CANADA
DEPARTMENT OF MINES
HON. P. E. BLONDIN, MINISTER; R. G. McCONNELL, B.A., DEPUTY MINISTER.

MINES BRANCH
EUGENE HAANEL, PH.D., DIRECTOR.

A GENERAL SUMMARY

OF THE

MINERAL PRODUCTION

OF

CANADA

During the Calendar Year

1915

JOHN McLEISH, B.A.

Chief of the Division of Mineral Resources and Statistics.

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General Summary

The term "mineral production" is so comprehensive that there is a wide divergence in methods both in the compilation of quantities of mineral products, and in the adoption of a basis of valuation. Such methods have been the subject of discussion in previous reports which need not be repeated at this time.

It was briefly stated in our preliminary report issued on March 1st, that the metal mining industry had in 1915, as a result of the demand created by the war, shown the highest production ever recorded and that the total value of the mineral production of Canada, had, notwithstanding the greatly decreased production of materials of construction, such as cement, clay and stone quarry products, etc., shown a very large increase over the production of the previous year.

Although military requirements caused restrictions to be placed upon the export of many mineral products, the mining industry suffered no serious loss in respect thereto. Producers were enabled in almost every instance to secure permits for exportation to approved destinations, the restriction serving chiefly as a means to enable the government to control the marketing outside of Canada of products that might be useful to the enemy.

The total value[1] of the metal and mineral production in 1915 was $137,109,171, compared with $128,863,075 in 1914, and $145,634,812 in 1913, the latter being the highest production recorded. The increase in 1915 over 1914 was thus $8,246,096, or 6·4 per cent, but the output is still less than that in 1913 by $8,525,641.

The record of annual mineral production in Canada since 1886, shown in the following table, indicates the rapid growth which the mineral industry has made.

[1] In 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, and silver 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 total value of the production in 1886 was $10,221,255, or about $2.23 per capita. In ten years the value had increased to $22,474,256, or $4.38 per capita, more than twice the total in 1886, and nearly twice the production per capita. The next ten years witnessed an increase to $79,286,697 in 1906, or $12.81 per capita, about 3½ times the production in 1896. From 1906 to 1913 the total production showed an increase of over 80 per cent with an increase of nearly 50 per cent in production per capita. The decrease of 1914 has been more than half made up by the increase of 1915.

Annual Mineral Production in Canada since 1886.

Year.	Value of production.	Value per capita.	Year.	Value of production.	Value per capita.
1886	$10,221,255	$ 2.23	1901	$65,797,911	$12.16
1887	10,321,331	2.23	1902	63,231,836	11.36
1888	12,518,894	2.67	1903	61,740,513	10.83
1889	14,013,113	2.96	1904	60,082,771	10.27
1890	16,763,353	3.50	1905	69,078,999	11.49
1891	18,976,616	3.92	1906	79,286,697	12.81
1892	16,623,415	3.39	1907	86,865,202	13.75
1893	20,035,082	4.04	1908	85,557,101	13.16
1894	19,931,158	3.98	1909	91,831,441	13.70
1895	20,505,917	4.05	1910	106,823,623	14.93
1896	22,474,256	4.38	1911	103,220,994	14.42
1897	28,485,023	5.49	1912	135,048,296	18.27
1898	38,412,431	7.32	1913	145,634,812	18.77
1899	49,234,005	9.27	1914	128,863,075	15.96
1900	64,420,877	12.04	1915	137,109,171	

The detailed comparative statement here presented shows the production of each important product during the past two years, the production which each contributes to the total production, and the increase or decrease as the case may be of the production in 1915, as compared with that of 1914.

Although the grand total shows a substantial increase it will be noted that 28 items in the table show a decreased production aggregating $12,381,915, whereas 29 items show increases aggregating $20,628,011, the net result being an increase of $8,246,096. The principal increases were in the metals and metalliferous ores and the principal decreases in cement, clay and quarry products. Among the non-metalliferous ores there was comparatively little change, the total increases being $1,728,027 and the total decreases $1,821,685, or a net decrease of $93,658.

The total value of the metallic production in 1915 was $75,814,841, as against $59,386,619 in 1914, an increase of $16,428,222 or over 27 per cent. With a practically unlimited demand and high prices there was an increased production of all metals with the notable exception of silver in which there was a falling off both in price and production. Notwithstanding these important increases however, it was only in the case of nickel and copper among the more important metals that the production in 1915 exceeded the maximum of previous years.

Comparative Statement of Mineral Production for Years 1914 and 1915.

Product.		1914.			1915.			Increase (+) or Decrease (−).		Increase (+) or Decrease (−).	
		Quantity.	Value (a).	Per cent of total.	Quantity.	Value (a).	Per cent of total.	Quantity.	%	Value.	%
Metallic.											
Antimony ore	*Tons.				1,341	$ 81,283				+$ 93,171	
Antimony refined	Lbs.				59,440	11,888					
Cobalt metallic and contained oxide, etc.	„				504,212	536,268	0·39				
Cobalt oxide	„	899,027			(l)						
Nickel oxide	„	392,512	$ 606,593	0·53	(m)						
Cobalt material, mixed cobalt and nickel oxides	„		79,995								
Copper (b)	„	75,735,960	10,301,606	8·07	100,785,150	17,410,635	12·69	+25,049,190	33·07	+ 7,109,029	69·11
Gold	Ozs.	773,178	15,983,007	12·40	918,056	18,977,901	13·84	+ 144,878	18·74	+ 2,994,894	18·74
Iron, pig, from Canadian ore (c)	Tons	95,744	1,138,912	0·88	158,595	1,715,874	1·25	+ 62,851	65·64	+ 576,962	50·66
Iron ore sold for export (k)	„	60,410	135,300	0·11	89,730	181,381		+ 29,320	48·54	+ 46,081	34·06
Lead (d)	Lbs.	36,337,765	1,627,568	1·27	46,316,450	2,593,721	1·89	+ 9,978,685	27·46	+ 966,153	59·36
Molybdenite	„	3,814	2,063		29,210	28,450		+ 25,396		+ 26,387	
Nickel (e)	„	45,517,937	13,655,381	10·59	68,308,657	20,492,597	14·95	+22,790,720	50·07	+ 6,837,216	50·07
Platinum	„				23	1,063		+ 23		+ 1,063	
Silver (f)	Ozs.	28,449,821	15,593,631	12·10	26,625,960	13,228,842	9·65	− 1,823,861	6·41	− 2,364,789	15·17
Zinc ore	Tons	10,893	262,563	0·20	14,895	554,938	0·40	+ 4,002	36·74	+ 292,375	111·35
Total			59,386,619	46·15		75,814,841	55·30			+16,428,222	27·66

Comparative Statement of Mineral Production for Years 1914 and 1915—*Continued.*

Product.	1914.			1915.			Increase (+) or Decrease (−).		Increase (+) or Decrease (−).	
	Quantity.	Value (a).	Per cent of total.	Quantity.	Value (a).	Per cent of total.	Quantity.	%	Value.	%
Non-metallic.										
Actinolite.....Tons	119	$ 1,304	.....	220	$ 2,420	.....	+ 101	84·87	+ $ 1,116	85·58
Arsenious oxide..... „	1,737	104,015	·08	2,396	147,830	.....	+ 659	37·94	+ 43,815	42·12
Asbestos..... „	96,542	2,892,266	2·22	111,142	3,553,166	2·59	+ 14,600	15·12	+ 660,900	22·85
Asbestic..... „	21,031	17,540	.....	25,700	21,819	.....	+ 4,669	22·20	+ 4,279	24·50
Chromite..... „	136	1,210	.....	12,341	179,543	.....	+ 12,205	.....	+ 178,333	.....
Coal..... „	13,637,529	33,471,801	25·97	13,267,023	32,111,182	23·42	− 370,506	2·72	− 1,360,619	4·06
Corundum..... „	548	72,176	·05	262	33,138	.....	− 286	52·19	− 39,038	54·09
Feldspar..... „	18,060	70,824	·05	14,559	57,801	.....	− 3,501	19·39	− 13,023	18·39
Graphite..... „	1,647	107,203	·08	2,635	124,223	.....	+ 988	59·99	+ 17,020	15·89
Graphite, artificial..... „	617	.....	.....	249	.....	.....	− 368	59·64	.....	.....
Grindstones..... „	3,976	54,504	·04	2,580	35,768	.....	− 1,396	35·11	− 18,736	34·38
Gypsum..... „	516,880	1,156,207	·89	474,815	854,929	0·62	− 72,065	13·94	− 301,278	26·06
Magnesite..... „	358	2,240	.....	14,779	126,584	.....	+ 14,421	.....	+ 124,344	.....
Manganese..... „	28	1,120	.....	201	9,360	.....	+ 173	.....	+ 8,240	.....
Mica.....	.....	109,061	·08	.....	91,905	.....	−	.....	− 17,156	15·73
Mineral pigments—										
Barytes..... Tons	612	6,169	.....	550	6,875	.....	− 62	10·13	+ 706	11·44
Ochres..... „	5,890	51,725	·04	6,248	48,353	.....	+ 358	6·08	− 3,372	6·52
Mineral water.....	.....	134,111	·10	.....	115,274	.....	.....	.....	− 18,837	14·05
Natural gas (g).....M. cu. ft.	21,692,504	3,484,727	2·70	20,124,162	3,706,035	2·70	− 1,568,342	7·23	+ 221,308	6·35
Peat..... Tons	685	2,470	.....	300	1,050	.....	− 385	56·20	− 1,420	57·49
Petroleum..... Bls.	214,805	343,124	·28	215,464	300,572	0·22	+ 659	0·31	− 42,552	12·40
Phosphate..... Tons	954	7,275	.....	217	2,502	.....	− 737	77·25	− 4,773	65·61
Pyrites..... „	228,314	744,508	·57	286,038	985,190	0·72	+ 57,724	25·28	+ 240,682	32·33
Quartz..... „	54,148	84,583	·06	127,108	205,153	0·15	+ 72,960	134·74	+ 120,570	142·55
Salt..... „	107,038	493,648	·38	119,900	600,226	0·44	+ 12,862	12·02	+ 106,578	21·59
Talc..... „	10,808	40,418	·03	11,885	40,554	.....	+ 1,077	9·87	+ 136	0·33
Tripolite..... „	650	13,000	.....	317	12,119	.....	− 333	51·23	− 881	6·78
Total.....	.....	43,467,229	33·72	.....	43,373,571	31·63	.....	.....	− 93,658	0·22

Structural Materials and Clay Products.										
Cement, Portland ..... Bls.	7,172,480	$9,187,924	7·13	5,681,032	$6,977,024	5·09	— 1,491,448	20·8	—$2,210,900	24·1
Clay products—										
Brick, common ..... No.	457,513,762	3,653,861	2·83	234,732,882	1,755,187	1·28	—222,780,880	48·69	— 1,898,674	51·96
Brick, pressed ..... "	93,634,858	1,115,556	·80	49,817,160	492,774	0·36	—43,817,668	46·80	— 622,782	55·83
Brick, paving ..... "	2,707,000	49,627	·03	1,227,647	20,694	.....	— 1,479,353	54·63	— 28,933	58·30
Brick, moulded and ornamental ..... "	1,554,496	23,592	.....	1,008,567	49,097	.....	— 545,829	35·11	+ 25,505	108·10
Fireclay, and fireclay products	.....	107,568	·08	.....	110,693	.....	.....	.....	+ 3,125	2·91
Fireproofing architectural terra-cotta	.....	405,543	·31	.....	253,401	0·18	.....	.....	— 152,142	37·52
Kaolin ..... Tons	1,000	10,000	.....	1,300	13,000	.....	+ 300	30·00	+ 3,000	30·00
Pottery	.....	35,371	·02	.....	64,900	.....	.....	.....	+ 29,529	83·48
Sewerpipe	.....	1,104,499	·84	.....	799,446	0·58	.....	.....	— 305,053	27·62
Tile, drain ..... No.	.....	366,340	·28	.....	355,296	0·26	.....	.....	— 11,044	3·02
Lime ..... Bus.	7,028,582	1,360,628	1·05	5,047,244	1,015,702	0·74	— 1,981,338	28·19	— 344,926	25·35
Sand-lime brick ..... No.	70,650,030	609,515	·47	17,960,802	141,742	.....	—52,689,228	74·58	— 467,773	76·75
Sand and gravel	.....	2,505,310	1·94	6,445,717	1,624,767	1·19	.....	.....	— 880,543	35·15
Slate ..... Squares	1,075	4,837	.....	397	2,039	.....	— 678	63·07	— 2,798	57·84
Stone—										
Granite	.....	2,176,602	1·69	.....	1,525,553	1·11	.....	.....	— 651,049	29·91
Limestone	.....	2,672,781	2·08	.....	2,312,081	1·69	.....	.....	— 360,700	13·50
Marble	.....	132,533	·10	.....	158,027	0·12	.....	.....	+ 25,494	19·24
Sandstone	.....	487,140	·38	.....	249,336	0·18	.....	.....	— 237,804	48·82
Total	.....	26,009,227	20·03	.....	17,920,759	13·07	.....	.....	— 8,088,468	31·1
Grand total	.....	128,863,075	100·00	.....	137,109,171	100·00	.....	.....	+ 8,246,096	6·40

*Short tons throughout. (*a*) The metals copper, lead, nickel and silver are for statistical and comparative purposes valued at the final average value of the refined metal. Pig-iron, zinc ore, and cobalt oxides are valued at the furnace or spot, and non-metallic products at the mine or point of shipment. (*b*) Copper content of smelter products and estimated recoveries from ores exported, at 17·275 cents per pound, in 1915, and 13·602 cents per pound in 1914. (*c*) The total production of pig-iron in Canada in 1915 was 913,775 tons valued at $11,374,199, of which it is estimated 755,180 tons valued at $9,658,325 should be credited to imported ores; in 1914 the total production was 783,164 tons valued at $10,002,856, of which 687,420 tons valued at $8,863,944 are credited to imported ores. (*d*) Refined lead and lead contained in base bullion exported at 5·600 cents per pound in 1915, and 4·479 cents in 1914, the average prices in Montreal. (*e*) Nickel content of matte produced and nickel recovered from silver-cobalt-nickel ores valued at 30 cents in 1915 and 1914. (Increasing quantities of nickel-copper matte are now being used in making monel metal which is sold at a price much below that of refined nickel. The value of the nickel contained in matte, as returned by the operators, was from 10 to 15 cents per pound for both years. (*f*) Silver recovered in bullion and recoverable from ores and smelter products exported at 49·684 cents per ounce in 1915, and at 54·811 cents in 1914. (*g*) Gross returns for sale of gas. (*h*) In 1915 and 1914 figures as reported by the producers, which differ slightly from those of the Trade and Navigation reports. (*l*) Included under cobalt in 1915. (*m*) Included under nickel in 1915.

Metal prices varied within wide limits during the year but with the exception of silver the average price for most metals was higher than the average for many years.

Metal Prices.

