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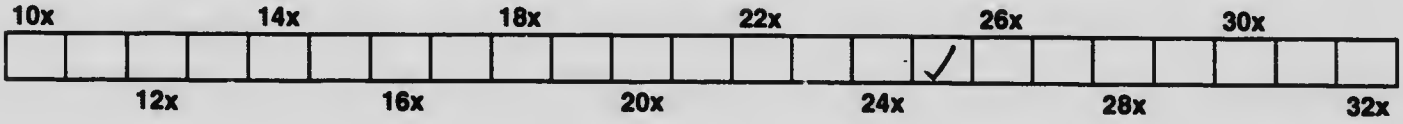

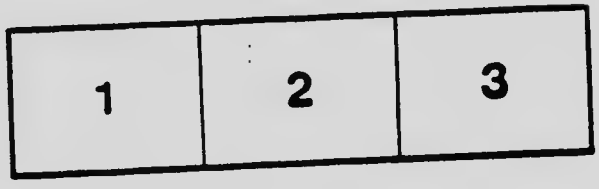

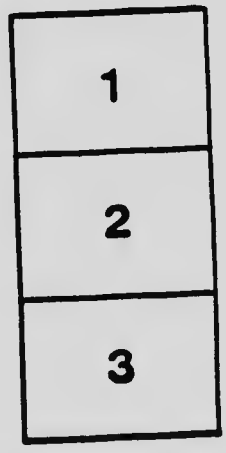

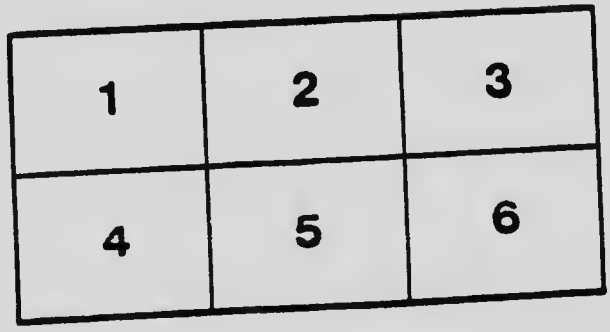

CANADA
DEPARTMENT OF MINES
MINES BRANCH
Hon. Robert Rogers, Minister; A. P. Low, LL.D., Deputy Minister;
Eugene Haanel, Ph.D., Director.

A GENERAL SUMMARY

OF THE

MINERAL PRODUCTION

OF

CANADA

During the Calendar Year

1911

JOHN McLEISH, B.A.
Chief of the Division of Mineral Resources and Statistics.

OTTAWA
GOVERNMENT PRINTING BUREAU
1912

No. 183

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THE

MINERAL PRODUCTION OF CANADA

During the Calendar Year

1911

General Summary.

The total value of the mineral production in Canada in 1911, according to revised statistics now complete, was $103,220,994, which although less than the production of 1910 by $3,602,629 was nevertheless much greater than the output of any other previous year. The total value of the production in 1910 was $106,823,623, the decrease in 1911 being equivalent to a little over 3 per cent. The largest production per capita was made in 1910 when the output averaged $14.93 per head of population; the year 1911 was next with an average output per capita of $14.42.

The year 1886 was the first year for which complete statistics of mineral production for the whole of Canada were collected by this Department, and the production that year was reported as $10,221,255, or about $2.23 per capita. In ten years the production had increased over 100 per cent, at $22,474,256, or $4.38 per capita, in 1896. At this time, the Yukon began to contribute largely to the gold production, and, during the next five years, an increase of nearly 200 per cent is shown, the total reaching a value of $65,797,911, or $12.16 per capita in 1901. The next three years witnessed a slight falling off; but from 1904 the production again rapidly increased to its present high record due to the general development of a wide variety of mineral products.

Annual Mineral Production in Canada since 1886.

Year.	Value of production.	lue per apita.	Year.	Value of production.	Value per capita.
	$	$ cts.		$	$ cts.
1886	10,221,255	2 23	1899	49,234,005	9 27
1887	10,321,331	2 23	1900	64,420,877	12 6[illegible]
1888	12,518,894	2 67	1901	65,797,911	12 16
1889	14,013,113	2 96	1902	63,231,836	11 36
1890	16,763,353	3 50	1903	61,740,513	10 83
1891	18,976,616	3 92	1904	60,082,771	10 27
1892	16,623,415	3 39	1905	69,078,999	11 49
1893	20,036,082	4 04	1906	79,286,697	12 81
1894	19,931,158	3 98	1907	86,865,202	13 75
1895	20,505,917	55	1908	85,557,101	13 16
1896	22,474,256	4 38	1909	91,831,441	13 70
1897	28,485,023	5 49	1910	106,823,623	14 93
1898	38,412,431	7 32	19	103,220,994	14 42

Comparative Statement of Mineral Production for Years 1910 and 1911.

