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CANADA
DEPARTMENT OF MINES

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PRELIMINARY REPORT

ON THE

MINERAL PRODUCTION OF
CANADA

DURING THE CALENDAR YEAR
1917

PREPARED BY

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No. 478

PRELIMINARY REPORT ON THE MINERAL PRODUCTION OF CANADA DURING THE CALENDAR YEAR 1917.

It is customary to express the total mineral production and to make comparison of production in different years in terms of dollars, or total values.

On this basis of record and comparison the total value¹ of the metal and mineral production in 1917, as shown in this preliminary report, was \$192,982,837. Compared with a production in 1916 valued at \$177,201,534, an increase of \$15,781,303, or 8.9 per cent, is shown, while compared with a production in 1915, valued at \$137,109,171, there is shown an increase of \$55,873,666, or 40.8 per cent.

It must not be inferred, however, that because such a large increase is shown in the value of our mineral production, that our mines and quarries have actually increased their tonnage output at the same average rate. In fact, an examination of the record will show that the quantities of many important products were considerably less in 1917 than in 1916, and over two-thirds of the increase in value is to be attributed to coal, gypsum and cement, in which the quantities marketed were less than in the previous year.

The interrelation of industry is shown by the effect of a diminished coal and coke output on the metallurgical production, the falling off in production of copper and gold is in part attributable to this cause. Lead and silver also show much smaller output. As against these decreases there has been an important increase in the production of zinc, and increases also in the production of cobalt, molybdenite, and nickel.

In 1916, the metal production showed a very large increase over that of the previous year, but in 1917 the net result in value has been an increase of only \$311,387, making a total value of \$106,630,752.

The total value of the non-metallic production, including clay and quarry products in 1917, was \$86,352,085, as compared with \$70,882,169 in 1916, showing an average increase of \$15,469,916, or 26 per cent. Practically every product, with the exception of the stone quarry output, shows an increased value of production; but in the case of coal, graphite, gypsum, and cement, the quantities actually marketed were less, notwithstanding the increased values.

¹In presenting a total valuation of the mineral production as is here given, it should be explained that the production of the metals copper, gold, lead, nickel, silver, and zinc is given as far as possible on the basis of the quantities of metals recovered in smelters, and the total quantities in each case are valued at the average market price of the refined metal in a recognized market. There is thus included in some cases the values that have accrued in the smelting or refining of metals outside of Canada.

The Mineral Production of Canada in 1917.

(SUBJECT TO REVISION.)

		Quantity.	Value.
METALLIC.			\$
Antimony ore (exports).....	*Tons	774	50,476
Cobalt, metallic contained in oxide, etc.....	Lbs.	1,089,134	1,742,614
Copper, value at 27.180 cents per lb.....	"	108,860,358	29,588,254
Gold.....	Ozs.	747,366	15,449,426
Iron, pig from Canadian ore.....	Tons	46,022	768,783
Iron ore sold for export.....	"	169,192	590,336
Lead, value at 11.137 cents per lb.....	Lbs.	32,072,269	3,571,889
Molybdenite (MoS ₂ contents at \$1 per lb.).....	"	271,530	271,530
Nickel, value at 40 cents per lb.....	"	84,470,970	33,778,388
Platinum.....	Ozs.	491	5,090
Silver, value at 81.417 cents per oz.....	"	22,150,680	18,034,419
Zinc, value at 8.901 cents per lb.....	Lbs.	31,227,351	2,779,547
Total.....			106,630,752
NON-METALLIC.			
Actinolite.....	Tons	120	1,320
Arsenic, white and arsenic in ore.....	"		709,937
Asbestos (b).....	"	144,185	7,215,389
Asbestic.....	"	9,596	18,688
Barytes (b).....	"	958	16,000
Chromite (a).....	"	36,352	490,001
Coal.....	"	14,015,588	47,643,646
Corundum.....	"	188	32,153
Feldspar (not complete).....	"	11,493	54,555
Fluorspar.....	"	4,249	68,756
Graphite.....	"	3,714	402,892
Grindstones.....	"	2,279	44,037
Gypsum.....	"	339,418	887,170
Magnesite.....	"	58,090	728,275
Manganese.....	"	158	14,836
Mica.....	"		350,732
Mineral pigments: iron oxides.....	"	9,372	81,685
Mineral water.....	"		145,276
Natural gas.....	M. cu. ft.	26,465,686	5,003,342
Petroleum.....	Brls.	205,332	478,937
Pyrites.....	Tons	403,243	1,586,091
Quartz.....	"	205,851	440,444
Salt.....	"	138,909	1,047,792
Talc.....	"	15,812	76,539
Total.....			67,249,514
STRUCTURAL MATERIALS AND CLAY PRODUCTS.			
Cement, Portland.....	Brls.	4,768,488	7,699,521
Clay products: \$4,603,755—			2,017,046
Brick: Common.....			589,406
Brick: Pressed and paving.....			9,594
Kaolin.....	Tons	533	122,878
Pottery.....			210,838
Refractories: Fireclay, firebrick, etc.....			778,159
Sewerpipe.....			434,465
Tile.....			441,369
All other: Fireproofing, hollow blocks, etc.....			1,517,918
Line.....	Bush.	6,338,212	1,908,773
Sand and Gravel.....	Tons	7,157,279	143,393
Sand-lime brick.....	No.	12,432,990	7,789
Slate.....	Sq.	1,422	
Stone: \$3,221,422—			613,588
Granite.....			2,291,692
Limestone.....			55,820
Marble.....			260,322
Sandstone.....			
Total structural materials and clay products.....			19,102,571
All other Non-Metallic.....			67,249,514
Total value Metallic.....			106,630,752
Grand Total, 1917.....			192,982,837

* Tons of 2,000 pounds.

(a) Shipments by mine operators. The final shipment of ores and concentrates (including customs mill shipments) were 23,327 short tons valued at \$572,115 and containing 8,465 tons of Cr₂O₃.

(h) Owing to delay in receipt of returns, the value of the production of barytes and part of the production of asbestos is not included in the total value.

Increase or Decrease in Principal Products, 1917.