	1910.	1911.	1912.	1913.	1914.	1915.
	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.
Antimony (ordinaries).....Per lb.	7·386	7·540	7·760	7·520	8·763	30·280
Copper, New York..... "	12·738	12·376	16·341	15·269	13·602	17·275
Lead " ..... "	4·446	4·420	4·471	4·370	3·862	4·673
" London..... "	2·807	3·035	3·895	4·072	4·146	4·979
" Montreal*..... "	3·246	3·480	4·467	4·659	4·479	5·600
Nickel, New York..... "	40·000	40·000	40·000	40·000	40·000	45·000
Silver, " .....Per oz.	53·486	53·304	60·835	59·791	54·811	49·684
Spelter, " .....Per lb.	5·520	5·758	6·943	5·648	5·213	13·230
Tin, " ..... "	34·123	42·281	46·096	44·252	34·301	38·500

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

The total value of the non-metalliferous production in 1915 was $61,294,330 as against $69,476,456 in 1914, a decrease of $8,182,126 or 11·78 per cent.

The decrease was most pronounced in the case of materials of construction such as cement, clay products, lime, stone quarry products, etc. The total value of the production of structural materials in 1915 was $17,920,759, as against $26,009,227 in 1914, a decrease of $8,088,468 or 31·1 per cent. Amongst the other products showing a falling off in production were coal, corundum, feldspar, grindstones, gypsum, mica and petroleum, whilst the principal products showing an increase were arsenious oxide, asbestos, chromite, graphite, magnesite, pyrites, quartz, and salt.

Coal is still the most important mineral product in Canada in point of value, having constituted 23·4 per cent of the total in 1915. The metals came next in importance with nickel contributing 14·9 per cent, copper 13·8 per cent, gold 12·7 per cent, and silver 9·6 per cent. The production of cement made up 5·1 per cent of the total, clay products 2·9 per cent, stone quarries 3·1 per cent, natural gas 2·7 per cent, and asbestos 2·6 per cent.

The production of pig-iron given in the general table includes only that proportion of the output of Canadian blast furnaces credited to Canadian ores. There is an important production of pig-iron from imported ores (shown in the footnotes of the general table, and in the chapter on iron and steel) and the total value thereof in 1915 was exceeded only by the production of coal, gold, silver, copper and nickel. There is also a large production of aluminium from imported ores, for which no value is included in the general table of production.

EXPORTS AND IMPORTS.

A very large portion of the mineral production of Canada is exported for consumption or refining outside of Canada. On the other hand considerable quantities of mine products, chiefly those which have been refined or subjected to partial treatment, or in the form of manufactured goods ready for consumption, are imported.

The total value of the exports of products of the mine, including direct mine products and manufactures thereof, in 1915 was $124,157,761, compared with $75,533,305 in 1914. This value includes for 1915 mine products to the value of $61,814,582 and manufactures valued at $62,343,179, as against mine products valued at $53,781,102, and manufactures valued at $21,752,203 in 1914.

Practically the whole of the Canadian production of copper, nickel, and silver is exported, also a very large proportion of the production of gold, asbestos, and mica. There are, as well, considerable exports of coal. These products alone contribute about 93 per cent of the value of the mine products exported. Manufactured products exported consist chiefly of iron and steel goods, agricultural implements, aluminium, calcium carbide, acetate of lime, fertilizers, and coke.

The United States is the chief destination of Canada's mine exports, about 72 per cent having been exported to that country during the fiscal year 1914–1915, and about 25 per cent to the United Kingdom.

The principal increases in exports of mine products in 1915 were in coal, copper, gold, lead, nickel, antimony, and pyrites. The exports of manufactured mine products were almost three times the total of similar exports in 1914.

The principal increases were in iron and steel goods, the total value of iron and steel exports in 1915 being $48,268,148, as against $14,391,746 in 1914. There were also, however, important increases in the export of aluminium, ferro-alloys, brass, and calcium carbide.

A great variety of mineral products chiefly in a manufactured or semi-manufactured condition are annually imported into Canada, these imports having increased with great rapidity during the ten years preceding 1913. During the past two years, however, there has been a falling off of 19·4 per cent. The total value of such imports during the calendar year 1915 was $146,323,500, as compared with imports valued at $181,675,667 in 1914; $259,299,745 in 1913; $238,212,835 in 1912; $181,773,708 in 1911, and $147,305,012 in 1910.

Of the total imports in 1915 about $35,000,000 was made up of the cruder forms of mineral products such as coal, diamonds unset and bort, iron ore, asphaltum, ores of metals, alumina, sand and gravel, etc., as against $46,000,000 for similar products in 1914.

The imports of iron and steel in 1915 included in this table, (see page 11), were valued at $74,308,983, as against $80,063,679 in 1914. Imports of the metals aluminium, antimony, copper, gold, silver, lead, platinum, tin, and zinc, and manufactures thereof, and metallic alloys, reached a total value of over $17,000,000 as compared with a value of over $30,000,000 in 1914; petroleum and products of, $7,979,264, as against $11,072,362 in 1914; clays and clay products $2,998,465, as against $4,467,140.

EXPORTS.

Exports of the Products of the Mine and of Manufactures of Mine Products—Calendar Years 1914 and 1915.

	1914.		1915.	
	Quantity.	Value.	Quantity.	Value.
MINE PRODUCTS.				
Arsenic.....Lbs.	3,751,900	$ 132,567	4,636,400	$ 174,190
Asbestos.....Tons	81,081	2,298,646	84,584	2,734,695
Asbestos sand..... "	18,991	108,548	25,103	157,410
Chromite..... "	.....	.....	7,290	81,838
Coal..... "	1,423,126	3,880,175	1,766,543	5,406,058
Copper, fine in ore, etc.....Lbs.	68,830,059	7,130,778	81,437,063	8,671,641
" black or coarse and in pigs..... "	6,581,564	908,201	21,292,516	3,788,715
Feldspar, magnesite and talc.....Tons	(a) 18,072	74,100	.....	148,915
Gold..... $	.....	15,242,200	.....	16,528,143
Gypsum, crude.....Tons	345,830	404,234	292,234	336,380
Lead, in ore, etc.....Lbs.	246,100	2,681	1,845,100	40,273
Lead, pig, etc..... "	510,573	19,507	2,066,929	79,067
Mica..... "	669,163	178,940	879,631	236,124
Mineral pigments..... "	3,554,900	22,311	2,391,600	17,263
Mineral water.....Gals.	2,287	599	198	53
Nickel, in ore, etc.....Lbs.	46,528,327	5,149,427	66,410,442	7,394,446
Oil, mineral, crude, etc.....Gals.	3,996	362	35,977	1,789
Oil, refined..... "	3,922	826	103,488	14,107
Ores—				
Antimony.....Tons	.....	.....	1,149	82,990
Corundum..... "	947	87,740	339	37,798
Iron..... "	135,451	360,974	79,770	206,823
Manganese..... "	30	750	255	6,855
Other ores..... "	12,770	782,437	23,816	798,214
Phosphates..... "	247	677	179	1,860
Platinum.....Ozs.	43	2,161	236	11,052
Plumbago, crude ore, etc.....Cwt.	18,375	50,528	5,254	12,009
Pyrites.....Tons	89,999	377,985	137,598	527,318
Salt.....Cwt.	9,527	5,229	8,893	5,836
Sand and gravel.....Tons	952,370	802,358	808,022	380,549
Silver.....Ozs.	28,020,089	15,584,813	27,672,481	13,812,038
Stone, building.....Tons	63,009	46,198	35,804	28,910
" ornamental..... "	231	5,607	29,976	12,764
" crushed..... "	25,130	18,153	42,716	24,453
" for manufacture of grindstones..... "	54	294	180	900
Other products of the mine.....	.....	101,096	.....	53,106
Total mine products.....	.....	53,781,102	.....	61,814,582

(a) Feldspar only in 1914.

Exports of the Products of the Mine and of Manufactures of Mine Products—Calendar Years 1914 and 1915.—*Continued.*

		1914.		1915.	
		Quantity.	Value.	Quantity.	Value.
MANUFACTURES					
Acetate of lime	Lbs.	16,052,255	$ 282,146	10,001,830	$ 205,748
Acid, sulphuric	"	7,485,509	45,612	19,270,572	243,457
Agricultural implements:—					
Cultivators	No.	6,030	146,668	5,957	166,602
Drills	"	3,961	259,701	6,400	422,772
Harrows	"	6,252	92,556	4,459	81,731
Harvesters and binders	"	19,474	2,015,996	7,668	809,141
Hay rakes	"	6,524	196,519	1,758	40,289
Mowing machines	"	21,457	725,831	5,031	175,912
Parts of	$	.....	712,414	.....	519,379
Ploughs	No.	12,896	324,349	14,923	309,286
Reapers	"	3,919	223,228	471	21,105
Seeders	"	32	1,810	2	87
Threshing machines	"	1,965	799,307	1,001	568,401
All other	$	.....	290,520	.....	302,355
Aluminium, in bars	Cwt.	145,108	2,364,907	186,808	3,333,726
" manufactures of	$	.....	5,571	.....	620,562
Asbestos, manufactures of	"	.....	94,538	.....	125,003
Bricks	M	1,486	11,871	1,155	9,089
Calcium carbide	Lbs.	15,447,014	470,387	102,017,471	3,160,950
Cement	$	.....	2,223	.....	5,161
Clay, manufactures of	"	.....	26,866	.....	25,202
Coke	Tons	67,838	306,117	35,869	160,053
Earthenware, and all manufactures of	$	.....	9,336	.....	11,281
Fertilizers	"	.....	2,390,494	.....	2,335,297
Grindstones, manufactured	"	.....	24,113	.....	35,334
Gypsum and plaster ground	"	.....	35,490	.....	80,933
Iron and steel:—					
Castings, n.e.s.	$	.....	24,218	.....	143,714
Ferro-silicon and ferro compounds	Tons	4,865	285,221	9,238	537,081
Gas buoys and parts of	$	.....	21,009	.....	2,017
Hardware, tools, etc.	"	.....	95,497	.....	321,021
" n.e.s.	"	.....	190,763	.....	401,053
Machinery (Linotype machines)	"	.....	5,562	.....	6,946
" n.e.s.	"	.....	344,689	.....	536,162
Pig-iron	Tons	14,198	201,145	17,307	231,551
Scrap iron and steel	Cwt.	708,107	446,337	1,787,155	883,134
Sewing machines	No.	2,109	31,392	2,557	30,479
Steel and manufactures of, all other	$	.....	2,931,908	.....	31,147,770
Stoves	No.	4,198	25,149	1,271	18,563
Typewriters	"	3,055	200,441	3,175	206,811
Vehicles:—					
Automobiles	"	5,621	3,011,327	13,475	6,756,395
" parts of	$	.....	384,428	.....	363,178
Bicycles	No.	111	10,021	116	4,692
" parts of	$	.....	3,973	.....	15,447
Washing machines	"	.....	33,986	.....	20,334
Wire and wire nails	Cwt.	193,255	355,781	1,439,950	3,224,740
Lime	$	.....	16,927	.....	15,617
Metals:—					
Brass, old and scrap	Cwt.	21,209	196,710	120,685	1,468,165
Copper "	"	19,871	231,710	41,616	616,553
Metallic shingles, etc.	$	.....	105,663	.....	66,655
Metals, n.o.p.	"	.....	393,829	.....	878,258
Mineral and aerated waters (in bottles)	"	.....	1,768	.....	3,525
Naphtha and gasoline	Gals.	43,023	11,607	16,644	4,540
Oil, n.o.p.	"	455,867	104,179	1,247,376	290,943
Phosphorus	Lbs.	610,350	92,303	545,050	77,476
Plumbago, manufactures of	$	.....	72,718	.....	84,316
Stone, building	"	.....	370	.....	660
" ornamental	"	.....	1,752	.....	5,990
Tar	"	.....	36,719	.....	37,331
Tin, manufactures of	"	.....	24,531	.....	173,206
Total manufactures	$	.....	21,752,203	.....	62,343,179
Grand total	$	.....	75,533,305	.....	124,157,761

EXPORTS.

Showing Destination of Mine Products during the Fiscal Years, 1912-1913, 1913-1914, and 1914-1915.

Destination.	1912–13. Value.	1913–14. Value.	1914–15. Value.
British Empire.			
United Kingdom	$ 12,066,622	$ 16,027,128	$ 12,219,937
Australia and Tasmania	73,283	92,457	125,903
Bermuda	5,315	1,192	.....
British South Africa	33,415	13,863	8,092
„ Guiana	37,983	23,351	.....
„ India	.....	.....	612
„ E. Indies, other	.....	.....	4,404
„ W. Indies	15,383	3,343	1,552
Gibralter	.....	.....	1,974
Hong Kong	491,121	1,058,229	213,254
Newfoundland and Labrador	498,989	649,682	516,756
New Zealand	948	.....	130
Total British Empire	13,223,059	17,869,245	13,092,614
Other Countries			
Alaska	327,325	102,383	243,231
Argentina	66,315	19,206	3,447
Austria-Hungary	32,474	74,200	37,124
Belgium	141,924	258,180	45,668
Brazil	54,760	.....	3,159
China	511,155	162,034	94,203
Cuba	8,852	19,253	1,461
Denmark	877	365	611
France	114,370	167,974	91,857
French Africa	2,127	.....	.....
Germany	172,966	618,201	290,276
Greece	.....	200	.....
Hawaii	.....	.....	26,262
Hayti	843	.....	.....
Holland	27,529	185,158	87,207
Italy	7,430	16,704	41,353
Japan	54,976	32,626	69,483
Mexico	69,946	.....	1,928
Miquelon and St. Pierre	47,093	20,476	36,519
Norway	.....	100	2,662
Panama	.....	.....	3,891
Phillppines	.....	.....	5,257
Portugal	.....	1,322	633
Roumania	4,791	.....	.....
Russia in Europe	.....	140	2,678
Spain	.....	10	911
Sweden	.....	150	345
United States	42,541,751	39,491,127	37,558,209
Uruguay	31,983	.....	.....
Total other countries	44,219,487	41,169,809	38,648,375
Grand total	57,442,546	59,039,054	51,740,989

IMPORTS.

Imports of Products of the Mine and Manufactures of Mine Products —Calendar Years 1913, 1914, and 1915.

