of the Canadian Pacific Railway (which, under the vigorous policy of a new Government, its construction will be rapidly pushed westward), is indicated as the natural pathway of commerce by the vast and inexhaustible coal beds through which it runs for over two hundred miles. From geological reports, and engineer's surveys, the district through which it passes possesses one of the largest coal fields in the world.

Between the 59th parallel and the north sea, it has been calculated that there cannot be much less than 500,000 square miles that are underlaid by true coal. The average breadth of this belt is about 280 miles. Iron is found throughout the coal region, at accessible distances from the line of railway, and gives promise of the establishment of future centres of industry along the line of the Canadian Pacific Railway. On the North Saskatchewan River, coal prevails with little interruption in beds two and two and one-half feet thick on the bank of the river, from a little below Edmonton, upwards for 200 miles.

On the Pembina River, 70 miles to the west, there is a seam ten feet thick of a very superior quality. On the Battle River it is also noted, and in the Red Deer branch of the South Saskatchewan, 170 miles from its mouth, are extensive deposits of coal, and at 100 miles further up it is there in beds so close, that of 20 feet of strata exposed, 12 feet are coal.

Specimens of coal from various sections of the Saskatchewan country were recently forwarded for analysis to Professor Hannel, of Victoria College, Ontario, with the following results, he says:—"The specimens were the outcrop in each case, and taken from points at least 300 miles apart."

—	St. Gr.	Mois- ture.	Vol. matter.	Fixed Carbon.	Ash.
1. Pembina coal, 100 miles N.W. from Edmonton.....	1,375	11.88	28.66	57.25	2.21
2. Belly River coal, South Saskatchewan.....	1,375	11.41	29.07	56.94	2.58
3. do	1,340	6.89	33.70	53.25	6.36
4. Saskatchewan coal, 900 miles N. N. W. of the city of Winnipeg, near Fort Edmonton.....	1,337	6.89	33.57	50.00	8.64

No. 1 and 2 are bituminous coals of a bright lustre, and contain all the qualities to render them superior coals for heating purposes, and 3 and 4 are much better than a great deal of the coal from Pennsylvania such as we are often obliged to burn

THOMAS SPENCE.

Clerk of the Legislative Assembly of Manitoba.

—Pamphlet on the "Prairie Lands of Canada."

CANADA FOR CANADIANS.

"A nation, whether it consume its own productions, or with them purchase from abroad, can have no more to spend than it produces. Therefore, the supreme policy of every nation is to develop its own producing forces."

Capital employed in production is spent and yet it reproduces itself. Wherever, therefore, a commodity is produced by the aid of capital, *two capitals* or values are to be regarded. There is first the capital or value spent and consumed in production; and there is secondly, the capital or value re-produced. It is the capital spent that remunerates the laborer and creates the home market. Yet the country is no poorer for the expenditure in production, for it still has the now made article equivalent or of greater value than the sum spent in production. The country, therefore, that has the resources and privilege of producing, at both ends of the exchange, has the benefit of spending two consumable capitals instead of one, and double its markets for all other commodities, and in the transaction creates two home markets. But if we produce only one, and leave the foreigner to produce the other, though he should fairly exchange with us, we create but one home market and sacrifice the other.

It is evident that the resources of a young country can be developed, only, by commanding the home market; and with our agricultural and manufacturing industries in the west, and minerals and productive interests in the east, a fiscal policy that would secure them the home market would cause an inter-provincial trade which would materially promote the general prosperity of the country.

"The truth is this:—

"The gross value of every product of industry is national net income. Whenever you import instead of producing, you may be losers by the change till your additional export doubles the value of new import."

The west looks to the east for a market for her agricultural and manufacturing industries. The east looks to the west for a market for her minerals and productive industry. The expansion and prosperity of these industries depend on a tariff or fiscal policy that will secure them the home market. Our prosperity is happily interwoven both as agriculturists, manufacturers, miners, and carriers, with the national prosperity, and we must look for good returns not by seeking to promote special interests or classes of trade, but by seeking the general welfare of the country

COUNTRIES THAT IMPOSE DUTY ON COAL.

The following countries, although producing no coal within their own borders levy a duty on all imported:

Cuba, 77 cents per ton.

Barbadoes, 50 cents per ton.

British Guiana, 36c. per ton	
Dominica, 50c.	"
Antigua, 50c.	"
Grenada, 50c.	"
Tobago, 50c.	"
Trinidad, 75c.	"
Bahamas, 17½c.	"
Newfoundland, 25c.	"

The following coal producing countries levy a duty on all imported, as follows :

United States, 75 cents per ton.

Germany's new tariff, 5 Pfennings per cwt., which is considered sufficient to shut out English competition, is equal to 25 cents per ton.

France, \$1.40 per ton, when carried in other than French bottoms.

" 22c. " when carried in French bottoms.

Spain 25c. "

Queen's Land, 30 cents per ton.

Victoria, 20 pr. c., *ad val.*

Tasmania, 25 pr. c., *ad val.*

AMERICAN COAL DUTY AND PRICES.

The following shows the rates of duty imposed upon foreign coal by the United States since 1824, under which protection their coal fields have been developed, and the wealth of the nation largely increased. From 1854 to 1864 the Reciprocity Treaty was in effect with Canada ; but there was a duty on all other foreign coal.

From 1824-43.....	\$1 68 per ton.
1843-46	1 75 "
1846-47.....	30 p.c. <i>ad val.</i>
1847-61.....	24 "
1862-64.....	1 00 per ton.
1865-66.....	1 10 "
1866-72	1 25 "
1872-79.....	75 "

Production of Bituminous coal in Cumberland, U.S., and cost in Boston, during the years 1865-66-67 :

1865, 903,495 tons cost in Boston, \$11 00 per ton.	
1866, 1,079,331, " 5 94 "	
1867, 1,193,822, " 4 97 "	

Showing that though a duty of \$1.25 was imposed on N.S. coal in 1866, the price fell in the Boston market, from \$11.00, in 1865, to \$5.94 and to \$4.97 in 1867.

TABLE showing comparative value of American, principally imported into Ontario, as compared with Nova Scotia Coals for Steam and Gas purposes.

	Moisture and Vol. Matter.	Fixed Carbon.	Ash.	Sulphur.	Coke in bush. per Ton.	Cubic feet of Gas per Ton.	Candle Power.	Cubic feet of Gas purified by 1 bushel Lime.	Authority.
<i>United States Coals.</i>									
Straitsville.....	37.25	52.77	9.88	0.68	30 do	10,000	14	.....	State Geologist, Ohio.
Gonghoigheny.....	38.00	56.10	5.90	0.98	.....	.....	.....	.....	do
Briar Hill, No. 1.....	39.50	58.70	1.80	.....	.....	.....	.....	.....	do
do No. 2.....	39.80	57.30	2.90	1.15	.....	.....	.....	.....	do
do No. 3.....	42.73	48.72	8.55	0.76	.....	.....	.....	.....	do
<i>Nova Scotia Coals.</i>									
Albion Mine (Pictou Co.).....	25.76	66.50	7.74	0.55	15.40	9,500	13	.....	Manhattan Gas Co.
Acadia Mine do.....	34.37	57.57	7.56	0.50	.....	.....	.....	.....	Centennial Report.
Vale Mine do.....	32.45	59.70	7.85	.....	.....	.....	.....	.....	Dawson Report.
Intercolonial Mine do.....	29.0	61.0	8.0	0.58	.....	.....	.....	.....	do
Spring Hill Mine (Cunroerland Co.).....	25.38	60.95	{ 13.67 }	0.84	.....	.....	.....	.....	Howe and Woodhouse
Blockhouse (C.B.).....	40.80	55.70	{ 3.50 }	.....	14.60	10,217	17	2,304	Manhattan Gas Co.
Pheasant do.....	37.26	58.39	4.35	2.17	.....	9,500	16.5	.....	Manhattan Gas Co.
Emery do.....	38.10	58.45	3.45	.....	.....	.....	.....	.....	Percy.
Lingan do.....	33.84	63.60	1.79	0.79	11.84	9,700	16	.....	Harrington.
Harcob do.....	36.54	62.53	0.93	.....	11.84	9,580	13	1,945	do
Sydney (Min) do.....	34.09	62.92	2.99	2.29	14.40	10,106	17	2,314	do
Toronto.....	31.87.	64.59	3.64	.....	.....	5,500	.....	.....	Howe.
.....	36.75	57.19	6.06	Trace.	.....	.....	.....	.....	Chapman.
<i>Coke from Albion Mines</i>									
Moisture.....	0.85	.....	.....	.....	.....	.....	.....	.....	.....
Fixed Organic Residue.....	.....	75.80	.....	.....	.....	.....	.....	.....	.....
Vol. Organic Matter.....	.....	.....	1.26	.....	.....	.....	.....	.....	.....
Ash.....	.....	.....	.....	23.09	.....	.....	.....	.....	.....
Sulphur.....	.....	.....	.....	.....	.....	.....	.....	0.387	Steel Co. of Canada.

The sales of the several Collieries in 1876, and Minimum and Maximum capacity, are as follows:—

Name of Colliery and County.	Coal sold in 1876.	Men Employed in 1876.	Min. Capacity.	Max. Capacity.
	Tons.	No.	Tons.	Tons.
<i>Cumberland County.</i>				
Cumberland Colliery.....	3,096	41	20,000	40,000
Scotia.....	1,121	13	20,000	40,000
South Joggins.....	11,765	64	30,000	60,000
Spring Hill.....	52,395	214	100,000	150,000
Folly Mountain.....	10			
<i>Pictou County.</i>				
Acadia.....	45,319	192	100,000	150,000
Albion Mine.....	90,550	615	120,000	180,000
Intercolonial.....	40,622	214	100,000	150,000
Nova Scotia.....	12,674	85	80,000	120,000
Valc.....	28,365	170	100,000	150,000
<i>Cape Breton.</i>				
Block House.....	31,033	129	80,000	120,000
Caledonia.....	25,323	88	80,000	120,000
Toronto.....	5,693	83	20,000	40,000
Emery.....	40	14	40,000	80,000
Gardiner.....		5	40,000	80,000
Glace Bay.....	28,598	127	80,000	120,000
Gowrie.....	20,163	166	50,000	75,000
Ingraham.....	40			
International.....	24,111	109	100,000	150,000
Lingan.....	15,289	103	60,000	90,000
Ontario.....	11,095	75	20,000	40,000
Reserve.....		10	80,000	120,000
Schooner Pond.....		20	40,000	60,000
South Head.....	653	11	20,000	30,000
Sydney Mines.....	102,614	516	150,000	200,000
Victoria.....	17,672	90	50,000	75,000
Port Hood.....	2,548	27	20,000	30,000
New Campbellton.....	3,362	48	20,000	30,000
<i>British Columbia.</i>				
Bayne's Sound Colliery.....	1,000	} 441	20,000	30,000
Wellington.....	60,000		100,000	150,000
Nanaimo.....	150,000		200,000	220,000
Totals.....	785,121	3,770	1,940,000	2,900,000

COAL Sales in Nova Scotia from 1785 to 1878 (Inclusive).

Year.	Sales.	Total.	Year.	Sales.	Total.
1785.....	1,668	14,349	1831.....	37,170	839,981
1786.....	3,000		1832.....	50,396	
1787.....	10,681		1833.....	64,743	
1788.....			1834.....	50,813	
1789.....			1835.....	56,434	
1790.....			1836.....	107,593	
1791.....	2,670	1837.....	118,942		
1792.....	2,143	1838.....	106,730		
1793.....	1,926	1839.....	145,962		
1794.....	4,405	1840.....	101,198		
1795.....	5,320	51,048	1841.....	148,294	
1796.....	5,249		1842.....	129,708	
1797.....	6,039		1843.....	105,161	
1798.....	5,948		1844.....	108,482	
1799.....	8,947		1845.....	150,674	
1800.....	8,401		1846.....	147,506	
1801.....	5,775		1847.....	201,670	
1802.....	7,769		1848.....	187,643	
1803.....	6,601		1849.....	174,592	
1804.....	5,976		1850.....	180,034	
1805.....	10,130	70,452	1851.....	153,499	
1806.....	4,938		1852.....	189,076	
1807.....	5,119		1853.....	217,426	
1808.....	6,616		1854.....	234,312	
1809.....	5,919		1855.....	238,215	
1810.....	8,609		1856.....	253,492	
1811.....	8,516		1857.....	294,198	
1812.....	9,570		1858.....	225,725	
1813.....	9,744		1859.....	270,293	
1814.....	9,866		1860.....	322,593	
1815.....	9,336	91,527	1861.....	326,429	
1816.....	8,619		1862.....	395,637	
1817.....	9,284		1863.....	429,351	
1818.....	7,920		1864.....	576,935	
1819.....	8,692		1865.....	635,586	
1820.....	9,980		1866.....	554,520	
1821.....	11,388		1867.....	471,185	
1822.....	7,512		1868.....	453,624	
1823.....	27,000		1869.....	513,795	
1824.....			1870.....	568,277	
1825.....		1871.....	596,418		
1826.....	12,600	1872.....	785,914		
1827.....	12,149	1873.....	881,106		
1828.....	20,967	1874.....	749,127		
1829.....	21,915	1875.....	706,795		
1830.....	27,269	1876.....	634,207		
		1877.....	687,055		
		1878.....	693,511		
		Total..		5,734,143	
		140,820		15,803,268	

NOVA SCOTIA COAL SALES, HOME AND FOREIGN.

Provinces.	1866.	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.
Quebec.....	9,600	12,206	9,191	4,419	49,752	44,759	94,519	187,059	162,269	189,754	117,303	95,118	83,710
New Brunswick.....	21,452	.....	.....	68,217	78,841	85,968	101,890	104,818	115,245
Newfoundland.....	40,689	.....	.....	55,861	55,696	62,348	51,742	49,342	31,361
Prince Edward Island.....	26,840	41,948	43,641	46,908	45,169	43,412
Nova Scotia.....	215,395	214,965	212,650	225,658	255,790	279,172
United States.....	404,252	338,492	198,920	376,135	209,448	252,170	154,092	264,760	138,335	89,746	71,634	118,216	88,495
West Indies.....	820	.....	1,170	1,380	.....	54,213	47,844	16,429	17,971	13,660	16,960
East Indies.....	1,003	.....	.....	.....
South America.....	147	186	120	60	.....	1,865	5,077	4,779	.....	573	526
French West Indies.....	2,305	1,651	.....	.....	.....	.....	.....	.....	.....
Spanish West Indies.....	4,311	2,407	10,211	2,379	.....	.....	.....	.....	.....	.....	.....
Spain.....	69	190	.....	.....	.....	.....	.....	.....	.....
St. Pierre et Miquelon.....	2,589	2,350	2,689	3,302	.....	.....	.....	.....	.....	.....	.....
Great Britain.....	666	200	170	270	.....	6,976	4,152	.....	1,101	4,379	3,594

EXPORTS of Coal into the United States from Nova Scotia.

