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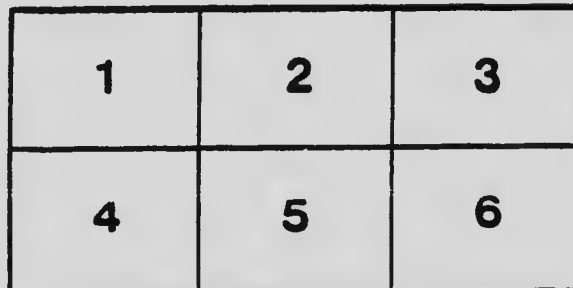
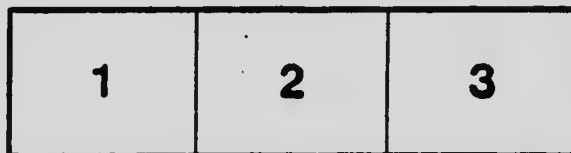
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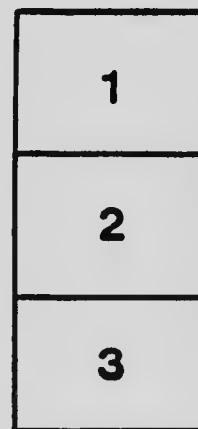
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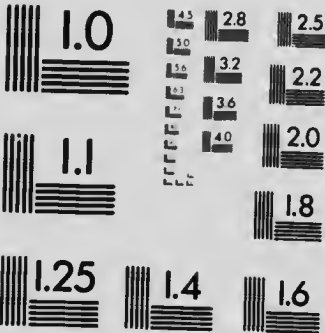
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CANADA
DEPARTMENT OF MINES
HON. MARTIN BURRELL, MINISTER; R. G. McCONNELL, DEPUTY MINISTER

MINES BRANCH
EUGENE HAANEL, PH.D., DIRECTOR

THE
PRODUCTION OF IRON AND STEEL
IN
CANADA

During the Calendar Year

1917

JOHN McLEISH, B.A.

Chief of the Division of Mineral Resources and Statistics.



OTTAWA
J. DE LABROQUERIE TACHÉ
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1919

No. 498.

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**ADVANCE CHAPTER OF THE ANNUAL REPORT ON THE MINERAL
PRODUCTION OF CANADA, DURING THE CALENDAR
YEAR 1917.**

*(Tons used throughout this report are short tons of 2,000 pounds, except where
otherwise stated.)*

IRON AND STEEL.

(INTRODUCTORY.)

The production of steel in Canada has been greatly stimulated by the demands created by the war and the production of both pig-iron and steel reached their highest output during 1917. The construction of new steel furnaces, including several electric furnaces, has greatly increased the steel-producing capacity, whereas pig-iron blast furnace capacity has remained practically stationary and pig-iron production has been brought to an output only slightly in excess of that obtained in 1911 and 1912.

The Canadian iron and steel industry continues to be based to a very large extent on imported iron ores and fuels. Only 4.2 per cent of the total iron ore charged to blast furnaces during 1917 was obtained from Canadian mines, the balance being imported from Newfoundland and the United States.

If the ores from Wabana, Newfoundland, be added to those from Canada, then about 44.4 per cent of the total blast furnace ore charge in 1917 was derived from British sources and 55.6 per cent from the United States.

It was shown in the report for 1913 that the total consumption of iron and steel in Canada during that year, which has probably been the maximum consumption of iron reached, was equivalent to from 6,000,000 to 7,000,000 tons of iron ore of 50 per cent grade. The Canadian production of iron ore during the same year was less than 5 per cent of this amount. The production of iron ore in Canada in 1917 was the lowest since 1900 with the one exception of the year 1911.

Trade in almost all classes of iron and steel products has become subject to government control and exports from Canada can be made only under licence obtained from the War Trade Board. Similarly, exports from the United States to Canada can be made only under licence obtained from the United States War Industries Board.

Prices, also, which had rapidly increased during 1916 and 1917, were placed under control in the United States in July of the latter year, and since Canadian consumption is being derived so largely from the United States it may be of interest to quote the price basis as follows:—

September 24, 1917.—Statement issued by Committee on Public Information (*Official Bulletin*, September 25, 1917):

"The President has approved an agreement between the War Industries Board and the steel men, fixing the following prices, which become effective immediately and are subject to revision January 1, 1918, viz.:

Commodity.	Basis	Price agreed upon:
Iron ore	Lower Lake Ports.	\$ 5.05 per G. T.
Coke	Connellsville	6.00 per N. T.
Pig-iron	Pittsburgh-Chicago	33.00 per G. T.
Steel bars	" "	2.90 per 100 lb.
Shapes	" "	3.00 per 100 lb.
Plates	" "	3.25 per 100 lb.

Subsequently the maximum prices were agreed upon covering the entire range of iron and steel products.

Summary of Iron and Steel Statistics, 1914-17.

	1914.	1915.	1916.	1917
Iron ore shipped from mines.....Short tons.	244,854	398,112	275,176	215,392
Canadian iron ore charged to blast furnaces....."	182,964	293,305	221,773	32,065
Imported iron ore charged to blast furnaces....."	1,324,326	1,463,488	1,964,598	2,084,231
Iron ore charged to steel furnaces....."	37,686	74,872	55,059	39,793
Pig-iron made in blast furnaces....."	783,164	913,775	1,169,257	1,156,789
Pig-iron made in electric furnaces....."	.....	.....	.....	13,691
Pig-iron and ferro-alloys exported....."	19,063	26,645	46,166	45,293
Pig-iron imported....."	78,680	47,842	58,130	83,400
Ferro-alloys made....."	7,524	10,794	28,628	47,465
Ferro-alloys imported....."	22,147	13,758	14,777	12,829
Pig-iron and ferro-alloy consumption....."	872,452	959,254	1,255,218	1,264,876
Pig-iron used in steel furnaces....."	619,030	747,834	949,444	1,112,682
Steel ingots and castings made....."	828,641	1,020,336	1,428,249	1,745,734
Steel rails made....."	428,225	232,411	90,123	46,645
Canadian coke used in iron blast furnaces....."	330,269	578,743	712,715	634,962
Imported coke used in iron blast furnaces....."	590,902	486,022	645,488	723,657
Iron and steel imported....."	878,179	771,007	864,916	929,776
Number of completed blast furnaces.....No.	22	19	20	.....
Number of men employed in blast furnaces....."	1,018	1,004	.....	.....
Wages paid in blast furnaces.....\$	693,632	675,453	.....	.....
Value of pig-iron produced.....\$	10,002,856	11,374,199	16,750,898	24,290,101
Value of iron and steel goods exported.....\$	14,391,746	48,268,148	63,857,681	46,751,681
Value of iron and steel goods imported.....\$	80,063,679	74,308,983	129,090,168	186,538,538

Average Monthly Prices of Iron and Steel Products in Pittsburgh in 1917.*

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
<i>Pig-Iron.</i>	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Bessemer ....per g. ton	35 95	35 95	37 45	42 20	44 95	55 20	57 95	53 55	48 30	37 25	37 25	37 25
Basic,	30 95	30 95	32 85	39 20	42 15	50 20	53 20	52 75	46 20	33 95	33 95	33 95
Foundry No. 2 " "	31 95	33 95	36 55	39 95	43 55	51 00	55 95	55 55	49 95	33 95	33 95	33 95
Malleable,	31 95	34 45	36 95	39 95	43 65	51 05	53 95	55 55	50 525	35 20	34 45	34 45
Gray Forge,	30 95	30 95	32 75	38 20	42 25	49 60	52 95	52 95	47 425	32 45	32 95	32 95
<i>Ferro Alloys.</i>												
Ferro silic. (50%) " "	122 50	156 25	175 00	187 50	230 00	230 00	237 50	225 00	212 50	171 25	157 50	172 50
Ferro-silic. (10%) " "	42 00	42 00	49 80	57 50	67 00	82 50	92 25	95 00	95 00	80 00	55 00	55 00
<i>Semi-finished.</i>												
Bessemer Billets " "	60 00	62 50	67 00	72 50	85 00	93 75	100 00	93 00	73 75	58 75	47 50	47 50
Open h. Billets, " "	60 00	62 50	67 50	72 50	85 00	93 75	100 00	93 00	73 75	58 75	47 50	47 50
Bessom. sh. bars " "	60 00	62 50	67 50	72 50	88 00	101 25	105 00	96 00	82 50	65 50	51 00	51 00
Open hearth												
Sheet bars,	60 00	62 50	67 50	72 00	88 00	101 25	105 00	96 00	82 50	65 50	51 00	51 00
Wire rods,	73 75	75 00	75 00	83 75	88 00	92 50	95 00	96 00	90 00	73 50	57 00	57 00
<i>Rolled products.</i>												
Per 100 lbs.												
Structural shapes, base.	3 10	3 25	3 45	3 70	4 00	4 00	4 50	4 50	3 75	3 00	3 00	3 00
Plates, base,	3 60	3 75	4 20	4 50	4 50	4 50	5 65	6 80	6 85	3 25	3 25	3 25
Steel bars, base,	2 95	3 00	3 20	3 40	3 50	3 65	3 90	4 00	3 73	2 90	2 90	2 90
Bar iron, base,	3 25	3 25	3 25	3 40	3 90	4 00	5 00	5 25	5 25	5 25	3 90	3 50
Shafting, discount,	10 00	10 00	10 00	10 60	10 00	5 00	5 00	5 00	5 00	6 25	17 0	17 00
Steel pipe, 2 to 3 in. disc	64 00	63 50	60 00	55 00	49 00	47 25	42 00	42 00	42 00	42 00	49 00	51 00
Standard spikes,	3 40	3 40	3 50	3 65	3 90	4 20	4 70	6 20	6 50	6 15	5 00	4 75
Hoops,	3 50	3 50	3 90	4 10	4 70	5 75	6 00	6 00	6 00	6 00	4 60	3 50
Bands,	3 00	3 00	3 35	3 35	3 60	5 50	6 00	6 00	6 00	6 00	4 30	2 90
Structural rivets,	4 25	4 25	4 50	4 75	5 05	5 25	5 25	5 25	5 25	5 25	5 00	4 65
No. 28 blacksheets,	4 55	4 55	5 05	5 75	7 00	8 15	9 00	9 00	8 75	7 75	5 25	5 00
" gal. sheets,	6 55	6 80	6 80	7 55	8 80	9 95	10 25	10 25	9 70	8 80	6 60	6 25
No. 10 blue annealed sheets,	4 10	4 35	4 70	5 35	6 65	8 00	8 50	8 50	8 50	7 85	4 75	4 25
Tin plate,	6 85	7 00	7 50	7 50	7 90	9 25	10 00	10 00	10 00	10 00	8 75	7 75
Wire nails, base,	3 00	3 00	3 16	3 20	3 50	3 65	4 00	4 00	4 00	3 90	3 50	3 50
Plain wire, base,	2 95	2 95	3 08	3 18	3 45	3 60	3 95	3 95	3 95	3 85	3 25	3 25
<i>old Material.</i>												
Per net ton.												
Heavy melting steel,	23 25	21 90	23 40	28 15	28 40	40 00	40 25	36 60	35 50	31 30	29 60	30 00
Low Phosphorus,	32 00	30 00	33 00	34 25	36 60	43 50	52 75	43 00	47 25	43 50	39 00	39 00
No. 1 cast,	20 00	19 75	21 50	23 35	24 60	33 25	34 75	35 00	32 50	28 00	28 50	28 50

* From "Iron Trade Review," Cleveland, O., Jan. 3, 1918, p. 126.