Products.	1913. Value.	1914. Value.	1915. Value.
Alumina	$ 614,713	$ 571,419	$ 892,634
Alum, alum cake, and chloralum	198,613	188,918	196,685
Aluminium and manufactures	745,694	860,351	722,235
Antimony regulus	49,408	47,498	344,918
Antimony salts	2,421	10,217	10,320
Arsenic, oxide and sulphide of	18,820	1,005	6,072
Asbestos	520,082	282,053	168,894
Asphaltum	905,829	712,980	570,295
Bells and gongs	130,351	99,898	43,205
Bismuth	4,940	3,927	9,004
Blanc fixe and satin white	38,043	39,849	59,471
Blast furnace slag	71,114	20,736	14,067
Borax	104,787	103,975	164,180
Brick and tile	1,928,735	1,296,657	488,288
Brick, fire, of a kind not made in Canada, and n.o.p.	1,192,857	690,133	813,071
Bromine and bromides	385	997	530
Burrstones	1,784	16	314
Cement, Portland, and manufactures	427,032	159,691	47,836
Chalk, Cornwall stone, feldspar, fluorspar, etc.	164,879	113,211	100,012
Clays	324,290	288,128	237,096
Coal: anthracite, bituminous, slack, and run-of-mine	47,949,119	39,801,498	28,345,605
Coal tar and coal pitch	225,765	198,283	151,377
Coke	2,180,830	1,585,259	1,608,464
Coke, ground for electric batteries	9,942	13,115	12,266
Copper and manufactures of	7,414,610	4,256,901	3,957,770
Cryolite	33,487	60,517	61,312
Crucibles, clay or plumbago	73,971	49,913	106,761
Chloride of lime	115,614	138,619	112,142
Cyanides of potassium, sodium, cyanogen, or cpd of bromine	217,472	309,913	367,329
Diamonds, unset, and bort	3,223,711	2,190,786	709,154
Earthenware	3,314,870	2,192,222	1,460,010
Earths, crude	9,527	3,992	1,811
Electric carbons	98,944	55,880	40,685
Emery	184,649	118,008	206,732
Fertilizers, compound or manufactured	505,904	677,174	734,952
Flint, quartz, silex, etc.	74,529	63,433	54,493
Foundry facings	24,226	11,372	9,855
Fullers earth	13,190	12,338	12,321
Fossils	3,237	4,477	4,000
Gannister	1,776	595	2,462
Gold and silver and manufactures of	2,736,517	15,777,804	1,829,953
Graphite and manufactures of	82,262	50,279	45,117
Grindstones	145,247	98,872	79,391
Gypsum and plaster of Paris	188,252	75,031	25,819
Hydrofluosilicic acid	46,517	41,576	36,085
Iron and steel—Total, 1913, $145,226,972 1914, 80,063,679 1915, 74,308,983			
Pig-iron	3,247,405	982,189	624,200
Ferro products and chrome steel	970,100	560,686	820,976
Ingots, blooms, billets, puddled bars, etc.	1,212,314	259,703	1,270,687
Scrap iron and scrap steel	1,488,255	337,406	127,614
Plates and sheets	13,965,865	7,576,312	7,647,560
Tin plates and sheets	3,954,615	3,151,385	2,883,951
Bars, rods, hoops, bands, etc.	10,195,280	5,138,193	5,829,088
Structural iron and steel	12,739,954	4,214,520	3,615,333
Rails and connexions	5,120,830	1,116,773	379,218
Pipes and fittings	847,922	395,466	110,978
Nails and spikes	360,489	210,098	86,876
Wire	3,688,660	3,205,635	2,175,834
Forging castings and manufactures	2,090,533	1,375,590	1,932,370
Other iron and steel products	85,344,750	51,238,306	46,804,298
Iron ore	3,877,824	2,387,358	2,331,755
Iron sand	10,168	13,743	3,263
Kainite	1,970	13,337	146
Lead and manufactures; litharge	1,215,433	1,042,538	2,482,916
Lime	238,271	211,123	98,040
Lithographic stone	7,152	4,107	1,316
Manganese, oxide of	46,990	42,287	46,678

IMPORTS.

Imports of Products of the Mine and Manufactures of Mine Products —Calendar Years 1913, 1914, and 1915.—*Continued.*

Products.	1913. Value.	1914. Value.	1915. Value.
Magnesia	$ 12,226	$ 16,429	$ 9,695
Meerschaum	111	372	73
Mercury or quicksilver, cinnabar	109,493	97,449	159,284
Metallic alloys:—			
Babbitt metal	41,112	26,489	16,709
Brass and manufactures of	4,667,768	2,868,464	3,177,942
Britannia metal	43,417	33,080	11,198
German silver, nickel, and nickel silver	249,192	238,612	274,706
Type metal	1,981	1,500	1,838
Mineral and bituminous substances	198,519	146,763	123,726
Mineral water, including aerated water	257,153	199,327	126,569
Nickel anodes	8,512	12,640	9,571
Ochres, etc.	283,554	278,064	284,749
Ores of metals, n.o.p., cobalt ore	894,989	574,690	962,999
Paraffin wax	72,351	57,527	40,965
Paraffin candles	37,546	44,874	27,552
Petroleum and products of	13,238,429	11,072,362	7,979,264
Phosphate (fertilizer)	16,070	20,220	14,148
Platinum and manufactures of	145,674	79,614	84,087
Potash and manufactures of	414,165	343,004	211,243
Precious stones	360,473	177,168	132
Pumice	17,861	16,976	18,814
Salt	565,283	540,881	517,526
Saltpetre	81,797	108,784	279,692
Sand and gravel	440,343	224,759	120,756
Slate and manufactures of	235,474	213,256	108,676
Sand paper	171,516	138,415	133,677
Soda products: barilla, bichromate, caustic, sal, and salt cake	998,993	960,670	858,364
Stone and manufactures of (including marble)	1,640,849	1,252,869	539,173
Soda, nitrate of	1,645,320	604,952	1,050,648
Sulphate of iron (copperas)	5,036	5,517	5,302
Sulphur and phosphorus	638,970	877,628	509,889
Sulphuric acid	4,054	7,149	4,872
Talc	10,706	8,983	1,866
Tin and manufactures of (including tinware)	3,118,760	2,023,329	1,634,796
Whiting and prepared chalk	151,380	134,511	109,551
Zinc and manufactures of	1,576,943	1,210,652	2,775,358
	259,299,745	181,675,667	146,323,500

METALLIC ORES AND PRODUCTS.

Antimony.—There was a production of antimony ore in 1915 (all exported) of 1,341 tons valued at $81,283, and of refined antimony 59,440 pounds valued at $11,888. There was no production during the three previous years. The imports of antimony or regulus thereof in 1915, were 1,962,194 pounds valued at $344,918, and of antimony salts 67,956 pounds, valued at $10,320, or a total value of imports of $355,238. In 1914 the imports were antimony and regulus 648,516 pounds valued at $47,498, and antimony salts 45,634 pounds, valued at $10,217, or a total value of imports of $57,715.

Cobalt.—Metallic cobalt, cobalt oxide, cobalt sulphate and other cobalt salts and alloys are produced in Ontario smelters. The production

in 1915 as metal or contained in cobalt oxide or other salt was equivalent to 504,212 pounds of cobalt and was valued at $536,268. This included 211,610 pounds of metallic cobalt and 423,717 pounds of cobalt oxide and cobalt sulphate. In 1914 the production was reported as 899,027 pounds of cobalt oxide and 242,572 pounds of cobalt contained in residues sold outside of Canada or equivalent to a total of 871,891 pounds of cobalt.

Copper.—The production of copper contained in blister, matte, or ore, which was practically all exported, was 100,785,150 pounds in 1915, valued at $17,410,635, as compared with 75,735,960 pounds in 1914, valued at $10,301,606.

The exports of copper in 1915 were reported as 106,891,179 pounds, valued at $13,076,909, as against exports in 1914 of 77,398,723 pounds, valued at $8,270,689. The total imports of copper in 1915 were valued at $3,957,770, and included crude and manufactured copper 19,497,500 pounds, valued at $3,402,922, and other manufactures of copper valued at $554,848.

The total imports of copper in 1914 were valued at $4,256,901, and included crude and manufactured copper, 26,280,815 pounds valued at $3,983,322, and other manufactures of copper, valued at $273,579.

Gold.—The total value of the production of gold in 1915 was $18,977,901, representing 918,056 fine ounces, as compared with $15,983,007, representing 773,178 fine ounces of metal in 1914.

The Yukon placer production in 1915 was 229,803 fine ounces, valued at $4,750,450.

Of the total production in 1915 about $5,524,476 were derived from alluvial workings; $8,909,170 in bullion from milling ores and $4,544,255 from ores and concentrates sent to smelters.

In 1914 about $5,687,501 were derived from alluvial workings; $6,051,-968 in bullion from milling ores, and $4,243,538 from ores and concentrates sent to smelters.

The exports of gold-bearing dust, quartz, nuggets, and gold in ore, etc., in 1915, were valued at $16,528,143, as against $15,242,200 in 1914.

The imports of gold bullion during the calendar year 1915 were $1,028,-405, of gold coin $19,910,229, and of manufactures of gold and silver $464,294.

Pig-Iron.—The total production of pig-iron in Canadian blast furnaces in 1915 was 913,775 tons valued at $11,374,199, of which it is estimated 755,180 tons valued at $9,658,325 should be credited to imported ores, and 158,575 tons, valued at $1,715,874 to domestic ores. In 1914 the total production was 783,164 tons, valued at $10,002,856, of which it is estimated that 687,420 tons, valued at $8,863,944, should be credited to imported ores, and 95,744 tons, valued at $1,138,912 to domestic ores.

The exports of pig-iron in 1915 were 17,307 tons, valued at $231,551, and of ferro-alloys 9,238 tons, valued at $537,081, or a total of 26,545 tons, valued at $768,632, as against total exports in 1914 of 19,063 tons, valued at $486,366.

The imports of pig-iron in 1915 were 47,482 tons, valued at $624,200; ferro-manganese, etc., 13,758 tons, valued at $807,312, as compared with imports in 1914 of pig-iron 78,594 tons, valued at $981,107; ferro-manganese, etc., 22,147 tons, valued at $549,485, and charcoal pig-iron 86 tons, valued at $1,082.

The total exports of iron and steel and manufactures thereof, in 1915 were valued at $48,268,148, as against $14,391,746 in 1914. The imports of iron and steel and manufactures thereof during the calendar year 1915 were valued at $74,308,983, as compared with $80,063,679 during the calendar year 1914.

Iron Ore.—The total shipments of iron ore from Canadian mines in 1915 were 398,112 tons, valued at $774,427, as compared with 244,854 tons valued at $542,041 in 1914. The quantity of imported iron ore used in Canadian blast furnaces in 1915 was about 1,314,957 tons, as compared with 1,324,326 tons of imported ore used in 1914.

Lead.—The production of lead in 1915 was 46,316,450 pounds, valued at $2,593,721, as against 36,337,765 pounds, valued at $1,627,568 in 1914.

The exports of lead in 1915 were pig lead 2,066,929 pounds, valued at $79,067, lead in ore, etc., 1,845,100 pounds, valued at $40,273; the exports in 1914 were pig lead 510,573 pounds, valued at $19,507, and lead in ore, etc., 246,100 pounds, valued at $2,681. The total value of the imports of lead and manufactures of, in 1915 was $2,482,916, as compared with imports in 1914, valued at $1,042,538.

Molybdenum.—The production of molybdenite in 1915 was equivalent to 29,210 pounds of concentrate, valued at $28,450, as compared with a production in 1914 equivalent to 3,814 pounds of concentrate valued at $2,063.

Nickel.—The production of nickel in 1915 including nickel contained in nickel-copper matte and nickel recovered as metal or oxide, etc., from the nickel-cobalt-silver ores of Cobalt, was 68,308,657 pounds valued at $20,492,597, which included 68,077,023 pounds contained in nickel-copper matte produced in the Sudbury district and 231,634 pounds recovered in Canadian smelters in the treatment of ores from Cobalt. During 1915 there were smelted 1,272,283 tons of nickel-copper ores producing 67,703 tons of matte as against 947,053 tons of ore producing 46,396 tons of matte in 1914, the nickel contents of the latter being 45,517,937 pounds. There were also produced in 1914, 392,512 pounds of nickel oxide.

The exports of nickel contained in ore matte, etc., during 1915 were 66,410,442 pounds, valued at $7,394,446, being 13,747,991 pounds to

Great Britain and 52,662,451 pounds to the United States. In 1914 the exports were 46,528,327 pounds, valued at $5,149,427; being 10,291,979 pounds to Great Britain; 36,015,642 pounds to the United States, and 220,706 pounds to other countries.

The imports of nickel, nickel-silver, in ingots, bars, sheets, etc., in 1915 were 710,344 pounds, valued at $197,168, as against 619,852 pounds, valued at $155,427 in 1914.

Silver.—The production of silver contained in bullion, or estimated as recovered from mattes and ores, etc., exported, was in 1915, 26,625,960 fine ounces, valued at $13,228,842, as compared with 28,449,821 fine ounces valued at $15,593,631 in 1914.

The exports of silver contained in ores, mattes, etc., in 1915 were 27,672,481 ounces, valued at $13,812,038, as against exports of 28,020,089 ounces, valued at $15,584,813 in 1914. The imports of silver bullion during the calendar year 1915 were valued at $337,254, as compared with bullion imports of $629,279 in 1914.

Zinc.—The shipments of zinc ore in 1915 were 14,895 tons, valued at $554,938, as compared with shipments of 10,893 tons, valued at $262,563 in 1914. The total value of the imports of zinc and manufactures of zinc, in 1915 was $2,775,358, as compared with imports, valued at $1,210,652 in 1914.

NON-METALLIC PRODUCTS.

Actinolite.—A production of 220 tons, valued at $2,420 was reported in 1915, as compared with 119 tons valued at $1,304 in 1914.

Arsenic.—Smelter returns show a production in 1915 of 2,396 tons of arsenious oxide, valued at $147,830, as compared with a production in 1914 of 1,737 tons, valued at $104,015.

The exports of arsenic in 1915 were 2,318 tons, valued at $174,190, as against 1,876 tons, valued at $132,567 in 1914. The imports of sulphide of arsenic in 1915 were 171,993 pounds, valued at $5,415 as against 11,494 pounds, valued at $756 in 1914. The imports of arsenious oxide in 1915 were 14,222 pounds valued at $657, as against 5,012 pounds, valued at $249 in 1914.

Asbestos.—The shipments of asbestos in 1915 were 111,142 tons, valued at $3,553,166, and of asbestic 25,700 tons, valued at $21,819, as compared with shipments in 1914 of asbestos 96,542 tons, valued at $2,892,266, and of asbestic 21,031 tons, valued at $17,540.

The shipments in 1915 consisted of 5,370 tons of crude asbestos, valued at $1,076,297, and 105,772 tons of mill stock valued at $2,476,869. The 1914 shipments included 4,147·9 tons of crude asbestos, valued at $773,193, and 92,394 tons of mill stock, valued at $2,119,073.

Exports in 1915 were 84,584 tons, valued at $2,734,695, as against 81,081 tons, valued at $2,298,646 in 1914. There were also exported in 1915, 25,103 tons of asbestic sand, valued at $157,410.

Imports of asbestos and manufactures of asbestos in 1915, were valued at $168,894, and in 1914, $282,053.

Chromite.—Shipments in 1915 were reported as 12,341 tons, valued at $179,540, as against 136 tons, valued at $1,210 in 1914.

The exports of chromite or chromic iron in 1915 were 7,290 tons, valued at $81,838.

Coal.—The production of coal in 1915 was 13,267,023 tons, valued at $32,111,182, as against 13,637,529 tons, valued at $33,471,801 in 1914.

The exports of coal in 1915 were 1,766,543 tons, valued at $5,406,058, as compared with 1,423,126 tons, valued at $3,880,175 in 1914. The total imports of coal in 1915 were 12,465,902 tons, valued at $28,345,605, as against imports in 1914 of 14,721,057 tons valued at $39,801,498.