Principal Products.		Increase (+) or Decrease (-) in quantity.		Increase (+) or Decrease (-) in value.	
			%	\$	%
Cobalt.....	Lbs.	+ 248,598	29.62	+ 818,024	88.47
Copper.....	"	- 8,289,670	7.08	- 2,278,896	7.15
Gold.....	Ozs.	- 83,126	19.68	- 3,785,550	19.68
Pig iron from Can. Ore.....	Tons	- 69,669	60.22	- 559,822	42.14
Lead.....	Lbs.	+ 9,425,346	22.71	+ 39,197	1.11
Molybdenite.....	"	+ 115,069	73.51	+ 115,069	73.51
Nickel.....	"	+ 1,512,406	1.82	+ 4,742,890	16.33
Silver.....	Ozs.	- 3,309,061	13.00	- 1,317,298	7.88
Zinc.....	Lbs.	+ 7,842,591	33.56	- 212,076	7.09
Total Metallic.....				+ 311,387	0.03
Asbestos and Asbestic.....	Tons	- 368	0.27	+ 2,005,208	38.35
Coal.....	"	- 467,807	3.2	+ 8,826,165	22.70
Graphite.....	"	- 241	6.1	+ 77,530	23.80
Gypsum.....	"	- 3,497	1.0	+ 148,577	20.10
Magnesite.....	"	+ 2,677	4.8	+ 164,446	29.20
Mica.....	"			+ 95,493	37.40
Natural Gas.....	M.	+ 998,228	3.9	+ 1,045,313	27.40
Petroleum.....	Brls.	+ 7,209	3.6	+ 86,653	22.10
Pyrites.....	Tons	+ 93,992	30.4	+ 501,996	46.30
Quartz.....	"	+ 69,106	50.5	+ 189,214	75.30
Salt.....	"	+ 6,006	4.5	+ 330,139	46.00
Cement.....	Brls.	- 601,072	11.2	+ 1,151,793	17.50
Clay Products.....	"			+ 482,950	11.70
Lime.....	Bush.	+ 844,962	15.4	+ 426,455	39.10
Sand and Gravel.....	Tons	+ 1,664,029	30.3	+ 817,310	74.90
Stone.....	"			- 514,990	13.80
Total Non-Metallic.....				+15,469,916	25.90
Grand Total Increase.....				+15,781,303	8.90

Metal Prices.

(In cents per pound or ounce).

	1912.	1913.	1914.	1915.	1916.	1917.
Antimony (ordinaries).... Per pound.	7.760	7.520	8.763	30.280	25.370	20.690
Copper, New York.....	16.341	15.269	13.602	17.275	27.202	27.187
Lead.....	4.471	4.370	3.862	4.673	6.858	8.787
" London.....	3.895	4.072	4.146	4.979	6.715	6.626
" Montreal.....	4.467	4.659	4.479	5.600	8.513	11.137
Nickel, New York.....	40.000	40.000	40.000	45.000	45.000	50.000
Silver, "..... Per ounce.	60.835	59.791	54.811	49.684	65.661	81.847
Spelter, "..... Per pound.	6.943	5.648	5.213	13.230	12.804	8.901
Tin, ".....	46.096	44.252	34.301	38.500	43.480	61.802

*Quotations furnished by Messrs. Thomas Robertson & Company, Montreal, Que.

Mineral Production by Provinces, 1916 and 1917.

	1916.		1917.		Increase (+) or Decrease (-).
	Value of Production.	Per cent of total.	Value of Production.	Per cent of total.	
Nova Scotia.....	\$ 20,042,262	11.31	\$ 25,333,643	13.13	+ 5,291,381
New Brunswick.....	1,118,187	0.63	1,372,620	0.71	+ 254,433
Quebec.....	14,406,598	8.13	17,115,161	8.87	+ 2,708,563
Ontario.....	80,461,323	45.41	88,821,815	46.02	+ 8,360,492
Manitoba.....	1,823,576	1.03	2,539,393	1.32	+ 715,817
Saskatchewan.....	590,473	0.33	832,335	0.43	+ 241,862
Alberta.....	13,297,543	7.50	16,426,154	8.51	+ 3,128,611
British Columbia.....	39,969,962	22.56	36,161,528	18.74	- 3,808,434
Yukon.....	5,491,610	3.10	4,380,188	2.27	- 1,111,422
Dominion.....	177,201,534	100.00	192,982,837	100.00	+15,781,303
					8.91

COPPER.

The production of copper in 1917, amounted to 108,860,358 pounds, valued at \$29,588,254, as against 117,150,028 pounds valued at \$31,867,150 in 1916, a decrease of 7.08 per cent in quantity and 7.15 per cent in value. Though less than the previous year, the 1917 production was greater than any other previous record. In 1916, the increase over the production of 1915 had been 16.2 per cent in quantity and 83.0 per cent in value.

The electrolytic copper refinery installed at Trail, B.C., began operations about November 1, 1916, with a capacity of 10 tons of refined copper per day, which has been increased to 20 tons per day.

Of the total 1917 production, 86,508,758 pounds were contained in blister copper and in matte produced in Canada, and 22,351,600 pounds estimated, as recovered from ores exported.

In addition to the recoveries from domestic ores, there were also recovered in British Columbia smelters, 5,033,630 pounds of copper from imported ores.

The Production in Quebec from pyrite ores was 5,013,560 pounds, valued at \$1,362,636, as against 5,703,347 pounds valued at \$1,551,424 in 1916. These are the quantities reported as being paid for; the actual metal contents were much higher.

The Ontario production is derived chiefly from the nickel-copper ores of the Sudbury district and of the Alexo mine in Timiskaming supplemented by a small recovery from the Cobalt district silver ores and by shipments made from a few copper properties under development. The total production in 1917 amounted to 42,796,213 pounds valued at \$11,632,014 as against 44,997,035 pounds valued at \$12,240,094 in 1916 a decrease of 4.0 per cent in quantity.

There was an important copper production in Manitoba in 1917 derived from the ore deposits at Schist Lake north-west of the Pas, operated by the Mandy Mining Company. These sulphide ores as well as those at Flin Flon Lake in the same district have had a very large amount of development work expended upon them during the past two years. The ore shipments which amounted to 3,388 tons were made under great difficulty of transportation having been hauled 40 miles by sleigh in winter, then 190 miles by barge during summer and then 1,500 miles by rail to the smelter at Trail.

The British Columbia production was 57,717,535 pounds valued at \$15,687,631, as against 63,642,550 pounds valued at \$17,312,046 in 1916—a decrease in quantity of over 9 per cent.

The production included 40,720,413 pounds recovered in blister and matte and 16,997,122 pounds being the estimated recovery from ores shipped to United States smelters.

The production from the Yukon in 1907 amounted to 2,182,050 pounds valued at \$593,081, as against 2,807,096 pounds valued at \$763,586 in 1915. The production is derived from the mines of the Whitehorse district in southern Yukon.

Prices:—The New York price of electrolytic copper, which was 28 cents early in 1917, increased to a maximum of 32 cents towards the middle of February though small lots sold as high as 34 cents. Then there was a gradual falling-off till it reached 24½ in July. The price remained uncertain until October when the United States War Industries Board, by agreement with the copper producers, fixed the price at 23½ cents which remained the price for the last quarter of 1917.

GOLD.

The total production of gold in placer and mill bullion and in smelter production in 1917, is estimated at 747,366 fine ounces valued at \$15,449,426 as compared with 930,492 fine ounces valued at \$19,234,976 in 1917, a decrease of \$3,785,550, or 19·68 per cent. This has been the lowest since 1912 when the new Porcupine field caused a considerable increase in Canada's production of gold.

The 1916 production has been the largest since 1902 when the Yukon output began to decline. The maximum production recorded was \$27,908,153 in 1900 and the lowest since that year was \$8,382,780 in 1907.

Of the total production in 1917, \$4,199,563, or 27·5 per cent were derived from placer and alluvial mining; \$9,433,033, or 61·0 per cent in bullion and refined gold; and \$1,816,827 or 11·5 per cent contained in matte, blister copper, residues and ores exported.