IRON ORE.

Shipments of iron ore were made during 1917 from nine mines or properties, but at five properties only were mining operations in progress, shipment from the other four being made from ore piles remaining from operations of previous years. The total shipments were less than in 1916 by 59,874 tons, a decrease of 21 per cent, and with the exception of 1911 were the lowest since 1910. The total shipments for the year were 215,302 tons valued at \$758,621 as against 275,176 tons valued at \$715,107 in 1916.

In 1917 shipments included 46,050 tons marketed in Canada and 169,252 tons sold for export. In 1916, 134,568 tons were reported as marketed in Canada and 140,608 tons sold for export. The ores shipped in 1917 comprised 17,741 tons of magnetite, titaniferous magnetite and ilmenite and 197,561 tons of roasted mixture of siderite and high sulphur hematite. The 1916 shipments included 45,541 tons of hematite; 210,522 tons of siderite and high sulphur hematite, roasted; 15,904 tons of magnetic concentrates and 3,200 tons of ilmenite.

There were no shipments of iron ore from Nova Scotia or New Brunswick deposits during the year though some development work was done by the Nova Scotia Steel and Coal Company, at Glencoe in Cape Breton. The Nictaux Nova Scotia and Bathurst New Brunswick properties owned by the Canada Iron Foundries, Ltd., still remain idle.

In Quebec the ilmenite property at Ivry-on-the-Lake, Terrebonne county, was again operated by the Manitou Iron Mining Company, the output being shipped as usual to Niagara Falls, N.Y.

Some titaniferous ores were also mined by the Baie St. Paul Titanie Iron Ore Company from the property "312" St. Urbain, Charlevoix county.

In addition to these active mining operations some magnetite ore was shipped from old dumps remaining at the Bristol mines in Pontiac county and at Ironsides in Hull township. The latter ore was shipped to Hull and Montreal and used in the calcining of magnesite at these places.

In Ontario the Algoma Steel Corporation was the principal shipper operating the Helen and Magpie mines. The Helen mine output during the past two years has consisted chiefly of high sulphur hematite which has been shipped to the Magpie plant and there mixed with siderite. The blended ore is roasted in rotary kilns producing a Bessemer grade of ore part of which was shipped to the company's furnaces at Sault Ste. Marie, but the greater portion going to United States furnaces.

Work on the magnetite ores at Sellwood owned by Moose Mountain, Ltd., was chiefly on construction and development including the experimental operation of the concentrating and briquetting plant during the last six months of the year. A few hundred tons only of concentrate and briquettes averaging over 62 per cent iron were shipped to plants in southern Ontario. A small shipment of titaniferous ore was made from the Orton mine in Hastings county by the Tivani Electric Steel Company of Belleville, and of hematite ore from the Playfair mine, near Perth, by the Canadian Union Iron Mines Corporation, Ltd.

Shipments of Iron Ore by Provinces, 1915-16-17.

Provinces.	1915.		1916.		1917.	
	Short Tons.	Value.	Short Tons.	Value.	Short Tons.	Value.
		\$		\$		\$
New Brunswick	3,683	8,261				
Quebec			3,209	8,308	17,189	54,815
Ontario	394,429	766,166	271,967	706,799	198,113	703,806
	398,112	774,427	275,176	715,107	215,302	758,621

Shipments of Iron Ore by Classes of Ore, 1907-1917.

In Short Tons.

Year.	Hematite.	Magnetite.	Carbonate Including Siderite.	Log Ore.	Total.
1907	205,795	50,073	42,740	14,248	312,856
1908	173,164	49,946	4,869	10,103	238,082
1909	190,473	74,240		3,330	268,043
1910	130,380	127,768		1,270	259,418
1911	137,309	72,945			210,344
1912	86,971	128,912			215,883
1913	(a) 92,386	215,248			307,634
1914	89,454	45,562	109,838		244,854
1915	205,989	59,217	132,906		398,112
1916	45,541	19,113	(b) 210,522		275,176
1917		17,741	197,561		215,302

(a) Small tonnage of siderite included.

(b) Includes roasted siderite and a blend of siderite and high sulphur hematite, roasted.

Shipments of Iron Ore by Provinces, 1886-1917.

Calendar Year.	New Brunswick.	Nova Scotia.	Quebec.	Ontario.	British Columbia.	Total. Short Tons.
1886		44,388		16,032	3,941	64,361
1887		43,532	13,404	15,698	2,796	76,330
1888		42,611	10,710	16,894	8,372	78,587
1889		54,161	14,533		15,487	84,181
1890		49,206	22,305	5,000		76,511
1891		53,649	14,380		950	68,979
1892		78,258	22,690		2,300	103,248
1893		102,201	22,076		1,325	125,602
1894		89,379	19,492		1,120	109,991
1895		83,792	17,783		1,222	102,797
1896		58,810	17,630	15,270	196	91,906
1897		23,400	22,436	2,770	2,099	50,705
1898		19,079	17,873	21,111	280	58,343
1899		28,000	19,420	25,126	2,071	74,617
1900		18,940	19,000	82,950	1,110	122,000
1901		18,619	15,489	272,538	7,000	313,646
1902		16,172	18,524	359,288	10,019	404,003
1903		40,335	12,035	209,634	2,290	264,294
1904		61,293	16,152	141,601		219,046
1905		84,952	12,681	193,464		291,097
1906		97,820	9,933	141,078		248,831
1907		89,839	12,748	207,769	2,500	319,856
1908		11,802	10,103	216,177		23,082
1909			4,150	263,893		268,043
1910	5,336	18,134	4,503	231,445		259,418
1911	31,120	22	3,616	175,686		210,344
1912	71,520	30,857	1,185	112,321		215,883
1913	86,416	20,436	5,102	195,680		307,634
1914	4,775			240,079		244,854
1915	3,683			394,429		398,112
1916			3,209	271,967		275,176
1917			17,150	198,152		215,302

EXPORTS AND IMPORTS OF IRON ORE.

Mine operators have reported directly the quantity of iron ore sold for export during the calendar year 1917 as 169,250 tons, as against 140,608 tons sold for export in 1916, 89,730 tons in 1915, and 60,414 tons in 1914. These records differ slightly

from those reported by the Department of Customs and shown in the table. The United States Department of Commerce record of imports from Canada is also given for comparison.

The customs record of imports of iron ore is shown in the table, the total for 1917 being only slightly less than that of 1916 but at a considerably higher price.

According to returns received from blast furnace operators the quantity of imported ores charged to blast furnaces during 1917 was 2,084,231 tons, as against 1,964,598 tons in 1916. The imported ores charged in 1917 included 874,134 tons from Newfoundland and 1,210,097 tons from the United States "Lake district." In 1916 the imported ores charged included 914,194 tons from Wabana, Newfoundland, and 1,050,404 tons of United States "Lake ores."

The total quantity of imported ores charged to Canadian blast furnaces since 1886 has been 21,493,125 tons, while the total quantity of iron ore shipped from Canadian mines during the same period was 5,974,779 tons.

Exports of Iron Ore.

Calendar Year.	Canadian Customs Record.			Calendar Year.	Imports into the United States from Canada.*		
	Short tons.	Value.	Average value.		Short tons.	Value.	Average value.
		\$	\$			\$	\$
1909.....	21,956	61,954	2 82				
1910.....	114,499	324,186	2 83				
1911.....	37,686	133,411	3 54	1911.....	56,538	106,038	1 87
1912.....	118,129	382,005	3 23	1912.....	119,476	201,882	1 69
1913.....	126,124	426,681	3 38	1913.....	201,443	409,098	2 03
1914.....	135,451	360,974	2 67	1914.....	58,816	153,415	2 61
1915.....	79,770	206,823	2 59	1915.....	94,219	245,092	2 60
1916.....	161,260	541,779	3 36	1916.....	153,255	509,602	3 32
1917.....	164,004	660,673	4 03	1917.....	200,239	766,688	3 83

*Compiled from the "Foreign Commerce and Navigation of the United States."

Imports of Iron Ore, 1912-1917.

Calendar Year.	United States.*		Newfoundland.		Other Countries.		Total.	
	Short tons.	Value.	Short tons.	Value.	Short tons.	Value.	Short tons.	Value.
		\$		\$		\$		\$
1912(*9 mos.) ...	1,206,587	3,090,207	840,892	840,892	50	975	2,047,509	3,932,974
1913.....	1,072,136	3,007,653	869,669	869,669	500	502	1,942,325	3,877,824
1914.....	749,979	1,972,550	389,850	389,850	7,279	24,958	1,147,108	2,387,358
1915.....	715,060	1,568,866	789,029	762,328	24	561	1,504,113	2,331,755
1916.....	1,364,992	3,463,419	974,685	956,594			2,339,677	4,419,013
1917.....							2,251,397	5,124,889

*Imports of iron ore separately stated in Customs Reports from April 1912 only.

PRODUCTION OF IRON ORE IN NEWFOUNDLAND.

The iron ore deposits at Wabana, Newfoundland, are owned and operated by the two Canadian companies operating coal mines and steel plants at Sydney and Sydney Mines, Cape Breton. The shipments from Wabana mines during 1917 were 883,346 short tons, all of which went to Cape Breton. The total shipments from Wabana since the mines were first operated in 1895 have amounted to 17,421,042 short tons, of which 11,622,287 tons were sent to Nova Scotia, 2,078,197 tons to the United States, and 3,720,558 tons to Great Britain and Europe.

Annual Shipments of Iron Ore from Wabana Mines, Newfoundland.

Calendar Year.	To Nova Scotia.	To United States.	To Great Britain and Europe.	Total Shipments.
	Short tons.	Short tons.	Short tons.	Short tons.
1895.....	2,686	.....	.....	2,686
1896.....	17,410	22,798	.....	40,208
1897.....	12,143	33,030	.....	50,833
1898.....	34,622	.....	5,651	113,262
1899.....	26,311	98,485	78,640	339,118
1900.....	195,507	153,867	214,322	364,150
1901.....	457,064	84,292	14,776	820,458
1902.....	376,322	96,702	279,102	814,445
1903.....	273,283	90,711	341,421	651,787
1904.....	342,710	6,025	287,793	647,429
1905.....	506,819	6,490	298,694	769,155
1906.....	628,152	141,854	255,846	983,873
1907.....	672,561	123,972	213,867	983,607
1908.....	713,772	59,537	167,074	973,337
1909.....	697,068	241,207	200,033	1,109,907
1910.....	808,762	247,336	171,722	1,259,626
1911.....	737,261	207,193	203,528	1,181,463
1912.....	956,458	191,779	237,009	1,331,910
1913.....	1,048,433	229,402	183,673	1,605,921
1914.....	417,409	43,513	328,086	633,929
1915.....	802,128	.....	172,998	868,451
1916.....	1,012,060	.....	66,323	1,012,060
1917.....	883,346	.....	.....	883,346
Total.....	11,622,287	2,073,197	3,720,558	17,421,042

IRON ORE PRICES.