The 1915 imports included 6,106,794 tons of bituminous round and run-of-mine coal, valued at $7,564,369; 4,072,192 tons of anthracite and anthracite dust, valued at $18,753,980; and 2,286,916 tons of bituminous slack, such as will pass through a ¾ inch screen, valued at $2,027,256. The consumption of coal in 1915 was approximately 23,906,692 tons, as against 26,852,323 tons in 1914.

The 1914 imports included 7,776,415 tons of bituminous round and run-of-mine coal, valued at $14,954,321; 4,435,010 tons of anthracite and anthracite dust, valued at $21,241,924; and 2,509,632 tons of bituminous slack, such as will pass through a ¾ inch screen, valued at $3,605,253.

Coke.—The quantity of oven coke made in 1915 was 1,200,766 tons, the quantity sold or used was 1,170,473 tons, valued at $4,258,580, as compared with 1,015,253 tons, made in 1914, and 1,023,860 tons sold or used, valued at $3,658,514. The quantity of coal charged to coke ovens in 1915 was 1,856,393 tons, as compared with 1,541,913 tons in 1914. The exports of coke in 1915 were 35,869 tons, valued at $160,053, and in 1914, 67,838 tons, valued at $306,117.

The imports of coke in 1915 were 637,857 tons, valued at $1,608,464, as compared with imports of 553,046 tons, valued at $1,585,259 in 1914.

Corundum.—The total sales of grain corundum in 1915 were 262 tons, valued at $33,138, as compared with sales of 548 tons, valued at $72,176 in 1914. Exports for 1915 were 339 tons, valued at $37,798, and in 1914 947 tons, valued at $87,740.

Feldspar.—Shipments of feldspar in 1915 were 14,559 tons, valued at $57,801, as compared with 18,060 tons, valued at $70,824, in 1914. The exports are not separately recorded in 1915, but in 1914 were 18,072 tons, valued at $74,100.

Fluorspar.—No production has been reported during the past three years. Canadian furnaces in 1915 used 13,520 tons of fluorspar and in 1914, 7,845 tons. Imports of hydrofluosilicic acid were 1,117,874 pounds, valued at $36,085, as against 1,384,087 pounds, valued at $41,576 in 1914.

Graphite.—Shipments of crude and milled graphite during 1915 totalled 2,635 tons, valued at $124,223, as against 1,647 tons, valued at $107,203 in 1914. The production of artificial graphite in 1915 was reported as 249 tons, as compared with 617 tons in 1914.

Exports of plumbago in 1915 are reported as 263 tons, valued at $12,009, and manufactures of plumbago, valued at $84,316. Exports in 1914 were; plumbago 919 tons, valued at $50,528, and manufactures of plumbago, valued at $72,718.

Imports of graphite in 1915 were valued at $151,878, and included: plumbago, not ground, $3,436; blacklead $6,084; plumbago ground and manufactures of, $35,597; and crucibles of clay or plumbago $106,761. Imports of graphite in 1914 were valued at $100,192, and included: plumbago not ground $801, blacklead $6,798, plumbago ground and manufactures of, $42,680, and crucibles of clay or plumbago $49,913.

Grindstones.—The production of grindstones, scythestones, and wood pulpstones in 1915 was 2,580 tons, valued as $35,768, as compared with 3,976 tons, valued at $54,504 in 1914. The exports in 1915 were: manufactured grindstones, valued at $35,334; and stone for the manufacture of grindstones 180 tons, valued at $900. The exports in 1914 were: manufactured grindstones, valued at $24,113, and stone for the manufacture of grindstones 54 tons, valued at $294.

The imports of abrasives in 1915 included: grindstones, valued at $79,391, burrstones $314, emery in bulk, crushed or ground $67,067; manufactures of emery, carborundum, etc., $139,665; pumice stone $18,814; also iron sand $3,263; sandpaper $133,677; and artificial abrasives $28,921. The imports of abrasives in 1914 included: grindstones valued at $98,872; burrstones $16; emery in bulk, crushed or ground $29,127; manufactures of emery, carborundum, etc. $88,881; pumice stone $16,976; also iron sand, $13,743; sandpaper $138,415.

Gypsum.—The total shipments of gypsum, crude and calcined, in 1915 were 474,815 tons, valued at $854,929, as compared with shipments of 516,880 tons, valued at $1,156,507 in 1914. The tonnage of gypsum mined or quarried in 1915 was 505,989, and the quantity calcined 84,763 tons. In 1914, 579,841 tons of gypsum were mined or quarried and 138,212 tons calcined.

The shipments in 1915 included: crude, lump 346,947 tons, valued at $375,815; crude crushed 48,735 tons, valued at $67,007; fine ground 6,455 tons, valued at $22,767; and calcined gypsum 72,678 tons, valued at $389,340. The shipments in 1914 included: crude lump 351,729 tons,

valued at $400,521, crude crushed 49,441 tons, valued at $61,686; fine ground 6,097 tons, valued at $14,496; and calcined gypsum 109,613 tons, valued at $679,504.

The exports of gypsum in 1915 were 292,234 tons of crude gypsum, valued at $336,380, and gypsum ground or calcined, valued at $80,933. The 1914 exports were: 345,830 tons of crude gypsum, valued at $404,234, and gypsum ground or calcined, valued at $35,490.

The imports of gypsum in 1915 were valued at $25,819, including: crude gypsum 1,799 tons, valued at $7,734; ground gypsum 134 tons, valued at $2,253; and plaster of Paris 2,441 tons, valued at $15,832.

The imports of gypsum in 1914 were valued at $75,031, and included: crude gypsum 3,572 tons, valued at $16,448; ground gypsum, 536 tons, valued at $4,301; and plaster of Paris 7,739 tons, valued at $54,282.

Magnesite.—Shipments of magnesite in 1915 were 14,779 tons, valued at $126,584, and in 1914, 358 tons, valued at $2,240. Imports of magnesia in 1915 were 182,249 pounds, valued at $9,695, as against 254,283 pounds, valued at $16,429 in 1914.

Manganese.—Shipments of manganese in 1915 were reported as 201 tons, valued at $9,360, as against 28 tons, valued at $1,120 in 1914. The exports in 1915 were 255 tons, valued at $6,855, as against 30 tons, valued at $750, exported in 1914. The 1915 imports included 1,238 tons of manganese oxide, valued at $46,678, as compared with 1,702 tons, valued at $42,487 in 1914.

Mica.—The value of the mica production in 1915, as reported by mine operators, was $91,905, as compared with $109,061 in 1914. The exports of mica in 1915 were 879,631 pounds, valued at $236,124, as against 669,163 pounds, valued at $178,940 in 1914.

Mineral Pigments.—Shipments of barytes in 1915 were 550 tons, valued at $6,875, as against 612 tons, valued at $6,169 in 1914. The production of ochres, iron oxides, in 1915, was 6,248 tons, valued at $48,353, as compared with 5,890 tons, valued at $51,725 in 1914.

The exports of iron oxides in 1915 were 1,196 tons, valued at $17,263, as against 1,777 tons, valued at $22,311 in 1914. The imports in 1915 were ochres and ochrey earth and raw siennas 1,240 tons, valued at $23,763, and oxides, dry fillers, fireproof umbers and burnt siennas 2,452 tons, valued at $260,986, as compared with imports in 1914 comprising: ochres and ochrey earth and raw siennas 1,532 tons, valued at $33,197, and oxides, dry fillers, fireproof umbers, and burnt siennas 4,023 tons, valued at $244,867.

Mineral Water.—The value of the production of mineral water in 1915 for which returns were received was $115,274, as compared with a value of $134,111 in 1914. The imports of mineral and aerated waters in 1915

were valued at $126,569, as against a value of $199,153 in 1914. The exports in 1915 were valued at $3,578, as against $1,367 in 1914.

Natural Gas.—The production of natural gas in 1915 was 20,124 million cubic feet, valued at $3,706,035, as compared with 21,693 million cubic feet, valued at $3,484,727 in 1914.

Peat.—Shipments of peat for fuel purposes in 1915 were 300 tons, valued at $1,050, as compared with 685 tons, valued at $2,470 in 1914.

Petroleum.—The production of crude petroleum in 1915 was 215,464 barrels or 7,541,230 gallons, valued at $300,572, as compared with 214,805 barrels, or 7,518,168 gallons, valued at $343,124 in 1914.

Exports of refined oil in 1915 were 103,488 gallons, valued at $14,107, and 2,922 gallons, valued at $826 in 1914. There was an export in 1915 of naphtha and gasoline of 16,644 gallons, valued at $4,540; crude mineral oil 35,977 gallons, valued at $1,789, and also an export of other oils n.e.s. of 1,247,376 gallons, valued at $290,943, which may have included products of petroleum. Exports in 1914 included: naphtha and gasoline, 43,023 gallons, valued at $11,607, crude mineral oil 3,996 gallons, valued at $362, and also an export of other oils n.e.s. of 455,867 gallons, valued at $104,179.

The total value of the imports of petroleum and petroleum products in 1915 was $8,047,781, as against a value of $11,174,763 in 1914.

The total imports of petroleum oils, crude and refined, in 1915 were 236,913,765 gals., valued at $7,979,264. The oil imports included, crude oil 192,588,487 gals., valued at $3,678,021, refined and illuminating oils, 6,792,873 gals., valued at $405,019; gasoline 28,030,972 gals., valued at $2,693,717; lubricating oils 4,547,179 gals., valued at $755,535, and other oils, products of petroleum 4,954,254 gals., valued at $446,972. The oil imports in 1914 were: crude oil 195,207,210 gals., valued at $5,750,971; refined and illuminating oils 12,833,065 gals., valued at $970,481; gasoline 24,396,401 gals., valued at $2,747,360; lubricating oils 5,767,676 gals., valued at $940,143, and other oils, products of petroleum 6,283,621 gals., valued at $663,407, making a total of 244,487,973 gals., valued at $[illegible]072,-362.

The imports of petroleum products in 1915 included 980,662 pounds of paraffin and paraffin wax candles, valued at $68,517, as compared with imports in 1914 of 1,594,236 pounds, valued at $102,401.

Phosphate.—Shipments of phosphate or apatite in 1915 were 217 tons, valued at $2,502, as compared with 954 tons, valued at $7,275 in 1914. Exports in 1915 were reported as 179 tons, valued at $1,860, as against 247 tons, valued at $677 in 1914. There was an export of phosphorus in 1915 of 545,050 pounds, valued at $77,476, while in 1914, 610,350 pounds, valued at $92,303 were exported.

The imports of phosphate rock (fertilizer) in 1915 were valued at $14,148; phosphorus 75,900 pounds, valued at $29,572; acid phosphate 1,964,131 pounds, valued at $105,035; and manufactured fertilizers, valued at $734,952. The imports of phosphate rock (fertilizer) in 1914 were valued at $20,220; phosphorus 20,994 pounds, valued at $6,760; acid phosphate 1,874,486 pounds, valued at $97,862; and manufactured fertilizers, valued at $677,174.

Pyrites.—The production of pyrites in 1915 was 286,038 tons, valued at $985,190, as compared with 228,314 tons, valued at $744,508 in 1914. The exports in 1915 were 137,598 tons, valued at $527,318, as against exports of 89,999 tons, valued at $377,985 in 1914. The imports of brimstone or sulphur in 1915 were 30,182 tons, valued at $480,317, as against 41,954 tons, valued at $870,868 in 1914.

Quartz.—The production of quartz in 1915 was reported as 127,108 tons, valued at $205,153, as compared with a production in 1914 of 54,148 tons, valued at $84,583. There were imported during 1915, 402 tons of silex or crystallized quartz, valued at $5,527, and 4,327 tons of flint, valued at $48,966, and in 1914, 870 tons of silex or crystallized quartz, valued at $15,502, and 3,835 tons of flint, valued at $47,931.

Salt.—The total sales of salt in 1915 were 119,900 tons, valued at $600,226 (exclusive of packages). The value of the packages used was $280,747. In 1914 the sales were 107,038 tons, valued at $493,648, and value of packages used $278,897.

Exports of salt in 1915 were 889,300 pounds, valued at $5,836, and in 1914, 952,700 pounds, valued at $5,229. The total imports of salt in 1915 were valued at $517,526, and included: 34,481 tons, valued at $135,446, subject to duty; and 103,006 tons, valued at $382,080, duty free. The 1914 imports were valued at $540,881, and included: 33,893 tons, valued at $151,108, subject to duty; and 108,753 tons, valued at $389,773, duty free.

Among the imports of soda products in 1915 are included: soda ash or barilla 65,566,168 pounds, valued at $448,845, soda bichromate 467,943 pounds, valued at $34,692; caustic soda, in packages of 25 pounds or more, 7,737,149 pounds, valued at $184,468; sal soda 6,833,000 pounds, valued at $43,312; nitrate of soda or cubic nitre 45,285,220 pounds, valued at $1,050,648; and sulphate of soda 30,970,231 pounds, valued at $147,047.

Talc.—The production of talc in 1915 was 11,885 tons, valued at $40,554, as against 10,808 tons, valued at $40,418 in 1914. Imports of talc for the year 1915 were 154 tons, valued at $1,866, as against 584 tons, valued at $8,983 in 1914.

Tripolite.—There were 317 tons of tripolite, valued at $12,119, shipped in 1915, as against shipments in 1914 of 650 tons, valued at $13,000.

STRUCTURAL MATERIALS AND CLAY PRODUCTS.

Cement.—The total sales of cement in 1915 were 5,681,032 barrels, valued at $6,977,024, as against 7,172,480 barrels, valued at $9,187,924 in 1914. The exports of cement in 1915 were valued at $5,161, as compared with exports valued at $2,223 in 1914.

The imports in 1915 included: manufactures of cement, valued at $7,410; and Portland cement 98,664 hundredweight (28,190 barrels), valued at $40,426.

The imports of cement in 1914 included: manufactures of cement, valued at $12,533; and Portland cement 343,076 hundredweight (98,022 barrels), valued at $147,158.

The consumption of Portland cement in Canada in 1915 was approximately 5,709,222 barrels, as compared with 7,270,502 barrels in 1914.

Clay Products.—The total value of the production of clay products in Canada in 1915 was $3,914,488, as compared with a total value of $6,871,957 in 1914. Brick and tile products alone were valued at $2,673,048, as against $5,208,976 in 1914. The value of sewerpipe production in 1915 was $799,446, as compared with $1,104,499 in 1914.

The only clay products exported in 1915 were: 1,155,000 building brick, valued at $9,089; manufactures of clay, valued at $25,202; and earthenware, valued at $11,281. The exports in 1914 were 1,486,000 building brick, valued at $11,871; manufactures of clay, valued at $26,866, and earthenware valued at $9,336. The total imports of clay products in 1915 were valued at $2,998,465, and included: brick and tile, valued at $1,301,-359; earthenware and chinaware, $1,460,010; and clays, valued at $237,096.

The total imports of clay products in 1914 were valued at $4,467,140, and included: brick and tile valued at $1,986,790; earthenware and chinaware $2,192,222; and clays valued at $288,128.

Kaolin.—In 1915 shipments of 1,300 tons, valued at $13,000 were reported, as compared with shipments in 1914 of 1,000 tons, valued at $10,000.