The production in Nova Scotia was only \$45,478 in 1917, about equal to that of 1913, which was the lowest ever recorded and showed a decrease of over 51 per cent from that of 1916. The decrease is mostly attributed to the great increase in cost for labour and material.

The production in Quebec is made partly from the pyrites ores of the Eastern Townships and partly from the zinc-lead ores of Notre-Dame des Anges, Portneuf county. Much of this gold is not paid for by the smelters.

The Ontario production of gold was \$8,916,113 being about 58 per cent of the total production for Canada and though it shows a decrease of 12 per cent from that of 1916, it was the second highest ever recorded.

The production from Manitoba, \$9,137 though small, points to the possibility of this province becoming an important producer. The gold was derived from the gold and copper ores of Herb and Schist lakes in the new Pas mining division in northern Manitoba.

The production in British Columbia in 1917 was \$2,776,558, a decrease of nearly 39 per cent which was due not only to the high cost of supplies but also in part to labour troubles in that province and the closing down for several months of the Rossland mines which contribute largely to the output of gold.

The production from the Yukon Territory amounted to \$3,671,008, or a decrease of over 16 per cent and included in addition to the alluvial gold, a small recovery from the gold and copper ores of the Whitehorse district and the gold-silver-lead ore of the Mayo district.

The exports of gold bullion, gold bearing dust, nuggets, gold in ore, etc., in 1917 are reported by the Customs Department as \$15,929,051.

LEAD.

The earlier estimates of the production of lead in 1917 included the recoveries of considerable quantities of lead from imported ores. The total production in 1917 of lead in bullion credited to Canadian mines together with the lead estimated as recoverable from ores exported was 32,072,269 pounds which at the average price of lead in Montreal 11·137 cents per pound would be worth \$3,571,889. The corresponding production in 1916 was 41,497,715 pounds valued at \$3,532,692, an average price of 8·513 cents. The decrease in quantity was 9,425,346 pounds, or 22·7 per cent but on account of the higher price there was a slight increase in total value.

There is such a divergence between the records of lead contents of ores and concentrates shipped and recoveries at smelters from domestic and imported ores that the following records are presented for comparison.

	1916.	1917.
	Pounds.	Pounds.
(1) Production: Smelter recoveries from Canadian ore and recoverable lead in ore exported.....	41,497,615	32,072,269
(2) Lead contents of ores and concentrates shipped from mines in Canada.....	54,124,628	37,624,567
(3) Total production of lead bullion in Canada (including lead from imported ores).....	43,100,236	41,427,304

The 1917 production included 30,077,230 pounds of lead in bullion of which a large portion was electrolytically refined and 1,995,039 pounds recoverable from ores exported. The lead bullion was produced chiefly at Trail with small contributions from smelters at Kingston and Galletta, Ont. (The total production of the smelters including lead from imported ores was as noted above 41,427,304 pounds.) The lead ores exported were derived from Notre-Dame des Anges, Que., the Surprise mine, Slocan, B.C., and the Silver King mine at Mayo, Yukon.

The total mine shipments of lead ores and concentrates was about 58,801 tons containing 37,624,567 pounds of lead as compared with shipments in 1916 of 84,516 tons containing 54,124,628 pounds of lead.

The exports of lead in 1917 were lead contained in ore concentrates, bullion, etc., 13,410,400 pounds valued at \$925,056. Exports in 1916 were: Lead in ore, etc., 9,048,400 pounds valued at \$558,180 and pig lead 112,100 pounds valued at \$7,710.

The average price of lead in January was 9.50 cents per pound advancing to a maximum of 14.62 cents in June and falling again to 7.92 in November, and 7.96 in December, the average for the year being 11.137 cents. This is the producer's price for lead in car lots as per quotations furnished by Messrs Robertson and Company.

NICKEL.

The production of nickel in 1917 has, as usual, been derived from the ores of the Sudbury district supplemented by the recovery of a small quantity of metallic nickel, nickel oxide, and other nickel salts as by-products in the treatment of ores from the silver-cobalt-nickel ores of the Cobalt district.

The total production was 84,470,970 pounds, worth, at 40 cents per pound, \$33,778,388, compared with 82,958,564 pounds valued at \$29,035,497 or 35 cents per pound, in 1916.

Sudbury District: The total production of nickel-copper matte at the smelter of the Canadian Copper Company and the Mond Nickel Company in the Sudbury district was 78,897 tons, containing 83,773,319 pounds of nickel and 42,392,588 pounds of copper, the average percentage of the combined metals in the matte being about 80; the tonnage of ore smelted (part being previously roasted) was 1,453,661 tons, which as usual included a small tonnage from the Alexo mine in the Timiskaming district. The production in 1916 was 80,011 tons of matte derived from 1,521,689 tons of nickel-copper ores smelted, the matte containing 82,596,862 pounds of nickel and 44,859,321 pounds of copper.

The refinery under construction at Port Colborne, Ont., by the International Nickel Company, had not been completed at the close of the year. The British American Nickel Corporation continued the development of its nickel properties particularly at the Murray mine, and work was begun on the first unit of the smelter a mile distant from the Murray mine. It is expected that construction work on the refinery will begin early in 1918.

Nickel was recovered as a by-product in smelters at Deloro, Thorold, and Welland, from the silver-cobalt-nickel ores of the Cobalt district; complete returns have not yet been received, but the total nickel contents of nickel oxide, nickel sulphate, and metallic nickel produced have been estimated at about 697,000 pounds. The products recovered in 1916 included 79,360 pounds of metallic nickel; 323,418 pounds of nickel oxide, and 232,450 pounds of nickel sulphate, having a total reported value of \$132,896 and containing 361,701 pounds of nickel metal.

The exports of nickel in ore matte or other form are reported by the Customs Department as 81,272,400 pounds, valued at \$8,708,650.

The imports of nickel into the United States during the eleven months ending November, 1917, which included small quantities from other sources as well as from Canada, are recorded as 69,265,880 pounds, containing in ore, matte, or other form valued at \$8,869,824, or an average of 12.81 cents per pound. The exports of nickel and nickel oxide, etc., during the same period were 21,430,306 pounds, valued at \$8,702,727, or an average of 40.61 cents per pound, of which about 66 per cent were consigned to Great Britain and 30 per cent to Italy and France.

The values per pound of these exports to different countries ranged from 38.5 cents to 48.6 cents per pound. The average value per pound of exports in 1916 was 38.775 cents, the range being from 37.13 cents to 45.21 cents. The average export value in 1914 was 34.26 cents.

The price of refined nickel in New York according to quotations published by the Engineering and Mining Journal continued at from 45 to 50 cents per pound for ordinary forms, with 5 cents more per pound asked for electrolytic nickel, until March 7, from which date the quotation was from 50 to 55 cents.

SILVER.

The production in silver of 1917 was 22,150,680 ounces, valued at \$18,034,419, as against 25,459,741 ounces, valued at \$16,717,121, in 1916, a decrease of 13.0 per cent in quantity, but an increase of 7.9 per cent in value.