The prices of Canadian iron ores are naturally based on prices current in the United States. "Lake ores," that is, those originating in what is generally known as the Lake Superior iron region, and which contributes about 80 per cent of the iron and steel requirements of the United States are quoted per gross ton delivered at Lake Erie ports. Ore prices and freights are usually fixed at the beginning of each season, and the price of any individual ore then depends on its variation from the standard in iron and phosphorus content, etc.

Bessemer ores are quoted on the basis of 55 per cent iron natural and 0.045 per cent phosphorus dried at 212° F. The base for Non-Bessemer ores is 51.5 per cent iron natural.

Iron ore prices per gross ton during the past four years have been as follows:—

	1914 and 1915.	1916.	1917 to July 1, 1918.	From July 1, 1918.
Old Range Bessemer.....	\$3 75	\$4 45	\$5 95	\$6 40
Mesabi Bessemer.....	3 50	4 20	5 70	6 15
Old Range Non-Bessemer.....	3 00	3 70	5 20	5 65
Mesabi Non-Bessemer.....	2 85	3 55	5 05	5 50

Since 1900 the price of Old Range Bessemer ores has ranged between a minimum of \$3 in 1904 and a maximum of \$6.48 in 1900, Non-Bessemer ores being generally from 50 to 80 cents lower.

LAKE FREIGHT RATES.

Lake freight rates on iron ore from upper lake ports to lake Erie during the past four years have been as follows, in cents per ton:—

	1914.	1915.	1916.	1917.
From Escanaba, Mich.....	35	25	35	75
" Marquette, Minn.....	45	35	45	90
" the head of the Lakes.....	50	40	50	100

The Marquette rate which covers shipments from Michipicoten fell from a maximum of 94 cents in 1900 to a minimum of 35 cents in 1915. The 1917 rate approaches very closely to the record.

Shipments from Key Harbour (Moose Mountain ore) have been at the Escanaba rate or 10 to 15 cents lower than Michipicoten.

The above rates are quoted net, there is an additional unloading charge of 10 cents per ton.

IRON ORE PRODUCTION IN THE UNITED STATES.

The shipments of iron ore from the Lake Superior district during 1917, including both rail and water shipments, were 64,275,000 gross tons, as compared with 66,394,507 tons shipped in 1916. The shipments in 1915 were 47,272,751 tons, in 1914, 32,729,726 tons; in 1913, 49,947,116 tons; and in 1912, 48,221,546 tons.

The total shipments of iron ore in the United States from all sources were in 1917, 75,573,181 gross tons as compared with 77,870,553 gross tons in 1916; 55,493,100 gross tons in 1915; 41,439,761 gross tons in 1914, and 61,980,437 gross tons in 1913.

During the past twenty years the Lake Superior district has supplied from 82 to 95 per cent of the total United States production.

PIG-IRON.

The total production of pig-iron in 1917, not including the output of ferro-alloys was 1,170,480 short tons (1,045,071 long tons) valued at \$25,925,960, as compared with 1,169,257 short tons (1,043,979 long tons) valued at \$16,750,898 in 1916.

The 1917 production included in addition to blast furnaces output a small quantity of high grade low phosphorous pig-iron made in electric furnaces the demand and high price offered for this grade of iron having made its manufacture from scrap steel in electric furnaces a profitable operation.

The electric pig-iron so produced amounted to 13,691 tons valued at \$735,859, or an average of \$53.75 per ton, and the production from blast furnaces was 1,156,789 short tons valued at \$24,290,101. Thus, although the total production of pig-iron was slightly greater than in 1916 the actual production in blast furnaces was somewhat less than during the previous year.

The Nova Scotia production, all blast furnace pig, was 472,147 tons as against 470,055 tons in 1916, and was the highest output made since 1913 when the maximum production of 480,068 tons was reached.

The Ontario production shown as 698,333 tons included 684,642 tons of blast furnace pig, and 13,691 tons of pig-iron made from scrap steel in electric furnaces. Though included with the Ontario record a portion of the electric furnace output was made in electric furnace plants at Montreal and Shawinigan Falls, Quebec.

Of the total output in 1917, 14,092 tons were made with charcoal as against 17,304 tons made with charcoal in 1916.

By grades, the 1917 production included: Basic, 961,656 tons; Bessemer, 27,783 tons; and foundry and all other, 181,041 tons. The 1916 production included: Basic, 953,627 tons; Bessemer, 31,388 tons; foundry and malleable, etc., 184,242 tons.

Annual Production of Pig-Iron by Provinces, 1887-1917.

Year.	Nova Scotia.		Ontario.		Quebec.		Total.	
	Short Tons.	Value.	Short tons.	Value.	Short tons.	Value.	Short tons.	Value.
		\$		\$		\$		\$
1887.....	19,320	250,000			5,507	116,192	24,827	366,192
1888.....	17,556	211,403			4,243	101,832	21,799	313,235
1889.....	21,289	383,202			4,632	116,670	25,921	499,872
1890.....	18,382	262,608			3,390	69,080	21,772	331,688
1891.....	20,840	297,728			3,051	71,173	23,891	368,901
1892.....	34,393	458,556			8,050	178,865	42,443	637,421
1893.....	46,472	553,408			9,475	236,875	55,947	790,283
1894.....	41,344	449,533			8,623	196,914	49,967	646,447
1895.....	35,192	417,083			7,292	169,653	42,484	586,736
1896.....	32,351	400,829	28,302	368,942	6,615	154,358	67,268	924,129
1897.....	22,540	239,000	26,115	291,466	9,392	217,235	58,007	738,701
1898.....	21,627	221,677	48,253	530,789	7,135	159,929	77,015	912,395
1899.....	31,130	404,300	64,749	808,157	7,094	164,819	102,943	1,377,306
1900.....	28,133	421,995	62,387	938,725	6,055	140,978	96,575	1,501,698
1901.....	151,130	1,764,017	116,371	1,599,413	6,875	149,493	274,376	3,512,923
1902.....	237,244	2,477,767	112,688	1,584,273	7,970	181,501	357,902	4,243,541
1903.....	201,246	2,186,273	87,004	1,345,464	9,635	210,973	297,846	3,742,710
1904.....	164,488	1,700,130	127,845	1,746,126	11,121	241,729	303,454	3,687,985
1905.....	261,014	2,440,722	256,704	3,868,197	7,588	166,267	525,306	6,475,186
1906.....	315,008	3,139,217	275,558	4,338,275	7,845	177,644	598,411	7,955,136
1907.....	366,456	4,211,913	275,459	4,581,309	10,647	232,004	651,962	9,125,226
1908.....	352,642	3,554,540	271,484	4,385,271	6,709	171,383	630,835	8,111,194
1909.....	345,380	3,453,800	467,012	6,002,441	4,770	125,623	757,162	9,581,844
1910.....	350,287	4,203,444	447,273	6,956,923	3,237	85,255	800,797	11,245,622
1911.....	390,242	4,682,904	526,635	7,606,939	658	17,282	917,535	12,397,125
1912.....	424,944	6,374,910	589,593	8,176,089			1,014,587	14,550,999
1913.....	489,068	7,291,020	648,899	9,338,992			1,124,967	16,540,012
1914.....	227,052	2,951,676	556,112	7,051,180			783,164	10,002,856
1915.....	420,275	5,463,575	493,500	5,910,624			913,775	11,374,199
1916.....	470,055	7,050,825	699,292	9,700,073			1,169,257	16,750,898
1917.....	472,147	10,387,234	698,333	14,038,726			1,170,480	25,425,960

Annual Production of Pig-Iron by Grades, and by Fuels.

In Short Tons.

Year.	By Grades.			By Fuels.		Electric.
	Basic.	Bessemer	Foundry and all other.	Charcoal.	Coke.	
1909.....	400,921	222,931	133,310	17,093	740,159	
1910.....	425,400	219,492	155,905	17,164	783,633	
1911.....	464,221	208,626	244,688	20,759	846,776	
1912.....	544,534	236,191	213,862	21,701	992,886	
1913.....	614,845	265,685	248,437	23,696	1,105,271	
1914.....	346,553	239,817	205,791	9,380	773,784	
1915.....	739,613	29,052	145,110	13,692	990,083	
1916.....	953,627	31,388	184,242	17,294	1,151,953	
1917.....	961,656	27,783	181,041	14,002	1,142,637	13,691

Monthly Prices of Foundry Pig-Iron at Montreal.*

	1908.	1909.	1910.	1911.	1912.	1913.	1914.	1915.	1916.	1917.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
January.....	21 00	18 00	18 50	21 00	19 75	22 00	19 75	19 35	23 50	28 00
February.....	21 00	18 00	18 50	21 00	19 05	22 00	19 75	19 35	23 50	28 30
March.....	22 00	18 00	18 50	21 00	19 00	22 00	19 75	20 10	24 00	28 30
April.....	20 00	18 00	19 00	21 00	18 50	22 00	19 75	19 90	25 00	30 35
May.....	19 00	18 75	19 00	19 25	18 50	22 00	19 75	19 90	25 00	40 45
June.....	18 75	18 75	18 50	19 25	18 50	21 50	19 75	19 90	25 00	40 50
July.....	18 75	18 50	18 50	19 25	18 50	20 50	19 50	19 90	25 00	40 50
August.....	18 00	18 50	18 00	19 25	19 00	20 50	19 50	19 90	25 00	**
September.....	18 00	18 50	18 00	19 25	20 00	20 50	19 50	20 00	25 00	**
October.....	17 75	19 00	21 00	19 25	20 50	20 50	19 50	20 00	25 00	**
November.....	18 00	19 00	21 00	19 25	20 50	19 75	19 40	21 00	25 00	**
December.....	18 25	19 00	21 00	19 25	21 50	19 75	19 40	22 00	28 00	**
Average.....	19 21	18 50	19 13	19 83	19 44	21 17	19 61	20 10	24 92	

* No. 1 Foundry Pig-iron, f.o.b. cars Montreal, price per ton of 2,240 pounds on the opening market day of each month. Quotation furnished by the Dominion Iron & Steel Co., Ltd.

** No quotation.

Average Monthly Prices of Bessemer Pig-Iron at Pittsburgh.*

Per Gross Ton (2,240 Pounds).

	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917
	\$	\$	\$	\$	\$	\$	\$	\$		\$
January.....	19.00	17.34	19.90	15.90	15.05	18.15	14.96	14.59	21.58	35.95
February.....	17.90	16.78	19.34	15.90	15.90	18.15	15.09	14.55	21.51	35.95
March.....	17.86	16.25	18.60	15.90	15.09	18.15	15.09	14.55	21.75	37.70
April.....	17.49	15.78	18.27	15.90	15.15	17.90	14.90	14.55	21.95	42.20
May.....	16.93	15.84	17.52	15.90	15.12	17.70	14.90	14.59	21.95	45.15
June.....	16.90	16.05	16.60	15.90	15.15	17.14	14.90	14.70	21.95	54.70
July.....	16.83	16.46	16.40	15.90	15.20	16.70	14.90	14.95	21.95	57.45
August.....	16.23	17.03	16.09	15.90	15.46	16.52	14.90	15.95	21.95	54.75
September.....	15.90	18.05	15.90	15.90	16.15	16.65	14.90	16.85	22.26	48.03
October.....	15.71	19.53	15.90	15.44	17.80	16.60	14.84	16.95	24.08	37.25
November.....	16.59	19.90	15.82	15.00	18.02	16.02	14.59	17.61	30.15	37.25
December.....	17.40	19.90	15.90	15.03	18.15	15.77	14.70	19.65	35.58	37.25

* From the *Iron Age*.