Year.	Tons.	Duty.	Year.	Tons.	Duty.
1850.....	98,173	24 ad val.	1865.....	465,194	Reciprocity.
1851.....	116,274	do	1866.....	404,252	\$1 25
1852.....	87,542	do	1867.....	338,482	1 25
1853.....	120,764	do	1868.....	228,132	1 25
1854.....	139,125	Reciprocity.	1869.....	257,485	1 25
1855.....	103,222	do	1870.....	188,180	1 25
1856.....	126,152	do	1871.....	165,431	1 25
1857.....	123,335	do	1872.....	151,092	0 75
1858.....	186,743	do	1873.....	264,760	0 75
1859.....	122,720	do	1874.....	138,335	0 75
1860.....	149,289	do	1875.....	89,748	0 75
1861.....	204,457	do	1876.....	71,634	0 75
1862.....	192,612	do	1877.....	118,216	0 75
1863.....	282,774	do	1878.....	88,495	0 75
1864.....	347,594	do			

IMPORTS of Coal into Canada from the United States (from Canadian Blue Books.)

Year.	No. of Tons.	Year.	No. of Tons.	Remarks.
1860.....	79,886	1873.....	463,858	
1861.....	171,561	1874.....	671,023	
1862.....	105,905	1875.....	512,835	
1863.....	103,547	1876.....	625,203	
1864 (six months).....	22,100	1877.....	415,869	Anthracite.
1865.....	132,200		353,795	Bituminous.
1866.....	110,755			
1867.....	182,669		769,664	
1868.....	183,391			
1869.....	204,268	1878.....	404,389	Anthracite.
1870.....	222,614		342,127	Bituminous.
1871.....	165,350			
1872.....	311,091		746,516	

1878, Bituminous		164,186	417,337	769,664	3,082,149			
Totals								
<i>Ontario.</i>								
1878, Anthracite				266,432	1,026,816			
do Bituminous				327,264	1,152,441		2,179,267	
Totals								
<i>Quebec.</i>								
1878, Anthracite		2,532	7,303	104,384	333,636			
do Bituminous		121,550	315,297	7,783	31,120			
do Other coal		17,728	39,168	1,627	6,776		732,393	884,798
Totals								3,054,846
<i>Other Provinces.</i>								
1878, Anthracite		3,074	7,765	32,673	107,871			
do Bituminous		6,949	17,728	5,433	21,979			
do Other coal								
Totals, 1878.		151,833	387,254	746,516	2,680,839			

IRON Production of the Globe, 1866 to 1877.

Countries.	Production.				Per-centage of Increase.
	Year.	Tons.	Year.	Tons.	
Great Britain	1866	4,596,279	1876	6,660,893	44.92
Germany	1866	1,000,492	1876	1,614,687	61.38
France	1866	1,260,348	1877	1,453,112	15.30
Belgium	1866	482,404	1876	490,508	1.68
Russia	1866	314,850	1875	426,896	35.59
Austro-Hungary	1866	284,638	1876	400,426	40.68
Sweden	1866	230,670	1876	351,719	52.48
Luxemburg	1866	46,460	1876	231,658	398.62
Spain	1866	39,254	1873	42,825	8.92
Italy	1866	22,200	1875	20,278	.....
Other Countries of Europe .....	.....	.....	1876	60,000	.....
United States	1866	1,225,031	1877	2,351,618	91.96
Other Countries of America .....	.....	.....	.....	115,000	.....
Asia .....	.....	.....	.....	60,000	.....
Africa .....	.....	.....	.....	30,000	.....
Australia .....	.....	.....	.....	15,000	.....
Canada .....	.....	.....	1877	11,000	.....
Total .....	.....	14,324,619	.....	14,335,619	.....

COAL Production of the Globe, 1866 to 1877.

	Per-centage of Increase.	Countries.	Production.				Per-centage of Increase	Per-centage of Decrease
			Year.	Tons.	Year.	Tons.		
893	44-92	Great Britain	1866	103,069,804	1876	135,611,788	31-57	.....
687	61-38	Germany	1866	28,162,805	1877	48,296,367	71-48	.....
112	15-90	France.....	1866	12,234,455	1877	16,889,201	38-04	.....
508	1-68	Belgium	1866	12,774,662	1876	14,329,578	12-17	.....
896	35-59	Austro-Hungary	1866	4,893,933	1876	13,362,586	175-08	.....
426	40-68	Russia	1866	271,533	1875	1,709,269	529-49	.....
713	52-48	Spain	1866	432,664	1876	706,814	63-36	.....
658	398-62	Italy	1866	70,000	1875	102,140	45-91	.....
325	8-92	Sweden.....	1866	36,467	1876	92,352	153-25	.....
278		Other Countries of Europe.....				80,000		.....
000		United States	1866	21,856,844	1877	50,000,000	133-08	.....
618	91-96	Canada	1866	558,519	1876	709,646	27-06	.....
000		Other Countries of America....				400,000		.....
000		Asia.....				4,120,000		.....
000		Africa.....				100,000		.....
000		Australia.....	1866	774,000	1876	1,380,000	78-29	.....
000		Canada (N.S. and B.C.)	1873	1,150,467	1877	927,426		19-38
319		Total		186,286,153		287,090,604		.....

TABLE showing value and properties of Canadian, English and American Coal.

	Weight per cubic foot, by experiment.	Cubic feet of space required to stow a ton.	Volatile combustible matter in 100 parts.	Fixed Carbon in 100 parts.	Earthy matter in 100 parts.	Pounds of Steam to 1 of Coal from 212°.	Total waste in the state of Ashes and Clinker, from 100 of Coal.	Weight of Clinker alone, from 100 of Coal.	Av. weight in lbs. of unburnt Coke, left on grate after each experiment.	Steam from 212° from 1 of combustible matter.
Pictou Nova Scotia.....	49.25	45.48	25.97	60.74	12.51	8.48	12.06	6.19	3.7	9.648
Sydney do	47.44	47.22	23.81	67.57	5.49	7.99	6.01	2.24	5.9	8.497
Liverpool (English).....	47.88	46.78	39.96	54.90	4.62	7.48	5.04	1.86	11.1	8.255
Newcastle do	50.82	44.08	35.83	57.00	5.40	8.66	5.68	3.14	10.7	9.178
Pittsburg, United States ...	46.81	47.85	36.76	54.93	7.07	8.20	8.25	0.94	9.9	8.942
Creek Company do ...	48.50	48.17	32.47	60.30	8.57	8.42	8.64	4.41	10.5	9.211

STATEMENT showing Cost of different Grades of Soft Coal coming into Toronto Market from 1874 to 1878, inclusive.

		1874.	1875.	1876.	1877.	1878.
Grades of Coal.		Per ton.	Per ton.	Per ton.	Per ton.	Per ton.
		\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Churchill	Cost at Lake ports, including handling and commission	4 40	3 75	3 50	3 30	3 25
	Lowest freight to Toronto	1 20	1 00	0 90	0 90	0 85
Brier Hill	Cost at Cleveland	4 20	3 50	3 25	3 10	2 90
	Freight to Toronto	1 20	1 00	0 90	0 90	0 85
Youghiogeny	Cost at Lake ports	4 50	4 25	4 00	3 50	3 30
	Freight from Lakeport to Toronto	1 20	1 00	0 90	0 90	0 85
Straitsville	Cost at Cleveland	3 00	3 00	2 80	2 60	2 40
	Freight to Toronto	1 20	1 00	0 90	0 90	0 85
Massilon	Cost at Lake ports . . . . .	.....	.....	2 80	2 65	2 45
	Freight to Toronto	1 20	1 00	0 90	0 90	0 85

American Coal.

unburnt Coke, left on grate after each experiment.

Steam from 2 1/2" from 1 of combustible matter.

3.7 9.648

5.9 8.497

11.1 8.255

10.7 9.178

9.9 8.942

10.5 9.211

PRICES OF AMERICAN BITUMINOUS COAL.

AVERAGE Price in Dollars of Cumberland Coal, F. O. B. at Baltimore, from 1853 to 1878, with Average Freight to Boston—Per ton of 2,240 lbs.

Years.	January.		February.		March.		April.		May.		June.		July.		August.		Septemb'r.		October.		Novemb'r.		December.		Average for year.		Average freight to Boston.		Average cost divid'd at Boston			
	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	cts.	\$	cts.		
1853.....									3	15			3	15	3	15			3	15	3	62	3	50			2	80				
1854.....	3	50												4	00	4	25			4	25	4	25	3	50			2	25			
1855.....	4	25	4	25	4	25	4	00	3	75	3	75	3	75	3	75	3	75	3	75	3	75	3	75	3	80	2	17	6	06		
1856.....					3	75	3	75	3	75	3	75	3	75	3	75	3	75	3	75	3	75	3	75	3	75	3	75	2	37	6	12
1857.....	4	35	4	35	4	35	4	50	4	28	4	24	4	23	4	15	4	23	4	25	4	25	4	25	4	28	1	84	6	12		
1858.....					3	80	3	75	3	50	3	73	3	62	3	75	3	62	3	75	3	75	3	75	3	70	1	73	5	43		
1859.....	4	12	3	75	3	37	3	18	4	07	3	65	3	45	3	93	3	42	3	55	3	55	3	55	3	63	1	83	5	46		
1860.....			3	50	3	75	3	45	3	37	3	50							3	50	3	25	3	50	3	47	2	55	6	02		
1861.....	3	00	3	66	3	42	3	50	3	50	3	50	3	50											3	44	2	25	5	69		
1862.....							4	00	4	00	4	25	4	11	4	33	4	25							4	16	2	41	6	58		
1863.....	5	50	6	00	6	00	5	68	5	50	5	50	5	50	5	50	5	50	5	25	5	50	5	50	5	57	3	28	8	85		
1864.....	5	75	5	75	5	83	6	00	6	14	6	21			7	41			8	36	8	36	8	63	6	84	3	39	10	23		
1865.....	8	56			10	25	9	01	8	00	6	50	6	75	7	00	7	00	6	75	6	75	6	75	7	57	7	57	9	36		
1866.....	6	35	7	00	6	00	6	00	6	00	6	00	5	75	5	66	5	61	5	66	5	62	5	66	5	94	3	53	9	47		
1867.....					5	25	5	13	5	08	4	88	4	92	4	88	4	92	4	88	4	88	4	88	4	97	4	97	2	68	7	65
1868.....	5	00	5	00	4	87	4	75	4	70	4	70	4	68	4	67	4	70	4	75	4	83	4	83	4	79	3	21	8	00		
1869.....	5	00	5	00	5	00	4	96	4	96	4	96	4	96	4	96	4	96	5	00	5	00	4	96	4	97	2	83	7	80		
1870.....	4	72	4	72	4	72	4	72	4	72	4	72	4	72	4	72	4	72	4	72	4	72	4	72	4	72	2	64	7	36		
1871.....	4	72	4	72	4	72	4	72	4	72	4	72	4	72	4	72	4	72	4	72	4	72	4	72	4	72	2	73	7	45		
1872.....	4	70	4	65	4	62	4	64	4	64	4	64	4	64	4	64	4	64	4	61	4	75	4	75	4	66	3	06	7	72		
1873.....	4	75	4	75	4	83	4	93	4	93	4	85	4	85	4	85	4	88	4	88					4	85	3	05	7	90		
1874.....	4	65	4	65	4	65	4	65	4	65	4	65	4	65	4	65	4	65	4	65	4	65	4	65	4	63	2	28	6	91		
1875.....	4	65	4	70	4	35	4	40	4	40	4	30	4	30	4	30	4	40	4	40	4	40	4	40	4	42	2	11	6	53		
1876.....	4	25	4	20	4	00	3	90	3	90	3	85	3	85	3	75	3	90	3	85	3	90	3	80	3	93	1	83	5	76		
1877.....	3	72	3	80	3	78	3	33	3	20	3	20	3	20	3	20	3	16	3	17	3	17	3	17	3	34	1	70	5	04		
1878.....	3	17	3	17	3	17	3	17	3	06															3	15	1	50	4	65		

Estimated area of the coal deposits of the different countries of the world:—

	Square Miles.
United States.....	192,000
Canada.....	60,000
Russia.....	30,000
Australia.....	24,000
Great Britain.....	11,900
Japan.....	5,000
Spain.....	3,501
France.....	2,086
India.....	2,004
Germany.....	1,770
Belgium.....	510

THE COST OF PRODUCING COAL.

A comparison of the expenses in the working of collieries will show how favourably the cost of mining in Canada compares with that of other countries.

Cost of Mining in England.

The following gives the actual cost in detail as it was early in 1878:—

	Durham.	Northumberland.
	Cts.	Cts.
Heaving	36	52
Other underground labor.....	30	30
Outside labor.....	17½	17
Royalty.....	11½	12
Materials, horses, machinery.....	24	23
Taxes and office charges.....	04	05
	—————	—————
	\$1 23	\$1 40

Cost of American Coal.

These figures show the out-put of the Blossburg Bituminous Coal Mines, Pa., in 1877, the pay-roll for the year, and its cost per ton:—Coal raised, 182,107 tons; pay-roll of the mines for the year, \$186,900; cost of coal, \$1.02.

The average cost of production for the 26 Bituminous Collieries in the County of Allegheny, in 1877, by the pay-roll of the mines, was 99 cents per ton.

Cost of Nova Scotia Coal.

The following is the out-put of the Glace Bay Mines, C.B., Nova Scotia, in 1877, and the cost of the production by the pay-roll:—Coal raised, 35,000 tons ; pay-roll for the year, \$33,600 ; cost per ton, 95 cents.

Cost of America Anthracite.

The following figures gives the out-put for a series of years, and shows the effect of large production in the cost, tonnage, expenses, and average cost per ton for coal at collieries worked by the Philadelphia and Reading Coal and Iron Company :

Years.	Tons.	Expenses.	Cost per Ton.
1873.....	1,348,838	\$3,385,149 68	\$2 51
1874.....	1,374,790	3,364,908 37	2 44·8
1875.....	1,510,572	2,821,609 51	1 86·7
1876.....	1,835,364	2,509,483 34	1 35·4
1877.....	3,794,528	3,942,591 71	1 09·9

To show more fully how largely production governs the cost of mining. The out-put of the above mines in April, 1875, was 5,790 tons ; the cost per ton for that month, \$12.53.