The high value of the production in 1917 was exceeded only in 1912 and 1913, when the Cobalt camp was at the maximum of its output.

The production in Ontario amounted to 19,254,616 ounces, valued at \$15,676,531, or 87 per cent of the total production for Canada. In 1911, the year of its maximum production, the percentage was 93.8. The production was from the ores of Cobalt and adjoining silver camps, with the exception of 80,863 ounces, the output of the gold and copper mines.

Of the Cobalt district production, amounting to 19,173,753 ounces, 85.3 per cent, or 16,363,605 ounces, were recovered in smelters and reduction works in Canada, and the balance, 14.7 per cent, or 2,810,148 ounces, were exported for smelting. Of the bullion produced in Ontario 9,929,326 ounces, or 60.7 per cent, was recovered in the mills of Cobalt, and 6,434,279, or 39.3 per cent, recovered in southern Ontario smelters.

The production in Quebec was 217,191 ounces, valued at \$176,830, as against 98,610 ounces valued at \$64,748 in 1916, and is derived from the pyritic ores of the Eastern Townships and the zinc-lead ores of Notre-Dame des Anges, Portneuf county.

In British Columbia the production was 2,580,521 ounces, valued at \$2,100,983, as against 3,392,872 ounces, valued at \$2,227,794, in 1916, showing a decrease in quantity of over 23 per cent and in value of 5.7 per cent. This production includes refined silver, silver contained in smelter products and estimated recoveries from ores exported.

The Yukon production amounted to 90,772 ounces, valued at \$73,904, as against 360,101 ounces, valued at \$236,446, in 1916, and included silver derived from the placer operations with also a certain amount recovered from the gold and copper ores of Whitehorse and the silver-lead ores shipped from Mayo.

The exports of silver bullion and silver in ore, etc., as reported by the Customs Department, were 21,718,784 ounces, valued at \$17,621,398, as against exports in 1916 of 25,279,359 ounces, valued at \$15,637,885.

The monthly average price of silver varied between a minimum of 73.861 cents per ounce in March and a maximum of 100.740 cents in September, averaging for the year 81.417 cents, as compared with an average of 65.661 cents in 1916.

ZINC.

During the past two years there has been a recovery of refined zinc in Canada at the zinc refinery erected by the Consolidated Mining and Smelting Company at Trail, B. C. Prior to 1916 all zinc ore mined in Canada was exported for smelting and refining. The establishment of the Trail plant has resulted in the mining and treatment of a much larger tonnage of zinc ores and a portion of the present production is still being exported for treatment.

The total recovery during 1917 in Canada of refined zinc, together with the zinc contained in ores exported (less 20 per cent allowed for smelter losses) amounted in 1917 to 31,227,351 pounds, which at the average price of spelter in New York, 8.901 cents per pound, would have a total value of \$2,779,547. The corresponding production in 1916 was 23,364,760 pounds, valued at \$2,991,623, or an average of 12.804 cents per pound.

Quebec in 1917 is credited with 1,161,062 pounds, and British Columbia with 30,066,289 pounds. In 1916 the Quebec production was 1,663,200 pounds, and British Columbia 21,701,560 pounds.

The total zinc ore shipments from mines in 1917 were about 116,660 tons, containing, without any deduction whatever, 61,920,149 pounds of zinc. The total ore shipments in 1916 were 82,077 tons, containing 48,498,078 pounds of zinc.

IRON ORE.

The total shipments of iron ores from Canadian mines during 1917 were 215,242 short tons valued at \$758,261 as compared with shipments of 275,176 tons valued at \$715,107 in 1916. The 1917 shipments included 198,092 tons from mines in Ontario and 17,150 tons from mines in Quebec, and of the latter amount a considerable tonnage was from old stock piles. The ores comprised 197,602 tons of hematite and roasted hematite and siderite, 12,664 tons of magnetite and 4,978 tons of titaniferous ores.

The principal operating properties were the Helen and Magpie mines of the Algoma Steel Corporation all of the ores mined being first roasted before shipment. The Moose Mountain Company continued development and experimental work in concentration and briquetting but made only small shipments.

In Quebec shipments of ilmenite were made from Ivry-on-the-Lake in Terrebonne county and of titaniferous ore from St. Urbain on the north shore of the St. Lawrence. Shipments of magnetite were also made from stock piles at the Bristol mine in Pontiac county and a small tonnage from Ironsides, in Hull township.

In the Great Lakes area the ore prices for 1917 were: Old Range Bessemer \$5.95 per gross ton; Messabi Bessemer \$5.75; Old Range Non-Bessemer \$5.20 and Messabi Non-Bessemer, \$5.05—an increase of \$1.50 over the 1916 prices. The same quotations have been continued into 1918.

Mine operators reported 169,192 tons of ore exported to the United States and 46,050 tons shipped to Canadian furnaces.

The Customs Departments shows exports of iron ores 164,004 tons valued at \$660,673 and imports amounting to 2,251,397 tons valued at \$5,124,889.

The total quantity of iron ore charged to blast furnaces in 1917 was 2,176,296 tons of which 92,065 tons were of domestic origin and 2,084,231 tons imported. The imported ore included 874,134 tons of Newfoundland ore and 1,210,097 tons of "Lake ore."

Shipments of iron ore from Wabana mines, Newfoundland in 1917 by the two Canadian companies operating there were 883,346 short tons, as against 1,012,060 tons in 1916 all of which went to Sydney and North Sydney in Cape Breton.

PIG IRON.

The production of pig iron in blast furnaces during 1917 was supplemented by a small production of high grade low phosphorus pig iron in electric furnaces made from shell turnings and other steel scrap. The total production from both sources (not including the output of spiegeleisen, or other ferro-alloys) was approximately 1,171,789 short tons (1,046,240 gross), final returns not yet having been received from all manufacturers of electric pig iron. Of the total, 1,156,789 tons were produced in blast furnaces and the balance in electric furnaces. In 1916 the production all made in blast furnaces was 1,169,257 short tons (1,043,979 long tons.)

The small increase in pig iron production in 1917 was therefore due entirely to the electric furnace production, there having been an actual falling off in the blast furnace output.

The production in Nova Scotia in 1917 was 472,147 tons as against 470,055 tons in 1916. In Ontario the production by blast furnaces in 1917 was 691,632 tons as against 699,202 tons in 1916.

By grades the 1917 production included: Basic 14,092 tons; Bessemer, 961,656 tons; Foundry and malleable, etc., 181,041 tons; electric furnace pig (subject to revision), 15,000 tons. The 1916 production included: Basic 953,627 tons; Bessemer 31,388 tons; foundry and malleable, etc., 184,242 tons.

The blast furnace plants operated were the same as in the previous year, viz: the Dominion Iron & Steel Company at Sydney, N.S., the Nova Scotia Steel & Coal Company, at North Sydney; the Standard Iron Company at Deseronto, Ont., The Steel Company of Canada, at Hamilton,

Ont., The Canadian Furnace Company, at Port Colborne, Ont., and the Algoma Steel Corporation at Sault Ste. Marie, Ont.