Average Monthly Price of Local No. 2 Foundry Pig-Iron at Chicago.*

(At Furnace) per Gross Ton (2,240 lbs.).

	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917
January.....	18.15	17.35	19.00	15.50	14.00	17.90	13.75	13.00	18.50	30.00
February.....	18.16	16.75	19.00	15.50	14.00	17.31	14.00	13.00	18.50	32.00
March.....	17.85	16.50	18.30	15.50	14.00	17.25	14.25	12.95	18.70	36.00
April.....	17.73	16.50	17.50	15.00	14.00	17.00	14.25	13.00	19.00	39.25
May.....	17.63	16.50	17.00	15.00	14.50	16.00	14.06	13.00	19.00	43.80
June.....	17.73	16.50	16.75	15.00	14.50	15.62	13.69	13.00	19.00	51.00
July.....	17.55	17.60	16.50	14.87	14.70	14.70	13.75	13.00	19.00	55.00
August.....	17.35	17.13	16.50	14.50	15.37	15.00	13.69	13.44	18.40	55.00
September.....	17.05	18.70	16.40	14.50	16.00	15.00	13.25	13.00	18.13	54.67
October.....	16.85	19.00	16.06	14.46	17.00	15.00	12.94	14.63	19.63	33.00
November.....	17.10	19.00	16.00	14.09	17.75	14.87	12.56	17.13	25.80	33.00
December.....	17.35	19.00	16.00	14.00	18.00	14.60	13.00	18.10	29.50	33.00

* From the *Iron Age*, New York.

The quantities of ores, fuels and flux charged to blast furnaces during the past ten years is shown in the following table. In 1917 about 95.8 per cent of the ore charged, 53.3 per cent of the coke, and a large proportion of the limestone, were imported. Previous to 1896 the entire Canadian pig-iron production was from Canadian ores but since that date increasing quantities of imported pig-iron have been used.

The iron industry at Sydney and North Sydney has been built up on the basis of the Newfoundland Wabana ores and the local coal supply, while in recent years a portion of the limestone required has also been obtained from Port au Port, Newfoundland. In Nova Scotia, therefore, while the fuel is all domestic, the ore is practically all imported, though from a British colony.

In Ontario large quantities of United States "Lake ores" are used. All the fuel used, with the exception of a small quantity of charcoal is imported either as coke, or as coal for charging the by-product coke ovens at Sault Ste. Marie. A portion of the limestone flux is also obtained from quarries situated in the United States. In 1917, Ontario furnaces used 1,210,097 tons of imported ores and 92,065 tons of Canadian ores, the percentage being 93 per cent imported and 7 per cent Canadian. In 1916, 1,050,404 tons of imported ore, or 82.6 per cent of the total and 221,273 tons of Canadian ores, or 17.4 per cent of the total were charged. In 1915, 623,094 tons of imported ore, or 68 per cent of the total, and 293,305 tons or 32 per cent of Canadian ores were charged.

Iron Ore, Fuel, and Flux charged to Blast Furnaces.

Calendar Year.	Iron Ore charged.		Fuel charged.			Limestone.
	Canadian.	Imported.	Charcoal.	Coke from Canadian Coal.	Coke Imported or made from Imported Coal.	
	Short tons.	Short tons.	Bushels.	Short tons.	Short tons.	Short tons.
1908	209,236	1,651,445	1,121,990	492,070	325,670	483,065
1909	231,994	1,235,140	1,779,258	412,016	507,255	529,076
1910	149,505	1,377,035	1,615,919	491,281	476,838	569,355
1911	67,434	1,628,368	1,960,459	543,333	577,388	625,216
1912	71,588	2,019,165	1,896,748	609,183	656,815	705,613
1913	130,436	2,110,828	2,206,191	710,260	706,888	630,119
1914	182,964	1,324,326	920,045	390,269	590,902	447,611
1915	293,305	1,463,488	1,314,907	578,743	486,022	573,743
1916	221,773	1,064,508	1,813,209	712,715	645,488	701,690
1917	92,065	2,084,231	1,288,330	634,962	723,657	750,826

IRON BLAST FURNACES IN CANADA IN 1917.

Of 19 furnaces 13 were in blast in 1917 for varying periods of time. The total daily capacity of the 19 furnaces is about 4,835 tons. The operating companies, with numbers and capacities of furnaces, were as follows:—

Dominion Iron & Steel Company, Sydney, C.B.: Six completed furnaces; one of 350 tons capacity and five of 250 tons capacity each per day; three operated throughout the year, one for 261 days and one for 113 days; one furnace idle throughout the year.

Nova Scotia Steel & Coal Co., Ltd., New Glasgow, N.S.: Two stacks and one set of stoves at Sydney Mines, C.B., of 250 tons capacity; operated throughout the year.

Londonderry Iron & Mining Co., Ltd., Londonderry, N.S. (in liquidation): One furnace of 100 tons capacity idle throughout the year, not operated since 1908.

Canada Iron Foundries, Ltd., Montreal, Que.: Two furnaces one of 125 tons, and the other of 250 tons capacity, at Midland Ont.; both idle throughout the year, not operated since 1913, the larger furnace sold to and removed by the Algoma Steel Corporation, Ltd.

Standard Iron Co., Ltd., Deseronto, Ont.: One furnace at Deseronto with a daily capacity of 65 tons, operated 214 days; one furnace of 65 tons at Parry Sound, idle throughout the year, not operated since 1913.

The Steel Company of Canada, Ltd., Hamilton, Ont.: Two furnaces; one of 260 tons capacity, operated for 295 days, a second furnace of 430 tons capacity operated 360 days.

Algoma Steel Corporation, Ltd., Sault Ste. Marie, Ont.: Three furnaces at Steelton, near Sault Ste. Marie; two of 280 tons capacity each, and one of 500 tons capacity, operated throughout the year. One new 400-ton furnace under construction.

The Atlantic Iron Co., Ltd., Port Arthur, Ont.: One furnace of 175 tons capacity idle throughout the year, not operated since 1911.

The Canadian Furnace Co. Ltd., Port Colborne, Ont.: One furnace of 325 tons capacity operated 357 days in 1916.

ELECTRIC FURNACE PLANTS MAKING PIG-IRON.

Fraser, Brace & Co., Ltd.: Furnace plant at Shawinigan Falls, Que.: One single phase 2½-ton furnace, a non-tilting, silicon brick lined shell on a solid foundation.

Canada Cement Company, Ltd., Montreal, Que.: The steel department includes two open-hearth furnaces and four 6-ton electric furnaces of three phase type. The electric furnaces were operated on pig-iron during a portion of the year.

Electro Foundries, Ltd., Orillia: One 6-ton three phase type electric furnace.

Wm. Kennedy & Sons, Collingwood: One electric furnace.

Turnbull Electro Metals, Ltd., St. Catharines, Ont.: One 6-ton three phase type electric furnace.

British Forgings, Ltd., Toronto, Ont.: An electric steel furnace plant comprising ten 6-ton Heroult furnaces some of which were used for the production of pig-iron during a portion of 1917.

Tivani Electric Steel Co., Ltd., Belleville, Ont.: This electric steel plant which includes three small furnaces was operated for the production of ferro-molybdenum during 1917, but in March, 1918, began the production of pig-iron.

Aetna Iron and Steel Co., Ltd., Port Moody, B.C.: One 6-ton Heroult electric furnace,—first production in May 1918.

Hull Iron and Steel Foundries, Hull, Que.: One 6-ton three phase tilting type electric furnace,—first production in April 1918.

Electric Smelting Co. of Brantford, Ltd., Hull, Que.: One 4-ton electric furnace,—first production in June 1918.

FERRO-ALLOY PRODUCTION.

The production of ferro-alloys during 1917 which reached a total of 43,465 tons, valued at \$3,549,811 included ferro-silicon, ferro-molybdenum and ferro-phosphorus made in electric furnaces, a small tonnage of low grade ferro-silicon recovered as a by-product in the manufacture of abrasives from bauxite in electric furnaces and some blast furnace spiegeleisen.

The total production during 1916 which included only ferro-silicon, ferro-molybdenum and ferro-phosphorus made in electric furnaces, was 28,628 tons, valued at \$1,777,615, as against 10,794 tons, valued at \$753,404 in 1915; 7,524 tons, valued at \$478,355 in 1914, and 8,075 tons, valued at \$493,018 in 1913. In 1912 the production was 7,814 tons, valued at \$465,225 and in 1911, 7,507 tons, valued at \$376,404.

FERRO-ALLOY PLANTS IN 1917.

Electro Metals, Ltd., Welland, Ont.: Plant includes 8 electric furnaces producing ferro-silicon of 25 per cent, 50 per cent, 75 per cent, and 85 per cent grades.

Tivani Electric Steel Co., Ltd., Belleville, Ont.: Small electric furnaces comprising three units of two furnaces each making ferro-molybdenum in 1917.

International Molybdenum Co. Ltd., Orillia, Ont.: Two small electric furnaces producing ferro-molybdenum in 1917.

Algoma Steel Corporation, Sault Ste. Marie, Ont.: Producing spiegeleisen in blast furnace.

The following firms were also recovering low grade ferro-silicon as a by-product in the manufacture of artificial abrasives in electric furnaces from bauxite:—

D. A. Brebner, Ltd., Hamilton, Ont.

National Abrasive Co., Hamilton, Ont.

The Exolon Company, Thorold, Ont.

The Norton Company, Chippewa, Ont.

The Canadian Aloxite Co., Niagara Falls, Ont.

Electric furnace plants for the manufacture of 50 per cent ferro-silicon are also under construction in 1918 by,

The Canadian Ferro Alloys Ltd., at Shawinigan Falls, Que.

The Leaside Munitions Ltd., at Beauport, Que.

EXPORTS AND IMPORTS OF PIG-IRON.

The exports of pig-iron during 1917 are reported as 12,081 tons, valued at \$123,814 or an average of \$35.08 per ton, as against exports during 1916 of 23,304 tons, valued at \$374,383, or an average of \$16.07 per ton. The exports of ferro-alloys during the same year were 33,212 tons, valued at \$2,616,924, or an average of \$78.79 per ton, as compared with exports in 1916 of 22,802 tons, valued at \$1,352,013, or an average of \$59.29 per ton.

The total exports of pig-iron and ferro-alloys were thus 45,293 tons, valued at \$3,040,738 in 1917, as against 46,106 tons, valued at \$1,726,306 in 1916.