Product.	1910.			1911.			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.	364	14,906	.....	0	0	.....	.....	.....	[illegible]	.....
Cobalt (i)..... Lbs.	.....	51,986	.....	.....	.....	.....	.....	.....	− 51,986	.....
Cobalt oxide and nickel oxide..... "	.....	.....	.....	154,174						
Cobalt material, mixed cobalt and nickel oxides..... "	.....	.....	.....	1,260,832	221,690	0·22	.....	.....	+ 221,690	.....
Copper (b)..... "	55,692,369	7,094,094	6·64	55,648,011	6,896,998	6·67	− 44,358	0·08	− 197,096	− 2·92
Gold..... Ozs.	473,707	10,205,835	9·55	473,159	9,781,077	9·48	− 20,548	4·16	− 424,758	− 4·16
Pig iron from Canadian ore (c)..... Tons	104,906	1,650,849	1·54	42,186	613,404	0·59	− 62,720	59·79	− 1,037,445	− 62·84
Iron ore sold for export (k)..... "	114,449	324,186	0·30	40,137	88,570	0·09	− 74,312	64·93	− 235,616	− 72·68
Lead (d)..... Lbs.	32,987,508	1,216,249	1·13	23,784,989	827,717	0·80	− 9,202,519	27·90	− 388,532	− 31·95
Nickel (e)..... "	37,271,033	11,181,310	10·46	34,098,744	10,229,623	9·91	− 3,172,289	8·51	− 951,687	− 8·51
Silver (f)..... Ozs.	32,869,264	17,580,455	16·45	32,559,044	17,355,272	16·81	− 310,220	0·94	− 225,183	− 1·28
Zinc ore..... Tons.	5,063	120,003	0·11	2,590	101,072	0·10	− 2,473	48·84	− 18,931	− 15·78
Total	.....	49,438,873	46·28	.....	46,105,423	44·67	.....	.....	− 3,333,450	− 6·74
Non-Metallic.										
Actinolite ..... Tons	30	330	.....	67	736	.....	+ 37	123·00	+ 406	123·00
Arsenious oxide..... "	(j) 2,049	(j) 81,044	.....	2,097	76,237	.....	+ 48	2·34	− 4,807	− 5·93
Asbestos..... "	2,508	2,555,974	2·39	101,393	2,922,062	2·83	+ 23,885	30·82	+ 366,088	+ 14·32
Asbestic..... "	24,707	17,629	.....	26,021	21,046	.....	+ 1,314	5·32	+ 3,417	+ 19·38
Chromite..... "	299	3,734	.....	157	2,587	.....	− 142	47·49	− 1,147	− 30·72
Coal..... "	12,909,152	30,909,779	28·93	11,323,388	26,467,646	25·64	− 1,585,764	12·28	− 4,442,133	− 13·50
Corundum..... "	1,870	198,690	0·18	1,472	161,873	0·15	− 398	21·28	− 36,807	− 18·53
Feldspar..... "	15,809	47,667	.....	17,723	51,939	.....	+ 1,914	12·11	+ 4,272	+ 8·96
Fluorspar..... "	2	15	.....	34	238	.....	+ 32	+	+ 223	.....
Graphite..... "	1,392	74,087	.....	1,269	69,576	.....	− 123	8·84	− 4,511	− 6·09
" artificial..... "	1,221	.....	.....	1,086	.....	.....	− 135	11·06	.....	.....
Grindstones..... "	3,973	47,196	.....	4,566	52,942	.....	+ 593	14·92	+ 5,746	+ 12·17
Gypsum..... "	525,246	934,446	0·87	518,393	993,394	0·96	− 6,853	1·31	+ 58,948	+ 6·31
Magnesite..... "	323	2,160	.....	991	5,531	.....	− 668	206·60	− 3,371	− 156·09
Manganese..... "	.....	.....	.....	5½	300	.....	+ 5½	.....	− 300	.....
Mica ..... £	.....	190,385	0·17	.....	128,677	0·12	.....	.....	− 61,708	− 32·41

Mineral pigments													
Barytes	Tons.	0	0		50	400		50			800		
Ochres	"	4,813	33,485		3,622	28,333		1,191	24 75		4,852	14 62	
Mineral water			199,563	0·18		223,758	0·21				24,195	12 12	
Natural gas *(g)*			1,346,471	1·26		1,917,678	1·80				571,207	42 42	
Peat	Tons.	841	2,604		1,463	3,817		622	73 96		1,213	46 58	
Petroleum *(h)*	Bls.	315,895	388,550	0·36	291,092	357,073	0·34	24,803	7 85		31,477	8 10	
Phosphate	Tons.	1,478	12,578		621	5,206		857	57 98		7,372	58 61	
Pyrites	"	53,870	187,064	0·17	82,466	365,820	0·35	28,736	53·45		178,756	95 56	
Quartz	"	88,205	91,951		60,526	83,865		27,679	31 38		8,086	8 79	
Salt	"	84,092	409,624	0·38	91,582	443,004	0·42	7,490	8 91		33,380	8 15	
Talc	"	7,112	22,308		7,300	22,100		188	2 64		208	0 93	
Tripolite	"	22	134		20	122		2	9 00		12	8 96	
Total			37,757,158	35·34		34,405,269	33·33				3,351,198	8 88	

* 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 12·376 cents per pound, in 1911; and 12·738 cents per pound in 1910. *(c)* The total production of pig iron in Canada in 1911 was 917,535 tons valued at $12,307,125, of which it is estimated 875,349 tons valued at $11,695,721 should be credited to imported ores; in 1910, the total production was 800,797 tons valued at $11,245,622, of which 695,891 tons valued at $9,594,773 are credited to imported ores. *(d)* Refined lead and lead contained in base bullion exported at 3·480 cents per pound, in 1911; and [illegible]·387 cents in 1910, the average prices in Montreal and Toronto respectively. *(e)* Nickel content of matte produced valued at 30 cents in 1910 and 1911. (I[illegible]easing 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 about 10 cents per pound for both years. *(f)* Estimated recoverable silver at 53·304 cents per ounce in 1911, and at 53·486 cents in 1910. *(g)* Gross returns for sale of gas. *(h)* Quantity on which bounty was paid and valued at $1.22½ per barrel in 1911 and at $1.23 in 1910. *(i)* Value received in 1910 by shippers of silver cobalt ores for cobalt content. Cobalt not paid for in 1911. *(j)* In 1910 includes 547 tons arsenical ore valued at $5,716. *(k)* In 1911, figures as reported by the producers, which differ slightly from those of the Trade and Navigation reports.