Pig iron was made in electric furnaces by: The Canada Cement Company, Ltd., Montreal; Frazer, Brace & Company, Ltd., Shawinigan Falls, Que., British Forgings, Ltd., Toronto, Ont., Electro Foundries, Ltd., Orillia, Ont., and Turnbull Electro Metals, Ltd., St. Catharines, Ont.

The total production in electric furnaces of pig iron ferro-alloys and steel ingots and castings was in 1917 about 99,000 short tons.

The production of ferro-alloys in Canada in 1917, chiefly ferro-silicon but including also spiegeleisen, ferro-molybdenum and ferro-phosphorus, all with the exception of the spiegeleisen being made in electric furnaces, reached a total of 40,329 tons valued at \$3,471,934, as against a total in 1916 of 28,628 tons valued at \$1,777,615.

The exports during 1917 of pig iron were 12,081 tons, valued at \$423,814 or an average of \$35.08 per ton and of ferro-alloys 33,212 tons valued at \$2,616,924, or an average of \$78.79 per ton.

The imports during 1917 included 82,758 tons of pig iron valued at \$2,744,055 or an average of \$33.16 per ton; 632 tons of charcoal pig iron valued at \$19,447, or an average of \$30.77 per ton, and 12,828 tons of ferro-alloys valued at \$2,029,990, or an average of \$158.25 per ton, making a total import of pig iron and ferro-alloys of 96,218 tons valued at \$4,793,492. The United States trade records show exports to Canada during the eleven months ending November 1917 of pig iron and ferro-alloys amounting to 130,087 gross tons (145,697 short tons) valued at \$5,170,005 a figure considerably higher than the Canadian record.

STEEL.

The estimated production of steel ingots and direct steel castings in 1917, final returns for all operations not yet having been received, was 1,736,514 short tons, (1,550,459 gross tons) of which 1,690,170 tons were ingots and 46,344 tons direct steel castings.

The total production in 1916 was 1,428,249 tons compared with which the 1917 production shows an increase of 308,265 tons, or 21.6 per cent.

The total production of electric steel in 1917 was probably not less than 50,000 tons as against 19,639 tons in 1916 and 5,625 tons in 1915.

The exports of steel ingots, or billets, ingots and blooms, during the nine months ending December (such exports not being separately classified previous to April 1917) were 41,558 tons valued at \$1,831,917. The recorded imports of iron and steel ingots and billets during the year was 20,429 tons valued at \$1,378,576. This item is also much lower than the United States trade record which shows exports to Canada during eleven months ending December of 143,209 gross tons (160,394 short tons), of billets, ingots and blooms of steel valued at \$11,418,033.

ASBESTOS.

The production of asbestos continues to increase under the stimulation of war demand. The product has been marketed at much higher prices and the total sales show a substantial increase. Stocks on hand at the end of 1917 were slightly in excess of those reported at the end of 1916.

In addition to the production in the Province of Quebec which is derived from the asbestos areas at Black Lake, Thetford, Robertsonville,

East Broughton and Danville, there is also included in the record of production as given herewith, a small output of crude asbestos amounting to 10 tons valued at \$2,150 produced and shipped from the Porcupine District in the Province of Ontario. These Ontario operations have been discontinued for the present but indicate the possibilities of sources of supply other than the well known areas in Quebec.

Output, Sales, and Stocks of asbestos.

	Output.	Sales.			Stock on hand, Dec. 31.		
	Tons.	Tons.	Value.	Per ton.	Tons.	Value.	Per ton.
1917.			\$	\$		\$	\$
Crude.....	6,268	5,383	2,748,071	510 51	1,322	738,195	558 39
Mill.....	144,040	138,802	4,467,318	33 67	12,102	479,119	39 58
Total asbestos.....	150,308	144,185	7,215,389	50 04	13,424	1,217,314	90 68
Asbestic.....		9,596	18,688	1 95			
1916.							
Crude.....	5,415	5,886	1,866,969	317 19	444	138,415	311 75
Mill.....	112,832	127,553	3,332,828	26 13	5,845	254,920	43 61
Total asbestos.....	118,247	133,439	5,199,797	38 97	6,289	393,335	62 54
Asbestic.....		20,710	29,072	1 40			

Exports of asbestos during the calendar year 1917 were 93,932 tons' valued at \$4,903,326,, or an average of \$52.20 per ton and asbestos and waste 52,088 tons valued at \$430,956, or an average of \$8.27 per ton. There was also an export of manufactures of asbestos valued at \$55,666.

The exports in 1916 were 96,775 tons of asbestos valued at \$3,872,463, or an average of \$40.01 per ton and asbestos sand and waste 33,564 tons valued at \$241,272, or an average of \$7.18 per ton; also manufactures of asbestos valued at \$4,741.

CHROMITE.

The total shipments of ores and concentrates by mine operators was 36,352 tons valued at \$490,001 containing approximately 8,626 tons, or an average of about 23.7 per cent, Cr_2O_3 . A portion of these shipments was made to the Customs mill at Lakeside, Black Lake, operated by the Mutual Chemical Company and the final shipments from the district of ores and concentrates was 23,327 short tons valued at \$572,115, and containing approximately 8,465 tons of Cr_2O_3 , or an average of 36 per cent.

Most of the concentrates shipped averaged 50 per cent Cr_2O_3 while a large percentage of the ore shipments averaged about 32 per cent.

The production was as usual obtained from the Eastern Townships of Quebec, chiefly at Black Lake and Thetford, with an important contribution from the new area at St. Cyr in the township of Cleveland, Richmond county.

The mine operators shipments in 1916 were 27,517 tons valued at \$311,460 and containing approximately 6,759 tons, or an average of 24.5

per cent Cr_2O_3 . Of this amount 13,268 tons were sold to a customs concentrator and the final shipments of ores and concentrates during the year was 15,249 tons valued at \$310,902.

The exports of chromite as reported by the Customs Department were 19,229 tons valued at \$342,528 as against 12,633 tons valued at \$152,534 exported in 1916.

COAL AND COKE.

COAL:—The total production of marketable coal during 1917 (comprising sales and shipments, colliery consumption and coal used in making coke or used otherwise by colliery operators) was less than the 1916 production by 467,807 tons, or 3·2 per cent in quantity but greater in total value by \$8,826,165 or 22·7 per cent.

Production, imports, exports and consumption during 1916 and 1917 were as follows:

	1916.		1917.	
	Short tons.	Value.	Short tons.	Value.
		\$		\$
Production.....	14,483,395	38,817,481	14,015,588	47,643,646
Exports.....	2,135,359	7,099,387	1,733,156	7,387,192
Imports.....	17,580,603	38,289,666	20,857,460	70,562,357
Consumption.....	29,928,139	33,139,892

The exports fell off by 402,203 tons, or 18·8 per cent, the imports were increased by 3,276,857 tons, or 18·6 per cent, the apparent consumption increased by 3,211,253 tons, or 10·7 per cent.

The total output of coal including waste and unmarketable slack was in 1917, 14,411,011 tons as against 14,815,703 tons in 1916.

The 1917 production included 108,225 tons of anthracite, all from one mine in Alberta; 11,135,095 tons of bituminous coal and 2,772,268 tons of lignite coal.