In November of the same year the out-put was 228,895 tons, and cost per ton only \$1.60.

In February, 1877, the out-put was 133,114 tons, and the cost per ton \$1.72.

In November of the same year the production came up to 279,247 tons, and the cost declined to 85 cents per ton.

These estimates do not include interest on capital invested or the royalty (except of the English mines), nor the depreciation of the plant.

Henry S. Poole, F.G.S., Inspector of Mines in Nova Scotia, in his annual report of 1878 (page 12) on the cost of production, remarks:—

In Cape Breton to-day the economies, perforce in many cases practised bear hardly on the coal miner ; but what is most felt is the want of steady work. While actually at work, the cost of all labor and material per ton is as low as 63 cents in one case, and not much more in some others. Was the demand only constant and uniform, coal could be mined in Cape Breton and a good profit made at present prices ; the irregularity of the trade and idle winters for the present debarring, in most cases, any such happy result.

COST OF PRODUCTION OF IRON IN U. S.

AVERAGE Cost per Ton of Pig Iron on Furnace Bank, and of Merchant Bar in Mill, from 1875 to 1879, inclusive, compiled from original data by Mr. W. E. S. Baker, Secretary of the Eastern Ironmasters' Association.

AVERAGE COST OF PIG IRON, 1875 TO 1879.

	1875.	1876.	1877.	January, 1879.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Cost of Ore to the ton of Pig Iron.....	11 95	9 54	7 69	6 51
do Coal do	8 01	6 79	4 93	5 29
do Limestone do	1 14	1 01	0 81	0 78
do Labour do	2 97	2 54	2 02	1 86
do General contingencies	2 10	1 73	1 65	1 29
Cost at Furnace Bank.....	26 17	21 61	17 10	15 73
Add interest on capital on a product of 6,000 tons.	1 70	1 59	1 26	1 15
Total cost to the producer.....	27 87	23 20	18 36	16 88

AVERAGE COST OF BAR IRON, 1875 TO 1879.

	1875.	1876.	1877.	January, 1879.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Cost of Pig Iron to the ton of Finished Bar Iron...	29 12	25 19	21 93	20 13
do Coal do do	8 73	6 85	5 89	6 01
do Labour do do	16 87	15 74	12 93	11 98
General contingencies.....	4 79	4 73	4 62	4 41
Cost in the Mill, finished	59 51	52 51	45 37	42 53
Add interest on capital on a product of 6,000 tons.	1 86	1 70	1 35	1 30
Total cost to the Manufacturer.....	61 37	54 21	46 72	43 83

	Tons.	Cwt.	Qrs.	Lbs.
Quantity of Ore used to make one ton of Pig Iron, average 10 years	2	15	1	17
do Coal do do	1	14	3	27
do Limestone do do .....	.....	16	1	66

The above group of furnaces used Juniata and Montour hematite ores, and a little Cornw The coal came chiefly from the Lehigh and Wyoming Valleys.

AVERAGE COST OF BAR IRON, 1875 TO 1879—*Concluded.*

	Tons.	Cwt.	Qrs.	Lbs.
Quantity of Pig Iron used to make one ton of Finished Bar Iron, average 10 years	1	04	1	13
Quantity of Coal used to make one ton of Finished Bar Iron, average 10 years	1	12	2	03

The above rolling-mills used Gray Forge pig iron and Clearfield and Cumberland coal.

COAL PRODUCTION OF GREAT BRITAIN.

Coal.—The production of mineral coal in Great Britain from 1854 to 1877 is given as follows by Mr. Robert Hunt, Keeper of Mining Records, Inspectors of Mines:—

Year.	Gross Tons.	Year.	Gross Tons.	Year.	Gross Tons.	Year.	Gross Tons.
1854.....	64,661,401	1860.....	80,042,698	1866.....	101,630,544	1872.....	123,497,316
1855.....	61,453,079	1861.....	83,635,214	1867.....	104,500,480	1873.....	127,016,747
1856.....	68,645,450	1862.....	81,638,838	1868.....	103,141,157	1874.....	125,043,257
1857.....	65,394,707	1863.....	86,292,215	1869.....	107,427,557	1875.....	131,867,105
1858.....	65,008,649	1864.....	92,787,873	1870.....	110,431,192	1876.....	135,611,788
1859.....	71,979,765	1865.....	96,150,587	1871.....	117,352,028	1877.....	136,000,000

COAL EXPORTS OF GREAT BRITAIN.

The following table will show the export coal trade of the United Kingdom, and the countries to which exported, omitting those taking less than 50,000 tons.

Countries to which Exported.	Tons. 1877	Countries to which Exported.	Tons. 1877.
Northern ports of Russia.....	943,584	Algeria.....	60,720
Southern ports of Russia.....	85,319	West Coast of Africa.....	88,636
Sweden	775,284	British South Africa.....	55,916
Norway.....	438,875	Continental India.....	577,337
Denmark.....	765,608	Straits Settlements	222,509
Germany.....	2,042,911	Ceylon.....	96,117
Holland.....	411,555	Java.....	111,533
Belgium	259,257	China.....	119,254
Channel Islands.....	66,552	British North America.....	179,076
France.....	3,010,143	United States—Atlantic Coast..	63,136
Portugal, Azores and Madeira .	260,293	do Pacific Coast....	75,378
Spain and Canaries.....	826,471	British West Indies.....	173,992
Gibraltar.....	180,522	Foreign West Indies.....	286,580
Italy	1,072,928	Peru.....	84,093
Austrian Territories.....	82,943	Chili.....	160,460
Malta.....	278,211	Brazil	340,225
Greece.....	80,578	Uruguay.....	141,404
Turkey.....	217,991	Argentine Republic	59,175
Egypt.....	520,476		

COAL EXPORTS OF UNITED STATES.

The following shows the export trade of the United States with the West Indies and South America for 1877:—

Countries.	Tons Bituminous.	Tons Anthracite.
Brazil.....	115	466
Central American States	59	61
Chili.....	1,940	1,021
Danish West Indies	7,779	.....
French West Indies.....	3,424	175
British West Indies	1,693	2,093
Dutch West Indies.....	.....	202
Peru.....	.....	2,138
San Domingo.....	297	484
Cuba.....	55,168	17,342
Porto Rico .....	.....	347
U. S. of Columbia.....	19,967	3,320
Venezuela.....	1,543	216

PRICE COAL AT TORONTO.

Names and prices of the principal coals at present used in Toronto, coming from the United States:—

		Per ton 2,240 lbs.
Brookfield	\$4 27 per ton of 2,000 lbs.	\$4 78
Churchill	4 27 do	4 78
Best Briar Hill	4 27 do	4 78
Union Briar Hill.....	3 97 do	4 45
Massilon.....	3 47 do	3 89
Straitsville.....	3 47 do	3 89
Monday Creek.....	3 47 do	3 89
Youghoigheny.....	4 00 do	4 48
Reynoldsville... ..	3 90 do	4 37

PRICE COAL, MONTREAL,

proposed for this pamphlet by W. J. Patterson, Esq., Secretary Board Trade, Montreal.

AVERAGE Prices of Coal delivered at Montreal since 1873:—

	1873.	1874.	1875.	1876.	1877.	1878.	
Nova Scotia.....	5 19	5 06	4 78	4 37	3 23	3 43	per ton, 2,240lbs.
Scotch Steam, including a small proportion of English.....	6 36	5 60	5 01	4 18	3 78	3 57	do

The International Coal Company (Cape Breton), tendered to supply a railway company 40,000 tons coal, to be delivered at Montreal during the summer (1879), at \$3.15 per ton. This proves that the duty of 50 cents per ton has not increased the cost to consumers.

Extract from letters of Mr. H. A. Budden, Montreal, read before the Dominion Board of Trade, 17th January, 1878.

MONTREAL, 13th December, 1877.

Among the various industries of the Dominion, that of coal mining is destined to take a prominent and exert an influence second to none. Canada will not attain its proper position until its extremities are bound together by a trans-continental railway, and traffic from the Atlantic and Pacific Oceans carried over it, the motive-power, coal, lies in abundance. The Nova Scotia collieries have been worked since 1785, while those of Vancouver Island are only in their infancy. No other fields have yet been opened; the total product of Vancouver Island in 1876 was about 150,000 tons, principal amount going to San Francisco. The quality of coal is very similar to that of Nova Scotia. The collieries are all situated near the sea, and capable of indefinite extension. The Nova Scotia coal fields, stretching out as they do into the Atlantic Ocean, invite the commerce of the world, and furnish coal at a nearer point to the sea board than any coal fields of the United States. On the Island of Cape Breton the coal area is very extensive and the coal of excellent quality, much esteemed for gas making and other purposes. North Sydney is becoming an important port of call for vessels seeking cargo, not only from the St. Lawrence, but from all ports on the Atlantic sea board. The collieries delivering coal in Sydney Harbour can supply an unlimited amount

The Pictou coal field is on the mainland of Nova Scotia, and within a few miles of Pictou Harbour, being also connected with Halifax by rail, one hundred miles distant. Five collieries are in operation fully equipped but languishing for want of demand; the excellent quality of these coals renders their use available for every purpose—they are exceptionally free from sulphur, and make a coke equal to the best North Durham; their hardness and exceptional freedom from foreign substances make them safe for shipment to warm climates. The Maritime Provinces with their fishing, shipping and mineral wealth will afford a growing market to the agriculturalists of Ontario and the west. Quebec will naturally take a foremost position in manufactures, and draw supplies from all. Ontario, besides her agriculture, has her petroleum wells and salt to develop. To enlarge the home market for coal and iron, a moderate tariff is required sufficient to give an impetus to their production and manufacture. This necessity arises from the peculiar position of Canada, her present home market is limited, and the miners and manufacturers of Great Britain and the United States are eager to control it.

The peninsula of western Ontario can have no cause to complain of a moderate tariff on coal and iron; the products, breadstuffs, cattle, butter, cheese and petroleum will find an increasing demand from a growing population in the Maritime Provinces.

An increased production of coal will enable it to be produced at a very much lower cost, and there is no reason why it should not compete with American coal on Lake Ontario, and neutralize the effect of the proposed duty.

An important feature in the improvement of the coal trade would be the establishment of sugar refineries at Halifax, St. John and Montreal and other places not only would the consumption of coal as fuel be considerable, but the export demand for coal as return cargo to the West Indies, and other sugar producing countries, would soon reach a magnitude much to be desired.

INTER-PROVINCIAL COAL TRADE.

Reproduced from No. 20 of the Maritime.

The *Coal Trade Review* refers in a late number to the agitation for a duty on coal entering the Dominion, and to the fact that the question affects twelve millions of dollars capital invested in the mines, and a population of 30,000 directly interested in this industry.

The carriage of 200,000 tons of coal at \$1 per ton would yield a gross income of \$200,000 each open season. Ten iron steam colliers of 1000 tons each, dead weight capacity, would cost in England to-day about £10 per such ton—£100,000 or \$500,000 in all.

It is clear, therefore, that at \$1 per ton a large profit would accrue to a coal transportation company doing this trade.

We have before us the example of the Philadelphia and Reading Company's steam colliers constructed to enable the company to successfully compete with other shippers who had a geographical advantage, such as New York, which is nearer points of heavy consumption ;

Six steamers were built in 1869 and in 1870, the Rattlesnake, Centipede, Achilles, Hercules, Panther and Leopard. The carrying capacity of these vessels ranged from 500 to 1,025 tons.

The first collier completed was the Rattlesnake, and she began operation in June, 1869. She was followed by the Centipede, September, 1869, Achilles, March, 1870, Hercules, May, 1870, Leopard, July, 1870, and Panther in August, 1870.

Many people doubted the wisdom of the collier business, but the officers of the P. & R. R. Co. had faith in the ultimate success of the enterprise.

After an experience covering a period of nearly four years it was found that the six steamers were not only a success, but that they were totally inadequate to carry on the largely-increased business. In 1874 the tonnage increased from 4,800 to 16,000 tons. It was, therefore, decided to increase the fleet, and during the year 1874 the Reading, Harrisburg, Lancaster, Williamsport, Allentown and Pottsville, built by Messrs. Cramp, and the Perkiomen and Berks were added.

The steamers are all built of iron, in the most substantial manner, and with water-tank bottoms. The entire construction is with a view of having the steamers especially adapted to the carrying of coal, as they do not bring any return cargo. The ships are of great strength, so as to enable them to lie aground with a full cargo on board, as they frequently do at the other end of the route.

HOW THE COLLIERS OPERATED.

We have to take Philadelphia as a starting point, and suppose a steamer had been made fast to a pier. The captain finds there a sufficient amount of coal to fill his vessel. The hatches have been opened previous to the vessel coming into the dock. In a very short time the loading commences, and is continued in the quickest way—by shutes in the hold of the vessel. No time is lost in the operations of one of those colliers. They generally leave for their destination at daylight on the day following their arrival here. As soon as the hatches are closed the vessel starts, and the work of cleansing up the decks is performed during the trip down the river. At the place of destination the hour for the arrival of the steamer is known some time before, and where the vessel is moored there is always a small army of men ready to go to work unloading the cargo. No preparations are necessary, as all of the hatches have been opened and other arrangements made before by the crew of the steamer. The unloading is done by means of large buckets, which are filled in the hold and drawn up by machinery at the rate of two or three per minute, and then the coal is dumped into cars and bins, as required. Despatch is the great consideration and one thousand six hundred and fifty tons of coal have been discharged in $11\frac{1}{2}$ working hours. This was at Salem, Mass. At other places the unloading is not done so rapidly. After the discharge of the cargo, water is taken in as ballast, and upon arriving at Port Richmond, Phila., the water is pumped out. The system of running the colliers is very complete. When a steamer reaches its destination the captain telegraphs the hour of his arrival and the hour when he will sail, and by an arrangement of whistle signals, intelligence is obtained at Port Richmond that the vessel is coming up the river, and when she arrives there preparations have already been made for loading her, as has been previously mentioned.

Some of these colliers have at times made trips to almost every port along the coast from Portland to Aspinwall, but the greater portion of the trade is with ports between New York and Portland. The average speed of the steamer is about ten miles per hour.

No time has been lost in the operations of the colliers, and the total number of voyages made in 1877 was 526; miles run, 483,236; coal carried, 602,496 tons. From June, 1860, when the first steamer was run, until the close of 1877, the colliers made 2,107 voyages, ran 2,046,488 miles, and carried 2,099,036 tons of coal.

The expenses of this line for the season, exclusive of insurance, were \$337,900 on the carriage of 602,496 tons of coal an average of 900 miles distance, equal to 56 cents per ton, which would be for the distance from Sydney to Toronto, 1,200 miles 75 cents per ton.