The exports between 1905 and 1913 did not exceed 10,000 tons in any one year, and consisted largely, if not entirely, of ferro-alloys. During 1914, however, there was a small export of pig-iron, chiefly from Sydney to Philadelphia. The exports during the first three months of the year were 4,431 tons, which probably included about 4,000 tons of pig-iron. From the first of April the exports were separately classified and during the last nine months of the year included 9,767 tons of pig-iron valued at \$118,111, or an average of \$12.09 per ton, and 4,865 tons of ferro-alloys valued at \$285,221, or an average of \$58.63 per ton.

Annual Exports of Pig-Iron and Ferro-alloys, 1915-17.

Calendar Year.	Pig-iron.			Ferro-alloys.		
	Short tons.	Value.	Average value.	Short tons.	Value.	Average value.
1915.	17,367	\$ 231,551	13.38	9,238	\$ 537,081	58.14
1916.	23,304	374,383	16.07	22,802	1,352,013	59.29
1917.	12,081	423,814	35.08	33,212	2,616,924	78.79

The imports of pig-iron during 1917 as shown by the Customs reports were 83,390 tons, valued at \$2,763,502, and the imports of ferro-alloys 12,828 tons, valued at \$2,029,990, making a total of 96,218 tons, valued at \$4,793,492. As against this record, however, the United States Department of Commerce shows exports to Canada during the same period of pig-iron and ferro-alloys amounting to 171,147 short tons, valued at \$6,279,651.

The Canadian imports of pig-iron in 1916 were 58,130 tons, valued at \$1,145,150, and of ferro-alloys 14,777 tons, valued at \$1,879,538, or a total of 72,907 tons, valued at \$3,024,688.

Previous to 1907 the annual imports of pig-iron varied from less than 20,000 tons to nearly 100,000 tons per annum. In 1907, however, the imports, exceeded 250,000 tons and during each of the years from 1910 to 1913, inclusive, the imports exceeded 200,000 tons.

The annual imports of ferro-alloys during the past few years have varied between 11,000 and 30,000 tons, having reached a maximum in 1913. During 1917 the exports of ferro-alloys were more than double the imports.

Annual Imports of Pig-Iron showing Country of Origin.

Calendar Year	United States.			Great Britain.			Other Countries.		
	Short tons.	Value.	Value per ton.	Short tons.	Value.	Value per ton.	Short tons.	Value.	Value per ton.
1908.	25,434	\$ 448,794	816 08	30,574	\$ 414,410	813 54	335	\$8,705	825 09
1909.	50,167	735,138	14 65	87,394	1,065,709	12 08	364	7,255	19 03
1910.	107,984	1,516,685	14 05	119,678	1,603,951	13 40	91	2,050	22 63
1911.	122,360	1,532,806	12 60	86,125	1,058,078	12 29	2	15	7 50
1912.	210,756	2,509,117	12 34	61,809	912,482	14 76	.....	.....	.....
1913.	213,969	2,688,974	13 50	22,800	358,431	15 72	.....	.....	.....
1914.	69,254	862,568	12 45	9,426	119,591	12 68	.....	.....	.....
1915.	46,894	615,265	13 12	388	8,932	15 19	.....	.....	.....
1916.	57,256	1,129,790	19 73	594	10,614	17 87	280	4,737	16 91
1917.	.....	.....	.....	.....	.....	.....	.....	.....	.....

*Destinations not reported for 1917.

Annual Imports of Pig-Iron since 1907.

Year.	Pig-iron.			Charcoal Pig-iron.			Total.	
	Short tons.	Value.	Average value.	Short tons.	Value.	Average value.	Short tons.	Value.
1907.	249,582	\$ 4,117,887	\$ 16 50	2,062	\$ 44,806	\$ 20 27	251,644	\$ 4,162,693
1908.	57,343	871,615	15 20	1,022	18,818	18 41	58,365	890,433
1909.	137,925	1,798,192	13 04	413	5,727	13 87	138,338	1,803,919
1910.	227,753	3,122,005	13 71	16,106	242,152	15 03	243,859	3,364,157
1911.	208,487	2,610,989	12 52	.....	.....	.....	208,487	2,610,989
1912.	272,565	3,511,599	12 88	115	1,370	11 91	272,680	3,512,969
1913.	235,843	3,234,877	13 72	926	12,528	13 53	236,769	3,247,405
1914.	78,594	981,107	12 48	80	1,082	12 58	78,674	982,189
1915.	47,482	624,200	13 15	.....	.....	.....	47,482	624,200
1916.	57,307	1,128,557	19 68	793	16,593	20 92	58,100	1,145,150
1917.	82,758	2,744,065	33 16	632	19,447	30 77	83,390	2,763,512

Imports of Ferro-alloys, 1916 and 1917.

	1916.			1917.		
	Tons.	Value.	Value per ton.	Tons.	Value.	Value per ton.
		\$	\$ cts.		\$	\$ cts.
Ferro-silicon containing not more than 15% silicon.	4,563.7	41,456	26 51	1,243.3	50,067	40 27
Ferro-silicon containing more than 15% silicon.	7.9	835	105 70	7.6	2,126	279 73
Spiegeleisen and ferro-manganese containing over 15% manganese.	12,658.0	1,309,660	110 58	10,872.0	1,430,091	131 54
Spiegeleisen and ferro-manganese containing not more than 15% manganese and other ferro-products, n.o.p.	547.4	437,587	799 39	705.6	547,766	776 23
	14,777.0	1,879,538	.....	12,828.5	2,029,990	.....

Imports of Ferro-Manganese, Ferro-Silicon, etc.

Calendar year.	Short tons.	Value.	Average value.	Calendar year.	Short tons.	Value.	Average value.
		\$	\$			\$	\$
1907	15,437	536,285	31 74	1913	30,355	990,443	30 98
1908	11,718	401,761	34 29	1914	22,147	549,485	27 81
1909	17,699	411,536	23 25	1915	13,758	807,312	58 68
1910	18,900	464,741	24 59	1916	14,777	1,879,538	127 19
1911	17,226	429,458	24 93	1917	12,828	2,029,990	158 25
1912	19,810	469,884	23 72				

CONSUMPTION OF PIG-IRON AND FERRO-ALLOYS.

The total quantity of pig-iron and ferro-alloys used in Canada arrived at by adding to the production the excess of imports over exports amounted in 1917 to 1,264,870 tons, as against 1,224,686 tons in 1916, and 959,254 tons in 1915. Of the total amount consumed in 1917, 1,146,861 tons are reported as having been used in steel furnaces, leaving 118,009 tons of iron available for foundry and other uses. The consumption in steel furnaces included 1,112,082 tons of pig-iron and 34,779 tons of ferro-alloys.

The annual consumption since 1910 compiled upon the same basis is shown in the following table:—

Consumption of Pig-Iron and Ferro-alloys.

Year.	Used in steel furnaces.		Available for foundry and other uses.	Total consumption * Short tons.
	Pig-iron.	Ferro-alloys.		
1910	690,913	8,143	361,914	1,060,970
1911	700,679	21,359	422,847	1,144,885
1912	735,559	24,237	548,024	1,307,820
1913	913,722	29,408	454,710	1,397,840
1914	619,030	20,252	233,170	872,452
1915	748,114	13,911	197,199	969,254
1916	949,444	25,949	249,302	1,224,686
1917	1,112,082	34,779	118,009	1,264,870

* Production of pig-iron and ferro-alloys plus excess of imports over exports.

STEEL.

The production of steel during 1917 has been reported from 27 separate plants (including 8 electric furnace plants), operated by 24 companies.

The total production of steel ingots and castings during the year was 1,745,734 short tons, as compared with 1,428,249 tons in 1916 and 1,020,896 tons in 1915. The increase in 1917 over 1916 was 317,485 tons or over 22 per cent as against an increase in 1916 over the previous year nearly 40 per cent.

The 1917 production included, open-hearth steel, 1,685,715 tons; electric steel, 50,467 tons; crucible and converter steels, 9,552 tons. In 1916 the open-hearth production was 1,400,883 tons; electric steel, 19,639 tons; Bessemer, crucible and other steels, 7,727 tons.

The production of electric steel in 1915 was 5,625 tons, and in 1914, the first year for which a production was reported, 61 tons.

Statistics of the production of steel ingots and castings since 1891 are given in the following table, the figures for 1894 to 1906, inclusive, having been collected and published by the American Iron and Steel Association; those for the years 1907 to 1916 have been collected by this Department.

Annual Production of Steel Ingots and Castings.

(In short tons).

Year.	Steel Ingots.				Steel Castings.			Total Ingots and castings.
	Open hearth.	Bessemer.	Electric and other steels.	Total ingots.	Open- hearth.	Electric and other steels.	Total castings.	
1894.....								28,767
1895.....								19,040
1896.....								17,920
1897.....								20,608
1898.....								24,125
1899.....								21,640
1900.....								26,106
1901.....								29,214
1902.....				197,959			5,922	203,881
1903.....				198,249			5,047	203,296
1904.....				159,352			7,286	166,638
1905.....				441,342			10,521	451,863
1906.....				622,623			16,773	639,396
1907.....	459,240	225,989		685,229	20,602	1,151	21,753	706,982
1908.....	443,442	137,557		578,999	9,051	713	9,764	588,763
1909.....	535,988	203,715		739,703	14,013	1,003	15,016	754,719
1910.....	580,932	222,668		803,600	18,685	599	18,684	822,284
1911.....	651,676	209,817		861,493	20,163	740	20,903	882,396
1912.....	692,236	231,044		923,280	31,845	2,556	34,401	957,681
1913.....	824,818	301,932		1,126,750	39,217	3,026	42,243	1,168,993
1914.....	608,383	203,181		811,567	15,315	1,759	17,074	828,641
1915.....	962,411	19,448	7,970	989,829	28,384	2,683	31,067	1,020,896
1916.....	1,377,387	1,416	18,900	1,397,703	23,496	7,050	30,546	1,428,249
1917.....	1,642,085		49,206	1,691,291	43,630	10,813	54,443	1,745,734

Materials charged to Steel Furnaces.—The total quantity of pig-iron used in steel furnaces during 1917 was 1,112,082 tons, of which 993,805 tons were produced by the firms reporting, and 118,277 tons purchased. The quantity of ferro-alloys used was 34,779 tons. The total quantity of scrap iron and steel used was 1,022,156 tons, of which 527,400 tons originated with the firms reporting, and 495,056 tons were reported as released. Ores used included 2,726 tons of manganese ore and 39,793 tons of iron ore, while 231,563 tons of limestone and dolomite were used, and 17,084 tons of fluor spar. In Ontario, about 1,188 million cubic feet of natural gas were used, while in Nova Scotia coke-oven gas was used at Sydney, of which a record of quantity was not obtained.

A record of materials used in steel furnaces covering the past eight years is shown in the following table:—

Pig-Iron, Scrap Iron, and other Materials Charged to Steel Furnaces.

(In short tons).