Lime.—The total production of lime in 1915 was 5,047,244 bushels, valued at $1,015,702, as compared with 7,028,582 bushels, valued at $1,360,628 in 1914. The exports of lime in 1915 were valued at $15,617, as against exports valued at $16,927 in 1914. The imports of lime in 1915 were 189,774 barrels, valued at $98,040, and in 1914, 340,829 barrels, valued at $211,123.

Sand-Lime Brick.—The total sales of sand-lime brick in 1915 were 17,960,802, valued at $141,742, an average value of $7.89 per thousand. The sales in 1914 were 70,650,030, valued at $609,515, an average value of $8.63 per thousand.

Slate.—The production of slate in 1915 was 397 squares, valued at $2,039, and 1,075 squares, valued at $4,837 in 1914.

The imports of slate in 1915 were valued at $108,676, and included roofing slate, valued at $34,528; school writing slate, $38,874, slate pencils $4,954, and manufactures of slate, $30,320. The imports of slate in 1914 were valued at $213,256, and included: roofing slate valued at $91,977; school writing slate $54,723; slate pencils $6,514, and manufactures of slate $59,444.

Stone.—The total value of the production of stone of all kinds in 1915 was $4,244,997, as compared with a value of $5,469,056 in 1914. The value of stone exports in 1915 was $72,777, as against $72,080 in 1914, and the total value of stone imported in 1915 was $539,173, as against imports valued at $1,252,869 in 1914. The production in 1915 included: granite, valued at $1,525,553, limestone $2,312,081, marble $158,027, and sandstone $249,336. The production in 1914 included: granite, valued at $2,176,602; limestone $2,672,781; marble $132,533, and sandstone $487,140.

Sand and Gravel.—According to returns received, the production of sand and gravel in 1915 was 6,445,717 tons, valued at $1,624,767, as compared with a value of $2,505,310 in 1914. The exports of sand and gravel in 1915 were 808,022 tons, valued at $380,549, and the imports 199,597 tons, valued at $120,756.

PRODUCTION BY PROVINCES.

A summary of the mineral production by provinces in 1914 and 1915 is shown in the accompanying tables, in the first of which the total production in the several provinces and the percentages of each, are given for the past three years. Ontario continues as the largest contributor to the total, having a production of $61,061,287, or 44·5 per cent, as against $53,034,677, or 41·1 per cent of the total in 1914. British Columbia was second, with a production of $28,689,425, or 20·9 per cent, against $24,164,039, or 18·7 per cent of the total in the previous year. Nova Scotia, third in importance, had a production of $18,088,342, or 13·2 per cent of the total in 1915, as against $17,584,639, or 13·6 per cent of the total in 1914. Quebec, in fourth place, had a production of $11,619,275, or 8·5 per cent; Alberta occupied fifth place, with a production of $9,909,347, or 7·2 per cent. The Yukon District, Manitoba, New Brunswick, and Saskatchewan, follow in the order named.

In making these comparisons it should be remembered that Nova Scotia is not credited with the large production of pig-iron and steel at Sydney and Sydney Mines, which is made almost entirely from imported iron ores and is not naturally credited as Canadian mine product. Similarly a large proportion of the pig-iron production in Ontario is excluded from

the total value, because it is derived from imported ores. The Province of Quebec also, is not credited with the production of aluminium at Shawenegan Falls, which is made from imported bauxite.

Mineral Production by Provinces, 1913, 1914, and 1915.

Province.	1913.		1914.		1915.	
	Value of production.	Per cent of total.	Value of production.	Per cent of total.	Value of production.	Per cent of total.
*Nova Scotia	$19,376,183	13·30	$17,584,639	13·65	$18,088,342	13·19
New Brunswick	1,102,613	0·76	1,014,570	0·79	903,467	0·66
Quebec	13,475,534	9·25	11,836,929	9·19	11,619,275	8·48
Ontario	59,167,749	40·63	53,034,677	41·16	61,071,287	44·54
Manitoba	2,214,496	1·52	2,413,489	1·87	1,318,387	0·96
Saskatchewan	881,142	0·60	712,313	0·55	451,933	0·33
Alberta	15,054,046	10·34	12,684,234	9·84	9,909,347	7·23
British Columbia	28,086,312	19·29	24,164,039	18·75	28,689,425	20·92
Yukon	6,276,737	4·31	5,418,185	4·20	5,057,708	3·69
Dominion	145,634,812	100·00	128,863,075	100·00	137,109,171	100·00

* Includes a small production of lime from Prince Edward Island in 1913 and 1914.

Mineral Production of Nova Scotia, 1914 and 1915.

Product.		1914.		1915.	
		Quantity.	Value.	Quantity.	Value.
Antimony ore	Tons	.....	.....	1,288	$ 77,300
Gold	Ozs.	2,904	$ 60,031	6,636	137,180
Barytes	Tons	612	6,169	550	6,875
Coal	"	7,370,924	16,452,955	7,463,370	16,659,308
Grindstones	"	350	5,270	285	5,300
Gypsum	"	303,155	368,931	298,864	339,857
Manganese	"	28	1,120	51	5,760
Tripolite	"	650	13,000	317	12,119
Clay products		.....	266,204	.....	221,881
Lime	Bus.	517,722	103,748	915,086	183,017
Stone		.....	221,090	.....	367,924
Other products		.....	86,121	.....	71,821
Total		.....	17,584,639	.....	18,088,342

The total production of pig-iron in Nova Scotia in 1915 was 420,275 tons valued at $5,463,575, and in 1914, 227,052 tons valued at $2,951,676.

Mineral Production of New Brunswick, 1914 and 1915.

Product.		1914.		1915.	
		Quantity.	Value.	Quantity.	Value.
Antimony, refined	Lbs.	.....	.....	13,440	$ 2,688
Iron ore sold for export	Tons	4,775	$ 10,841	3,683	8,261
Coal	"	98,049	241,075	127,391	309,612
Grindstones	"	3,626	49,234	2,295	30,468
Gypsum	"	79,083	200,680	74,501	184,929
Manganese ore	"	.....	.....	150	3,600
Natural gas	M cu. ft	425,826	54,249	430,692	60,383
Petroleum	Bls.	1,725	2,742	1,020	1,423
Clay products		.....	66,502	.....	35,780
Lime	Bus.	391,739	102,980	369,117	93,797
Stone		.....	261,172	.....	153,512
Other products		.....	25,095	.....	19,014
Total		.....	1,014,570	.....	903,467

Mineral Production of Quebec, 1914 and 1915.

Product.		1914.		1915.	
		Quantity.	Value.	Quantity.	Value.
Copper	Lbs.	4,201,497	$ 571,488	4,197,482	$ 725,115
Gold	Ozs.	1,292	26,708	1,099	22,720
Lead	Lbs.	.....	.....	40,401	2,262
Silver	Ozs.	57,737	31,646	63,450	31,524
Zinc ore	Tons	969	10,017	300	16,500
Asbestos and asbestic	"	117,573	2,909,806	136,842	3,574,985
Chromite	"	136	1,210	12,341	179,543
Feldspar	"	98	2,156	572	2,005
Graphite	"	261	18,886	75½	5,431
Magnesite	"	358	2,240	14,779	126,584
Mica		.....	62,794	.....	50,390
Mineral water	Gals.	.....	16,566	.....	18,086
Ochres, iron oxides	Tons	5,890	51,725	6,248	48,353
Phosphate	"	554	4,875	200	2,400
Pyrites	"	117,698	470,792	142,735	570,940
Quartz	"	847	847	778	778
Cement	Bls.	2,846,061	3,331,601	2,390,724	2,812,797
Clay products		.....	1,257,700	.....	905,425
Kaolin	Tons	1,000	10,000	1,300	13,000
Lime	Bus.	1,767,935	389,064	1,351,306	274,831
Slate	Squares	1,075	4,837	397	2,039
Stone		.....	2,286,078	.....	1,966,194
Other products		.....	375,893	.....	267,373
Total		.....	11,836,929	.....	11,619,275

There was also in this Province an important production of aluminium from imported ores.

Mineral Production of Ontario, 1914 and 1915.

Product.	1914.		1915.	
	Quantity.	Value.	Quantity.	Value.
Cobalt, (metallic and in oxide, etc.) Lbs.	889,027	$ 571,710	504,212	$ 536,268
Cobalt "				
Cobalt-nickel residues, mixed cobalt and nickel oxides	.....	79,995	(c) (d)	.....
Copper Lbs.	28,948,211	3,937,536	39,361,464	6,799,693
Gold Ozs.	268,264	5,545,509	406,577	8,404,693
Iron ore, sold for export Tons	55,635	124,459	86,047	173,120
Iron, pig, from Canadian ore (a) "	95,744	1,138,912	158,595	1,715,874
Lead Lbs.	.....	.....	88,985	4,983
Molybdenite "	.....	1,500	23,300	25,800
Nickel "	45,517,937	13,655,381	68,308,657	20,492,597
Nickel oxide "	392,512	34,883	(e)	.....
Silver Ozs.	25,139,214	13,779,055	22,748,609	11,302,419
Actinolite Tons	119	1,304	220	2,420
Arsenious oxide "	1,737	104,015	2,396	147,830
Corundum "	548	72,176	262	33,138
Feldspar "	17,962	68,668	13,987	55,796
Graphite "	1,386	88,317	2,559½	118,792
Gypsum "	81,219	204,033	81,172	190,422
Mica	.....	46,267	.....	41,515
Mineral water	.....	115,215	.....	95,788
Natural gas (b) M. cu. ft.	14,094,521	2,215,808	15,211,523	2,622,838
Peat Tons	685	2,470	300	1,050
Petroleum Bls.	212,693	338,182	214,444	299,149
Phosphate Tons	400	2,400	17	102
Pyrites "	110,616	273,716	143,303	414,250
Quartz "	52,947	83,628	95,771	143,257
Salt "	107,038	493,648	119,900	600,226
Talc "	10,808	40,418	11,885	40,554
Cement Bls.	2,775,142	3,062,129	2,407,670	2,597,807
Clay products	.....	3,979,606	.....	2,254,863
Lime Bus.	3,393,078	556,850	1,903,914	328,515
Sand-lime brick No.	43,804,995	329,403	13,237,682	93,965
Stone	.....	1,253,849	.....	806,137
Other products	.....	833,635	.....	727,426
Total	.....	53,034,677	.....	61,071,287

(a) The total production of pig-iron in Ontario in 1915 was 493,500 tons, valued at $5,910,624; in 1914 556,112 tons, valued at $7,051,180.

(b) Figures for 1915, from Ontario Bureau of Mines. (c) Included under cobalt. (d) Included under cobalt and nickel. (e) Included under nickel.

Mineral Production of Manitoba, 1914 and 1915.

Product.	1914.		1915.	
	Quantity.	Value.	Quantity.	Value.
Calcined gypsum.....Tons	53,423	$ 382,563	20,278	$ 139,721
Clay products.....	.....	317,488	.....	93,674
Lime.....Bus.	526,167	92,898	281,432	71,372
Cement.....Bls.	402,131	737,046	339,554	625,369
Sand-lime brick.....No.	19,200,809	207,501	2,775,420	31,121
Stone.....	.....	361,912	.....	153,464
Other products.....	.....	314,081	.....	203,666
Total.....	.....	2,413,489	.....	1,318,387

Mineral Production of Saskatchewan, 1914 and 1915.

Product.	1914.		1915.	
	Quantity.	Value.	Quantity.	Value.
Coal.....Tons	232,299	$ 374,245	240,107	$ 365,246
Clay products.....	.....	98,349	.....	44,406
Sand-lime brick.....No.	1,550,000	17,700	473,000	4,075
Other products.....	.....	222,019	.....	38,206
Total.....	.....	712,313	.....	451,933

Mineral Production of Alberta, 1914 and 1915.

Product.	1914.		1915.	
	Quantity.	Value.	Quantity.	Value.
Gold.....Ozs.	48	$ 992	195	$ 4,026
Coal.....Tons	3,683,015	9,350,392	3,360,818	8,283,079
Natural gas.....M. cu. ft.	7,172,157	1,214,670	4,481,947	1,022,814
Cement.....Bls.	641,395	1,212,342	233,648	415,009
Clay products.....	.....	462,199	.....	115,696
Lime.....Bus.	280,252	58,321	74,152	14,445
Sand-lime brick.....No.	5,453,000	49,731	764,700	6,191
Stone.....	.....	60,272	.....	890
Other products.....	.....	275,315	.....	47,197
Total.....	.....	12,684,234	.....	9,909,347

Mineral Production of British Columbia, 1914 and 1915.

Product.		1914.		1915.	
		Quantity.	Value.	Quantity.	Value.
Copper (a)	Lbs.	41,219,202	$5,606,636	56,692,988	$9,793,714
Gold	Ozs.	252,730	5,224,393	273,376	5,651,184
Lead	Lbs.	36,289,845	1,625,422	45,377,064	2,541,116
Platinum	Ozs.	.....	.....	23	1,063
Silver	"	3,159,897	1,731,971	3,565,852	1,771,658
Zinc ore	Tons	9,924	252,546	14,595	538,438
Coal	Tons	2,239,799	6,999,374	2,065,613	6,455,041
Mineral water		.....	2,330	.....	1,400
Quartz	Tons	.....	.....	30,559	61,118
Cement	Bls.	491,151	833,606	309,436	526,042
Clay products		.....	413,909	.....	229,763
Lime	Bus.	151,689	56,767	152,237	49,725
Stone		.....	1,024,683	.....	796,876
Other products		.....	392,402	.....	272,287
Total		.....	24,164,039	.....	28,689,425

(a) Smelter recoveries of copper.

Mineral Production of Yukon, 1914 and 1915.

Product.		1914.		1915.	
		Quantity.	Value.	Quantity.	Value.
Copper	Lbs.	1,367,050	$ 185,946	533,216	$ 92,113
Gold	Ozs.	247,940	5,125,374	230,173	4,758,098
Lead	Lbs.	47,920	2,146	810,000	45,360
Silver	Ozs.	92,973	50,959	248,049	123,241
Coal	Tons	13,443	53,760	9,724	38,896
Total		.....	5,418,185	.....	5,057,708

Mineral Production by Provinces, 1899-1915.