Comparative Statement of Mineral Production for Years 1910 and 1911—*Continued.*

Product.		1910.			1911.			Increase (+) or Decrease (−).		Increase (+) or Decrease (−).	
		Quantity.	Value.	Per cent of total.	Quantity.	Value. (a)	Per cent of total.	Quantity.	%	Value.	%
Structural Materials and Clay Products.			$	%		$	%			$	
Cement, Portland	Bls.	4,753,975	6,412,215	6·00	5,692,915	7,644,537	7·41	+ 938,940	19·75	+ 1,232,322	19·22
Clay products—											
Brick, common	No.	627,715,319	5,105,354	4·77	645,550,517	5,420,890	5·25	+ 17,835,198	2·84	+ 315,536	6·18
Brick, pressed	"	67,895,034	807,294	0·75	87,350,539	1,094,582	1·06	+ 19,455,505	28·65	+ 287,288	35·59
Brick, paving	"	4,214,917	78,980		5,220,400	79,444		+ 1,005,483	23·86	+ 464	0·59
Brick, moulded and ornamental		703,345	16,092		605,643	11,281		− 97,702	13·89	− 4,811	29·89
Fireclay, and fireclay products			50,215			89,130				+ 38,915	77·50
Fire-proofing and architectural terra-cotta			176,979	0·16		409,585	0·39			+ 232,606	131·00
Pottery			250,924	0·23		102,493	0·10			− 148,431	59·15
Sewer-pipe			774,110	0·72		812,716	0·79			+ 38,606	4·99
Tile, drain	No.	24,562,648	370,008	0·34		339,812	0·32			− 30,196	8·16
Lime	Bus.	5,848,146	1,137,079	1·06	7,533,525	1,517,599	1·47	+ 1,685,379	28·82	+ 380,520	33·46
Sand-lime brick	No.	44,593,541	371,857	0·34	51,535,243	442,427	0·43	+ 6,941,702	15·57	+ 70,570	18·98
Sand and gravel (exports)	Tons.	624,824	407,974	0·38	573,494	408,110	0·39	− 51,330	8·22	+ 136	0·03
Slate	Squares.	3,959	18,492		1,833	8,248		2,126	53·70	− 10,244	55·39
Stone—											
Granite			739,516	0·69		1,119,865	1·08			+ 380,349	51·43
Limestone			2,249,576	2·10		2,594,926	2·51			+ 345,350	15·35
Marble			158,779	0·14		162,783	0·15			+ 4,004	2·52
Sandstone			502,148	0·47		451,183	0·43			− 50,965	10·15
Total			19,627,592	18·37		22,709,611	22·00			+ 3,082,019	13·57
Grand total			106,823,623	100·00		103,220,994	100·00			− 3,602,629	3·37

The production of metalliferous products in 1911 was valued at $46,105,423, being 44·67 per cent of the total mineral output and a decrease in value from the previous year of $3,333,450, or about 6¾ per cent. The value of the production of non-metalliferous products (excluding structural material and clays) in 1911 was $34,405,960, being 33·33 per cent of the total mineral output and a decrease of $3,351,198, or 8·8 per cent from the value of the production in 1910. The value of the production of clay, lime and stone, and other structural materials in 1911 was $22,709,611, or 22 per cent of the total production; and an increase of $3,082,019, or 13·5 per cent, over the 1910 output.

The most important product in point of value was coal which contributed over 25½ per cent of the total production; silver, next in importance, contributed over 16¾ per cent, nickel nearly 10 per cent; gold almost 9½ per cent; clay products 8 per cent; cement 7⅜ per cent; copper 6⅜ per cent.

The falling off in production in 1911, while apparently quite general among the metals, is to be ascribed in large part to the long continued strike of coal miners in the Province of Alberta and the Crowsnest district of British Columbia. The scarcity of coal and coke in these Provinces seriously interfered with the smelting industry of British Columbia and undoubtedly resulted in a smaller production of copper, silver, and gold than would otherwise have been made. In the case of iron, while a decrease is shown in the quantity of pig iron attributable to Canadian ore, the total production of pig iron from domestic and imported ores showed a very large increase over the 1910 output.

The prices of metals upon which the value of the production directly depends did not vary greatly during the year, in fact the averages have been fairly stationary during the past three years. The prices of copper, lead, and silver on the New York market were fractionally lower in 1911. Spelter was fractionally higher and nickel showed no change. On the London market and in Montreal which follows London, lead showed an increased average price.

—	1907.	1908.	1909.	1910.	1911.
	Cts.	Cts.	Cts.	Cts.	Cts.
Copper, New York	20·004	13·208	12·982	12·738	12·376
Lead "	5·325	4·200	4·273	4·446	4·420
" London	4·143	2·935	2·839	2·807	3·035
" Montreal*	4·701	3·364	3·268	3·246	3·480
Nickel, New York	45·000	43·000	40·000	40·000	40·000
Silver "	65·327	52·864	51·503	53·486	53·304
Spelter "	5·962	4·720	5·503	5·520	5·758
Tin "	38·166	29·465	29·725	34·123	42·281

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

Amongst the non-metallic products the most serious falling off was in coal, due as already intimated to labour difficulties; smaller decreases are shown in

corundum, mica, and petroleum, while on the other hand substantial increases were made in the sales of asbestos, gypsum, natural gas, pyrites, and salt. The structural materials and clay products nearly all show an increased 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 1911, was $52,546,593, as compared with $51,856,862 in 1910. This value includes for 1911 mine products to the value of $41,121,688 and manufactures valued at $11,424,905. 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 also considerable exports of coal. These items alone contribute about 74·4 per cent of the value of the mine products exported. Manufactures of mine products exported consist chiefly of iron and steel goods, aluminium, calcium carbide, lime, acetate of lime, and coke.