The provinces of New Brunswick, Saskatchewan, Alberta and the Yukon made greater production of coal during 1917 and with the exception of the Yukon, show the highest annual production on record. The total increases in these provinces was 284,781 tons. The total decrease in Nova Scotia and British Columbia was 752,588 tons leaving a net decrease as already shown.

The Nova Scotia production fell off 587,456 tons, or 8·5 per cent as compared with 1916: New Brunswick increased 45,120 tons, or 31·4 per cent; Saskatchewan increased 74,004 tons, or 26·3 per cent; Alberta increased 164,085 tons, or 3·6 per cent, notwithstanding the serious loss of output due to strikes; the British Columbia production fell off 165,132 tons or 6·4 per cent; the Yukon production though small shows a large percentage increase.

Production of Coal.

Province.	1915.		1916.		1917.	
	Tons.	Value.	Tons.	Value.	Tons.	Value.
		\$		\$		\$
Nova Scotia.....	7,463,370	16,659,308	6,912,140	18,514,662	6,324,684	23,740,176
New Brunswick.....	127,391	309,612	143,540	386,016	188,660	705,673
Saskatchewan.....	240,107	365,246	281,300	441,836	355,304	662,228
Alberta.....	3,360,818	8,283,079	4,559,054	11,386,577	4,723,139	14,197,756
British Columbia.....	2,065,613	6,455,041	2,584,061	8,075,190	2,418,929	8,308,581
Yukon Territory.....	9,724	38,896	3,300	13,200	4,872	29,232
	13,267,023	32,111,182	14,483,395	38,817,481	14,015,588	47,643,646

Monthly Production of Coal in Canada by Provinces, 1917.

(IN SHORT TONS.)

Month.	Nova Scotia.	New Brunswick.	Saskatchewan.	Alberta.	British Columbia.	Total.
January.....	533,111	17,144	37,693	489,727	187,396	1,265,071
February.....	468,589	16,634	27,890	445,011	208,884	1,167,008
March.....	485,864	17,351	22,932	451,125	241,227	1,218,499
April.....	490,764	14,963	13,471	209,288	160,140	888,626
May.....	505,008	13,700	18,051	99,027	158,399	794,185
June.....	585,454	13,881	21,688	101,875	153,004	875,902
July.....	575,667	14,832	20,380	355,936	191,540	1,158,355
August.....	600,974	14,514	27,255	488,940	212,848	1,344,531
September.....	543,929	15,120	27,642	455,879	210,082	*1,257,524
October.....	578,572	16,097	39,968	540,576	230,871	1,406,684
November.....	538,019	16,629	51,485	588,674	238,632	1,433,439
December.....	418,733	17,195	46,849	497,081	225,906	1,205,764
	6,324,684	188,660	355,304	4,723,139	2,418,929	*14,015,588

*Includes 4,872 tons produced in the Yukon District.

The total imports in 1917 included 15,537,262 tons of bituminous coal valued at \$42,452,771, or an average of \$2.72 per ton as against 13,009,788 tons valued at \$17,073,303, or an average of \$1.24 in 1916, showing an increase in 1917 of 2,527,474 tons, or 19.4 per cent; and 5,320,198 tons of anthracite valued at \$28,109,586, or an average of \$5.28 per ton as against 4,570,815 tons valued at \$22,216,363, or an average of \$4.86 in 1916, an increase in 1917 of 749,383 tons, or 14.1 per cent.

Imports of Coal.

	1916.			1917.		
	Tons.	Value.	Aver.	Tons.	Value.	Aver.
		\$	\$		\$	\$
Bituminous, round and run of mine..	9,504,552	12,368,679	1.30	12,407,486	33,712,894	2.72
Bituminous, slack.....	3,505,236	3,704,624	1.06	3,129,776	8,739,877	2.79
Anthracite, coal and dust.....	4,570,815	22,216,363	4.86	5,320,198	28,109,586	5.28
Total.....	17,580,603	38,289,666	2.18	20,857,460	70,562,357	3.38

vinces the shipments were: Nova Scotia 218,558 tons valued at \$306,447;

COKE.—The total output of oven coke during 1917 was 1,231,865 short tons made from 1,978,893 tons of coal of which 1,379,038 tons were of domestic origin and 599,855 tons imported. The total coke used, or sold by producers during the year was 1,245,862 tons valued at \$6,713,073, or an average of \$5.39 per ton. In 1916 the total output was 1,448,782 tons and the quantity sold by the producers was 1,469,741 tons valued at \$6,049,412, or an average of \$4.19 per ton.

By provinces the output was: Nova Scotia 645,069 tons, a decrease of 8,767 tons; Ontario 375,014 tons (all from imported coal), a decrease of 77,488 tons; Alberta 31,196 tons, a decrease of 11,352 tons; and British Columbia 180,586 tons, a decrease of 119,310 tons.

The ovens operated during the year were those at Sydney and Sydney Mines, N.S., Sault Ste. Marie, Ont., Coleman, Alta., and Fernie, Michel and Union Bay, B.C.

At the close of the year 1657 ovens were in operation and 875 were idle.

The exports of coke in 1917 were 23,595 tons valued at \$137,318, as against 48,539 tons valued at \$221,334 in 1916. The imports of coke in 1917 were 970,106 tons valued at \$6,517,260 as against 757,116 tons valued at \$3,229,078 in 1916.

Of the total output of coke 914,466 tons, or 74 per cent was made in by-product recovery ovens and the recovery of by-products included: Ammonium sulphate, 9,941 tons, and tar 8,277,078 gallons as against 11,040 tons of sulphate of ammonia and 9,012,202 gallons of tar in 1916. There was also an important recovery of benzol, toluol, naphtha and naphthalene.

FLUORSPAR.

High prices have stimulated the mining of fluorspar at Madoc, Ontario, and production has increased from 1,284 tons valued at \$10,238, or an average of \$7.97 to, 4,249 tons valued at \$68,756 or an average of \$16.08 in 1917.

There is an annual consumption of fluorspar in Canadian steel furnaces of from 10,000 to 15,000 tons.

GRAPHITE.

The production of graphite in 1917 which was 3,714 tons valued at \$402,892 included 541 tons valued at \$106,305 or \$196.50 per ton from Quebec and Baffin Island and 3,173 tons valued at \$296,587, or an average of \$93.47 per ton from mills in Ontario.

Graphite operators reported that of the total shipment 3,510 tons valued at \$372,167 were sold for export. The Customs records show exports of plumbago, crude ore, and concentrate 112 tons valued at \$7,455 and manufactures of plumbago valued at \$384,505.

It is of interest to note that a small shipment of high grade graphite was made during the year from deposits which were worked by the Hudson's Bay Company in the vicinity of Lake Harbour on Baffin Island. This graphite was sold to the Dominion Crucible Company at St. Johns, Que., who confirm the opinion of the Hudson's Bay Company that this graphite is of very high quality and comparable with the best Ceylon product.

GYPSUM.