Calendar Year.	Nova Scotia*.	New Brunswick.	Quebec.	Ontario.	Manitoba.	Alberta.	Saskatchewan.	Yukon.	British Columbia.	Total.
1899	$ 6,817,274	$ 420,227	$ 2,585,635	$ 9,819,557	$17,108,707				$12,482,605	$ 49,234,005
1900	9,298,479	439,060	3,292,383	11,258,099	23,452,330				16,680,526	64,420,877
1901	7,770,159	467,985	3,759,984	13,970,010	19,297,940				20,531,833	65,797,911
1902	10,686,549	607,129	3,743,636	14,619,091	16,127,400				17,448,031	63,231,836
1903	11,431,914	580,495	3,585,938	14,160,033	14,082,986				17,899,147	61,740,513
1904	11,212,746	559,913	3,688,482	12,582,843	12,713,613				19,325,174	60,082,771
1905	11,507,047	559,035	4,405,975	18,833,292	11,387,642				22,386,008	69,078,999
1906	12,894,303	646,328	5,242,058	25,111,682	10,092,726				25,299,600	79,286,697
1907	14,532,040	664,467	6,205,553	30,381,638	$ 898,775	$ 4,657,524	$ 533,251	$3,335,898	25,656,056	86,865,202
1908	14,487,108	579,816	6,372,949	30,623,812	584,374	5,122,505	413,212	3,669,290	23,704,035	85,557,101
1909	12,504,810	657,035	7,086,265	37,374,577	1,193,377	6,047,447	456,246	4,032,678	22,479,006	91,831,441
1910	14,195,730	581,942	8,270,136	43,538,078	1,500,359	8,996,210	498,122	4,764,474	24,478,572	106,823,623
1911	15,409,397	612,830	9,304,717	42,796,162	1,791,772	6,662,673	636,706	4,707,432	21,299,305	103,220,994
1912	18,922,236	771,004	11,656,998	51,985,876	2,463,074	12,073,589	1,165,642	5,933,242	30,076,635	135,048,290
1913	19,376,183	1,102,613	13,475,534	59,167,749	2,214,496	15,054,046	881,142	6,276,737	28,086,312	145,634,812
1914	17,584,639	1,014,570	11,836,929	53,034,677	2,413,489	12,684,234	712,313	5,418,185	24,164,039	128,863,075
1915	18,088,342	903,467	11,619,275	61,071,287	1,318,387	9,909,347	451,933	5,057,708	28,689,425	137,109,171

*Includes a small production of lime from Prince Edward Island.

MINE PRODUCTION.

For a number of years past this Division has endeavoured to obtain from every mine operator in Canada, an annual return with respect to labour employed, wages paid, tonnage and value of ores or minerals mined, treated and shipped, and in the case of metallic ores, the quantities of metals contained in the ores shipped or treated. In the case, however, of gold placer mining and the production of crude petroleum, it has not as yet been found feasible to obtain complete returns from the operators themselves, so that in these cases, while a record of production is available, there is no record of the labour employed, nor of the wages paid.

Statistics covering each of the past six years are shown in the accompanying tables. According to the records shown the total value of the mineral production compiled on this basis was $115,158,848 in 1915, as against $114,239,635 in 1914, $126,444,201 in 1913, $120,332,966 in 1912, $91,876,084 in 1911, and $92,501,244 in 1910. Excluding placer and hydraulic workings and petroleum wells, the total number of shipping mines, clay works, quarries, etc., in 1915 was 1,618 as against 1,661 in 1914, and 1,529 in 1913. The total number of men employed was 56,876 in 1915, as against 66,855 in 1914, and 71,011 in 1913. The total wages paid were $37,720,762 in 1915, as against $43,609,696 in 1914, and $50,368,602 in 1913.

The total number of metalliferous mines shipping in 1915 exclusive of placer and hydraulic workings was 205, as against 187 in 1914, and 183 in 1913; number of men employed in 1915, 12,698, as against 11,994 in 1914 and 12,437 in 1913; wages paid $11,805,919 in 1915, as against $11,669,854 in 1914, and $11,746,400 in 1913; tons of ore mined 6,138,150 in 1915, as against 4,997,406 in 1914, and 4,736,288 in 1913; tons of ore concentrates, or metal shipped from mines 4,259,734 in 1915 as against 3,115,855 in 1914, and 3,423,414 in 1913; total net value of shipments including placer gold $53,864,518 in 1915, compared with $44,763,179 in 1914, and $47,170,740 in 1913.

In non-metalliferous mining, exclusive of stone quarries, clay works, etc., and not including petroleum wells, there were employed in 1915 an average of 30,392 men earning in wages $20,257,126, as against 33,732 men, earning in wages $22,058,526 in 1914, and 34,207 men employed and $25,752,148 wages paid in 1913.

The manufacture of cement, clay products, and lime, and the quarrying of stone, etc., employed in 1915 an average of 13,786 men earning in wages $5,657,717, as against 21,129 men earning in wages $9,881,316 in 1914. These operations in 1913 engaged an average of 24,367 men earning $12,870,054.

It should be noted that these records cover only active shipping mines and do not include the labour employed in prospecting or in developing new properties, nor is there included any record of the labour employed

in the smelting and refining of ores, nor in blast furnace operations. The values of the ores given herewith are in general those furnished by the operators. In certain cases, however, where such values have not been furnished, estimates have been made.

There has been added to the statement of ore shipments in 1915, 1914, and 1913, tables showing the quantities of metals contained in the ores shipped, the record showing the total quantities of metals contained without any deductions or allowances being made for smelter or treatment losses. Comparison of this record of metal contents of ore shipments with statistics of the production of the metals is not in all cases feasible because of the lapse of time between the shipment from the mine and the treatment at the smelter.

Mine Production, 1910.

	No. of mines or works.	Men employed.		Wages paid.	Ores or minerals mined.	Metals, ores, concentrates or minerals shipped.	Net value of shipments.
		Underground	Surface.				
METALLIFEROUS ORES.	No.	No.		$	Tons.	Tons.	$
Iron ores	8	971		443,998	335,768	259,418	574,362
Milling gold ores—							
Bullion shipped							659,987
Concentrates	47	969		725,989	138,021	8,997	565,340
Silver-cobalt ores—							
Mine bullion shipped						35	542,034
Ore and concentrate	38	1,623	1,322	2,642,133	274,780	35,627	15,344,470
Nickel-copper ores	7	660	286	719,237	652,392	652,392	2,609,568
Copper ores	3	118	97	105,366	54,220	36,714	172,162
Silver-lead and zinc ores	48	592	282	850,416	180,070	58,418	1,668,415
Copper-gold-silver ores	19	1,432	487	1,872,242	1,958,591	1,924,405	7,888,306
Shipping mines not reporting—.							
Silver-lead	12						
Copper-gold	9				1,994	1,994	
Placer mining—							
Yukon							4,550,000
British Columbia							540,000
Other provinces							1,850
Total metallic	191	8,839		7,359,381	3,595,836	2,978,000	35,116,494
Total non-metallic		36,210		22,698,000	16,148,993	13,800,989	37,757,158
Total structural material		17,259		7,547,000			19,627,592
Total		62,308		37,604,381			92,501,244

Mine Production, 1911.

	No. of mines or works.	Men employed.		Wages paid.	Ores or minerals mined.	Metals, ores, concentrates or minerals shipped.	Net value of shipments.
		Underground	Surface.				
METALLIFEROUS ORES.	No.	No.		$	Tons.	Tons.	$
Iron ores	8	943		449,468	421,113	210,344	522,319
Milling gold ores—							
Bullion shipped	.....	.....		.....	.....	.....	513,991
Concentrates	45	1,085		954,659	118,758	8,026	663,213
Silver-cobalt ores—							
Mine bullion shipped	.....	.....	.....	.....	.....	130	2,007,440
Ore and concentrate	36	1,794	1,448	2,722,228	254,290	25,539	14,400,245
Nickel-copper ores	7	858	425	889,894	612,511	612,511	2,450,044
Copper ores	2	119	67	98,084	66,088	39,047	247,555
Silver-lead and zinc ores	40	528	297	809,862	120,323	48,660	1,186,996
Gold-copper-silver ores	22	1,495	563	1,933,385	1,602,247	1,486,931	7,727,696
Placer mining—							
Yukon	.....	.....	.....	.....	.....	.....	4,606,812
British Columbia	.....	.....	.....	.....	.....	.....	426,000
Other provinces	.....	.....	.....	.....	.....	.....	8,202
Total metallic	160	9,622		7,857,580	3,195,330	2,431,188	34,760,513
Total non-metallic	.....	32,126		18,469,420	13,890,468	12,247,348	34,405,960
Total structural materials	.....	19,004		8,827,508	.....	.....	22,709,611
		60,752		35,154,508	.....	.....	91,876,084

Mine Production, 1912.

	No. of mines or works.	Men employed.		Wages paid.	Ores or minerals mined.	Metals, ores, concentrates or minerals shipped.	Net value of shipments.
		Underground	Surface.				
METALLIFEROUS ORES.	No.	No.		$	Tons.	Tons.	$
Iron ores	8	524		371,938	171,792	215,883	523,315
Milling gold ore—							
Bullion shipped	43			.....	.....	5	2,278,066
Concentrates	.....	1,671		1,551,006	290,297	6,114	669,727
Silver-cobalt ores—							
Mine bullion shipped	31	.....	.....	.....	.....	164	2,899,360
Ore and concentrate	.....	1,685	1,448	3,107,286	319,348	29,106	14,592,559
Nickel-copper ores	8	970	830	1,404,652	737,726	737,726	2,953,306
Copper ores	3	154	95	160,765	64,952	60,869	508,993
Silver-lead and zinc ores	50	597	331	1,002,203	202,343	66,377	2,767,741
Gold-copper-silver ores	20	1,434	873	2,515,728	2,408,059	2,244,193	13,113,144
Tungsten concentrates	.....	.....	.....	.....	.....	14	7,840
Placer mining—							
Yukon	.....	.....	.....	.....	.....	.....	5,576,493
British Columbia	.....	.....	.....	.....	.....	.....	555,500
Other provinces	.....	.....	.....	.....	.....	.....	11,379
Total metalliferous	163	10,612		10,113,578	4,194,517	3,360,451	46,457,423
Total non-metalliferous	443	33,954		23,877,781	17,165,628	15,548,981	45,080,674
Total structural materials	831	22,168		11,511,120	.....	.....	28,794,869
	1,437	66,734		45,502,479	.....	.....	120,332,966

Mine Production, 1913.

	No. of mines or works.	Men employed.		Wages paid.	Ores or minerals mined.	Metals, ores, concentrates or minerals shipped.	Net value of shipments.
		Underground.	Surface.				
METALLIFEROUS ORES.	No.	No.		$	Tons.	Tons.	$
Iron ores	12	877		529,934	324,935	307,634	629,843
Milling gold ore—							
Bullion shipped						11	5,060,018
Concentrates	50	2,210		2,079,005	515,855	10,269	873,901
Silver-cobalt ores—							
Mine bullion shipped						260	4,539,906
Ore and concentrate	30	2,089	1,525	3,387,069	456,241	40,579	12,565,718
Nickel-copper ores	9	1,258	617	1,665,659	784,697	784,697	3,138,788
Copper ores	3	191	92	155,318	97,899	87,376	458,136
Silver-lead and zinc ores	57	830	468	1,287,761	256,302	85,978	3,276,812
Zinc products						Zinc 7,889	186,827
Gold-copper-silver ores	22	1,413	867	2,641,654	2,300,359	2,098,775	10,056,739
Placer mining—							
Yukon							5,874,052
British Columbia							510,000
Other provinces							
Total metalllferous	183	12,437		11,746,400	4,736,288	3,423,468	47,170,740
Total non-metalliferous	435	34,207		25,752,148	18,636,039	16,198,066	48,463,709
Total structural materials	911	24,367		12,870,054			30,809,752
	1,529	71,011		50,368,602			126,444,201

Mine Production 1913, Content of Shipments.

	Gold.	Silver.	Nickel.	Copper.	Lead.	Zinc.
	Ozs.	Ozs.	Lbs.	Lbs.	Lbs.	Lbs.
Milling gold ore—						
Bullion	250,851	59,015				
Concentrates	46,959	33,898		2,354	142,497	
Silver-cobalt ores—						
Mine bullion shipped		7,599,929				
Ore and concentrate		21,862,174				
Nickel-copper ores			51,203,607	27,010,719		
Copper ores	738	36,393		4,996,393		
Silver-lead zinc ores	999	2,564,155			53,807,570	
Zinc products		143,459				7,069,800
Gold-copper-silver ores	207,486	733,758		60,090,180		
Placer mining—						
Yukon	282,320	63,522				
British Columbia	24,671					
Total	814,024	33,096,303	51,203,607	92,099,646	53,950,067	7,069,800

Mine Production, 1914.

	No. of mines or works.	Men employed.		Wages paid.	Ores or minerals mined.	Metals, ores, concentrates or minerals shipped.	Net value of shipments.
		Underground.	Surface.				
METALLIFEROUS ORES.	No.	No.		$	Tons.	Tons.	$
Iron ores	5	598		364,489	345,410	244,854	542,041
Milling gold ore—							
Bullion shipped	.....	.....	.....	.....	.....	13	6,101,463
Concentrates	44	1,070	1,206	2,603,414	754,732	6,974	860,379
Silver-cobalt ores—							
Mine bullion shipped	.....	.....	.....	.....	.....	354	5,665,006
Ore and concentrate	29	1,412	1,883	3,207,116	733,174	16,917	7,827,140
Nickel-copper ores	9	736	1,286	1,693,997	1,000,364	999,908	5,020,003
Copper ores	4	113	180	177,721	119,292	117,762	502,637
Silver-lead and zinc ores	76	394	817	1,110,876	186,646	70,207	2,652,802
Zinc products	.....	.....	.....	.....	.....	10,893	262,563
Gold-copper-silver ores	20	823	1,746	2,512,241	1,857,788	1,647,973	9,580,537
Placer mining—							
Yukon	.....	.....	.....	.....	.....	10	5,182,616
British Columbia	.....	.....	.....	.....	.....	1	565,000
Other provinces	.....	.....	.....	.....	.....	.....	(a) 992
Total metalliferous	187	11,994		11,669,854	4,997,406	3,115,855	44,763,179
Total non-metalliferous	451	33,732		22,058,526	17,078,300	14,708,307	43,467,229
Total structural materials	1,023	21,129		9,881,316	.....	.....	26,009,227
	1,661	66,855		43,609,696	22,075,706	17,824,162	114,239,635

(a) Alberta production.

Mine Production 1914, Content of Shipments.

	Gold.	Silver.	Nickel.	Copper.	Lead.	Zinc.
	Ozs.	Ozs.	Lbs.	Lbs.	Lbs.	Lbs.
Milling gold ore—						
Bullion	289,860	85,110	.....	.....	.....	.....
Concentrates	38,717	64,218	.....	90	15,141	.....
Silver-cobalt ores—						
Mine bullion shipped	.....	10,335,527	.....	.....	.....	.....
Ore and concentrate	.....	15,523,608	.....	.....	.....	.....
Nickel-copper ores	.....	.....	60,800,799	36,300,532	.....	.....
Copper ores	1,059	51,440	.....	6,450,899	.....	.....
Silver-lead zinc ores	334	2,501,820	.....	.....	50,527,130	.....
Zinc products	.....	376,420	.....	.....	.....	9,101,460
Gold-copper-silver ores	182,784	761,890	.....	53,771,126	.....	.....
Placer mining—						
Yukon	247,753	55,744	.....	.....	.....	.....
British Columbia	27,332	.....	.....	.....	.....	.....
Alberta	48	.....	.....	.....	.....	.....
Total	787,887	29,755,777	60,800,799	96,522,647	50,542,271	9,101,460

Mine Production, 1915.