The United States is the chief destination of Canada's mine exports, about 77·4 per cent having been exported to that country during the fiscal year 1910-1911, and about 15·7 per cent to Great Britain.

A great variety of mineral products, chiefly in a manufactured or semi-manufactured condition, are annually imported into Canada. The total value of these imports during the calendar year 1911 was $181,839,077, as compared with imports valued at $147,305,012 in 1910. Of the total imports in 1911, nearly $48,000,000 in value consisted of the cruder forms of mineral products such as coal, ores of metals, diamonds unset and bort, asphaltum, alumina, clays, etc., whilst iron and steel and manufactures thereof were imported to the value of over $93,000,000. Imports of the metals copper, gold, silver, lead, platinum, tin, and zinc, and manufactures thereof, reached a total value of over $18,750,000, and imports of petroleum and clay products exceeded $11,000,000 in value.

The great excess of imports over exports would seem to indicate the existence of large opportunities for the development not only of Canada's mineral production but also of many manufacturing industries which utilize mine products as raw materials. The fact, however, must not be overlooked that the geographical situation of Canada and the United States, separated by an imaginary barrier 3,000 miles in length, evidently results, notwithstanding the tariffs on both sides, in a mutually advantageous interchange of trade. Then we find large exports as well as imports of coal and of agricultural implements. The continued large export of crude unrefined ores and metal products and the cor-

responding imports of refined and manufactured metal products still point to opportunities for the development of metallurgical industries as well as industries for the treatment, refinement, and manufacture of non-metallic products.

Exports of the Products of the Mine and of Manufactures of Mine Products—Calendar Years 1910 and 1911.

		1910.		1911.	
		Quantity.	Value.	Quantity.	Value.
MINE PRODUCTS.			$		$
Arsenic	Lbs.	4,512,673	173,932	4,125,558	81,761
Asbestos	Tons.	71,485	2,108,632	75,120	2,067,259
Barytes	Cwt.	5	150	.....	.....
Chromite	Tons.	15	150	.....	.....
Coal	"	2,377,049	6,077,350	1,500,639	4,357,074
Copper, fine in ore, etc	Lbs.	56,964,127	5,840,553	55,208,054	459,770
" black or coarse and in pigs	"	.....	.....	79,656	7,925
Feldspar	Tons.	15,601	47,962	16,150	56,085
Gold	...	.....	5,491,051	.....	7,493,523
Gypsum	Tons.	346,081	416,725	362,102	425,161
Lead, in ore, etc	Lbs.	46,800	1,308	65,100	1,826
" in pig, etc	"	7,712,253	248,174	71,961	2,806
Mica	"	937,263	330,903	693,940	242,548
Mineral pigments	"	3,491,737	29,839	3,999,925	27,070
Mineral water	Gals.	16,136	7,169	26,495	12,952
Nickel, in ore, etc	Lbs.	36,014,782	4,039,040	32,619,971	3,676,396
Oil, refined	Gals.	2,818	462	489	73
Ores—					
Antimony	Tons.	239	14,095	57	4,946
Corundum	"	.....	.....	742	77,777
Iron	"	114,499	324,186	37,686	133,411
Manganese	"	4	160	4	225
Other ores	"	9,534	641,426	6,919	375,695
Phosphates	"	.....	.....	3	100
Platinum	Ozs.	2,254	62,776	39	1,961
Plumbago	Cwt.	15,768	53,008	16,263	43,249
Pyrites	Tons.	30,434	110,071	32,102	120,585
Salt	Lbs.	275,200	2,618	454,600	5,065
Sand and gravel	Tons.	624,824	407,974	573,494	408,110
Silver	Ozs.	30,699,770	15,649,537	31,216,725	15,807,366
Stone, building	Tons.	63,407	18,867	83,767	25,103
" ornamental	"	446	3,352	168	1,796
" for manufacture of grindstones	"	308	338	15	22
Other products of the mine	.....	.....	134,462	.....	204,028
Total mine products	.....	.....	42,236,270	.....	41,121,688
MANUFACTURES.					
Acetate of lime	Lbs.	.....	.....	7,428,157	117,904
Agricultural implements—					
Cultivators	No.	.....	.....	5,923	138,377
Harrows	"	8,924	115,068	5,412	95,904
Harvesters	"	11,382	1,234,794	14,355	1,432,911
Hay rakes	"	6,344	205,342	11,085	317,842
Mowing machines	"	18,745	634,326	22,859	778,274
Parts of	.....	.....	575,848	.....	796,246
Ploughs	No.	16,888	540,677	20,437	508,095

Exports of the Products of the Mine and of Manufactures of Mine Products—Calendar Years 1910 and 1911—*Continued.*