The carriage of coal to Toronto from Cleveland, Ohio, is now 85 cents per net ton. The price of Briar Hill is at Cleveland, f. o. b. \$3.25, add freight, 80c., \$4.05, equal to \$4.56 per gross ton at Toronto; the price of Sydney is \$2.00 f. o. b., plus freight by Steam Collier, \$1.00, would be at Toronto \$3.00 per gross ton.

With these facts before us can we refuse to accept as a certainty the inference that, fostered by a protective tariff, our mines would in a very short time be able to organize a system of transport delivery of coal in Ontario for prices far below what any foreign company has done or will do?

Extract from the Report of Canal Commissioners Report, 1871.

When Nova Scotia coal of the best description can be supplied abundantly and cheaply to Western Ports, a great impulse will necessarily be given to the transfer of the trade of the St. Lawrence and Lakes to screw steamers, a transfer already taking place, as we have previously shown. A wrong impression prevails in many quarters with respect to the value of Nova Scotia coal, for steam purposes; many think it very inferior to the American article in this particular. The true state of the case, however, is that whenever it has had a fair trial, it answers steam purposes most admirably. The last annual report of the Boston and Yarmouth (N. S.) Steam Navigation Company gives us some important facts bearing upon this subject. In 1868, they had to change the coal used in their boats, in consequence of the strike among the miners of Pennsylvania. Cow Bay, Cape Breton, coal was then burned during the latter part of the season. Fourteen trips were made in which hard coal was used, and eighteen with soft or bituminous. A saving of \$1,000 was the result of the eighteen trips. The same steamer has, on the average, consumed forty tons of anthracite per round trip, which, at a cost of \$5.50 per ton, made \$220. The round trip requires forty-three tons of Cow Bay coal, which at \$3.60 per ton is \$154.80, showing a saving of \$66.20 per trip, or upwards of \$2,000 for the season. With a through trade between Toronto and Pictou, there is every reason to believe that coal suitable for propellers can be supplied at depots on the lake and river for

very little over \$4 a ton. With the canals enlarged coal freights would be reduced to the minimum point—a lake propeller would always be able to back from the lower ports a cargo of coal, rather than come empty—just as the English timber ships have been accustomed to bring the same article instead of empty last.

EXTRACTS FROM THE REPORT OF THE SELECT COMMITTEE OF THE HOUSE OF COMMONS IN 1877 ON COAL AND INTER-PROVINCIAL TRADE.

WEDNESDAY, April 4th, 1877.

Mr. NAPIER ROBINSON, manager of the Toronto Coal Mining Company, located at Sydney, C.B., examined.

Q. How does the coal compare with the coal from the United States?—It is a better coal in a good many respects than any Ohio coal I have ever seen. The only coal that I would at all compare with it is the Briar Hill, and in point of heating quality and durability our coal is superior to the Briar Hill.

Q. What is your opinion regarding the imposition of a duty on coal imported?—I think it would lead to a very largely extended market.

Q. In what direction?—Both west and in Montreal, Quebec and New Brunswick.

Q. Do you consider the duty would raise or materially affect the price of coal in Ontario?—On the higher grades I don't think it would affect the price at all. I am sure it would not.

Q. What do you mean by the higher grades?—The higher qualities of bituminous gas coal, and the best domestic coal such as the Briar Hill and Massilon.

By Dr. Tupper:—

Q. Do our coals compare favourably with those of Cleveland for domestic purposes?—Yes. Our coal for domestic purposes is superior to any other coal I have ever seen, and as a steam coal equal to any of them.

By the Chairman:—

Q. You were speaking about the down freights and return cargoes. Do you contemplate or expect that in case of a trade being established with Ontario it would be necessary to consume everything that came down, or is there a port of transshipment?—Decidedly we should tranship.

Q. Of what nature would your transshipment be, and to where would they be sent?—There is in the first place a very large port demand; that is, ships calling in at the port of Sydney and taking away an immense quantity of flour, provisions and other articles; and then I think Sydney could be made a port of transshipment for oil and lumber, and to a certain extent, grain for European markets.

Q. Is Sydney much frequented by vessels?—Yes, it is one of the largest ports of call on the Continent. I have frequently seen 20 to 30 vessels arrive there in one day, and 200 and 300 in port at one time.

Q. Why do they come to Sydney?—They come seeking freights.

Q. On account of its situation?—Yes; principally on that account.

WEDNESDAY, 11th April, 1877.

Committee met.

J. M. VERNON, Merchant, called, and made the following statement:—

If a regular trade be carried on between our Maritime Provinces and Ontario, the 50,000 tons of cereals, which now go *via* New York and Boston, would be moved by rail or steamer, and coal could be carried back as return freight, delivered in Toronto at \$4.50 long ton. Coal fresh from the mine and delivered by rail is worth 50 cents per ton more than coal that undergoes the dumping process and exposed to the weather in the yards.

The development of our coal fields are of the utmost importance to the country at large, and Ontario is as much interested in this matter as any other Province of the Dominion. But there is no reasonable hope to be indulged in until our iron interests are developed. The iron ores of Canada comprise hematite, limonite, magnetite, &c., &c., equal to any in the world for purity and richness. The magnetic oxide deposits on the Moisie have no superior in the world.

It may be estimated that 4,000,000 of tons of coal would be consumed annually in the Dominion; and under a fair development of home industry, about 300,000 tons of pig iron would be demanded annually. To make this would require the labour of 13,000 men, and the mining of the coal 20,000 men. Thus it is seen that by encouraging these two branches of industry, the labour of 33,000 men are required annually, and which would represent a population of 120,000.

The transportation of this coal and iron alone would double the tonnage of our ports and treble the traffic on our railways, and place us in a position to command the trade of the West and our great North-West which seek other channels to tide-water.

Let the Government extend its fostering care over our national industries, and there is no difficulty in the way of supplying Ontario with Nova Scotia coal for her manufactories and domestic consumption as cheaply, if not cheaper, than she now obtains it from the United States, and much cheaper than the New England States pay for their supply from Virginia and Pennsylvania. New England pays from \$6 to \$8 per short ton for the coal, and yet she submits gracefully to a 75c. per ton duty because her other industries are amply protected against foreign competition.

Let the Government place us on an equal footing with the United States, by charging them 75 cents duty per short ton, and we will give Ontario as cheap coal as she now receives, and we will be enabled thereby to command our own market, and the \$3,320,000 spent annually for coal from other countries will remain at home.

The average cost for five years of the coal imported into Ontario was \$4.50 the short ton, or \$5 the long ton. Then an arrangement in progress by which Toronto will receive coal at \$4.50 the long ton, or about \$1 the short ton.

When this coal trade to the West is fully established it will enable railways to carry the products of our Western Provinces to market lower than was ever contemplated by any railway man.

As an illustration of the close relations of the coal trade to the general industry of the country, especially the iron trade, the following calculations may be interesting:—

The Canadian Pacific Railway, from Thunder Bay to the terminus on the Pacific, may be estimated at 2,000 miles. It will require 300,000 tons of pig-iron to make rails, fastenings and bridges, and about 80,000 tons for rolling stock, &c.

To produce this quantity of pig iron will require about 800,000 tons of ore, and 1,200,000 tons of coal. To move this ore and coal, &c., for the purpose of manufacture, will take about 120,000 tons of coal.

The total consumption of coal in making rails, fastenings, iron for bridges, and rolling-stock and for transportation of the same to points of use, &c., cannot fall short of 1,500,000 tons. This quantity could absorb the output of two ordinary mines for ten years, and increase the coal trade of Nova Scotia 150,000 tons for ten years.

It would take two rolling mills ten years to produce the rails and iron; and the labor required for mining, manufacturing iron, rails, bridges and rolling-stock, and transportation to and fro of all the various articles specified, will be over 3,000 men, representing a population of 15,000 people who would be directly fed and clothed for ten years, by simply developing these sources of wealth as indicated.

MONDAY, 16th April, 1877.

Committee met.—Mr. MacKAY in the Chair.

Mr. FRANCIS CLEMOW, Coal Merchant and Director of the Ottawa Gas Company, called and examined :

By Mr. Dymond :—

Has been a Director of the Gas Company for ten years. Trades in both bituminous and anthracite coal. Obtain supplies of bituminous coal from Nova Scotia and the United States. Formerly purchased in Great Britain, but has discontinued since 1873, owing to the advance in price. Buys chiefly from the Caledonia Block House, Intercolonial and International Mines. Uses 3,000 tons of gas coal per annum. That is the highest quality of coal, and cost last year \$5.75 per ton of 2,240 pounds. The cost was made up as follows : Initial cost, \$2; freight to Montreal, \$2; harbour dues, 10 cents per net ton; insurance, 3 cents per ton; freight to Ottawa \$1.60—total, \$5.75. This year was offered coal at the mines above named for \$1.50; freight to Montreal, \$2; harbour dues, &c., 13 cents; freight to Ottawa, \$1.50—total, \$5.15 per gross ton. Has bought the Willow Bank, United States, coal, last year, at \$5 per net ton, and the Youghoigheny at \$5.90; in both cases the charges included delivery on the wharf at Ottawa. At the above rate American coal would come to \$5.62½ for Willow Bank and \$6.64 for Youghoigheny.

By Mr. Tupper :—

Mr. G. H. DOBSON called and examined :

Q. Where do you reside?—In Sydney, Cape Breton.

Q. Were you sent as a delegate to the Dominion Board of Trade?—Yes.

Q. By whom?—By the Cape Breton Board of Trade.

Q. Have you been spending some considerable time in endeavoring to ascertain how far trade can be promoted between the Upper Provinces and Nova Scotia?—Yes; some years.

Q. What is the annual consumption of coal in Canada?—Last year it was 1,415,516 tons, of which 352,414 tons was hard coal, I think. There is a little difference in our imports being made up to the 30th of June and the production by the mines return being made up to the 31st December.

Q. Where is the natural market of the Nova Scotia coal?—Wherever we can get a return cargo from, or get a vessel bound to a loading port. It has been stated

here, by previous witnesses, that the natural market for Nova Scotia coal is the New England States; but so far as I can see, we have no particular natural market. England sends coal all over the world, and wherever there is a demand, and we can get vessels for, is our natural market. I have been engaged in the trade for eight years, and I should say that Montreal and Quebec are as convenient markets for us as the United States.

Q. Would the securing of the Canadian markets benefit the coal owners and trade generally?—Yes.

Q. How?—It would give our coal producers the supplying of the Canadian markets; and would also give the Canadian producers the supplying of the Maritime Provinces. I might state that, last year the Maritime Provinces, inclusive of Newfoundland, imported 463,586 barrels of flour and 9,254,273 pounds of meat from the United States.

Q. In what year was the coal trade most prosperous?—In 1873.

Q. How many tons was produced that year?—1,051,467 tons.

Q. How many men were employed?—5,000 men and boys, representing a population of 30,000.

Q. How many days' work did they do in the aggregate?—955,722 days' work.

Q. How many vessels were there employed in carrying the coal, and what was their tonnage?—3,604 vessels, of which 428 were steamers, representing a gross tonnage of 820,144 tons.

Q. How many seamen did they employ?—About 22,000.

Q. What amount of capital was there in circulation, directly and indirectly caused by the coal production?—The best estimate I can get places the amount at \$4,913,381.

Q. How do you propose to send coal to Ontario?—By securing the markets of the Maritime Provinces for Ontario products, and the Ontario markets for our coal we now import largely from the United States; last year our imports from the United States aggregated \$7,622,712.

Q. Those products, you say, could be largely obtained from Old Canada if an interchange could be made between them and Nova Scotia coal?—Yes, very largely; I find that the coal imports into Canada are estimated at \$3,220,300.

Q. How are the Nova Scotia coal mines situated with regard to supplying the Canadian market?—Very conveniently. We are half-way between the grain-producing centres of the West, and the market of the Old World—halfway between Chicago and Liverpool. The lake vessels might terminate their voyage at Sydney,

and their cargoes be there transhipped into the ocean vessels. I may say that Atlantic freights are less by 30 per cent. from Sydney than from New York, Baltimore and other American ports; and, besides, the port charges at Sydney are \$100, against from \$800 to \$1,000 at Montreal and the American ports.

Q. Does England supply distant markets with coal, as near to them as the American mines are to Ontario?—Yes. For instance, she supplies Cuba, that has American coal quite near, and San Francisco, with British Columbia coal near. Coals are shipped 15,000 miles to India, which are quite near to the China and Australian coal-fields.

By Mr. Goudge:—

Q. On what do you base your statement that the ocean freights from Sydney are 30 per cent. lower than those from the more southerly ports?—On the fact that we have been tendered vessels by shipowners in New Brunswick and Nova Scotia at 30 per cent. less from Sydney than from the other ports.

Q. Why do you get them for 30 per cent. less?—The reason is that we are 800 miles nearer Europe than New York and other American ports, and the port charges are very much less.

Q. Does Newfoundland take flour from the United States?—Yes.

Q. In case a large coal trade existed between Ontario and Nova Scotia, could Ontario supply the Newfoundland market?—Canada could supply the Newfoundland market with flour with return cargoes of coal west from Nova Scotia. Mr. Robinson in his evidence alluded to the vessels going out from England and bringing coal as ballast. I think there are only five ports in England from which vessels take coal. It does not pay the vessels to change ports and bring out coal as ballast, nor can the English coal producer supply coal as ballast where they have to ship it to ports where vessels are lying. I hold that Montreal and Quebec would get more tonnage by taking coal from Sydney, than if they were dependent on English coal as ballast. Sydney is becoming the North American port of call, and vessels bound west seeking freights call there now almost entirely. On arrival they enquire for Montreal, St. John, New York, Baltimore and Philadelphia freight markets, and often Montreal quotes higher than any of the other ports; and could we get coal freights at a low rate to Montreal Montreal would command more ocean tonnage.

Q. That is if you prevented vessels from bringing out coal as ballast?—We could furnish coal as cheaply as the English coal and could give Montreal and Quebec more tonnage.

EFFECT OF THE COAL DUTY.

In 1870 the Parliament of Canada imposed a duty of 50 cents per ton on all imported coal and removed it in 1871, with the following result:—

Imports in 1869,—	389,485,	the year before the duty.
do 1870,—	272,595,	the year of the duty.
do 1871,—	484,826,	the year after the duty.
Cost to the consumer in Montreal, in 1869,	\$5 to \$8	per ton.
do	1870,	\$4.50 do
do	1871,	\$5 to \$10 do
Productions in Nova Scotia, 1869,	511,795.	
do	1870,	568,277.
do	1871,	596,418.