The total quantity of gypsum rock quarried in 1917 was 365,959 tons of which 97,667 tons were calcined. The shipments of all grades totalled 339,418 tons valued at \$887,170 and included lump 226,846 tons valued at \$251,960; crushed 32,305 tons valued at \$51,869; fine ground 4,843 tons valued at \$19,222, and calcined 75,424 tons valued at \$564,119. By pro-

New Brunswick 38,556 tons valued at \$191,631; Ontario 48,947 tons valued at \$130,138; Manitoba 33,347 tons valued at \$258,934.

In 1916 the quantity quarried was 424,431 tons of which 94,414 were calcined. The shipments included: Lump 249,893 tons; crushed 15,680 tons; fine ground 6,096 tons and calcined 71,246 or a total of 342,915 tons valued at \$738,598.

Exports of crude gypsum were 224,423 tons valued at \$245,182 and of gypsum or plaster ground valued at \$146,384. The corresponding exports in 1916 were: crude gypsum 221,234 tons valued at \$252,476 and gypsum or plaster ground valued at \$154,630.

The imports of gypsum of all grades during 1917 were valued at \$35,460 and included: Crude gypsum 64 tons valued at \$999; ground gypsum 282 tons valued at \$5,355 and Plaster of Paris 3,101 tons valued at \$29,106. The total value of imports in 1916 was \$43,291.

MAGNESITE.

The production of magnesite was confined to the deposits in Argen-teuil county, Quebec. The shipments in 1917 were 58,090 tons valued at \$728,275 and include crude ore, calcined magnesite (burnt in lime kilns), and dead burnt clinker (sintered in rotary kilns after mixture with about 5 per cent of magnesite). The crude ore was sold at about \$10 per ton, the calcined at \$28.50 and the clinkered, or dead burned material at from \$40 to \$46 per ton. The shipments in 1916 were 55,413 tons valued at \$563,829 or an average of \$10.17 per ton, and 14,779 tons valued at \$126,584, or an average of \$8.56 per ton in 1915.

PETROLEUM.

The production of crude petroleum in 1917, while about 7,000 barrels greater than in 1916, was less than the production of any other previous year for which records are available. A bounty of $1\frac{1}{2}$ cents per gallon is paid on the marketed production of crude oil from Canadian oil fields, the administration of the "Petroleum Bounty Act" being under the Department of Trade and Commerce. According to the bounty record the production in 1917 in Ontario and New Brunswick was 205,332 barrels (8,186,614 imperial gallons). The average monthly price for crude oil during the year was \$2.33 $\frac{1}{4}$, at which rate the total production would be worth \$478,937. There was also a small production of crude oil in Alberta of which record has not yet been received. The specific gravity of this oil is below the standard specified in the "Petroleum Bounty Act," and no bounty is therefore paid thereon. According to press report, based on inland revenue inspection records, there was a recovery during the year from Alberta crude oils of 294,000 gallons* of gasoline and refined illuminating oils.

The total production of crude oil in 1916 (exclusive of Alberta) was 198,123 barrels, valued at \$392,284, compared with which the 1917 production shows an increase of about 3.6 per cent in quantity, but of over 22 per cent in total value.

The price of crude oil at Petrolia was quoted at \$2.08 per barrel at the beginning of the year, and was increased by 10 cents on January 8, 5 cents on January 30, 5 cents on April 16, and by 20 cents on August 20, running at \$2.48 throughout the balance of the year. The average monthly price for the year was \$2.33 $\frac{1}{4}$, as against an average price of \$1.98 in 1916 and \$1.395 in 1915.

*Direct returns to this office from the Alberta refineries show a production of about 312,000 gallons of gasoline and other refined oils.

The Ontario production in 1917 was, according to the records of the Department of Trade and Commerce at Ottawa, 202,991 barrels. The production in barrels of the various fields, as furnished by the supervisor of petroleum bounties at Petrolia, was as follows in barrels: Petrolia and Enniskillen, 74,267; Oil Springs, 46,902; Sarnia township, 4,493; Moore township, 6,282; Plympton township, 579; or a total for Lambton of 132,523 barrels; Bothwell, 29,682; Tilbury, 10,041; Dutton, 2,941; Onondaga, 382; Moza township, 20,998; and Thamesville, 6,420. The bounty supervisor states that "A new, extensive oil field at North Glencoe in the township of Moza in the county of Middlesex has created a great deal of interest among oil producers and has already produced about 21,000 barrels."

This new production has offset a continued falling-off in the production from the older fields.

The production by districts in 1916 was: Lambton, 142,208 barrels; Bothwell, 33,856 barrels; Dutton, 2,851 barrels; Tilbury, 16,296 barrels; Onondaga and Belle River, 1,663 barrels.

The production in New Brunswick, according to bounty records, was 2,341 barrels in 1917, as against 1,345 barrels in 1916 and 1,020 barrels in 1915.

Exports of petroleum entered as crude mineral oil in 1917 were 2,130 gallons, valued at \$183, and of refined oil 28,212 gallons, valued at \$6,558. There was also an export of naphtha and gasoline of 24,304 gallons, valued at \$7,419.

The total value of the imports of petroleum and petroleum products in 1917 was \$21,455,326, as against a value of \$14,705,323 in 1916.

The total imports of petroleum oils, crude and refined, in 1917 were 378,224,746 gallons, valued at \$21,239,347. These oil imports included: crude oil for refining, 183,105,102 gallons valued at \$8,411,730; petroleum and gas oils, 142,455,582 gallons valued at \$4,521,854; and illuminating oils, 13,457,096 gallons valued at \$1,093,560; lubricating oils, 5,315,811 gallons valued at \$1,209,930; gasoline, 15,369,172 gallons valued at \$3,293,760, and other oils, products of petroleum, 18,521,983 gallons, valued at \$2,708,513. The imports of petroleum products included 1,620,634 pounds of paraffin wax, valued at \$140,722, and paraffin wax candles, 513,339 pounds valued at \$75,257, or a total value of \$215,979.

The total imports of petroleum oils, crude and refined, in 1916 were 292,426,121 gallons, valued at \$14,604,476. The imports of paraffin wax and wax candles were 1,281,376 pounds, valued at \$100,847.

PYRITES.

The total shipments of pyrites as sulphur ore in 1914 were 403,243 short tons, valued at \$1,586,091, and containing a total sulphur content of 150,896 tons, or an average of 37.4 per cent. The average sulphur content varied among the shipping mines from 34.5 per cent to 46 per cent. By provinces the shipments were: Quebec, 122,822 tons, valued at \$501,111; Ontario, 274,712 tons, valued at \$1,056,435; and British Columbia 5,709 tons, valued at \$28,545. Of the total shipments, about 341,676 tons, or 85 per cent, were exported to the United States, according to producers' reports, the sulphur content of which was 126,106 tons.

The 1916 shipments of pyrites were 309,251 short tons, containing 116,980 tons of sulphur, or an average of 37.8 per cent, the increased production in 1917 being 93,992 tons, or 30 per cent. By provinces the shipments were: Quebec, 130,639 tons; Ontario, 177,552 tons, and British Columbia 1,060 tons.