—		1910.		1911.	
		Quantity.	Value.	Quantity.	Value.
MANUFACTURES.—*Continued.*			$		$
Reapers	No.	3,411	220,517	9,385	574,315
Seeders	"	256	13,727	174	13,795
Threshing machines	"	29	8,576	339	92,442
All other	"	.....	1,163,722	.....	1,533,728
Aluminium, in bars	Cwt.	77,224	1,160,242	49,901	747,587
" manufactures of	"	.....	3,741	.....	1,555
Bricks	M	390	2,762	394	3,977
Calcium carbide	Lbs.	.....	.....	4,888,975	142,402
Cement		.....	12,914	.....	4,067
Clay, manufactures of		.....	9,061	.....	2,071
Coke	Tons.	57,971	250,715	9,852	39,823
Earthenware, and all manufactures of		.....	.....	.....	6,101
Grindstones, manufactured		.....	23,164	.....	29,184
Gypsum and plaster ground		.....	12,306	.....	4,429
Iron and steel:—					
Castings, N.E.S.		.....	51,958	.....	33,441
Gas buoys and parts of		.....	.....	.....	68,485
Hardware, tools, etc		.....	88,844	.....	94,513
" N.E.S.		.....	43,472	.....	44,199
Machinery (Linotype machines)		.....	39,438	.....	12,239
" N.E.S.		.....	301,961	.....	431,493
Pig iron	Tons.	9,763	296,310	5,870	271,968
Scrap iron and steel	Cwt.	223,264	171,603	84,153	54,618
Sewing machines	No.	17,334	188,196	18,519	218,075
Steel and manufactures of		.....	1,110,925	.....	769,692
Stoves	No.	1,058	15,832	1,176	20,626
Typewriters	"	5,970	409,326	4,771	318,935
Vehicles—					
Automobiles	"	387	433,663	1,509	1,184,506
" parts of		.....	.....	.....	45,798
Bicycles	No.	72	2,710	90	5,936
" parts of		.....	28,654	.....	50,828
Lime		.....	44,762	.....	39,536
Metals, N.O.P.		.....	133,426	.....	175,716
Naphtha and gasoline	Gals.	.....	.....	23,959	4,427
Plumbago, manufactures of		.....	66,658	.....	33,956
Stone, building		.....	80	.....	456
" ornamental		.....	5,272	.....	980
Tar		.....	.....	.....	56,669
Tin, manufactures of		.....	.....	.....	30,176
Total manufactures		.....	9,620,592	.....	11,424,905
Grand total		.....	51,856,862	.....	52,546,593

EXPORTS.

Showing Destination of Mine Products during the Fiscal Years 1909-10 and 1910-11.

Destination.	1909-10 Value.	1910-11 Value.
	$	$
United States	33,488,464	33,129,505
United Kingdom	3,820,574	6,726,015
Newfoundland and Labrador	528,031	580,632
Alaska	.....	392,715
Hong Kong	216,514	376,553
Mexico	325,153	302,055
Chinese Empire	777,147	301,870
Germany in Europe	43,975	239,596
Belgium	177,675	220,244
Australia and Tasmania	212,950	161,017
France	110,222	116,326
Japan	202,071	85,247
Bermuda	53,071	66,525
St. Pierre and Miquelon Islands	28,450	24,941
Holland and Netherlands	17,218	21,609
British West Indies	13,552	11,904
Cuba	14,946	10,161
Italy	10,956	8,000
British Possessions (All other)	10,903	2,768
Central American States and Costa Rica	66	2,376
Uruguay	.....	1,742
New Zealand	8,518	2,309
Argentina	4,516	1,383
San Domingo	.....	1,000
Austria-Hungary	1,030	720
Switzerland	73	300
Dutch Guiana	.....	48
Other countries	20,942	.....
	40,087,017	42,787,561

IMPORTS.

Imports of Products of the Mine and Manufactures of Mine Products—Calendar Years 1910 and 1911.

Products.	1910 Value.	1911 Value.
	$	$
Alumina	403,283	372,009
Alum, alum cake, and chloralum	26,145	88,516
Aluminium and manufactures	756,550	648,046
Antimony	25,296	36,405
Antimony salts	9,152	2,418
Arsenic, oxide and sulphide of	15,837	6,823
Asbestos	230,489	319,815
Asphaltum	441,945	558,784
Bells and gongs	111,185	104,965
Bismuth	6,996	7,012
Blanc fixe and satin white	22,726	29,796
Blast furnace slag	105,574	141,136
Borax	103,177	120,313
Brick and tile	943,846	1,555,347
Brick, fire, of a kind not made in Canada	811,927	814,414
Bromine	323	40
Burrstones	854	1,642
Cement, hydraulic, Portland and manufactures	476,113	848,416
Chalk, Cornwall stone, feldspar, fluorspar, etc	121,959	147,640
Clays	292,508	270,247
Coal: anthracite, bituminous, slack, and run of mine	28,450,001	39,292,591
Coal tar and coal pitch	74,352	81,555
Coke	1,908,725	1,843,248
Coke, ground, for electric batteries		6,840
Copper and manufactures of	4,369,773	4,936,769
Cryolite	54,561	29,602
Crucibles, clay or plumbago	52,896	56,814
Chloride of lime	116,923	118,501
Cyanides, of potassium, sodium, cyanogen, or cpd of bromine	90,639	94,397
Diamonds, unset, and bort	2,231,824	2,612,150
Earthenware	2,283,116	2,516,536
Earths, crude	8,228	9,398
Electric carbons	56,764	56,529
Emery	133,290	150,444
Fertilizers, compound or manufactured	388,467	396,645
Flint, quartz, silex, etc	45,942	56,624
Foundry facings	23,441	21,816
Fullers earth	6,015	7,024
Fossils	3,171	1,180
Gannister	2,344	2,821
Gold and silver and manufactures of	2,393,860	2,480,017
Graphite and manufactures of	59,957	56,132
Grindstones	71,394	123,356
Gypsum and plaster of Paris	169,798	205,782
Iron and steel.—Total* 1910: $75,758,594; 1911: $92 165,437		
Agricultural implements	3,816,505	4,508,694
Bar iron or steel, rolled, whether in coils, bundles, rods or bars	2,901,814	3,017,349
Castings, iron or steel, N.O.P	547,731	794,953
Cutlery	1,018,065	1,041,412
Engines, locomotive and others	2,415,497	3,221,249
Iron, pig	3,400,183	2,681,795
Iron or steel blooms, billets, puddled bars and loops, ingots, cogged ingots, slabs, or other forms, N.O.P., etc	790,195	1,671,207
" " rolled, angles, tees, beams, channels, girders, etc	4,843,429	5,091,695
" " rolled, not less than 30" wide nor less than ¼" thick	1,771,330	1,503,123
" " skelp, sheared or rolled in grooves, etc	1,813,131	1,914,819
" " sheets, flat galvanized, Canada plates, etc	4,446,505	4,487,900
Machines and machinery	19,979,850	28,250,006
Steel rails	756,531	2,583,486