We thus see that while the duty in no way increased the price of coal to the consumer, it yet diminished our imports to the extent of 116,890, and enabled the Nova Scotia collieries to increase their shipments by 56,482.

Table of distances from Sydney to the following ports:—

	Miles.	Depth of Water.
Sydney to Quebec	720	...
do Montreal.....	900	23 feet.
do Toronto.....	1,200	13 do
do Chicago.....	2,161	14 do
do Miramichi.....	300	22 do
do St. John's, Newfoundland.....	400	...
do St. John, N.B.....	540	...
do Halifax, N.S.....	240	...
do Portland, U.S.....	580	..
do Boston, U.S.....	600	..
do New York, U.S.....	750	..

THE IRON INDUSTRY.

Attention has been awakened by the discussion on the Iron and Coal Industries, since the introduction of the new tariff, as to our supply of iron ore and capacity for its manufacture.

Much has been written from time to time on this subject by the geological survey and others, but the information submitted is in so scattered a form as not to be convenient to the general public. It is the object of the second issue of this pamphlet to give a concise report of some of the more important iron deposits of the Dominion, with the number and capacity of our blast furnaces and mills.

The tables annexed show that the importation of iron since 1872, aggregates \$96,387,420.00, which money has been sent out of the country for an article we possess in great abundance, and for the manufacture of which we possess all the necessary facilities at home.

The statistics of the English, American and Belgian iron trade, herewith submitted, show the commercial importance of this industry to the countries developing it.

IRON DEPOSITS OF THE DOMINION.

BRITISH COLUMBIA.

Magnetic Iron Ore.

(*Texada Island, B.C.—Geological Survey.*)

"This important deposit occurs in crystalline rock supposed to be of Carboniferous age. The largest exposure is on the south side of the island, about three miles north-west of Gillies' Bay. Here the ore-bed is seen to be from twenty to twenty-five feet thick, and to rest on grey crystalline limestone, with which, for about two feet down, are interstratified bands of ore, of from half-an-inch to one inch in thickness. From this point to the north-west, for nearly a mile, the bed is occasionally seen, and at one place there is a continuous exposure about 250 feet long and from one to ten feet thick. To the north-east it is also said to have been traced for more than three miles. As regards mining and shipment the ore is most favorably situated, while in the event of smelting operations being carried on, there is an abundance of wood suitable for making charcoal on the island, and Comox Harbour, from which the coal of the Comox area will be shipped, is less than twenty miles distant."

The ore is of an iron-grey colour, and frequently contains little cavities, which hold red or yellow ochre. Sometimes the cavities are lined with octahedral crystals of magnetite. A partial analysis of a specimen collected by Mr. James Richardson,

of the Geological Survey, gives 68.40 per cent. of iron, and only .003 per cent. of phosphorus. The deposit is in part owned by Messrs. Nelson & Moody, of Burrard Inlet.—*Carboniferous?*

(*An Island in Queen Charlotte Sound, B.C.,—Captain Lewis, Victoria.*)

The island is not named on any of the charts, but it occurs near the Walker group, in Schooner Passage. The ore is a finely-granular magnetite, exceptionally rich in iron, the specimens examined yielding as high as 71.57 per cent.

ONTARIO.

In the Lakes Superior and Huron regions are many deposits of valuable iron ore, both magnetic and hematite; for instance, lot No. 10, Z, Township of McGregor, in localities to the south of Nequaquon and Gun-flint Lakes, in the north-west corner of Neebing, containing 37.73 iron; near the mouth of the Little Pic River is found a deposit, 90 feet thick, containing 36 to 46 per cent. of iron; also, deposits of ore at the west end of Little Long Lake; Gros Cap, mouth of the Michipicoton River; Mammoth and Vulcan Iron Mountains, near Batchawana Bay, containing 50 per cent. of iron, and at Agawa River, these are magnetites; the Silver Lake mining location, about four and a-half miles north-east of Thunder Bay, beds about 45 feet thick, contains 68 per cent. of iron; lots 67 B and 68 B, Loon Lake, Thunder Bay; the Dickson location, Desert Lake, Bruce Mines; location Y, VIII., Desert Lake, all showing good deposits of hematite ore.

GALWAY.

In lots 27, in 13th and 14th; 23, in 14th, and 22 and 24, in the 12th ranges of the Township of Galway. Prof. Chapman found magnetic ore rich in iron, and free from titanium.

THE SNOWDON IRON LOCATION.

Situated on lot No. 20, range 1, of Snowdon; 15 miles from Cobocok, the terminus of the Nipissing Railway—a branch is now under construction; the aggregate thickness of the mine is about 50 to 60 feet, in beds of six or seven feet. Messrs. Shortis & Co., of Port Hope, are the owners. Dr. Chapman gives an analysis as follows: sesqui oxide of iron, 58.35; protoxide of iron, 24.87; metallic iron, 60.18; alumina, 0.42; titanio acid, 0.73; oxide of manganese, 0.13; (magnesia, lime, silica), rock matter, 15.16; phosphoric acid, 0.17; sulphur, 0.04.

THE BAIRTON ORE BED.

Owned by the Collingwood, Peterborough and Marmora Railway & Mining Co., is an important deposit of magnetite, containing an admixture of hematite, has been

worked for many years. From 1839 to 1875, 142,000 tons of ore have been produced and shipped to the United States. A blast furnace, for the reduction of this ore, was erected in the Township of Marmora. Dr. Hunt gave an analysis as follows: mag. oxide of iron, 72.80=52.72, iron; magnesia, 6.46; lime, 0.35; carbonate of lime, 2.40; carbonate of magnesia, 0.84; phosphorus, 0.035; sulphur, 0.027; water, 3.50; insoluble, 14.73; capacity of furnace, about four tons.

THE SEYMOUR ORE BED.

Situated on lot 11, in range 5, of Madoc; the bed is from 25 to 30 feet thick. In 1837 a furnace was erected in Madoc Village to smelt this ore; capacity, about five tons; the product was a very fine iron. The Grand Junction Railway passed near the mine. Dr. Hunt gives the following analysis: per and pro. of iron, 89.22; metallic iron, 64.61; phosphorous, 0.012; sulphur, 0.073; insoluble matter, 10.42.

THE NEILSON MINE.

The west half of 19, in range 2, of Madoc. Containing a bed of about 25 feet.

THE COOKE MINE.

The west half of 16, in range 5, of Madoc; resembles the Seymour Mine.

THE MOORE MINE.

The east half of 17 in range 5 of Madoc is a continuation of the Cooke Mine.

THE FOLEY IRON MINE.

On the 9th and 10th lots, in range 8, of Bathurst, is an irregular deposit of two feet in thickness, has been traced fifty-six miles from Eagle Lake, in Hinchinbrooke, to Fitzroy on the Ottawa River.

THE GLENDOWER OR HOUSE MINE.

Situated on lot 4, in range 1, of Bedford, the thickness of bed is about eighty-five feet., containing 64.03 of iron, about 1,500 tons a month have been raised and shipped to Elmira, N.Y. A. Cleaveling, of Kingston, Superintendent.

MACHAR MINE.

Township of Bedford is a continuation of the Glendower bed; the ore is shipped.

THE SILVER LAKE MINES.

A magnetite of black colour, and bright lustre, worked by Mr. Oliver, of Perth, analysis of ore mag. ox. of iron 88.59 = 64.15 iron, titanitic acid 1.75, residue 5.75.

THE CHAFFEY MINE.

Situated on lots 26 and 27, in range 6, of South Crosby, the bed of ore is about two hundred feet thick; is on an island in the Rideau Canal. The ore is a titaniferous magnetite. Dr. Hunt's analysis gives mag. ox. of iron 69.77 = 50.52 iron; titanio acid, 9.80; magnesia, 4.50; alumina, 5.65; silica, 7.10; water, 2.45; phosphorus, 1.52; sulphur, 0.85; the annual production is 7,500 tons, is shipped to Cleveland.

THE BISHOP MINE.

Situated on lots 2 and 3, range 12, of Fitzroy; the ore is crystalline; mine undeveloped; owned by Andrew Bishop, Bell's Corners.

THE WALLBRIDGE HEMATITE MINE.

Situated on the east half of lot 12, range 5, of Madoc. Iron from the ore was made of superior quality at Three Rivers; the owner is T. C. Wallbridge, Belleville.

THE COWAN MINE.

Situated on the east half of lot 1, in range 4, of Dalhousie; this mine has been worked for several years by Alex. Cowan, of Belleville, and others. The ore is a red hematite, giving 60 per cent. of iron; shipped to Cleveland; from 3,000 to 4,000 tons of ore have been annually shipped.

MAC NAB.

On lot 6, concession C and D, there is a deposit at the surface measuring about thirty feet in thickness, giving 59.09 iron. The mine has not been developed.

QUEBEC.

THE HAYCOCK IRON LOCATION.

Situate about nine miles from the City of Ottawa, and six and a-quarter miles from the navigable water of the Gatineau, a branch of the Ottawa River, and the Quebec, Montreal, Ottawa and Occidental Railway, in the 11th range of Hull and 6th of Templeton, is a mine of specular hematite ore of great purity, owned by the Ottawa Iron and Steel Manufacturing Company. Dr. E. J. Chapman, professor of mineralogy and geology, reports the extent to be enough to last for ages. He gives, in a portion of the property, the width of veins as 70 feet; length, 3,500 feet, and depth of 200 feet; contents over six millions of British tons; the strata dips at an angle of 45° to 50°. His analyses are as follow:—

	Prof. Chapman.			Griswold & Co., per Wendell.	Blodgett, Britten.	Cambria Works	E. Riley, F. C. S.	Harrington.
	1	2	3					
Peroxide or sesquioxide of iron	89.80	88.08	85.45	87.40	55.93	.....	89.04	.....
Protoxide of iron.....	7.06	6.86	5.24	3.93	10.09	.....	7.92	.....
Titanic acid.....	2.34	3.17	2.12	3.41	3.84	.....	.....	.....
Protoxide of manganese	Trace.	0.55	0.41	0.37	.....	.....	.....	.....
Magnesia	0.22	0.13	0.17	0.47	0.08	.....	0.40	.....
Lime.....	Trace.	0.55	0.41	0.66	0.13	.....	0.56	.....
Phosphoric acid.....	Trace.	0.16	0.13	0.25	0.14	.....	0.21	0.34
Sulphur.....	Trace.	0.03	0.07	0.10	0.02	.....	0.04	0.37
Graphite	0.43	0.35	0.28	.....	.....	.....	.....	.....
Insular rock matter	0.11	0.26	5.77	.....	1.09	.....	.....	.....
Oxygen with iron.....	.....	.....	.....	.....	26.85	.....	.....	.....
Alumina .....	.....	.....	.....	1.67	0.49	.....	0.32	.....
Silica.....	.....	.....	.....	2.10	1.34	.....	1.77	.....
Totals.....	99.96	100.14	100.05	100.34	100.00	.....	100.26	.....
Metallic iron.....	68.34	66.98	63.88	64.24	66.02	66.00	68.49	64.45
as=	66.40	.....	.....	.....	.....	.....	.....	.....
Phosphorus.....	.....	.....	.....	0.10	0.06	.....	0.093	.....

There are four most complete Catalan forges erected. The Company propose to erect one or more blast furnaces, a rolling-mill and foundry, and enter into the manufacture of iron bridges, &c.

THE FORSYTH AND BALDWIN MINES.

Are situate about half-a-mile apart on lot 11 in the 7th range of Hull, about six miles from Ottawa; the ore is a mixture of hematite and "red ore," not being a black ore is not essentially a magnetite. A blast furnace, now out of order, is situated on the navigable water of the Gatineau River. The thickness of the ore bed is in some places 60 feet, yielding 60 to 62 per cent. of iron. The analysis of Dr. Hunt gives peroxide of iron 62.20; protoxide, 17.78; oxide of manganese, traces; lime, 1.85; magnesia, 0.18; phosphorus, 0.15; sulphur, 0.28; carbonic acid, 1.17; silica, 11.11; graphite, 0.71. Capacity of furnace, 13 tons.

THE HALL MINE.

Situate on lot 16, range 3, of Buckingham; owned by Edward Haycock. The indications are good for a large amount of ore. The mine is undeveloped.

THE OLIVER MINE.

Situated on lots 14 and 15, in range 4, of South Sherbrooke; owned by Mr. Oliver, of Perth; contains metallic iron, 64.15; titanitic acid, 1.75.

THE TAYLOR MINE.

Situated on lot 22, in range of Bristol. This mine of magnetic ore, owned by Taylor & Burns, of Peterborough, has beds of nine or ten feet thickness, holding a considerable portion of hematite. The analysis of the Geological Department gives peroxide of iron, 65.44, protoxide of iron, 14.50=58.37 iron; bisulphide of iron, 2.74; sulphur, 1.46; protoxide of manganese, 0.11; alumina, 0.60; lime, 3.90; magnesia, 0.45; silica, 11.45; carbonic acid, 1.64; phosphoric acid, traces; titanitic, none; water, 14. Too much pyrites is present in the ore.

THE MOISIE.

This mine of iron-sand is situated on the River Moisie; owned by the estate of The Moisie Iron Co. Mr. Wm. Molson erected Bloomary Furnaces, making a superior class of iron. The same estate own valuable rolling mills and nail factory in Montreal. Dr. Hunt gives the analysis of washed sand, 55.23 per cent. iron; 0.16, titanitic acid; 0.07, sulphur; 0.007, phosphorous; 5.92, insoluble matter.

THE TITANIC IRON CO.

own a mine of titaniferous iron ore on St Urbane, Bay St. Paul; the bed is 90 feet thick; the ore contains 40 per cent. of titanitic acid; 37 per cent. metallic iron. The Company, in 1873, erected two blast furnaces; capacity of each furnace, from four to six tons.

THE ST. MAURICE FORGES.

Owned by F. McDougal & Son, Three Rivers—using a bog ore—making a very fine iron with charcoal fuel. The first furnace was erected in 1737; still running with same fuel; capacity, four tons.

L'ISLET.

Owned also by F. McDougal & Son, has a blast furnace, using bog ore; capacity, four tons.

RIVIÈRE AUX VACHES.

The blast furnace erected in 1869—using bog ore—making a fine car-wheel iron, is owned by F. McDougal & Son; capacity from April, 1869, to June, 1873, 5,520 tons.

VAUDREUIL.

A mine of bog ore is found at Côté St. Charles attaining a thickness of eight feet; the ore contains 50 per cent. of iron. On the McGillis property, St. Elizabeth, the ore analysis—metallic iron, 28.67; peroxide of iron, 40.96; oxide of manganese, 26.34; lime, 1.48; phosphoric acid, 0.60; insoluble matter and soluble silica, 12.08; water and organic matter, 17.97.