Year.	Pig-iron.	Ferro-alloys.	Scrap Iron and Steel.	Iron Ore	Manganese Ore.	Fluorspar.	Limestone and Dolomite.
1910	690,913	8,143	211,453	39,332	1,317	7,461	144,110
1911	700,769	21,359	278,797	42,892	829	8,067	130,270
1912	735,559	24,237	336,265	43,006	985	9,709	148,045
1913	913,722	29,408	406,403	55,018	1,342	10,687	197,028
1914	619,030	20,252	286,863	37,686	723	7,845	114,859
1915	748,114	13,941	413,266	74,872	908	13,520	252,045
1916	949,444	25,940	469,162	55,059	1,578	13,213	224,772
1917	1,112,082	34,779	1,022,456	39,793	2,726	17,084	231,563

It will be noted that there is a large consumption of scrap iron and steel in the manufacture of steel ingots and castings. For each 100 tons of pig-iron used in 1917 the quantity of scrap charged was 91 tons. In 1916, 71.5 tons of scrap iron were used to each 100 tons of pig-iron and in the two preceding years the ratios were 55.2 tons and 46.3 tons respectively.

The exports of scrap iron and steel in 1917 are shown by the customs reports as 176,571 tons, valued at \$2,300,022, or an average of \$13.02 per ton, as against exports of 114,300 tons, valued at \$1,357,018, or an average of \$11.87 per ton in 1916, and 89,358 tons, valued at \$883,134, or an average of \$9.88 per ton in 1915.

From 1900 to 1912 the annual exports of scrap varied considerably, the lowest being 4,208 tons in 1911 and the highest 24,109 tons in 1905. During the past five years the exports have increased very rapidly.

The total imports of scrap iron and scrap steel in 1917 are reported as 20,654 tons, valued at \$454,079, or an average of \$21.98 per ton, as against imports in 1916 of 11,574 tons, valued at \$179,751, or an average of \$15.53 per ton, and imports in 1915 of 11,477 tons, valued at \$127,614, or an average of \$11.12 per ton. In 1913 the imports exceeded 100,000 tons and during the preceding 20 years the imports varied from 8,000 tons to 70,000 tons per annum.

Tabulated records of the exports and imports of scrap iron and steel were published in the report on production of iron and steel, 1916.

Rolling Mill Production.—Statistics of the production of rolled iron and steel products have been received from all firms operating rolling mills in Canada. The principal rolled products are, in addition to blooms and billets, steel rails, wire rods, bars and rods, and a small tonnage of plates and structural steel. In addition to rolled products there are also manufactured at some of these plants, forgings, angle splice bars, rail fastenings, nails and spikes, wire and wire fencing, and many other classes of finished iron and steel products, a detailed record of which is not obtained.

The quantity of steel used by rolling mills in 1917 included 1,503,599 tons of ingot produced by firms reporting, 49,680 tons of ingots, blooms, billets, and plates, purchased, and 125,554 tons of scrap iron and steel. In 1916 the quantity of steel used by rolling mills included 1,360,797 tons of ingots produced by firms reporting 83,090 tons of ingots, blooms, and billets purchased, and 130,734 tons of scrap iron and steel. In 1915 the quantities of steel used included 1,033,682 tons of ingots produced by firms reporting 21,975 tons of ingots, blooms and billets purchased, and 57,051 tons of scrap iron and steel.

The production in 1917 included: Steel rails, 46,645 tons; wire rods, 195,392 tons; bars, plates and structural steel, 631,389 tons; forged products, 87,155 tons. The production in 1916 included: Steel rails, 90,123 tons; wire rods, 179,226 tons; bars and plates, 619,500 tons; forged products, etc., 152,668 tons. The production in

1915 included: Steel rails, 232,411 tons; wire rods, 124,381 tons; bars and plates, 294,595 tons; forged products, etc., 34,358 tons. In addition to the above there was also a small production of billets for export.

The annual production of rolling mills in so far as returns have been furnished to this Department, are as follows:—

Annual Production of Rolling Mills.

(In short tons).

Year.	Steel Rails.	Wire Rods.	Bars and Plates.	Other Products.*
1908.	300,935	41,420		
1909.	377,642	81,762		
1910.	399,762	88,456	128,940	28,354
1911.	399,760	85,811	202,023	62,676
1912.	471,422	68,174	267,797	36,441
1913.	554,481	57,389	269,096	51,654
1914.	428,226	93,856	143,754	42,070
1915.	232,411	124,381	294,595	34,358
1916.	90,123	179,226	619,500	132,668
1917.	46,645	195,392	654,389	87,155

* Includes forged products, angle splice bars, and rail fastenings.

Steel Billets.—A record of monthly prices of mild steel billets at Montreal as quoted by the Dominion Iron and Steel Company, is shown in an accompanying table.¹

During 1916 prices steadily increased during the year, quotations in January and February being from \$38.50 to \$40.50 per gross ton and in December from \$52 to \$55 per gross ton. In April of 1917 the price was increased to \$60 and for the last eight months of the year, quotations are not recorded.

In Pittsburgh, open-hearth billets averaged \$32 per gross ton in January, 1916, increasing to \$45 in April and May. There was a slight decrease during the next three months followed by further increases to a maximum monthly average of \$57.50 in December. In 1917 prices continued to increase, reaching a maximum of \$100 in July. A fixed maximum of \$47.50 came into full effect in November.

Monthly Prices of Mild Steel Billets at Montreal.*

	1908.	1909.	1910.	1911.	1912.	1913.	1914.	1915.	1916.	1917.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
January	30 00	26 00	26 50	27 00	24 75	26 50	24 50	24 75	39 50	53 50
February	30 75	26 00	26 50	27 00	23 75	30 00	24 50	24 75	39 50	53 50
March	31 00	26 25	26 50	27 00	23 75	30 00	24 50	26 50	45 50	53 50
April	30 75	26 25	26 50	27 00	23 75	30 00	25 25	26 50	44 50	60 00
May	31 75	26 25	26 50	26 75	23 75	31 00	25 25	26 50	44 50	
June	33 75	26 50	26 00	25 75	23 75	31 00	25 25	26 50	44 50	
July	26 75	26 50	26 00	25 75	23 75	29 00	25 25	26 50	44 50	
August	27 00	26 50	25 75	25 00	24 25	29 00	25 25	29 50	44 50	
September	27 00	26 25	25 50	25 00	24 75	28 00	25 25	31 00	44 50	
October	27 25	26 25	25 50	23 75	25 25	26 50	25 25	31 00	46 00	
November	27 00	26 25	24 75	23 75	25 25	25 50	24 75	32 00	52 00	
December	26 75	26 50	25 00	24 75	26 00	25 50	24 75	34 00	53 50	
Average	29 15	26 29	25 91	25 71	24 40	28 50	25 23	28 29	45 02	

* Average price per ton of 2,240 pounds, f.o.b. Montreal in the first week of each month, quotations supplied by the Dominion Iron & Steel Co., Ltd.

** No quotations.

¹ Compiled from the annual records of wholesale prices published by the Department of Labour.

Average Monthly Prices of Bessemer Steel Billets at Pittsburgh.*

	1908.	1909.	1910.	1911.	1912.	1913.	1914.	1915.	1916.	1917.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
January	28 00	25 00	27 50	23 00	20 00	28 30	20 13	19 25	52 00	63 00
February	28 00	25 00	27 50	23 00	20 00	28 50	21 00	19 50	33 50	65 00
March	28 00	23 00	27 50	23 00	19 75	28 50	21 00	19 70	42 40	66 25
April	28 00	23 00	26 75	23 00	20 00	28 50	20 80	20 00	45 00	73 75
May	28 00	23 00	26 12	22 60	20 80	27 37	20 00	20 00	45 00	86 00
June	25 75	23 00	25 30	21 00	20 87	26 50	19 50	20 50	43 50	98 75
July	25 00	23 50	25 00	21 00	21 50	26 10	19 00	21 38	41 00	100 00
August	25 00	24 13	24 62	21 00	22 12	26 00	20 25	23 13	44 20	86 00
September	25 00	25 00	24 40	20 75	23 62	24 87	21 00	24 10	45 00	66 25
October	25 00	26 25	23 75	20 00	26 00	23 30	20 00	24 63	46 25	49 38
November	25 00	27 13	23 30	19 50	27 00	21 00	19 25	26 50	52 00	47 50
December	25 00	27 50	23 00	19 25	27 00	20 00	19 00	30 60	57 50	47 50

*As compiled and published by "The Iron Age," New York.

The Dominion Iron and Steel Company, has, during the past three years, been making some export of steel billets for European demand. The exports are separately reported by the Customs Department since April, 1917, and the total exports of billets, ingots, and blooms during the nine months ending December, 1917, were 41,558 tons valued at \$1,831,917, or an average of \$44.08 per ton. There was also an export of bars and rods during the same period of 41,321 tons valued at \$3,633,787, or an average of \$87.94 per ton.

There has been a considerable annual importation as shown in the accompanying tables of iron and steel billets, and of iron and steel ingots, blooms, slabs, puddled bars, etc. The export records of the United States appear to show considerably larger exports of these products to Canada than is included in the Canadian record, a difference which may be due to the inclusion in the Canadian record of considerable quantities of material free of duty for the use of the Imperial Government.

According to the United States record¹ there was exported from the United States to Canada during the calendar year 1917, billets, ingots and blooms of steel, 150,533 gross tons (168,597 short tons), valued at \$11,962,280, or an average of \$70.95 per short ton, as against 105,260 gross tons (117,891 short tons), valued at \$6,657,538, or an average of \$56.43 per short ton, in 1916, and 58,486 gross tons (65,504 short tons), valued at \$1,528,155, or an average of \$23.33 per short ton, in 1915.

The second table following shows for a number of years the exports of billets, ingots and blooms of steel to Canada. The principal differences between this and the Canadian record appears to be for the years 1916 and 1917. There is shown in this table also a record of the exports from the United States to Canada of steel rails, sheets and plates, structural iron and steel, tin plate, etc., wire and manufactures of wire, pipe and fittings, and metal-working machinery.

¹ Monthly Summary of Foreign Commerce of the United States, Department of Commerce, Washington, D.C.

Imports of Iron and Steel Ingots, Blooms, Billets, etc.

Fiscal Year.	Iron and steel billets weighing not less than 60 pounds per lineal yard.			Iron or steel ingots, clogged ingots, blooms, slabs, puddled bars and loops, or other forms, n.e.p., less finished than iron or steel bars, but more advanced than pig-iron, except castings.			Steel billets, n.e.p.			Total.	
	Short tons.	Value.	Per ton.	Short tons.	Value.	Per ton.	Short tons.	Value.	Per ton.	Short tons.	Value.
1908	14,866	\$ 416,163	\$ cts. 27 99	4,722	\$ 135,177	\$ cts. 28 63	1,634	\$ 48,672	\$ cts. 29 79	21,222	\$ 600,012
1909	3,940	95,350	24 20	3,715	53,135	14 30	1,252	31,869	25 86	8,887	190,354
1910	28,358	518,102	18 27	5,775	97,333	16 85	2,082	63,080	23 32	36,815	678,524
1911	44,457	861,036	19 37	3,228	68,616	21 28	711	19,940	28 05	48,396	949,592
1912	85,852	1,593,665	18 56	2,608	52,063	19 97	729	17,242	23 65	89,189	1,682,970
Calendar Year											
1913	51,765	1,178,151	22 76	665	19,379	29 61	453	14,784	32 67	52,873	1,212,314
1914	12,247	241,234	19 70	155	3,348	21 65	647	15,121	23 37	13,019	259,703
1915	32,210	715,493	22 21	10,980	316,814	28 86	10,928	238,380	21 81	54,118	1,270,687
1916*	12,627	495,625	39 25	7,946	385,816	47 59	363	14,005	46 24	20,876	1,405,446
1917*	10,186	663,668	65 15	10,243	714,908	69 79	348	22,573	64 83	20,777	1,401,149

* Import record not complete. See explanation in text.