IMPORTS.

Imports of Products of the Mine and Manufactures of Mine Products—Calendar Years 1910 and 1911—*Continued.*

Products.	1910. Value.	1911. Value.
	$	$
Iron and steel—*Con.*		
Tubing	2,025,021	2,372,182
Wire	3,572,046	3,622,766
All other iron and steel and manufactures of	21,660,761	26,403,401
Iron sand	6,647	8,340
Kainite	4,905	9,262
Lead and manufactures of	833,743	1,049,276
Lime	138,847	161,985
Litharge	56,049	65,743
Lithographic stone	10,441	12,344
Manganese, oxide of	17,133	22,612
Magnesia	10,847	11,012
Meerschaum	26	150
Mercury or quicksilver	63,450	67,416
Metallic alloys:		
Babbitt metal	24,931	35,073
Brass and manufactures of*	2,862,686	3,218,942
Britannia metal	45,132	32,430
German silver, nickel, and nickel silver	123,521	147,315
Type metal	159	321
Mineral and bituminous substances	76,327	168,577
Mineral water, including aerated water	202,306	229,367
Nickel anodes	23,317	34,199
Ochres, etc	55,393	53,092
Ores of metals, N.O.P.	4,302,801	4,014,748
Paraffin wax	58,673	75,661
Paraffin candles	21,433	30,763
Petroleum and products of	4,826,763	6,009,730
Phosphate (fertilizer)	72,950	46,217
Platinum and manufactures of	102,318	176,101
Potash and manufactures of	191,912	203,4[illegible]
Precious stones	506,984	344,659
Pumice	14,829	18,779
Salt	462,061	436,118
Saltpetre	90,488	101,082
Sand and gravel	196,766	240,613
Slate and manufactures of	142,285	169,685
Sand paper	148,384	164,474
Soda products: barilla, bichromate, caustic, salt, and salt cake	767,846	800,805
Stone and manufactures of (including marble)	845,123	1,140,852
Soda, nitrate of	767,562	867,778
Sulphate of iron	10,094	4,773
Sulphur and phosphorus	476,684	450,875
Sulphuric acid	21,702	9,281
Talc	.....	6,413
Tin and manufactures of (including tinware)	4,045,256	5,442,551
Whiting and prepared chalk	129,509	136,022
Zinc and manufactures of	1,086,829	1,227,660
	147,305,012	181,839,077

* Trade and Commerce reports.

METALLIC ORES AND PRODUCTS

Antimony.—The production of antimony in 1911 was limited to a few pounds of refined antimony recovered at the lead refinery at Trail, B.C. Shipments of antimony ore in 1910 were reported as 364 tons valued at $13,906. There was no production of refined antimony in 1910, but 61,207 pounds valued at $4,285 were produced in 1909. An export of antimony ore in 1911 is reported of 57 tons valued at $4,946, as against exports of 239 tons valued at $14,095 in 1910. The imports of antimony or regulus thereof, in 1911, were 561,046 pounds valued at $36,405, and of antimony salts 18,420 pounds valued at $2,418 or a total value of imports of $38,823. In 1910, the imports were antimony and regulus of 388,952 pounds valued at $25,296, and antimony salts 94,330 pounds valued at $9,152, or a total value of $34,448.

Cobalt.—The mine owners received no payment on account of cobalt contents of ores shipped in 1911, as against $51,986 received in 1910. Cobalt oxide and cobalt material are being produced in Canadian smelters, the production, in 1911, of cobalt oxide and nickel oxide being 154,174 pounds and of cobalt material and mixed cobalt and nickel oxides 1,260,832 pounds, the value being $221,690. During 1910, the shipments as reported by the Ontario Bureau of Mines included 13,508 pounds of cobalt oxide valued at $9,630, and 108,178 pounds of mixed oxides of nickel and cobalt valued at $18,760.

Copper.—The production of copper contained in blister matte or ore which was practically all exported was 55,648,011 pounds in 1911, valued at $6,886,998, as compared with 55,692,369 pounds, valued at $7,094,094, in 1910.

The exports in 1911 were reported as 55,287,710 pounds, valued at $5,467,725, as against exports of 56,964,127 pounds, valued at $5,840,553, in 1910. The total imports of copper in 1911 were valued at $4,936,769; and included crude and manufactured copper to the extent of 37,352,237 pounds valued at $4,721,480, together with other manufactures of copper of which the quantity is not recorded, valued at $215,289. The copper imports in 1910 were valued at $4,369,773, including 30,237,106 pounds of crude and manufactured copper, valued at $4,219,451, and other copper manufactures of which the quantity is not recorded, valued at $150,322.