The Customs records show exports of pyrites during 1917 as 279,646 tons, valued at \$974,200. Apparently, the exports of copper pyrites from

Quebec are not included in this record. Exports of sulphuric acid during 1917 were 18,955,100 pounds, valued at \$197,888, as against 3,151,700 pounds, valued at \$74,527, in 1916. Imports of brimstone, or crude sulphur, in 1917 were 82,445 tons, valued at \$1,515,309, and 73,467 tons in 1916, valued at \$1,186,618. Imports of sulphuric acid in 1917 were 216 tons, valued at \$15,680, as against imports in 1916 of 2,403 tons, valued at \$115,173.

SALT.

The Canadian production of salt is still obtained entirely from southern Ontario and the yearly output has been slowly though steadily increasing. Total sales in 1917, including the salt equivalent of brine used for chemical manufacturing were about 138,909 tons valued at \$1,047,792 as against 132,903 tons valued at \$717,653 in 1916. These values are as far as possible exclusive of packages. The value of packages used in 1917 was \$403,879 and in 1916 \$309,603. By grades the production included: Table and dairy 34,252 tons; common fine 65,117 tons; common coarse 37,398 tons; and land salt 2,142 tons. The production by grades in 1916 was: Table and dairy 35,045 tons; common fine 54,596; common coarse 41,259 tons, and land salt 2,003 tons.

The exports of salt in 1917 were 8,643 tons valued at \$94,364. The imports of salt were 170,810 tons valued at \$1,088,205 and included 44,973 tons of fine salt in bulk valued at \$184,792; 12,293 tons of salt in packages valued at \$120,665; and 113,544 tons of salt imported from Great Britain for the use of fisheries valued at \$782,748. The total imports in 1916 were 101,208 tons valued at \$694 835.

STRUCTURAL MATERIALS.

The total value of the production of structural materials including cement, clay products, lime, sand and gravel, stone quarries, etc., for the year 1917 was \$19,102,571, an increase of \$1,635,385, or 9.4 per cent over the 1916 value. This is the first increase in production of this class of products that has been recorded since 1913, the total having been \$17,467,186 in 1916, \$17,920,759 in 1915 and \$26,009,227 in 1914.

CEMENT.

The total quantity of Portland cement sold, or used in 1917 was 4,768,488 barrels of 350 pounds each valued at \$7,699,521 or an average of \$1.61 per barrel, as compared with 5,369,560 barrels sold, or used in 1916 valued at \$6,547,728 or an average of \$1.22 per barrel showing a decrease in quantity of 601,072 barrels or 11.2 per cent, but an increase in total value of \$1,151,793, or 17.6 per cent.

The total quantity of cement made in 1917 was 4,987,255 barrels, as compared with 4,753,033 barrels an increase of 234,222 barrels or 4.9 per cent. Cement mills were slightly more active in 1917. The output was sufficient to increase stocks during the year by about 220,000 barrels whereas in 1916 the output was less than sales and stocks were drawn upon to the extent of about 620,000 barrels.

The total imports of cement in 1917 were 30,031 cwt. equivalent to 8,580 barrels of 350 pounds each valued at \$19,646, or an average of \$2.29 per barrel as compared with imports of 20,596 barrels valued at \$31,621, or an average of \$1.54 per barrel in 1916.

The total consumption of cement, therefore, neglecting a small export, was 4,777,068 barrels as compared with a consumption of 5,390,156 barrels, showing a decrease of 613,088 barrels, or about 11.4 per cent.



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Mineral Production in Canada, 1916.

(REVISED.)

		Quantity.	Value.
METALLIC.			
Antimony ore.....	*Tons	885	\$ 94,537
" refined.....	Lbs.	107,185	41,823
Cobalt metallic and contained in oxide, etc.....	"	840,536	924,590
Copper, value at 27-202c. per lb.....	"	117,150,028	31,867,150
Gold.....	Ozs.	930,492	19,234,976
Iron, pig, from Can. ore (c).....	Tons	115,691	1,328,605
Iron ore, sold for export.....	"	140,608	393,689
Lead, value at 8-513c. per lb.....	Lbs.	41,497,615	3,532,692
Molybdenite, value at \$1.00 per lb.....	"	156,461	156,461
Nickel, value at 35c. per lb.....	"	82,958,564	29,035,498
Platinum.....	Ozs.	15	600
Silver, value at 65-661c. per oz.....	"	25,459,741	16,717,121
Zinc, value at 12-804c. per lb.....	Lbs.	23,364,760	2,991,623
			106,319,365
NON-METALLIC.			
Actinolite.....	Tons	250	2,750
Arsenious oxide.....	"	2,186	262,349
Asbestos.....	"	133,439	5,199,797
Asbestic.....	"	20,710	29,072
Chromite.....	"	27,517	311,460
Coal.....	"	14,483,395	38,817,481
Corundum.....	"	67	10,307
Feldspar.....	"	19,488	71,407
Fluorspar.....	"	1,284	10,238
Graphite.....	"	3,955	325,362
artificial.....	"	263	
Grindstones.....	"	3,478	52,782
Gypsum.....	"	342,915	738,593
Magnesite.....	"	55,413	563,829
Manganese.....	"	957	89,544
Mica.....	"	1,208	255,239
Mineral pigments—			
Barytes.....	Tons	1,368	19,393
Oxides.....	"	8,811	58,711
Mineral water.....			127,806
Natural gas.....	M.cu.ft.	25,467,458	3,958,029
Peat.....	Tons	300	1,500
Petroleum.....	Bis.	198,123	392,284
Phosphate.....	Tons	203	2,514
Pyrites.....	"	309,251	1,084,095
Quartz.....	"	136,745	251,226
Salt.....	"	132,903	717,653
Talc.....	"	13,104	49,423
Tripolite.....	"	620	12,139
			53,414,983
STRUCTURAL MATERIALS AND CLAY PRODUCTS.			
Cement, Portland.....	Bis.	5,369,560	6,547,728
Clay products (\$4,120,805)—			
Brick, common.....	No.	237,034,675	1,826,844
pressed.....	"	44,947,089	492,355
paving.....	"	1,589,893	30,144
moulded and ornamental.....	"		21,102
Fireclay and fireclay products.....	"		234,562
Fireproofing architectural terra-cotta.....	"		361,555
Kaolin.....	Tons	1,750	17,500
Pottery.....	"		61,069
Sewerpipe.....	"		716,287
Tile, drain.....	No.		359,387
Lime.....	Bus.	5,493,250	1,091,463
Sand-lime brick.....	No.	16,540,747	126,235
Sand and gravel.....	Tons	8,156,207	1,838,320
Slate.....	Sq.	1,262	6,223
Stone (\$3,736,412)—			
Granite.....			1,247,267
Limestone.....			2,224,091
Marble.....			118,810
Sandstone.....			146,244
Total.....			17,467,186
Grand total.....			177,201,534

*Short tons throughout.

(c) The total production of pig-iron in Canada in 1916 was 1,169,257 tons valued at \$16,750,898, of which it is estimated 1,053,566 tons valued at \$15,422,293 should be credited to imported ores.