	No. of mines or works.	Men employed.		Wages paid.	Ores or minerals mined.	Metals, ores, concentrates or minerals shipped.	Net value of shipments.
		Underground.	Surface.				
METALLIFEROUS ORES	No.	No.		$	Tons.	Tons.	$
Antimony ore	7	157		55,038	15,318	1,491	83,971
Molybdenite	4	52		16,990	.....	37	28,450
Iron ores	5	399		230,346	251,742	398,112	774,427
Milling gold ore—							
Bullion shipped	.....	.....	.....	.....	.....	18	8,953,130
Concentrates	50	1,324	1,555	2,893,187	1,180,477	8,335	711,947
Silver-cobalt ores—							
Mine bullion shipped	.....	.....	.....	.....	.....	232	3,410,936
Ore and concentrate	25	1,008	1,531	2,363,414	588,404	61,362	8,326,776
Nickel-copper ores	9	857	1,745	2,202,536	1,364,048	1,372,724	10,552,673
Copper ores	6	173	205	215,065	141,758	142,121	1,026,562
Silver-lead and zinc ores	66	328	784	960,894	215,694	73,752	2,958,394
Zinc products	.....	.....	.....	.....	.....	14,895	540,022
Gold-copper-silver ores	33	886	1,694	2,868,449	2,380,709	2,186,646	10,947,059
Placer mining—							
Yukon	.....	.....	.....	.....	.....	9	4,776,145
British Columbia	.....	.....	.....	.....	.....	.....	770,000
Alberta	.....	.....	.....	.....	.....	.....	4,026
Total metalliferous	205	12,698		11,805,919	6,138,150	4,259,734	53,864,518
Total non-metalliferous	472	30,392		20,257,126	16,594,889	14,481,882	43,373,571
Total structural materials	943	13,786		5,657,717	.....	.....	17,920,759
	1,618	56,876		37,720,762	.....	.....	115,158,848

Mine Production 1915, Content of Shipments.

	Gold.	Silver.	Nickel.	Copper.	Lead.	Zinc.	Antimony.
	Ozs.	Ozs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Antimony ore	.....	.....	.....	.....	.....	.....	1,080,196
Milling gold ore—							
Bullion	430,981	87,116	.....	.....	.....	.....	.....
Concentrates	35,779	37,507	.....	.....	.....	.....	.....
Silver-cobalt ores—							
Mine bullion shipped	.....	6,752,183	.....	.....	.....	.....	.....
Ore and concentrate	.....	17,603,943	.....	.....	.....	.....	.....
Nickel-copper ores	.....	.....	87,782,224	46,636,547	.....	.....	.....
Copper ores	1,151	64,965	.....	7,075,858	.....	.....	.....
Silver-lead zinc ores	459	2,637,444	.....	.....	48,708,005	.....	.....
Zinc products	.....	316,731	.....	.....	.....	12,231,439	.....
Gold-copper-silver ores	202,127	849,784	.....	69,516,485	.....	.....	.....
Placer mining—							
Yukon	229,803	25,689	.....	.....	.....	.....	.....
British Columbia	37,249	.....	.....	.....	.....	.....	.....
Alberta	195	.....	.....	.....	.....	.....	.....
Total	937,744	28,375,362	87,782,224	123,228,890	48,708,005	12,231,439	1,080,196

Labour and Wages Statistics Covering Non-Metalliferous Mines During 1913, 1914, and 1915.

	1913.			1914.			1915.		
	No. active mines or works.	No. employed.	Wages paid.	No. active mines or works.	No. employed.	Wages paid.	No. active mines or works.	No. employed.	Wages paid.
NON-METALLIC.									
Asbestos and asbestic	10	2,951	$ 1,687,957	10	2,992	$1,283,977	9	2,394	$ 1,091,076
Chromite	.....	(b)	.....	.....	(b)	.....	6	204	116,339
Coal	236	27,917	22,065,141	231	27,571	19,060,011	255	24,574	17,385,200
Feldspar	5	78	33,900	5	104	29,197	6	87	21,173
Graphite	6	135	63,714	4	135	47,776	5	110	40,643
Grindstones, pulpstones, scythestones	5	125	27,500	5	155	34,950	4	110	18,996
Gypsum	18	1,400	641,735	16	1,149	552,192	16	1,152	468,612
Magnesite	.....	(b)	.....	.....	(b)	.....	4	110	23,607
Mica and phosphate	27	209	85,334	30	232	78,646	23	138	47,372
Mineral pigments: barytes, and ochres	4	64	25,818	4	73	21,146	4	61	24,197
Mineral water	14	79	36,639	18	64	32,058	17	50	23,066
Natural gas	78	547	614,425	92	561	474,293	(a) 88	619	511,967
Peat	2	37	5,000	.....	(b)	.....	1	18	3,200
Pyrites	6	151	131,161	8	214	165,001	7	207	172,986
Quartz	6	130	69,441	8	81	33,872	6	122	78,747
Salt	12	251	178,386	11	253	178,277	11	254	186,059
All others †	6	133	85,997	9	148	67,130	10	182	43,886
Total non-metallic	435	34,207	25,752,148	451	33,732	22,058,526	472	30,392	20,257,126
STRUCTURAL									
Cement	27	4,276	3,466,451	24	2,977	2,271,006	20	1,686	1,184,459
Clay products	456	11,218	4,696,801	419	8,339	3,201,380	349	4,405	1,452,828
Lime	77	1,076	577,841	85	1,015	518,331	78	633	293,735
Sand-lime brick	22	589	289,398	21	467	190,031	18	177	41,043
Sand and gravel	110	1,042	607,554	254	2,382	821,601	241	1,721	491,830
Slate	1	35	12,544	1	20	7,150	1	20	5,520
Stone	218	6,131	3,219,465	219	5,929	2,871,817	236	5,144	2,188,302
Total structural	911	24,367	12,870,054	1,023	21,129	9,881,316	943	13,786	5,657,717
Total non-metalliferous	1,346	58,574	38,622,202	1,474	54,861	31,939,842	1,415	44,178	25,874,670

†Includes in 1913—actinolite, corundum, tripolite and talc.
" " 1914—actinolite, chromite, corundum, magnesite, manganese, peat, talc, and tripolite.
" " 1915—actinolite, corundum, manganese, talc, and tripolite.

(a) Estimated for 1915. (b) Included in 'All other.'

SMELTER PRODUCTION.

Statistics of the production of copper, lead, and silver smelters and refineries, showing the tonnage of ore treated, the matte, blister, base bullion, or refined metal produced, etc., have been collected by this Branch since 1908.

The smelting companies in 1915 were as follows:—

Antimony Smelter:—

New Brunswick Metals, Ltd., Lake George, N.B.

Copper Smelters:—

Consolidated Mining and Smelting Co. of Canada, Ltd., Trail, B.C.

Granby Consolidated Mining, Smelting and Power Co., Ltd., Grand Forks and Anyox, B.C.

British Columbia Copper Co., Ltd., Greenwood, B.C.

Tyee Copper Company, Ltd., Ladysmith, B.C. (idle since 1911).

Nickel-Copper Smelters:—

Mond Nickel Co., Ltd., Coniston, Ont.

Canadian Copper Company, Copper Cliff, Ont.

Lead Smelters:—

North American Smelting Co., Kingston, Ont. (idle since 1913).

Consolidated Mining and Smelting Co. of Canada, Ltd., Trail, B.C.

Silver-Cobalt-Nickel Smelters:—

Coniagas Reduction Co., Ltd., Thorold, Ont.

Deloro Mining and Reduction Co., Ltd., Deloro, Ont.

Metals Chemical Co., Ltd., Welland, Ont.

Standard Smelting and Refining Co., Chippewa, Ont.

Zinc Smelters:—

Electro-Zinc Co., Welland, Ont.

Consolidated Mining and Smelting Co., of Canada, Ltd., Trail, B.C.

French Complex Ore Reduction Co. (Experimental).

The antimony smelter at St. George, N.B., was in operation for a short time only, while the zinc reduction had not passed definitely beyond the experimental stage in so far as actual production is concerned. The Consolidated Mining and Smelting Co., had, however, attained a production of about ½ ton of spelter per day and had well under way the building and equipment of works to have a capacity of 45 tons of spelter per day. The zinc refinery buildings include structures for grinding, roasting, leaching, electrolyzing and melting plants, motor generator building, and trans-

former station, together with flue systems, Cottrell dust collecting plant, and a concrete stack 200 feet high and 12 feet inside diameter. The zinc plant at Welland, Ont., has been designed primarily for the recovery of metallic zinc from zinc oxide though it is intended ultimately to equip the plant for the treatment of zinc ore.

With the exception of zinc the total quantity of ores and concentrates treated in these smelters during 1915 was 3,624,582 tons (including 94,688 tons of imported ore), as compared with 2,650,155 tons (including 58,894 tons of imported ores) in 1914, and 3,027,291 tons in 1913.

The largest proportion of the total tonnage (61·9 per cent in 1915) consists as usual of the copper-gold-silver ores of British Columbia, chiefly from the Boundary (Phoenix and Greenwood) Rossland and Coast (Texada Island and Granby Bay) districts. The nickel-copper ores of the Sudbury district, Ontario, contributed about 35 per cent of the total tonnage, the balance being lead ores and other ores treated in lead furnaces and the silver-cobalt ores of Ontario treated in silver smelters. Gold and silver ores treated by cyanide processes are not included in this record.

The quantities of the several classes of ores smelted during the past eight years have been as follows:—

Tons of Ores Smelted, 1908-1915.

Year.	Nickel-copper ores.	Silver-cobalt ores.	Lead ores.	Copper-gold-silver ores.	Totals.
1908	360,180	7,182	53,545	1,797,488	2,218,395
1909	462,336	8,384	54,539	1,850,889	2,376,148
1910	628,947	9,466	57,549	1,987,752	2,683,714
1911	610,834	9,330	55,408	1,517,981	2,193,553
1912	725,065	8,097	59,932	2,212,316	3,005,410
1913	823,403	6,124	78,010	2,119,754	3,027,291
1914	947,053	5,681	71,224	1,626,197	2,650,155
1915	1,272,283	7,526	99,528	2,245,245	3,624,582

The products obtained in Canada from the treatment of these ores include: pig lead, produced at Kingston, Ont. (furnace idle in 1914 and 1915) refined pig lead and lead pipe produced at Trail, B.C.; fine gold, fine silver, copper sulphate and antimony, produced from the residue of the Trail lead refinery; silver bullion, white arsenic, metallic arsenic, metallic nickel, metallic cobalt, nickel oxide, cobalt oxide, nickel sulphate, cobalt sulphate and cobalt alloys produced in Ontario from the Cobalt District ores.

In addition to these refined products, blister copper, copper matte, and nickel-copper matte are produced and exported for refining.

The aggregate results of smelting and refining operations may be summarized as shown in the next table. Unfortunately the figures cannot be taken to represent the total production from smelting ores mined in Canada, since considerable quantities of copper and silver ores are still shipped to

other smelters outside of Canada for smelting, nor do these represent the entire recovery of these metals in Canada in metallic form since there is considerable recovery of both gold and silver bullion as a result of milling, amalgamation and cyanide treatment.

It should also be noted that the figures include the results of the treatment in British Columbia of a small quantity of imported ores.

Smelter and Refinery Production in Canada.

Refined products produced.	Calendar Years.					
	1910.	1911.	1912.	1913.	1914.	1915.
Antimony.....Lbs.	.....	.....	.....	.....	.....	59,440
Gold.....Ozs.	13,298	15,270	12,118	11,977	11,088	17,813
Silver..... „	16,373,799	19,078,768	17,572,217	13,789,709	11,096,861	12,248,415
Lead.....Lbs.	32,987,508	23,525,050	35,893,190	37,923,043	36,443,706	43,518,618
Copper sulphate..... „	163,228	197,187	87,110	130,533	152,060	175,579
Cobalt metallic..... „	.....	.....	.....	.....	.....	211,610
Cobalt oxide..... „	.....	154,174	349,054	660,079	899,027	(1) 423,717
Nickel oxide..... „	.....		.....	268,304	392,512	(2) 272,025
Nickel, metallic..... „	.....	.....	.....	.....	.....	55,325
White arsenic..... „	3,003,467	4,194,209	4,090,768	3,384,249	3,474,322	4,792,637

Matte, blister copper, and other smelter products obtained and exported for refining.

	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
(3) Blister copper.....	13,918	10,710	17,063	15,270	13,238	22,263
(4) Copper matte.....	11,519	11,320	6,727	5,159	6,291	7,619
(5) Nickel-copper matte.....	33,033	32,607	41,925	47,150	46,396	67,703
(6) Cobalt material.....	54	630	642	122	101	.....

Metals contained in above unrefined smelter products.

Gold.....Ozs.	197,181	175,189	184,815	213,279	170,818	182,051
Silver..... „	2,136,414	585,896	686,171	934,601	873,400	855,519
Copper.....Lbs.	56,149,299	29,855,868	58,405,910	59,245,722	59,237,016	88,679,451
Nickel..... „	37,587,676	34,098,744	44,841,542	49,676,772	45,517,937	68,077,823

(1) Includes a small quantity of cobalt sulphate.
(2) Includes a small quantity of nickel sulphate.
(3) Blister copper carrying gold and silver values.
(4) Copper matte carrying gold and silver values.
(5) Bessemer nickel-copper carrying small gold and silver values as well as metals of the platinum group.
(6) Cobalt material carrying nickel and silver values.

Nickel-Copper Ores.—These ores of the Sudbury district, together with a small tonnage from the Alexo mine in the district of Timiskaming, Ontario, are treated in the smelters of the Canadian Copper Company at Copper Cliff, and the Mond Nickel Company at Coniston, formerly at Victoria Mines. In addition to the nickel and copper which will probably average slightly over 3 per cent nickel, and 2 per cent copper, these ores of the Sudbury district contain small amounts of gold, silver, platinum, and palla-

dium. The present metallurgical practice involves the following processes:—

I. Roasting the ores in open heaps, to remove part of the sulphur.

II. Smelting in water-jacketed blast furnaces, to produce a low grade matte, containing 33 per cent copper-nickel and nearly all the precious metals.

III. Converting the furnace matte in Bessemer basic converters, to make a matte containing about 80 per cent copper-nickel.

IV. Refining the converter matte, separating the nickel-copper, and precious metals.

At the present time the first three processes only are carried on in Canada. The converter matte is shipped to the United States and to England for final treatment.

The Copper Cliff plant, includes: seven blast furnaces, capacity 3,000 tons of ore per day; five basic converter stands; two McDougall reverberatories and four Wedge roasting furnaces.

At the Coniston plant there are three furnaces with a total capacity of from 1,600 to 1,800 tons of ore per day; three Pierce-Smith standard basic converters with an output capacity of 20 tons each of Bessemer matte.

The total quantity of nickel-copper ore mined during 1915 was, 1,364,048 tons and the quantity smelted 1,272,283 tons. There were produced 67,703 tons of Bessemer matte, containing 19,608 tons of copper and 34,039 tons of nickel. This is the largest production since the beginning of operations in 1886.

The total quantity of nickel-copper ore mined during 1914 was 1,000,364 tons and the quantity smelted 947,053 tons. There were produced 46,396 tons of Bessemer matte, containing 14,448 tons of copper and 22,759 tons of nickel.

Statistics of smelter production from these ores since the commencement of this industry are shown in the following table:—

Smelter Production of the Nickel-Copper Ores of the Sudbury District.

IN SHORT TONS.