Gold.—The total value of the production of gold in 1911 was $9,781,077, representing 473,159 fine ounces of metal and showing a decrease of $424,758 or over 4 per cent from the production of 1910, which was valued at $10,205,835, representing 493,707 fine ounces.

The Yukon placer production in 1911 was $4,580,000, as against $4,550,000 in 1910.

Of the total production in 1911 about $5,014,207 were derived from alluvial workings; $513,991 as bullion from milling ores, and $4,252,879 from ores and concentrates sent to smelters. In 1910, $5,091,850 were derived from alluvial

workings; $680,149 as bullion from milling ores, and $4,433,628 obtained from ores and concentrates sent to smelters.

The exports of gold bearing dust, quartz, nuggets, and gold in ore, etc., in 1911, were valued at $7,493,523, as against $5,491,051 in 1910.

The imports of gold coin during the calendar year 1911 were $20,417,799, and of gold bullion $924,233.

Pig Iron.—The total production of pig iron in Canadian blast furnaces in 1911 was 917,535 tons valued at $12,307,125, of which it is estimated 875,349 tons valued at $11,693,721 should be credited to imported ores and 42,186 tons valued at $613,404 to domestic ores. In 1910 the total production was 800,797 tons valued at $11,245,622, of which 104,906 tons valued at $1,650,849 were credited to Canadian ore.

The exports of pig iron, including ferro-products, in 1911, were 5,870 tons, valued at $271,968, as against 9,763 tons valued at $296,310 in 1910. The imports of pig iron in 1911 were 208,487 tons valued at $2,610,989, and ferro-manganese, etc., 17,226 tons valued at $429,465, as compared with imports in 1910 of pig iron 227,753 tons valued at $3,122,695; charcoal pig iron 16,106 tons valued at $242,152; and ferro-manganese 18,900 tons valued at $464,741.

The total exports of iron and steel and manufactures thereof, in 1911, were valued at $9,907,281, as against $7,895,489 in 1910. The imports of iron and steel and manufactures thereof during the calendar year 1911 were valued at $93,165,437, as compared with $75,758,594 during the calendar year 1910.

Iron Ore.—The total shipments of iron ore from Canadian mines in 1911 were 210,344 tons, valued at $522,319, as compared with 259,418 tons valued at $574,362 in 1910. The exports of iron ore in 1911 were 37,686 tons, valued at $133,411; as against 114,499 tons valued at $324,186 exported in 1910. The quantity of imported iron ore used in Canada in 1911 was about 1,628,368 tons, as compared with 1,377,035 tons of imported ore used in 1910.

Lead.—The production of lead in 1911 was 23,784,969 pounds valued at $827,717, as against 32,987,508 pounds, valued at $1,216,249, in 1910. The exports of lead in 1911 were: lead in ore, etc., 65,100 pounds; pig lead 71,961 pounds—total 137,061 pounds; while in 1910 the exports were: lead in ore, etc., 46,800 pounds; pig lead 7,712,253 pounds—total 7,759,053 pounds. The total value of the imports of lead and manufactures of, in 1911, was $1,049,276, as compared with imports in 1910 valued at $833,743.

Nickel.—The production of nickel contained in nickel-copper matte produced in Canada and exported for refinement was, in 1911, 34,098,744 pounds, as compared with a production of 37,271,033 pounds in 1910. During 1911 there were smelted 610,834 tons of ore producing 32,607 tons of matte, as against 628,947 tons of ore smelted in 1910, producing 35,033 tons of matte. Small quantities of nickel oxide are also produced in connexion with the treatment of the Cobalt District silver ores. The exports of nickel contained in ore, matte,

etc., during 1911, were 32,619,971 pounds valued at $3,676,396: being 5,023,393 pounds to Great Britain and 27,596,578 pounds to the United States. In 1910 the exports were 36,014,782 pounds valued at $4,039,040: being 5,335,331 pounds to Great Britain and 30,679,451 pounds to the United States. The imports of nickel and nickel anodes in 1911 were valued at $34,199, as against a value of $23,317 imported in 1910.

Silver. — The production of silver contained in bullion, or estimated as recovered from mattes and ore, etc., exported was, in 1911, 32,559,044 fine ounces valued at $17,355,272, as compared with a production of 32,869,264 fine ounces valued at $17,580,455 in 1910. About 93·8 per cent of the production in 1911 was derived from "Cobalt District" of Ontario. The production of silver in 1905 was only 6,000,023 ounces and in 1900, 4,468,225 ounces. The exports of silver contained in ores, mattes, etc., in 1911, were 31,216,725 ounces valued at $15,807,366; as against exports of 30,699,770 ounces valued at $15,649,537 in 1910. The imports of silver bullion during the calendar year 1911 were valued at $847,645, as compared with bullion imports of $502,772 in 1910.

Zinc.—The shipments of zinc ore in 1911 were 2,590 tons valued at $101,072, as compared with shipments of 5,063 tons valued at $120,003 in 1910. The total value of the imports of zinc and manufactures of zinc, in 1911, was $1,227,660, as compared with imports valued at $1,086,829 in 1910.

NON-METALLIC PRODUCTS.

Actinolite.—A production of 67 tons valued at $736 was reported in 1911, as compared with 30 tons valued at $330 in 1910.