ST. VALIÈRE.

This deposit of ore containing about 50 per cent. of iron, extends over an area of from 10 to 15 miles; situated near the branches of Rivière du Sud.

NEW BRUNSWICK.

CARLETON COUNTY IRON MINES.

Analysis of Iron Ores.

These ores are three miles from the furnaces which are situate at Woodstock. The following is an analysis by John Mitchell, Esq., of London, England:—

	Veins Nos.					
	1	2	3	4	5	6
Peroxide of iron.....	49.357	47.858	39.285	67.857	42.857	50.000
Protoxide of iron.....	0.412	2.140	1.140	1.070	.....	2.490
Alumina.....	6.200	3.924	3.116	2.004	6.412	6.114
Oxide of manganese.....	4.784	6.110	5.872	0.976	2.140	3.742
Peroxide of manganese.....	.....	.....	.....	.....	8.740	.....
Lime.....	2.014	1.004	1.120	0.887	1.074	1.146
Magnesia.....	3.911	5.018	4.602	2.940	5.107	4.072
Silica.....	22.021	16.842	25.964	15.630	22.420	19.842
Carbonic acid and water.....	7.621	13.890	16.764	5.609	8.974	10.630
Potash, soda, sulphuric acid and phosphoric acid make the rest.	.....	.....	.....	.....	.....	.....
Percentage of metallic iron.....	34.867	35.147	28.377	48.323	30.000	36.848

THICKNESS OF THE BEDS.

The brown hematite iron ore occurs in veins between red and green clay slates lying on edge with more or less inclination. These veins are from two to eight and ten feet, and in No. 4, 20 feet in thickness, and the quantity is inexhaustible. The mines are under a 99 years' lease (1850) from Government. The quantity mined amounts to 100,000 tons at an average cost of \$1.20, delivered at the roasting kilns (of which there are three), three tons of the raw producing one ton of pig iron. The woods used for charcoal are maple, birch and beech. The facility for obtaining fuel has been greatly increased by the building of the New Brunswick Railway.

There are two blast furnaces blown by two high pressure steam engines, the works being located on two terraces rising from the River St. John. Red bricks for building are made on the premises, the clay being excellent for the purpose. The charcoal kilns are rectangular, with arched roofs and from 65 to 80 cords capacity, producing 40 bushels of charcoal to the cord. Wood ranges from \$1.50 to \$2 per cord delivered at the works, to which there is an easy down grade from the mines.

There are other iron beds in the County of Carleton besides those mentioned especially in the Parish of Aberdeen, at a distance of about four miles from the St. John River. Wood is also abundant in this locality.

BURTON.

Beds of bog ore are found in Greens, Sunbury and York Counties, of a thickness of several feet. The Burton ore contains 47 per cent. of iron.

NOVA SCOTIA.

NICTAUX.

The supply of iron ores at Nictaux is inexhaustible. A partial analysis has been made; the ore holds numerous fossils of the Lower Devonian age. "It was very fine grained and tough, breaking with a sub-conchoidal fracture. Calculating the iron as magnetic oxide it contained"—

Magnetic oxide of iron.....	69.17
Phosphoric acid.....	1.82
Sulphur.....	0.05
Insoluble matter.....	18

A small Catalan forge produced some bar iron from these ores in the first decade of the present century.

MOOSE RIVER.

In the year 1826 the Provincial Association employed Cyrus Alger to erect the Annapolis Iron Works at Moose River. "Excellent iron was produced, both pig iron for foundry purposes and refined for bar iron."

Although the iron deposits at Moose River were found rich with every convenience most conducive to the manufacture of iron yet operations had to be suspended owing to the want of protection.

POTTER MINE.

Dr. E. C. Dew and O. Underwood, of Boston, are the owners of this mine of magnetic iron ore, situated about two and one-half miles from Clementsport, Annapolis County; in 1831 a blast furnace, capacity, one hundred tons per month, was erected; the contents of the ore is 45 per cent. metallic iron.

THE STEEL COMPANY OF CANADA

Own a vein of hematite in Cook's Brook, Londonderry, from three to four feet thick. The Geological Department return an analysis of peroxide of iron, 96.93; pro- of manganese, trans-alumina, 0.33; lime, 0.04; magnesia, 0.11; pho. acid, 0.07; sulphur, none; water, 0.82; insoluble matter, 1.26; the Londonderry furnace is near the mine.

On the southern slope of the Cobequid Hills has been traced for a distance of twelve miles an important mine of limonite. The Geological Department analysis gives:

	Ocre Limonite.	Compact Limonite.
Per. of iron.....	79.68	84.73
Pro. " .....	.....	traces
Pro. of manganese.....	2.51	0.23
Alumina.....	0.63	0.23
Lime.....	0.57	0.14
Magnesia.....	0.34	0.14
Silica.....	3.05	.....
Pho. acid.....	0.44	0.19
Sul. acid	0.01	0.01
Water.....	12.43	.....
Insoluble residue..	.....	2.67
	99.66	99.74
Metallie iron	55.78	59.31

The works of this company consist of two blast furnaces, capable of producing 30,000 tons of coke pig iron per annum; one blast furnace capacity of producing 3,000 tons of charcoal pig iron per annum; one rolling mill, capacity, 10,000 tons of bar and sheet iron per annum; one foundry, capacity, 12,000 car wheels per annum; expenditure in work, two millions of dollars; expenditure, current year, in prosecuting labor, \$422,000; the consumption of coal, 1,100 tons per week; there are also two Siemens rotary furnaces; the works are connected with the Intercolonial Railway by a branch railway. These iron deposits are in close proximity to the coal fields, and have every facility for the manufacturing of iron.

PICTOU ORE BED.

Lease No. 29 is a mine from ten to twenty feet in thickness of hematite ore, situated on the East River, in the neighbourhood of the Pictou coal field; Dr. T. E. Thorp, of Glasgow, gives an analysis, per. of iron, 96.63; pro. of iron, 0.98; sul. of iron, 0.06; phos., none; silica and insoluble matter, 3.20; metallic iron, 68.33.

GREAT RED HEMATITE BED OF MCLELLAN'S MOUNTAIN.

This bed of ore has been traced across "Right of Work," No. 8, Pictou County, varying in width from fifteen to thirty feet, angle of depth from 25° to 75°. Dr. Stevenson McAdam, of Edinburgh, analysis the ore as ox. of iron, 75.67; ox. of manganese, 0.52; alumina, 0.45; car. of lime, 2.44; car. of magnesia, 0.98; phos. acid, 0.22; sulphur, 0.29; titanio acid, trace silica, 19.43; metallic iron, 54.36.

LEASE 28.

In Pictou county a bed of red hematite, yielding 43 per cent., situated between McLellan's Mountain and East River.

THE FRASER SADDLER AREA.

Lease 26, Pictou County; a lode from six to twenty-two feet in thickness of limonite, is traced from the north branch of east branch, East River, to a point seven miles higher up. The Geological Department analysis gives, per. of iron, 85.01; pro. of manganese, 0.38; alumina, 0.69; lime, 0.49; magnesia, 0.19; pho.-acid, trace sul. acid, 0.55; water, 11.13; insoluble matter, 2.14; metallic iron, 59.50.

THE CULLEN AREA.

Lease No. 105, Pictou County, on the banks of a stream running into East River, is exposed a lode of limonite, varying in width up to three feet. The geological department give analysis, per of iron, 76.93; pro. of iron, 4.97; pro. of manganese, 0.68; alumina, 1.019; lime, 0.313; magnesia, 0.052; silica, 5.83; pho.-acid, 0.98; sul. acid, 0.11; water, 9.46; organic matter, 0.18; metallic iron, 57.71.

SUTHERLAND RIVER.

An irregular bed of sparry iron ore has been traced for several hundred yards; the thickness of bed, about ten feet. The Geological Department analysis gives, sesq. of iron, 16.98; car. of iron, 65.61; car. of manganese, 7.98; car of lime, 2.67; car of magnesia, 3.23; silica, 3.76; sulphur ; phosphorus, 0.013; water, 0.76; metallic iron, 43.56.

 IRON ORES OF CAPE BRETON.

From the transactions of the Newcastle-on-Tyne Institute of Mining Engineers.

At Loraine, near Louisburg, boulders of a compact red hematite, of excellent quality, have been found; but the writer is not aware of any attempts to prove the ore *in situ*. The following is an analysis of it by Mr. G. F. Dowing, of Workinton:—

Peroxide of iron.....	90.14
Lime and magnesia	4.20
Sulphur .....	.10
Phosphoric acid.....	.11
Silica	5.45
Phosphorous in 100 parts of iron.....	.054

This ore resembles some of the Cumberland (England) red hematites in appearance and quality.

Near the summit of the lower carboniferous, as exposed near Sydney, is a thick bed of red marl, with nodules of limestone. Near the top of this bed is a hard grey sandstone, containing a variable amount of peroxide of iron in places, equal to 30 per cent. of metallic iron.

At Big Pond, on the East Bay of the Bras d'Or Lake, a bed of red hematite, about eight feet thick, has been traced about 700 yards. According to Dr. Howe, of Windsor, the ore contains 61.39 per cent. of iron, 9 per cent. of silica, and mere traces of sulphur and phosphorus. On the opposite of East Bay similar ore has been found.

Several openings have been made on what appear to be separate beds, and several hundred tons of ore have been extracted for shipment to the United States. The following analysis is by the officers of the Geological Survey:—

Peroxide of iron.....	85.037
Phosphoric acid.....	.032
Sulphur .....	.075
Silica	5.130
	<hr/>
	90.374
Metallic iron.....	59.526

At Whycocomagh, in rocks of upper silurian age (?) no less than nine deposits have been exposed and traced a few hundred yards; from surface indications they appear to extend much further. One bed of magnetite is nine feet thick, and another of red hematite six feet. The former, on analysis by the officers of the Geologica

Survey, was found to consist of a mixture of specular and magnetic ore, with a considerable quantity of silicious matter, and gave 42.64 per cent. metallic iron, and 26 per cent. of phosphoric acid. The latter gave, it is stated, 56 per cent. of iron. These deposits, being on elevated ground and only a quarter of a mile from shipping, are well situated for working.

And yet another superlative advantage with these deposits is, that they lie in close contiguity to the great coal seams of this Island.

STATEMENT OF THE STEEL COMPANY OF CANADA.

The works of the Steel Company of Canada, at Londonderry, N.S., consist of two blast furnaces, capable of producing 30,000 tons of coke pig iron per annum, but of which one only has yet been lit; of a third blast furnace, capable of producing 3,000 tons of charcoal pig iron per annum; of a rolling mill, capacity 10,000 tons of bar and sheet iron per annum; and of a foundry, capacity 12,000 ear wheels per annum.

These works are within about two miles of the Intercolonial Railway, with which they are connected by a branch line. In their erection, and in developing mines, and building railways and other structures necessary for conducting the business of iron making, a capital expenditure exceeding *two millions of dollars* has been made, mainly for labour, and a further considerable expenditure is in contemplation to complete the works, should circumstances warrant.

During the past year one of the blast furnaces has been steadily running, and the rolling mill, although not completed till December, has been operated to about one-third of its present capacity.

If both furnaces and the rolling mill, as now completed, had been in operation throughout the year, their output would, at present low prices, have been worth \$750,000, and its average price about \$1,000,000.

The amount of current expenditure during the year ending 31st December, 1878, was \$422,000, all for labor directly or indirectly employed in Canada. Thus:—

Wages paid to the Company's employees.....	\$206,000	
Deduct proportion applicable to construction....	26,000	
		\$180,000
Cost of coal, ore, lime, and other native products got out by contractors and consumed.....	151,000	
Freight paid the Intercolonial Railway.	91,000	
		\$422,000

With the works in full operation this disbursement would be very much increased, probably by 75 per cent.

The iron produced is of finer quality than has hitherto been usually imported. This is due to the character of the ore, which does not admit of the manufacture of inferior iron at any reduction in cost, but the benefit of the quality goes at present entirely to the consumer, who naturally declines to pay a higher price than that at which he can obtain the foreign iron, which hitherto he has been compelled to use and to which he is accustomed.

The competition which the Company encounters in the disposal of its products is:—

1st. With iron from Great Britain brought out as ballast, or at nominal rates of freight; say 2s. 6d. stg., per ton and upwards.

2nd. With iron from the United States, which, during the past twelve months, has been offered in Canada with little regard to cost, and in some instances with the avowed intention of shutting up the Steel Company's works.

With respect to the former, the rate of freight charged on the Steel Company's iron from Londonderry, N.S., to Montreal, the chief market of the Dominion, is \$3 per ton, and it is evident that it stands at a disadvantage in competing with the European manufacturer, whose product is transported to the same point at a lower rate.

With respect to competition from the United States, if no duty were levied on iron in that country, the Steel Company's works, situated close to the Bay of Fundy, would find an outlet for a large portion of their product in the New England States, but they are effectually shut out from that market by duties of \$7 per ton on pig iron, and 35 per cent. *ad valorem* and upwards (mainly 1c. to 1½c. per lb.,) on bar iron; and such being the case, it is manifestly unfair that they should have to compete in their own market (especially in Ontario, which is at a distance) with iron from New York, Pennsylvania, Ohio, &c., admitted free of duty or at only 5 per cent.

Before the Londonderry iron was put on the Canadian market, American pig of somewhat similar character, sold in Ontario and Quebec at \$2 to \$3 per ton above the price of good Scotch iron, but to meet the competition of the home-made article this difference has been entirely thrown off. It is, therefore, evident that the establishment of the Steel Company's works has already effected an actual reduction in the price of iron in Canada, which would be lost were they to suspend operations.

The present consumption^o of coal in the Steel Company's works exceeds 1,100 tons per week. If they were fully employed it would be 2,000 tons per week or more. In the encouragement of the home manufacture of iron, therefore, the best means of developing the coal mines of Canada will be found.

The manufacturers of Ontario, who are the largest consumers of iron in the Dominion, have, through their Association, asked that duties of \$3 per ton on pig be imposed; the consumers of the other Provinces are, also, generally favourable to the imposition of protective duties, all being apparently alive to the importance of encouraging the home manufacture of iron. And it is evident that if the value of an industry to the country in which it is established, and therefore its right to claim protection, depends upon the extent to which it affords employment to labor, none can prefer a stronger claim to consideration than the manufacturer of iron, the whole cost of the article produced being practically for wages, as the ore, coal, lime, and other materials used, possess in themselves no value while lying in the bowels of the earth; and, further, that as the manufacture of iron requires the employment of strong, able-bodied men, almost exclusively, it sustains a far greater population than most other industries, in which women and children are largely employed. Without such protection as will enable it, at least, to avoid loss, the Steel Company of Canada cannot long continue to operate its works, and as their stoppage would practically amount to an almost total loss of the large capital invested, it is unnecessary to dwell on the discouraging effect it would have on all further attempts to establish iron manufacturing in Canada.