Exports of Various Iron and Steel Products from the United States to Canada.

Calendar Year.	Billets, Ingots and Blooms of Steel.			Steel Rails for Railways.			Sheets and Plates.			Structural Iron and Steel.		
	Short tons.	Value.	Value per ton.	Short tons.	Value.	Value per ton.	Short tons.	Value.	Value per ton.	Short tons.	Value.	Value per ton.
		\$	¢		\$	¢		\$	¢		\$	¢
1910.....	23,160	461,294	19 91	28,382	750,424	26 41				83,838	2,346,363	28 91
1911.....	64,020	1,262,732	19 72	98,613	2,499,110	25 34				115,420	4,113,858	35 64
1912.....	92,976	1,941,015	20 88	149,353	3,799,685	25 44				190,346	6,823,072	35 85
1913.....	45,568	961,373	21 16	181,408	4,791,569	26 41	356,344	12,364,721	34 70	322,768	10,463,154	32 42
1914.....	16,044	311,297	19 40	25,949	6,855,468	26 42	297,203	6,855,461	33 09	125,457	3,454,572	27 53
1915.....	65,504	1,528,155	23 33	8,521	230,637	27 07	223,715	7,781,270	34 78	110,725	3,063,362	27 67
1916.....	117,891	6,657,538	56 43	46,011	1,586,639	34 48	253,335	14,712,640	57 49	125,169	5,768,908	46 25
1917.....	168,597	11,962,280	70 95	54,088	1,815,768	33 57	256,918	25,451,608	99 05	131,383	9,235,063	70 29

Calendar Year.	Tin Plate, Terne Plates and Tappers Tin.			Wire.			Pipe and Fittings.			Metal Working Machinery.		
	Short tons.	Value.	Value per ton.	Short tons.	Value.	Value per ton.	Short tons.	Value.	Value per ton.		Value.	
		\$	¢		\$	¢		\$	¢		\$	
1910.....	12,473	881,719	70 69	47,074	2,077,002	44 12	30,008	1,371,399	45 70		466,216	
1911.....	32,095	2,243,492	69 90	62,895	2,670,765	42 46	40,485	1,833,764	45 79		1,083,718	
1912.....	52,746	3,662,770	69 44	64,354	2,496,781	38 80	86,163	4,288,887	49 81		1,885,241	
1913.....	51,524	3,842,159	74 57	53,749	2,143,449	39 88	79,929	4,093,699	51 22		1,988,463	
1914.....	39,770	2,614,859	65 75	53,254	2,083,130	39 12					767,064	
1915.....	43,874	2,762,406	62 99	57,963	2,159,436	41 56	15,374	654,817	62 10		4,836,065	
1916.....	57,633	4,694,005	81 45	66,690	4,289,572	64 32	21,859	1,697,511	77 66		7,929,989	
1917.....	66,329	9,160,783	138 11	54,447	4,456,350	81 84	22,333	2,524,392	113 03		5,542,823	

Steel Rails.—The production of steel rails in Canada during 1917 was 46,645 short tons, as against 90,123 short tons in 1916, and 232,411 short tons in 1915. The annual production from 1905 to 1915 varied between 200,000 tons and 500,000 per annum.

The exports of steel rails during the nine months ending December 31, 1917, were 26,402 tons, valued at \$1,605,742, or an average of \$60.82 per ton. Previous to April 1, 1917, the exports of rails were not separately classified, although during the past three years shipments have been made to South Africa and the United States. The imports of steel rails as recorded in the Customs reports were 18,160 tons, valued at \$689,197. The United States exports to Canada during the same period, however, are reported as 54,088 short tons, valued at \$1,315,768, or an average of \$33.57 per ton.

The annual imports of steel rails from 1895 to 1905 ranged between 50,000 tons and 212,000 tons, averaging about 125,000 tons. From 1906 to date, however, or since the establishment of the rail mills at Sydney and Sault Ste. Marie, the imports have fallen to an annual average of about 60,000 tons, the variation being between a minimum of 10,420 tons in 1915 and a maximum of 177,041 tons in 1913.

Wire rods.—The production of wire rods in Canadian rolling mills in 1917 was 195,392 tons as compared with 179,226 tons in 1916, and 124,381 tons in 1915. From 1903 to 1914 inclusive, the average annual production was about 70,000 tons. The imports of wire rods in the coil in 1917 were 55,314 tons valued at \$3,536,501, or an average of \$63.93 per ton as compared with imports in 1916 of 66,166 tons valued at \$3,069,162, or an average of \$46.39 per ton. The annual imports have varied between rather wide limits having been as high as 55,000 tons in 1902 and less than 10,000 tons in 1908, the highest import having been reached during the fiscal year of 1913 with a total of 91,919 tons.

The average monthly price of wire rods in Pittsburgh in 1917 rose from \$75 in January to a maximum of \$96.25 in August. Quotations were then slided off to the Government fixed price of \$57 which received approval on October 11, 1917.

Annual Imports of Wire Rods.*

Calendar Year.	Short Tons.	Value.	Value per Ton.	Calendar Year.	Short Tons.	Value.	Value per Ton.
		\$	\$ cts.			\$	\$ cts.
1913.....	79,608	1,362,235	24 65	1916.....	66,166	3,069,162	46 39
1914.....	65,250	1,472,597	22 57	1917....	55,314	3,536,501	63 93
1915.....	71,839	1,695,842	23 60				

* Rolled iron wire rods in the coil of iron or steel not over 3/4 inch in diameter when imported by wire manufacturers for use in making wire in the coil in their own factories.
Rolled round rods in the coil of iron or steel for the manufacture of chains.

Average Monthly Prices of Bessemer Wire Rods at Pittsburgh.*

	1908.	1909.	1910.	1911.	1912.	1913.	1914.	1915.	1916.	1917.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
January.....	34 30	33 00	33 00	28 00	24 37½	30 00	25 50	25 00	43 00	75 00
February.....	35 00	33 00	33 00	28 75	25 00	30 00	26 38	25 00	48 00	.....
March.....	35 00	33 00	33 00	29 00	25 00	30 00	26 50	25 00	54 80	81 00
April.....	35 00	29 00	32 50	29 00	25 00	30 00	26 00	25 00	60 00	85 00
May.....	35 00	27 50	32 00	29 00	25 00	30 00	25 50	25 00	60 00	86 00
June.....	33 50	27 50	30 80	28 25	25 00	29 50	24 50	25 00	53 75	92 50
July.....	33 00	29 40	29 25	27 00	25 00	28 30	24 50	25 00	55 75	96 25
August.....	33 25	31 00	28 25	27 00	25 80	28 00	25 00	27 00	55 00	94 00
September.....	33 00	31 50	28 00	27 00	27 00	27 37½	26 20	29 40	55 00	88 75
October.....	33 00	31 87½	28 50	26 00	28 50	26 60	25 88	31 75	55 00	77 25
November.....	33 00	32 50	28 12½	25 30	29 75	25 87½	25 25	36 25	63 00	57 00
December.....	33 00	33 00	28 00	24 50	30 00	25 17	25 00	39 00	68 75	57 00

* As compiled and published by "The Iron Age," New York.

Tin Plate.—There is no production of tin plate in Canada. The imports during 1917 were 66,676 tons valued at \$9,985,631, or an average of \$149.76 per ton as compared with imports in 1916 of 57,543 tons valued at \$5,221,163, or an average of \$90.74 per ton. The imports during the past ten years have averaged about 42,500 tons per annum.

Annual Imports of Tin Plate.

Calendar Year.	Tons.	Value.	Calendar Year.	Tons.	Value.
		\$			\$
1909.	36,904	2,216,089	1914.	50,791	3,151,385
1910.	39,101	2,475,010	1915.	45,165	2,883,951
1911.	47,006	3,172,943	1916.	57,543	5,221,163
1912.	60,502	3,826,735	1917.	66,676	9,985,631
1913.	58,031	3,954,615			

EXPORTS AND IMPORTS OF IRON AND STEEL GOODS.

Canada imports large quantities of iron and steel, much larger quantities than are manufactured in domestic steel mills. Reference has already been made to exports and imports of a few specific products; the following, however, is a general summary of the available records relating to exports and imports of iron and steel as compiled from the reports of the Customs Department. Mention has already been made of the fact that some of these records such as imports of billets, steel rails, and pig-iron, are apparently incomplete. It is assumed that considerable quantities of these products have been imported by and for the use of the Imperial Government as munitions of war and entered under a special item of the Customs classification to cover such imports instead of under the usual classification. This fact should be kept in mind in analysing the statistics, since it may explain a number of apparent discrepancies between these records and those available from other sources, such, for instance, as the United States Department of Commerce records of Foreign Trade.

The exports of iron and steel from Canada have consisted chiefly of manufactured goods, such as agricultural implements, automobiles, bicycles, machinery, etc. During the past two years, however, there have been considerable exports of steel rails, billets, rods and wire products.

The total recorded value of iron and steel exported during the calendar year 1917 was \$46,791,681, as compared with a value of exports in 1916 of \$63,958,553 and in 1915 of \$48,268,148.

The exports during 1917 included: Pig-iron and ferro-alloys, 45,293 tons valued at \$3,040,738; scrap iron and steel, 176,571 tons valued at \$2,300,022; wire and wire nails, 105,482 tons valued at \$9,823,700; billets, bars, rods and rails during the last nine months of the year, 109,281 tons valued at \$7,071,446; agricultural implements valued at \$5,430,906; automobiles and bicycles, \$6,711,888; other manufactures of iron and steel, \$12,412,981.

The exports during 1916 included: Pig-iron and ferro-alloys, 46,106 tons valued at \$1,726,396; scrap iron and steel, 114,300 tons valued at \$1,357,018; wire and wire nails, 122,526 tons valued at \$8,597,320; agricultural implements valued at \$3,740,494; automobiles and bicycles, \$6,807,499; other manufactures of iron and steel, \$729,831.

The exports during 1915 included: Pig-iron and ferro-alloys, 26,545 tons valued at \$768,632; scrap iron and steel, 89,358 tons valued at \$883,134; wire and wire nails, 71,998 tons valued at \$3,224,740; agricultural implements valued at \$3,417,060; automobiles and bicycles, \$7,139,712; other manufactures of iron and steel, \$32,834,870.

The exports during 1914 included: Pig-iron and ferro-alloys, 19,063 tons, valued at \$486,366; scrap-iron and steel, 35,405 tons, valued at \$446,337; wire and wire

nails, 9,663 tons, valued at \$355,781; agricultural implements, valued at \$5,788,900; automobiles and bicycles, \$3,409,749; other manufactures of iron and steel, \$3,904,614.

A detailed record of these exports during the last two years is shown in the accompanying table:—

Exports of Iron and Steel Goods, the Products of Canada, during the Calendar Years 1916 and 1917.