Calendar Year.	Ore mined.	Ore smelted.	Matte shipped.	Value matte.	Nickel content of matte.	Copper content of matte.
1886	3,307					
1887	567	30,000	.....	.....	900	1,500
1888	.....					
1889	44,990	40,146	3,274	.....	432	733
1890	.....	.....	.....	.....	718	651
1891	83,300	72,558	10,336	.....	2,018	2,064
1892	74,381	57,022	.....	.....	1,207	1,102
1893	.....	.....	9,425	.....	1,991	1,821
1894	103,223	96,038	11,681	$ 766,422	2,454	2,604
1895	74,135	68,618	10,188	890,834	1,944	2,288
1896	94,966	71,027	10,759	416,594	1,699	1,584
1897	93,154	96,370	13,968	.....	1,999	2,750
1898	123,820	121,924	.....	.....	2,759	4,187
1899	159,957	172,761	.....	702,341	2,872	2,834
1900	196,420	.....	23,336	1,076,306	3,540	3,364
1901	315,692	255,958	.....	1,661,839	4,594	4,318
1902	269,538	211,847	25,311	1,327,448	5,347	3,553
1903	136,033	207,030	13,832	2,686,469	6,253	3,576
1904	203,388	118,470	10,154	2,193,198	5,274	2,455
1905	277,766	251,421	17,405	4,019,814	9,438	4,386
1906	343,814	340,059	20,310	4,628,011	10,745	5,264
1907	351,916	359,076	22,025	3,289,382	10,595	6,996
1908	409,551	360,180	21,210	2,930,989	9,572	7,503
1909	451,892	462,336	25,845	1,913,012	13,141	7,873
1910	652,392	628,947	35,033	5,380,064	18,636	9,630
1911	612,511	610,834	32,607	4,945,593	17,049	8,966
1912	737,726	725,065	41,925	6,303,102	22,421	11,116
1913	784,697	823,403	47,150	7,076,945	24,838	12,938
1914	1,000,364	947,053	46,396	7,189,031	22,759	14,448
1915	1,364,048	1,272,283	67,703	10,352,344	34,039	19,608

Silver-Copper-Nickel-Arsenic Ores.—The first shipments of silver ores from the Cobalt district were made in 1904, and in 1906 the first works for the treatment of these ores in Canada were established by the Canadian Copper Company, at Copper Cliff, Ont. This plant was closed down, however, in 1913. Operations have been continuous at the plants of the Coniagas Reduction Company, at Thorold, and the Deloro Mining and Reduction Company, at Deloro, Ont., while during the past two years Metals Chemical Company have operated a small plant at Welland, Ont. In addition to the above there have been in previous years intermittent operations at plants established at Kingston, Ont., Orillia, and North Bay. The products recovered in the plants now operating, include: refined silver, arsenious oxide, metallic arsenic, metallic cobalt, metallic nickel, cobalt oxide, nickel oxide, cobalt sulphate, nickel sulphate and cobalt alloys.

The tonnage of ore treated in these smelters in 1915 was 7,526 tons, as against 5,681 tons in 1914 and 9,466 tons in 1910. The recoveries in 1915 included: 9,885,986 fine ounces of silver in bullion; 4,792,637 pounds of

arsenious oxide; 504,212 pounds of cobalt as metal or contained in cobalt salts, and 231,634 pounds of nickel as metal or contained in nickel salts.

Lead Smelters.—The lead smelter and refinery at Trail, B.C., owned by the Consolidated Mining and Smelting Company, was the only lead smelter operated during 1915. The small plant at Kingston, Ontario, built by the North American Smelting Company, and completed in 1912 was operated in 1913, but remained idle throughout 1914 and 1915.

The Trail plant now includes a new lead ore sampling mill, Wedge roasting furnaces, Huntingdon Heberlein converters; four lead furnaces with Cottrell dust collecting plant; electrolytic lead refinery, and lead pipe plant. The total capacity of the plant is about 125 tons of refined lead per day.

In the lead refinery, the bullion from the smelter is cast into anodes and re-deposited electrolytically upon cathode sheets of refined lead. The refined lead is cast into pigs or manufactured into lead pipe. The slimes from the tank room carry gold, silver, antimony, arsenic, and copper.

The first two are recovered as fine metals, and the copper as copper sulphate. Antimony is also recovered, though not regularly, and bearing metal is manufactured.

The annual production of refined lead, fine gold and silver, and copper sulphate has been as follows:—

Production of Refined Lead, Fine Gold, and Silver at Trail.

Calendar Year.	Refined lead.	Fine gold.	Fine silver.	Copper sulphate.
	Lbs.	Ozs.	Ozs.	Lbs.
1904	7,519,440	4,336	551,450	56,000
1905	15,804,509	8,602	1,088,328	77,175
1906	20,471,314	9,993	1,263,809	143,135
1907	26,607,461	10,395	1,631,422	97,751
1908	36,549,274	15,346	1,956,039	203,379
1909	41,883,614	18,241	2,003,003	51,405
1910	32,987,508	13,298	1,798,960	163,228
1911	23,525,050	15,270	1,325,601	197,187
1912	37,008,490	12,118	1,896,999	87,110
1913	39,663,766	11,977	2,433,002	130,533
1914	36,443,706	11,088	2,043,868	152,060
1915	43,518,618	17,813	2,362,429	175,579

Amongst the improvements at the lead plant during the Company's first year ending September 30, are included:—

"Purchase of the rights to use the Cottrell patents and the building and the extension of the Cottrell plants for the lead roasters and furnaces. The saving from the use of these plants is very great already and will be greater after some alterations in the electrical equipment."

"An additional lead furnace with the necessary flues and extension to the furnace building."

"An additional crane in the Huntingdon and Heberlein plant."

"Wash houses for men working around the lead plant."

"New lead sampling mill."

"Rebuilding tanks and alterations to the lead refinery."

Gold-Silver-Copper Ores of British Columbia.—Four copper smelters were active in British Columbia during 1915. These were the Trail copper furnace of the Consolidated Mining and Smelting Company treating the ores of the Rossland camp and other ores of the district; the Grand Forks plant of the Granby Consolidated Mining, Smelting and Power Co.; the Greenwood plant of the British Columbia Copper Company, treating chiefly the low grade ores of the Boundary district, and the Anyox plant of the Granby Consolidated Company, treating the ores of the Hidden Creek mines at Anyox and other coast properties.

On the coast, the Tyee Copper Company's furnace at Ladysmith was idle throughout the year.

The aggregate production of British Columbia copper smelters during the past four years, including the foreign ores treated, was as follows:—

Production of British Columbia Copper Smelters.

——	1912.	1913.	1914.	1915.
Ore smelted.....Tons	2,212,316	2,119,754	1,612,197	2,245,245
Smelter products—				
Matte..... "	6,727	5,159	6,291	7,619
Blister..... "	17,069	15,270	13,238	22,263
Metallic content of matte and blister—				
Gold.....Ozs.	184,815	213,279	170,818	182,051
Silver..... "	686,171	934,601	873,400	855,519
Copper.....Lbs.	36,174,185	33,370,176	30,341,191	49,463,286

Trail Smelter.—Statistics of the production of the Trail smelter including both the copper and lead furnaces, have been published in the annual reports of the Company, the figures since 1906 having been as follows:—

Production of Trail Smelter

Fiscal Year.	Ore smelted.	Metals contained in matte and bullion produced.			
		Gold.	Silver.	Lead.	Copper.
	Tons.	Ozs.	Ozs.	Lbs.	Lbs.
1906 (6 months), ending June 30th.....	157,640	64,590	1,074,255	15,133,683	2,399,161
1907, ending June 30th.....	222,573	69,168	1,100,271	20,283,083	3,443,310
1908 " "	305,956	121,380	2,224,888	32,157,139	4,004,468
1909 " "	347,417	114,920	2,443,475	43,675,077	4,637,631
1910 " "	487,125	137,614	2,162,406	42,368,816	5,974,959
1911 " "	388,785	119,067	1,458,758	24,026,015	4,421,988
1912 " "	296,458	129,789	1,765,992	26,072,074	2,914,141
1913 (15 mos. to Sept. 30, 1913).....	407,124	186,017	3,224,408	48,325,252	3,454,814
1914 ending Sept. 30.....	374,771	129,083	2,568,301	34,617,318	3,645,997
1915 " "	447,064	148,891	2,230,500	40,177,910	5,306,184
Total 1894 to date.....	4,372,886	1,610,903	22,247,832	374,091,124	63,196,978

The Trail copper smelting plant now includes: five furnaces with a daily capacity of 3,000 tons of ore. There was being installed during 1915,

now recently completed, a converter plant comprising two Great Falls type converters, 12 feet in diameter also an electrolytic copper refinery with an initial daily capacity of 10 tons of refined copper, sufficient to handle the output of the smelters and converters. The slimes from the refinery will be re-treated for the recovery of gold and silver values.

Granby and Anyox Smelters.—The Granby smelter is situated at Grand Forks in the Boundary district, and the Anyox smelter at Observatory inlet, Portland canal; both are owned by the Granby Consolidated Mining, Smelting and Power Company. The ores treated at Grand Forks are those from the Company's mines at Phoenix, together with a small tonnage of custom ore; while at the Anyox smelter the ores from the Hidden Creek mine and other coast properties are reduced.

The Phoenix ores have been of particular interest because of the low tenor of their metal values, their self-fluxing character, and the large tonnage treated. The percentage of metals contained has been decreasing and the recovery of metals from Phoenix mine ores, during the year ending June 30, 1915, as shown in the Company's annual report was: copper 16·12 pounds; silver 0·191 ounces; and gold 0·0382 ounces per ton of ore smelted.

During the first year of operation 1900–1901, the recovery from 172,258 tons of ore smelted was 31·49 lbs. of copper, 0·4406 ounces of silver and 0·1003 ounces of gold per ton of ore stripped, according to a statement in the Company's report for 1910.

The first furnace of 300 tons capacity was completed in 1900 and since that date the capacity of the plant has been increased from time to time until at present there are eight furnaces with a total capacity of about 4,500 tons per day. The converter plant was first installed in 1902, and enlarged in 1909 and includes: 3 stands and 10 shells with a daily capacity of 100,000 pounds of blister.

The ore at the Hidden Creek mines, Anyox, is higher in copper than the Phoenix ores. Recoveries during the Company's fiscal year ending June 30, 1915, when the quantity smelted was 462,340 tons, were 34·58 pounds of copper; 0·3087 ounces of silver, and 0·00796 ounces of gold per ton.

At Anyox "the furnaces, of which there are four (with a total daily capacity of 3,000 tons) are 50 inches wide by 30 feet long, and are the regular type of rectangular water-jacketed matting furnace made by the Traylor Engineering & Mfg. Co.; an agglomerator for handling converter slag and matte has also been installed. The converter room is in one end of the main smelter building, in which are three converter stands. The converters of the Great Falls type are 12 feet in diameter.

The quantities of ores smelted and the total production of metals shown in the accompanying table, are compiled from the Company's annual published reports.

Ores treated at Grand Forks and Anyox, during the twelve months ending June 30, 1915.

ORES OF	Ore smelted. Dry tons.	Lbs. Cu. recovered per ton ore.	Metals recovered and sold.		
			Copper. Lbs. fine.	Silver. Ozs. fine.	Gold. Ozs. fine.
Phoenix Mines	611,097	16·12	9,850,302	116,752	23,355
Anyox Mines	462,340	34·58	15,895,757	142,725	3,581
Both plants	1,073,437	23·99	25,746,059	259,477	26,936
Foreign ores purchased	24,583		892,853	118,404	4,452
Total	1,098,020		26,638,912	377,881	31,388

The following table shows the annual recoveries since 1901.

Ores Smelted and Metals Recovered at Granby Smelters.

Year ending June 30.	ALL MATERIALS SMELTED.					METALS PRODUCED.		
	Granby ore.		Foreign.		Total.	Gold.	Silver.	Copper.
	Anyox.	Phoenix.	Ore.	Matte.				
	Tons.	Tons.	Tons.	Tons.	Tons.	Ozs.	Ozs.	Lbs.
1901	.....	169,087	7,832	.....	176,919	8,871	34,990	5,435,955
1902	.....	293,645	4,454	3,001	301,100	30,786	274,511	10,836,851
1903	.....	289,583	7,691	6,223	303,497	35,121	277,574	12,551,758
1904	.....	516,059	36,182	4,290	556,531	54,493	275,935	16,020,986
1905	.....	550,738	39,382	.....	590,120	42,980	215,449	14,224,692
1906	.....	796,188	36,158	.....	832,346	50,020	316,947	19,939,004
1907	.....	649,022	16,893	.....	665,915	32,738	201,337	16,410,576
1908	.....	858,432	24,179	.....	882,611	40,068	300,204	21,092,288
1909	.....	964,789	19,944	.....	984,733	45,760	335,520	21,901,528
1910	.....	1,175,548	21,829	.....	1,197,377	48,752	356,746	22,754,899
1911	.....	959,563	24,783	.....	984,346	41,707	343,178	17,858,860
1912	.....	721,719	17,800	.....	739,519	33,932	225,305	13,231,121
1913	.....	1,264,690	15,179	.....	1,279,869	47,266	324,336	22,688,614
1914	63,105	1,201,955	23,940	.....	1,289,000	43,882	435,275	23,320,097
1915	462,340	611,097	24,583	.....	1,098,020	31,388	377,881	26,638,912
Total	525,445	11,022,115	320,829	13,514	11,881,903	587,764	4,295,188	264,906,141

Greenwood Smelter.—The plant of the British Columbia Copper Company, at Greenwood, B.C., includes three large furnaces, having a total daily capacity of from 2,400 to 2,500 tons, and a converter plant of 2 stands and 7 shells with a capacity of about 35,000 pounds of blister copper per day.

The last annual published report of the Canada Copper Corporation, Ltd., which controls the British Columbia Copper Company, covering the year ending December 31, 1915, contains the following references to smelting operations:—

"Average metallurgical conditions were fair during the period of operation. A slightly reduced tonnage per furnace over former operations was obtained, due to running a more refractory charge than formerly. The supply of ore available only permitted the operation of one furnace.

The total amount of ore smelted during the period under review was 122,514 tons, dry weight, and consisted of:—

Company ores.....115,140 tons dry weight.
Custom ores..... 7,374 „ „

The coke used represented 14·44% of the total charge and averaged 22% in ash.

The time of actual operation was 158 furnace days and the actual amount of ore smelted per day per furnace was 775·4 tons. The work was performed by an average of 49·2 men per day with an average wage of $3.48 per day.

There were produced 1,850 tons of matte, averaging 48% copper per ton. The amount of slag made was 105,280 tons, containing 0·0043 ozs. gold per ton; 0·072 ozs. silver per ton; and 0·286% copper.

The balance of the analysis was as follows:—

Silica, 38·5%; iron 23·5%, lime 20·5%.

The production of metals amounted to:—

Copper (fine)..... 1,734.385 pounds
Silver.....23,002·62 ounces
Gold..... 5,417·0839 ounces."

Ladysmith Smelter.—This smelter which has not been operated since 1911 is owned by the Tyee Copper Company, Ltd., and located at Ladysmith, Vancouver island, B.C. The plant includes: two furnaces with a total daily capacity of 500 tons of ore. When in operation the copper matte produced averaged 40–43 per cent copper.