GILLESPIE, MOFFATT & CO.,

Agents,

Montreal.

IMPORTS of Coal and Iron (from the Blue Books), and Estimated Amount paid for Transportation.

Years.	Total Iron Imports.	Total Coal Imports.	Total Coal and Iron Imports.	Estimated Amount of Freight.	Total paid for Iron, Coal, and External Freights.
	\$	\$	\$	\$	\$
1872.....	12,291,908	2,015,233	14,307,141	1,198,638	15,503,779
1873.....	20,202,753	2,557,789	22,760,542	1,198,334	23,958,876
1874.....	18,878,411	3,803,260	22,681,671	1,658,828	24,330,499
1875.....	15,783,960	3,076,088	18,860,048	1,354,870	20,214,918
1876.....	11,600,897	3,320,060	14,920,957	1,637,760	16,558,717
1877.....	9,330,982	3,499,561	12,820,543	1,917,960	14,748,503
1878.....	8,298,517	3,054,846	11,353,363	1,839,596	13,192,959
Total.....	96,387,428	21,356,837	117,714,265	10,793,966	128,508,251

IMPORTATIONS of Hardware, Iron, Steel and their Products into the Dominion,
from 1872 to 1878.

Articles.	1872.	1873.	1874.	1875.	1876.	1877.	1878.
Hardware and cutlery	409,462	319,404	635,992	454,626	287,166	207,839	241,286
Spades, shovels, forks and edge tools	86,213	91,788	114,837	76,198	60,846	791,382	874,406
Spikes, nails, tacks, brads and sprigs	137,749	187,808	223,888	298,747	228,752	273,246	233,785
Stoves and other iron cast- ings	270,984	418,068	737,197	651,386	393,630	432,742	396,154
Other hardware	3,019,617	3,590,071	3,618,057	3,405,835	2,401,256	1,592,619	1,623,823
Locomotive engines and cars.	443,842	1,623,902	1,699,567	181,449	41,735	121,715	135,647
Machinery, not elsewhere mentioned	662,001	816,422	1,268,469	733,786	619,831	384,896	366,948
Steam engines, other than locomotives	45,639	48,818	37,387	124,621	30,390	33,397	7,131
Locomotive engine frames, axles, &c.	115,413	329,252	1,897,103	38,160	12,227	79,336	30,679
Iron	3,276,172	4,842,108	3,442,431	3,797,533	3,107,212	2,820,333	2,366,932
Cranks and shafts for steam- boats and mills	14,631	23,368	10,990	10,845	2,630	3,226	.....
Railway bars, chairs, fish plates and car axles	3,005,592	6,891,861	4,326,325	5,287,861	3,897,770	1,901,097	1,405,822
Steel, wrought and cast	619,236	754,319	679,863	575,032	384,105	495,494	393,072
Iron tubing and piping	190,420	265,564	186,306	147,181	133,347	193,660	232,832
Total	12,291,908	20,202,753	18,878,411	15,783,960	11,600,897	9,330,982	8,298,517

DUTY on Iron entering Canada and the United States.

Description.	Canadian, Old Tariff, 1879.	Canadian, New Tariff, March, 1879.	American, 1879.
Pig iron	Free	\$2 per ton	\$7 per ton.
Bar iron	5 per cent.	17½ per cent.	\$25 to \$30 per ton.
Iron rails	Free	15 do	\$14 per ton.
Steel rails	do	10 do	\$25 do
Cars and locomotives	17½ per cent.	25 do	35 per cent.
Machinery	do	25 do	do

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Montreal.

Amount paid

Total
paid for Iron,
Coal,
and External
Freights.

\$
15,503,779
23,958,876
24,330,499
20,214,918
16,558,717
14,748,503
13,192,959
128,508,251

TONNAGE and Value of Coal and Iron Production, Great Britain, United States,
Belgium and Canada, for the Year 1877.

Countries.	Coal.		Pig Iron.		Total.
	Tons.	Value.	Tons.	Value.	
		\$		\$	\$
Great Britain.....	134,610,763	219,444,045	6,608,664	78,685,306	292,129,351
United States	50,000,000	75,000,000	2,314,585	34,000,000	109,000,000
Belgium	14,329,578	35,000,000	418,366	5,857,124	40,857,124
Canada	883,511	1,544,526	15,000	210,000	1,754,526

AMERICAN PRODUCTION OF PIG IRON FROM 1854 TO 1877.

In the following table we give the statistics of the production of pig iron in tons in the United States from 1854 to 1877, classified according to the kind of fuel used.

Years.	Anthracite.	Charcoal.	Bituminous Coal and Coke.	Total.
1854.....	339,435	342,298	54,485	736,218
1855.....	381,866	339,922	62,390	784,178
1856.....	443,113	370,470	69,554	883,137
1857.....	390,385	330,321	77,451	798,157
1858.....	361,430	285,313	58,351	705,094
1859.....	471,745	284,041	84,841	840,627
1860.....	519,211	278,331	122,228	919,770
1861.....	409,229	195,278	127,037	731,544
1862.....	470,315	186,660	130,637	787,662
1863.....	577,638	212,005	157,961	947,604
1864.....	684,018	241,853	210,125	1,135,996
1865.....	479,558	262,342	189,632	931,582
1866.....	749,367	332,580	268,396	1,350,343
1867.....	798,638	344,341	318,647	1,461,626
1868.....	853,000	370,000	340,000	1,603,000
1869.....	971,150	392,150	553,341	1,916,641
1870.....	930,000	365,000	570,000	1,865,000
1871.....	956,608	385,000	570,000	1,911,608
1872.....	1,369,812	500,587	984,159	2,854,558
1873.....	1,312,754	577,620	977,904	2,868,278
1874.....	1,202,144	576,557	910,712	2,689,413
1875.....	908,046	410,990	947,545	2,266,581
1876.....	794,578	308,649	990,009	2,093,236
1877.....	934,797	317,843	1,061,945	2,314,585

AMERICAN IMPORTATION OF IRON.

QUANTITIES and Value of Pig and Rolled Iron imported into the United States from 1855 to 1877, compiled from Statistics supplied by the United States Bureau of Statistics.

Fiscal Years.	Pig Iron.		Railroad Iron, Including Steel Rails.		Bar, Rod, Hoop, Sheet and Plate Iron.	
	Gross Tons.	Value.	Gross Tons.	Value.	Gross Tons.	Value.
		\$		\$		\$
1855.....	98,925	1,979,463	127,516	4,993,900	144,911	7,728,406
1856.....	59,012	1,171,185	155,495	6,179,280	137,778	6,990,744
1857.....	51,794	1,001,742	179,305	7,455,596	123,970	6,640,900
1858.....	41,986	739,949	75,745	2,987,576	91,546	4,863,811
1859.....	72,517	1,049,200	69,965	2,274,032	120,686	5,657,305
1860.....	71,498	1,005,865	122,175	3,709,376	172,532	6,407,738
1861.....	74,026	979,916	74,490	2,162,695	125,454	5,585,498
1862.....	22,247	285,323	8,611	222,967	33,170	1,581,270
1863.....	31,007	435,194	17,088	540,494	86,834	4,102,227
1864.....	102,223	1,288,424	118,714	3,904,017	123,830	5,981,150
1865.....	50,652	806,552	77,518	2,903,828	65,292	3,746,855
1866.....	102,392	1,683,186	78,007	2,806,390	79,926	3,993,356
1867.....	112,042	1,831,465	96,272	3,317,862	101,754	5,325,665
1868.....	112,133	1,778,977	151,097	4,373,192	92,359	4,788,012
1869.....	136,975	2,138,030	237,703	7,305,845	102,791	4,945,910
1870.....	153,283	2,509,280	279,765	9,669,571	89,370	4,479,524
1871.....	178,138	3,106,490	458,055	17,360,297	112,735	5,206,720
1872.....	247,528	5,122,318	531,536	22,056,635	130,200	6,900,521
1873.....	215,495	7,203,769	357,629	19,740,702	95,744	7,477,556
1874.....	92,041	3,288,022	148,918	10,758,435	40,163	4,042,078
1875.....	53,748	1,458,668	42,082	2,932,311	28,929	2,613,854
1876.....	79,455	1,918,547	4,708	321,020	30,898	2,317,125
1877.....	67,922	1,556,415	30	1,464	26,306	1,632,815

During the year ended December 31, 1877, the imported iron and steel products aggregated \$9,195,363 in value, against \$10,584,125 in 1876; \$15,264,131 in 1875; \$24,578,638 in 1874; \$45,764,670 in 1873; and \$61,724,227 in 1872.

AMERICAN EXPORT OF IRON.

Fiscal Years.	Pig Iron.		Railroad Iron.		Bar and other Irons.		Total Value of Exports.
	Tons.	Value.	Tons.	Value.	Tons.	Value.	
		\$		\$		\$	
1872.....	1,477	72,718	1,212	86,820	.....	9,870,187	10,030,125
1873.....	10,103	414,349	375	30,743	.....	11,648,858	12,129,939
1874.....	16,030	447,619	1,267	73,159	.....	14,869,022	15,389,807
1875.....	8,738	250,919	1,210	67,064	.....	15,774,923	16,092,906
1876.....	3,805	94,314	3,665	153,465	.....	11,546,964	11,794,743
1877.....	7,687	171,755	7,445	281,198	.....	16,207,222	16,659,675

The following table shows, in Metric Tons, the course of Belgian Iron, Steel and Coal Imports and Exports during the last three years:—

Imports.	Pig and other Iron.	Iron Ore.	Coal and Coke.	Steel.	Exports.	Pig and other Iron.	Iron Ore.	Coal and Coke.	Steel.
1875.....	162,346	804,370	724,440	5,341	1875.....	222,096	141,767	4,709,747	7,318
1876.....	222,263	671,134	832,296	6,137	1876.....	204,262	166,417	4,399,605	5,567
1877.....	207,353	783,298	678,318	4,659	1877.....	213,715	215,658	4,060,722	15,527

In 1877 Belgium exported 201,688 metric tons of manufactured iron, and imported only 13,974 tons. In the same year Belgium imported 193,380 tons of pig iron, and exported only 12,027 tons. Of iron ore there were imported 783,298 tons, 215,658 tons of which were re-exported. The grand duchy of Luxemburg supplied 573,600 tons.

It is worthy of remark that Belgium, with a population nearly identical with that of Canada, but having only one fifty-secondth part of its area, produces annually Coal and Pig Iron to the value of \$40,857,124, and that is exclusive of bar and other iron in manufactured forms. The annual production of Coal and Pig Iron in Canada, in value, amounts to only about \$1,754,526. Hence the value of the annual production of Coal and Pig Iron in Belgium is over 23 times that of Canada.

This is not the less striking when it is remembered that the estimated coal area of Belgium is but 510 square miles; while the coal area of Canada is estimated at 60,000 square miles.

The following table shows in detail the production of iron and steel rails in the United States since the beginning of the manufacture of Bessemer steel rails:

Years.	Iron Rails all kinds. Net tons.	Bessemer Steel Rails. Net tons.	Total. Net tons.
1867.....	459,558	2,550	462,108
1868.....	499,489	7,225	506,714
1869.....	583,936	9,650	593,586
1870.....	586,090	34,000	620,090
1871.....	737,483	38,250	775,733
1872.....	905,930	94,070	1,000,000
1873.....	761,662	129,015	890,677
1874.....	584,469	144,944	729,413
1875.....	501,649	290,863	792,512
1876.....	487,168	412,461	879,629
1877.....	332,540	432,169	764,709

INTERPROVINCIAL TRADE.

Shipments from Quebec and Ontario to the Lower Provinces *via* the Inter-colonial Railway for 1877:—

Barrels of flour.....	245,710
Bushels of grain.....	292,852
1878—Barrels of flour.....	637,778
Bushels of grain.....	331,170
Head of live stock.....	46,498
All other goods in tons.....	375,025

SHIPMENTS of Produce to the Maritime Provinces from Montreal *via* River St. Lawrence, during season of Navigation for past eight years.

By W. J. Patterson, Secretary, Montreal Board of Trade—

Years.	Wheat.	Corn.	Peas.	Oats.	Flour.	Meal.	Butter.	Cheese.	Pork.
1872.....	2,758	8,300	18,345	20,803	242,935	9,883	13,818	not given.	not given.
1873.....	588	1,583	14,533	23,415	321,512	6,627	11,403	do	do
1874.....	2,151	6,169	11,952	10,940	309,774	14,312	9,339	12,577	do
1875.....	800	2,500	13,287	4,029	206,123	7,688	7,382	2,324	5,798
1876.....	18,533	330	15,703	4,021	275,180	11,371	10,358	1,643	6,750
1877.....	3,036	1,345	11,276	928	182,543	12,452	10,910	2,691	10,024
1878.....	4,751	291	12,658	319	161,885	6,345	9,812	2,054	5,765

STATEMENT of Flour, Oatmeal, and Grain shipped from Canada over the Grand Trunk Railway, *via* Portland to the Maritime Provinces, from 1872 to 1878.

From Grand Trunk Agent, Portland—

Years.	No. of Barrels, Flour.	No. of Barrels, Oatmeal.	No. of Bushels, Grain.
1872.....	119,200	5,200	36,000
1873.....	117,500	6,800	50,400
1874.....	125,000	8,600	35,280
1875.....	98,100	4,700	25,200
1876.....	86,900	2,000	7,200
1877.....	10,000	2,100	.....
1878.....	2,900	400	.....

Shipment of Canadian flour *via* Boston.

1878 15,570 barrels.

TOTAL shipment of Flour and Grain from Ontario and Quebec to the Maritime Provinces, from 1872 to 1878. The grain shipments are converted in flour and meal by estimating five bushels to the barrel.

Years.	By River St. Lawrence.	By Grand Trunk Railway, Portland.	By Intercolonial.	By Boston.	Total.
1872.....	252,576	*131,600			384,176
1873.....	329,536	*134,380			463,916
1874.....	340,984	*140,656			481,640
1875.....	210,248	*107,040			317,288
1876.....	282,897	*90,000			372,897
1877.....	185,860	*12,000	304,852		502,702
1878.....	165,489	*3,300	704,012	*15,570	888,371

*This, in the Trade and Navigation Returns is given as being American, which is an error, as it comes from Ontario *via* Portland and Boston.