		1916.			1917.		
		Quantity.	Value.	Average Value.	Quantity.	Value.	Average Value.
			\$	\$		\$	\$
Stoves	No.		29,856			50,451	
Gas buoys and parts of	\$		2,484			85	
Castings, n.e.s.	"		167,881			583,297	
Pig iron	Tons.	29,304	374,233	16.97	12,081	423,814	35.08
Ferro-silicon and ferro-alloys	"	22,802	1,352,013	59.29	33,212	2,616,924	78.79
Bars and rods†	"				41,321	3,653,787	87.94
Billets, ingots and bloom†	"				41,558	1,831,917	44.08
Rail†	"				26,402	1,605,742	60.82
Wire and wire nails	"	122,526	8,957,320	70.17	105,482	9,823,707	93.13
Machinery (linotype machines)	\$		35,465			6,977	
Machinery, n.e.s.	\$		1,208,863			2,499,681	
Sewing machines, parts of	\$		82,032			157,899	
Washing machines, etc.	\$		5,763			6,400	
Typewriters	No.	3,597	246,791	68.60	1,833	97,904	51.99
Scrap iron and steel	Tons.	114,300	1,357,018	11.87	176,591	2,300,022	13.02
Hardware, tools, etc.	\$		376,549			940,347	
Hardware, n.e.s.	\$		515,613			917,177	
Cream separators*	\$		34,567			150,923	
All other iron and steel	\$		38,974,154			7,000,678	
Agricultural implements							
Mowing machines	No.	6,672	233,024	34.93	12,149	486,593	40.16
Reapers	"	1,115	65,011	58.31	2,771	188,897	68.17
Drills	"	4,712	317,831	67.44	6,240	314,435	50.39
Harvesters and binders	"	7,495	814,517	108.67	9,502	1,158,751	121.95
Ploughs	"	17,700	483,650	27.32	25,354	1,150,386	45.37
Harrow	"	6,691	97,214	14.63	4,093	93,609	22.87
Hay rakes	"	2,011	43,746	21.75	4,704	116,395	26.86
Seeders	"	2	128	64.00	26	2,621	100.81
Threshing machines	"	1,522	465,209	305.66	1,172	274,764	234.44
Cultivators	"	4,219	142,028	33.66	6,336	170,611	26.93
All other	\$		292,603			297,640	
Parts of	\$		750,966			1,025,275	
Automobiles	No.	12,579	6,078,668	483.24	9,492	4,561,875	480.60
" parts of	\$		672,060			2,035,769	
Bicycles	No.	580	50,894	87.75	454	61,984	136.53
" parts of	\$		5,877			52,260	
Gasoline engines	No.	529	86,310	163.16	800	152,275	190.31
Total			63,958,558			46,791,681	

* 9 months in 1916. † 9 months in 1917.

Annual Exports of Iron and Steel Products since 1909.

Calendar Year.	Value.	Calendar Year.	Value.	Calendar Year.	Value.
	\$		\$		\$
1909*	7,172,413	1912	10,682,484	1915	48,268,148
1910	7,395,489	1913	13,999,149	1916	63,958,558
1911	9,907,281	1914	14,391,746	1917	46,791,681

* Agricultural implements, automobiles and bicycles included in 1909 and subsequent years.

Separate records, covering a period of years, of the annual exports of pig-iron and ferro-alloys and of scrap iron and steel have already been given on previous pages.

The total value of the imports of iron and steel goods during the calendar year 1917, subject to the explanation already made in respect to certain products not recorded under the usual and regular classification and therefore omitted from this record was \$186,538,538 as compared with a value of \$129,090,241 imported during the calendar year 1916, \$74,308,983 imported during the calendar year 1915, \$80,063,679 imported during 1914, and \$145,226,972 imported during 1913. Previous to 1913 the record is shown covering the fiscal years. During the twelve months ending March, 1913, the imports were valued at \$148,579,272, as against imports valued at \$105,611,450 during the twelve months ending March, 1912.

Between 1895 and 1904, the imports of iron and steel increased from about \$8,600,000 to over \$40,000,000. During the next five years there was comparatively little change, but from 1909 to 1913 the increase was again very rapid. During the latter part of 1913 there was, however, a distinct check to imports with the heavy falling off shown in 1914 and 1915.

The imports during 1917 subject to duty were valued at \$153,743,649, the imports free of duty during the same period being valued at \$32,794,889.

The imports during 1916 subject to duty were valued at \$107,863,317, the imports free of duty during the same period being valued at \$21,226,931. These imports include all classes of manufactured iron and steel goods as well as those of cruder form. In many cases the values only of the imported goods are given, so that a total tonnage of imports cannot be stated. In the case of most of the cruder materials, however, the quantities are given and a compilation of these showing the importation of the cruder forms of iron and steel since 1909 is shown in the accompanying tables.

Thus, during the twelve months ending December 31st, 1916, there was imported 929,776 tons of iron and steel valued at \$84,448,580, or an average of \$90.83 per ton, together with other iron and steel goods, the quantities of which are not stated, valued at \$102,089,958.

During the twelve months ending December, 1916, there were imported 864,916 tons of iron and steel valued at \$52,114,258, or an average of \$60.25 per ton, together with other iron and steel goods of which the quantities are not stated, valued at \$76,975,990.

During the twelve months ending December, 1915, there were imported 771,007 tons of iron and steel valued at \$27,504,685, or an average value per ton of \$35.67, together with other iron and steel goods, the quantities of which are not stated, valued at \$46,804,298.

Summary of Imports of Iron and Steel, 1916 and 1917.

Material.	1916.			1917.		
	Tons.	Value.	Average	Tons.	Value.	Average.
		\$	\$		\$	\$
Pig iron.....	58,330	1,145,150	19.61	83,416	2,704,165	33.14
Ferro-alloys and chrome steel.....	14,840	1,893,879	127.62	12,886	9,945,505	158.75
Ingots, blooms, billets, puddled bars, etc.....	(b) 20,876	895,446	42.89	20,778	1,491,782	67.46
Scrap iron and scrap steel.....	11,572	179,751	15.53	20,654	454,079	21.90
Plates and sheets.....	225,439	12,806,096	56.81	185,074	17,582,700	95.00
Tin plates and sheets.....	57,543	5,221,163	90.73	66,676	9,985,631	149.76
Bars, rods, hoops, bands, etc.....	198,654	13,352,807	67.27	228,512	22,567,187	98.76
Structural iron and steel.....	158,905	8,042,127	50.61	185,065	15,282,012	82.18
Rails and connexions.....	14,003	470,023	33.57	22,213	944,595	42.52
Pipe and fittings (a).....	5,599	165,576	30.67	2,348	143,124	60.96
Nails and spikes.....	4,103	283,007	68.98	10,928	802,021	81.63
Wire (a).....	66,115	4,306,674	65.12	51,764	4,409,376	85.18
Forgings, castings and manufactures.....	29,137	3,343,559	114.00	38,562	5,976,313	154.98
Total.....	(b) 864,916	52,114,238	60.25	(c) 929,776	81,418,580	90.83
Other iron and steel products valued at.....		76,975,990			102,689,958	
Total value of imports of iron and steel.....		129,090,248			186,538,538	

(a) There are additional imports of pipe and wire included under "other iron and steel products."

(b) This figure should be increased by nearly 100,000 tons and the value in proportion, because of the imports of steel billets entered under a general classification. See explanation under steel billets, page No. 24.

(c) This figure should be increased by about 150,000 tons. See footnote (b).

Summary of Tonnage of Iron and Steel Imported during Calendar Years 1913-17.

(In short tons.)

Material.	1913.	1914.	1915.	1916.	1917.
Pig iron.....	236,769	78,680	47,482	58,330	83,416
Ferro-products and chrome steel.....	30,678	22,271	13,905	14,840	12,886
Ingots, blooms, billets, puddled bars, etc.....	52,872	13,049	54,118	(b) 20,876	(c) 20,778
Scrap iron and scrap steel.....	104,747	27,688	11,477	11,574	20,654
Plates and sheets.....	365,675	227,633	224,484	225,439	185,074
Tin plates and sheets.....	58,031	50,791	45,165	57,543	66,676
Bars, rods, hoops, bands, etc.....	277,879	148,368	156,990	198,652	228,512
Structural iron and steel.....	439,871	160,538	126,780	158,905	185,065
Rails and connexions.....	182,421	42,064	12,481	14,003	22,213
Pipe and fittings (a).....	30,663	15,614	4,489	5,599	2,348
Nails and spikes.....	7,584	4,864	1,522	4,103	10,928
Wire (a).....	70,712	66,280	49,529	66,115	51,764
Forgings, castings and manufactures.....	32,604	20,339	22,585	29,137	38,562
Total.....	1,890,506	878,179	771,907	(b) 864,916	(c) 929,776

(a) There are additional imports of pipe and wire included under "other iron and steel products."

(b) (c) See footnotes to previous table.

Summary of Tonnage of Iron and Steel Imported 1909-13.

(in short tons.)

Material.	Twelve Months Ending March.				
	1909.	1910.	1911.	1912.	1913.
Pig-iron	58,891	159,506	270,102	201,112	291,994
Ferro-products and chrome steel	13,206	15,153	10,182	18,548	23,378
Ingot, blooms, billets, puddled bars, etc	8,887	36,810	48,395	80,190	80,745
Scrap iron and scrap steel	26,212	28,797	53,824	78,378	103,317
Plates and sheets	116,610	200,575	206,680	243,461	376,633
Tin plates and sheets	26,850	39,866	44,025	46,802	64,571
Bars, rods, hoops, bands, etc	73,261	117,159	185,845	198,139	279,878
Structural iron and steel	162,735	195,748	232,585	268,572	377,551
Rails and connexions	32,543	55,183	86,600	97,062	150,318
Pipe and fittings	18,309	16,706	28,831	26,627	40,987
Nails and spikes	1,611	3,476	3,374	7,201	11,429
Wire	39,375	68,211	64,850	69,597	80,846
Forgings, castings, and manufactures	14,394	18,093	24,523	27,008	47,195
Total	592,593	955,291	1,215,086	1,368,357	1,939,743

Annual Imports of Iron and Steel Products since 1895.

Year.	Value.	Year.	Value.	Year.	Value.	Year.	Value.
	\$		\$		\$		\$
1895 (a)	8,684,024	1901	25,023,453	1907*	44,730,403	1913 (b) ...	148,379,272
1896	10,206,759	1902	31,591,484	1908 (b)	64,257,238	1913 (c) ...	145,226,972
1897	11,063,156	1903	39,536,897	1909	42,075,797	1914	80,063,679
1898	16,340,592	1904	40,449,175	1910	62,356,974	1915	74,309,983
1899	19,463,329	1905	40,829,233	1911	88,179,152	1916	1,000,243
1900	27,926,766	1906 (c) ...	42,210,305	1912	105,614,450	1917	146,538,538

*Nine months ending March, 1907.

(a) Twelve months ending June from 1895 to 1906 inclusive.

(b) Twelve months ending March from 1908 to 1913 inclusive.

(c) Twelve months ending December from 1913 to date.