The following is the coal shipments from Nova Scotia to Quebec and Ontario from 1872 to 1878:—

	Tons.
1872.....	94,519
1873.....	187,059
1874.....	162,269
1875.....	189,754
1876.....	117,303
1877.....	95,418
1878.....	89,710

It will be seen that during the seven years the flour imports to the Lower Provinces have increased nearly three hundred per cent., while the coal exports to the Upper Provinces show a falling off.

COAL Freights from Sydney to Quebec, Montreal and New York, by Vessel, from 1873 to 1878.

Year.	From Sydney to		
	Quebec.	Montreal.	New York.
	\$ cts.	\$ cts.	\$ cts.
1873.....	2 50	3 50	3 50
1874.....	2 25	2 75	2 75
1875.....	1 75	2 25	2 25
1876.....	1 50	1 90	1 80
1877.....	1 25	1 75	1 60
1878.....	1 00	1 45	1 50

Inter-

Law.

Pork.

at given.
do
do
5,798
6,750
10,024
5,765

Trunk

Bushels,
min.

36,000
50,400
35,280
25,200
7,200

THE AMOUNT OF EMPLOYMENT THE TRANSPORTATION OF COAL
FURNISHES THE RAILWAY LINES.

GREAT BRITAIN.

Since 1860, the railways in carriage of coal, have been gaining on the Coasting Trade of England, and more especially since 1875.

Thus there were brought to London :—

	By Sea.	By Railways and Canals.
In the year 1863.....	3,282,512 tons.	1,763,637 tons.
do 1864.....	3,067,490 do	2,302,779 do
do 1876.....	3,221,754 do	5,096,173 do
do 1877.....	3,221,754 do	5,335,482 do

As early as the year 1867, it was calculated that the quantity of coals carried by railways was double that of all other goods.

GERMANY.

The railway transportation of coal in Germany in 1870 and 1876, was—

1870.	1876.
17,987,879 metric tons.	30,334,875 metric tons.

UNITED STATES.

The large movement of coal tonnage in the United States, illustrates the importance of the coal trade to the transportation lines.

The coal tonnage moved by rail in

1866	20,020,000 tons.
1876	42,150,000 do.

The coal receipts at Buffalo, N.Y., by water and rail, for 1871 and 1876, were as follows :—

	Canal and Lake.	By Rail.
In the year 1871.....	271,356	376,063
do 1876.....	202,593	647,842

CANADA.

The coal imports into Canada, for the year 1873 gave the American routes of transportation the handling of 769,664 tons. Most all of this tonnage on the American side, was handled by rail roads.

THE RELATION OF COAL EXPORTS TO THE SHIPPING OF GREAT BRITAIN.

The following table shows the increase of Coal Exports from Great Britain and the parallel increase of Shipping Tonnage.

Year.	Tons Coal.	Shipping Tonnage.		Total Shipping Tonnage, Steam and Sail.
		Sail.	Steam.	
1860	7,851,234	4,204,360	454,327	4,658,687
1870	11,504,272	6,993,153	1,651,767	8,644,920
1873	12,339,156	5,320,089	2,624,431	7,944,520
1875	14,475,036	5,383,763	3,015,773	8,399,536
1877	15,369,828	5,526,930	3,283,910	8,810,840

A COMPARISON of the *total* tonnage (entered) in Canada, United States and Great Britain, distinguishing home and foreign, shows the following:—

	Canadian Ports.		American Ports.		British Ports.	
	British Tonnage.	Foreign Tonnage.	American Tonnage.	Foreign Tonnage.	British Tonnage.	Foreign Tonnage.
1868.....	1-659 635	414-374	3-550 000	4-495-000	11-225-000	5-396 000
1869.....	1-819-490	609-593	3-402-000	5-347-000	11-721-000	5-476-000
1873.....	2-132-250	900-496	3-612-000	8-083-000	14-541-000	7-323-000
1878.....	*2-079 825	1-261-688	4-755-000	13-109 000	17-281-334	8-339-839

* British Tonnage 1-152-046. Canadian Tonnage 927-779. Any ship can carry away a Nation's Commerce. None will return a profit, but a home *tonnage*.

NEW COAL RATES FOR 1879.

The Cleveland Association of Vessel Owners, at a late meeting, adopted the following schedule of rates on coal and iron ore:—Coal from Cleveland to Chicago and Lake Michigan ports, per ton, 55c.; Detroit and Wyandotta, 35c.; Port Huron and [Sarnia, 45c.;] Detour and Marquette, 50c.; Portage Lake, 65c.; Duluth, 75c.; coal from Buffalo, 50c.; Lake Ontario ports, \$1.25; Port Stanley, 35c.

SHOWING OF THE TABLES.

1. That Nova Scotia exports of coal to the United States have fallen from 465,194 in 1865 to 88,495 tons in 1878, while our importations from the United States have risen from 162,200 tons in 1865, to 746,516 tons in 1878.

2. That the duty in 1870 increased the home production, diminished the importation, and did not increase, but reduced the price to the Dominion consumer.

3. That in the tables annexed, Canada is the only coal producing country in the world which shows a falling off in the output.

4. That with a duty varying from 75 cents to \$1.70 per ton on coal, the United States have increased their production from 21,000,000 tons in 1866 to upwards of 50,000,000 tons in 1878, causing with transportation a circulation of not less than \$150,000,000 of productive capital.

5. That the capacity of the present working collieries of the Dominion is 2,000,000 tons annually ; not one-third of this is now being raised to the surface, but with a tariff that would secure the home market, this output would be attained, and the coal delivered to the consumer as cheaply as it could be obtained from abroad.

6. That the analysis shows our bituminous coal for gas, steam or domestic purposes to be quite the equal of any imported from the United States.

7. That the evidence before the coal committee (annexed) shows the position of our coal fields to be such as to secure cheap water transportation with the interior of Canada.

8. That under a protective tariff the production of pig iron in the United States has increased from 1,225,035 tons in 1866, to 2,351,618 in 1878, or 91 per cent., and caused a falling off in the importations of from 215,000 tons = \$7,000,000, in 1873, to 67,700 tons in 1877 = \$1,000,000.

9. That the importation of railroad iron, including steel rails, has in the United States fallen off from 536,900 tons in 1872 = \$22,056,635, to 30 tons \$1,464 in 1877.

CANADIAN ROUTES OF TRANSPORTATION.

There are three routes of transportation by which an interchange of products between the east and the west, or an Inter-Provincial trade may be easily established.

1st. All rail—By the Intercolonial, Grand Trunk, and their connections between Halifax, Pictou, Montreal, and western points.

2nd. All water—From Pictou, Sydney, and other Atlantic ports by the St. Lawrence to Montreal, and through the canals to western lake ports.

3rd. By ocean vessels from Sydney and Pictou to Montreal, and by lake vessels or rail from Montreal to Western Points.

1st. All rail route—In the East or on the Atlantic seaboard, the Intercolonial Railway passes through some of the richest coal and iron deposits on the continent, while in the west, the Grand Trunk with its connections stretches out through the most productive, agricultural and manufacturing centres of the Dominion, thus affording a most favorable opportunity for freight both ways, and a mutual interchange in trade.

Where coal is carried as a return freight in the common box cars, it can be, and it is now carried over American lines as low as $\frac{1}{3}$ of a cent, or \$0.00 $\frac{2}{3}$ per ton. It is the large tonnage of coal moving west that cheapens the cost of eastern bound freight in the United States. Why not Ontario take its coal from Pictou, and thus make Halifax a winter grain port on the same principle?

The distance from the Pictou collieries to Toronto, by the Intercolonial and Grand Trunk Railways, is 1,168 miles. To estimate the freight on coal at what the American lines are carrying it at, $\frac{1}{3}$ of a cent or \$0.00 $\frac{2}{3}$ per short ton per mile, the Pictou coal could be laid down in Toronto at \$2.33 freight, or including cost at mine (\$1.50), at \$3.83.

Both hard and soft coals are carried in the ordinary box car over United States lines, no difficulty whatever being experienced in cleaning the cars to fit them for the carriage of grain, flour, etc. There are several thousands of these cars at present in the trade, carrying coal west from Buffalo, Pennsylvania, Lehigh Valley, Pittston and Butler Mines to Chicago; returning, carry grain, flour and general merchandise east.

It is contended that Halifax is farther from the grain centres and the Rail Carriage—thence to our Atlantic ports longer than to American ports. But this apparent disadvantage is more than counterbalanced by our ports being very much nearer

the European markets than New York and other United States ports, by from 600 to 800 miles; besides which the expenses to ships loading in Canadian ports are very much less than in United States ports. In the past ten years the railway lines of the latter country and of Canada, during the season of lake navigation, have increased their amounts of freight by nearly 50 per cent., while in the same season, and within the period named, the water lines of the interior show a falling off in the same ratio.

It is estimated that the expense of running ocean vessels is from 15 to 20 per cent. greater, including insurance and extra cost of construction, than that of running lake or inland vessels. If this is the case, and seeing that the railways still monopolise the inland trade, the shortening of the ocean voyage by the increased distance of railway from western centres to Halifax, must be a decided advantage in favor of the latter as a grain port.

2nd. All water route—It is proposed to employ lake propellers to carry grain, &c., from Toronto, Chicago and other Western centres to Pictou and Sydney, there to be transhipped into ocean vessels, to the European and Brazillian markets—these propellers to carry coal and other eastern products, as return freight, to the west.

Pictou possesses peculiar advantages, as a Canadian summer port, for making up assorted cargoes for the markets of the Tropics. The fishing grounds of the St. Lawrence are in close proximity to this port; its coal basins are among the richest in the Dominion, and underlies its harbour. A supply of cheap ocean tonnage can be had there at all times during the navigation season,—an essential condition in the establishment of foreign trade relations.

Again, further east lies Sydney, which possesses every possible advantage, in so far as the supply of an abundant, cheap ocean tonnage enters as a factor in securing European, West India, and South American trade. Shipowners have offered to carry eastern bound freight to Europe, for 25 per cent. less ocean freight, than from New York, Montreal, Philadelphia, or Baltimore.

Sydney now commands more seeking tonnage than any other North American port, New York excepted. The convenience of the port of North Sydney for either eastern or western bound seeking tonnage, its unequalled low port charges, and the coal freights to be had for Canadian and American ports, have given it a large maritime trade. It is estimated that by securing down freights, coal could be carried to Toronto, from Sydney or Pictou, as return freight, at from \$1.50 to \$2.00 per ton.

It would be well for Canadians to follow the example of the Americans in this trade. The lake propellers, during the summer of 1878, carried grain from Chicago to Buffalo, distance 356 miles, and coal back from Buffalo to Chicago at 25 cents per

nett ton. The distance from Sydney and Pictou to Toronto, by water, is 1183 miles. Propellers of 600 tons and drawing nine feet of water, could pass through the canals, and consequently are available for this trade.

It has already been remarked, that Canada, from her magnificent water course which takes its rise in the very heart of the North American continent, expected to win a large part of the carrying trade of the west and north-west. But in this we have been disappointed. New York, our great rival, has in the main, borne off this trade from us. The return freights secured over American routes, and the supply of ocean seeking tonnage always found at New York and other United States ports, give them an advantage which can only be counterbalanced by connecting the St. Lawrence trade with a Dominion Atlantic port commanding trans-Atlantic seeking tonnage, and furnishing return freights to the west.

3rd. Water and Rail Route, or Ocean and Inland Vessels—Ocean vessels engaged in the trans-Atlantic trade, on their western bound voyage, in ballast, call at Sydney and Pictou, and take coal thence to Montreal at rates ranging from \$1.25 to \$1.75 per long ton. This coal could be conveyed from Montreal to a given western point, say Toronto, at from \$1.00 to \$1.25, and to Ottawa at from .90 cents to \$1.00. A good round duty on coal, to cause Quebec and Montreal to draw their supplies from Sydney and Pictou, would give the lumber and grain shippers of these ports a more handy and cheap supply of ocean tonnage than they can now obtain by chartering in England—such vessels bringing out coal merely as ballast. There are not many points in England at which coal is shipped, and ships seldom change ports for outward ballast; thus when vessels are chartered in England, they are from thirty to forty days from their port of loading, which often proves detrimental to the shippers. Sydney and Pictou can supply the St. Lawrence consumers with as cheap coal as can be obtained from any other sources, and at the same time furnish the St. Lawrence with a sufficient supply of ocean tonnage, within six or seven days of port of loading.

KINGSTON, 7th April, 1879.

G. H. DONSON, Esq.,

Ottawa.

DEAR SIR,—In reply to your enquiry relative to the dimensions of propellers that can pass through the locks of the St. Lawrence Canals between Kingston and Montreal, I beg leave to state that vessels 180 feet in length and not exceeding 45 feet beam, drawing 9 feet water, can pass through those locks, therefore, propellers of a carrying capacity of 600 tons weight can be built to navigate the canals; the same vessels will carry on deep water 750 tons weight. This class of vessels, with high pressure engine, can now be put in commission for the sum of \$45,000. The cost of running such a steamer will be about \$55.00 per day. A vessel of this description

should make the round trip from Toronto to Pictou in about 21 days, consequently, if a good share of return freight could be secured the trade would pay tolerably well. Those craft would be well suited to navigate the lower St. Lawrence.

The present locks of the Welland Canal admit vessels 144 feet in length, 26-2½ beam and drawing 10 feet of water. The best carrying propeller through from Chicago carries to Kingston about 17,200 bushels (560 tons) wheat, but from Kingston to Montreal 4,500 bushels. This class of craft will carry to Montreal about 400 tons weight. Cost of building and completing ready for freight, \$26,000; running expenses each day, \$47. At present several vessels of this class, but not all so large carrying, can be purchased reasonable at several of our lake ports. Those vessels also can be made suitable to navigate the lower St. Lawrence between Pictou, Sydney and Halifax, or other coast ports.

I am, Dear Sir,

Respectfully yours,

WM. POWER,

Ship-builder.

IN CONCLUSION.

In bringing these remarks and statistics to a close it is only necessary for the reader to consider the immense mineral resources of the Dominion, the large and increasing domestic demand for coal and iron products, and the facilities for their development and transportation to market to be able to appreciate their national importance. It must be apparent to all that the supplying of the home market with our own coal and iron resources, would build up our commerce and give Canada an increased carrying trade, diversify industry and furnish employment to the people according to their tastes and capacities. A writer remarks:—"The history of all countries abundantly demonstrates the fact that no nation has long lagged in the race of commercial advancement, which adopted a policy for the development of its coal and iron industries."

Under the protection given our industries the field offered for enterprise and the investment of capital is inviting. It remains for Canadians to buckle on their armour and become co-operators in the development of their industries and the consequent prosperity of the country.

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