Arsenic.—Smelter returns show a production in 1911 of 2,097 tons of arsenious oxide valued at $76,237, as compared with a production in 1910 of 1,502 tons valued at $75,328. There was also a production, in 1910, of 547 tons of arsenical ore valued at $5,[illegible].

The exports of arsenic in 1911 were 2,063 tons valued at $81,761, as against 2,256 tons valued at $173,932 exported in 1910. The imports of arsenious oxide in 1911 were 7,3[illegible] pounds valued at $158, as compared with 260,415 pounds valued at $6,89[illegible] in 1910. The imports of sulphate of arsenic in 1911 were 330,170 pounds, valued at $6,665, and in 1910, 257,451 pounds valued at $8,946.

Asbestos.—The shipments of asbestos in 1911 were 101,393 tons valued at $2,922,062, and of asbestic 26,021 tons valued at $21,046. The shipments in 1910 were 77,508 tons of asbestos valued at $2,555,974, and 24,707 tons of asbestic valued at $17,629. The shipments in 1911 consisted of 4,864·1 tons of crude asbestos valued at $744,9[illegible] and 96,529 tons of mill stock valued at $2,177,100. Considerable quantities both of crude and of mill stock were held in manufacturers' hands at the close of the year.

Exports in 1911 were 75,120 tons valued at $2,067,259, as against 71,485 tons valued at $2,108,632 in 1910.

Imports and manufactures of asbestos in 1911 were valued at $319,815, and in 1910, $230,489.

Chromite.—Shipments of chromite in 1911 were reported as 157 tons valued at $2,587, as compared with shipments of 299 tons valued at $3,734 in 1910.

Coal.—The production of coal in 1911 was 11,323,388 tons valued at $26,467,646, as against 12,969,152 tons valued at $30,909,779 in 1910. The exports of coal in 1911 were 1,500,639 tons valued at $4,357,074, as compared with 2,377,049 tons valued at $6,077,350 exported in 1910. The total imports of coal in 1911 were 14,558,892 tons valued at $39,292,591, as against imports in 1910 of 10,597,782 tons valued at $28,450,001.

The 1911 imports included 8,905,815 tons of bituminous round and run of mine coal, valued at $18,407,603; 4,020,577 tons of anthracite and anthracite dust, valued at $18,794,192; and 1,632,500 tons of bituminous slack, such as will pass through a ½" screen, valued at $2,090,796.

In 1910 the imports included 5,966,466 tons of bituminous round and run of mine valued at $11,919,341; 3,266,235 tons of anthracite and anthracite dust valued at $14,735,062; and 1,365,281 tons of bituminous slack, such as will pass through a ½" screen, valued at $1,795,598. The consumption of coal in 1911 was approximately 24,247,698 tons, as against 20,970,226 tons in 1910.

Coke.—The total quantity of oven coke made in 1911 was 954,388 tons, the quantity sold or used was 935,651 tons, valued at $3,630,410; as compared with 901,269 tons made and 902,715 tons sold or used, valued at $3,462,872, in 1910. The quantity of coal charged to coke ovens, in 1911, was 1,409,844 tons, as against 1,373,793 tons in 1910. The exports of coke in 1911 were 9,852 tons valued at $39,823, and in 1910, 57,971 tons valued at $250,715. The imports of coke in 1911 were 751,389 tons valued at $1,843,248, as compared with imports of 737,088 tons valued at $1,908,725 in 1910.

Corundum.—The total sales of grain corundum in 1911 were 1,472 tons valued at $161,873, as compared with sales in 1910 of 1,870 tons valued at $198,680.

Feldspar.—Shipments of feldspar in 1911 were 17,723 tons valued at $51,939, as compared with 15,809 tons valued at $47,667 shipped in 1910. The exports are recorded as 16,150 tons valued at $56,085 in 1911 and 15,601 tons valued at $47,962 in 1910.

Fluorspar.—About 34 tons valued at $238 were shipped from the mine in 1911 and 2 tons valued at $15 in 1910. Canadian steel furnaces in 1911 used 8,067 tons of fluorspar.

Graphite.—Shipments of crude and milled graphite during 1911 totalled 1,269 tons valued at $60,576, as against 1,392 tons valued at $74,087 shipped in

1910. The production of artificial graphite in 1911 was reported as 1,081 tons, as compared with 1,221 tons in 1910.

Exports of plumbago in 1911 are reported as 813 tons valued at $43,249, and manufactures of plumbago valued at $33,956. Exports in 1910 were: plumbago 788 tons valued at $53,008, and manufactures of plumbago valued at $66,658. Imports of graphite in 1911 were valued at $112,916 and included: plumbago not ground, $4,940; blacklead, $14,172; plumbago ground and manufactures of, $37,020; and crucibles of clay or plumbago, $56,814. In 1910 the imports were valued at $112,853, including: plumbago not ground, $4,867; blacklead, $10,048; plumbago ground and manufactures of, $45,042; and crucibles of clay or plumbago, $52,896.

Grindstones.—The production of grindstones, scythestones, and wood pulpstones, in 1911, was 4,566 tons valued at $52,942, as compared with 3,973 tons valued at $47,196 in 1910. The exports in 1911 included: stone for the manufacture of grindstones, 15 tons valued at $22; and manufactured grindstones valued at $29,184; the exports in 1910 were: stone for the manufacture of grindstones, 308 tons valued at $338; and manufactured grindstones valued at $23,164. The imports of abrasives in 1911 included: grindstones valued at $123,356; burrstones, $1,642; emery in bulk crushed or ground, $46,274; manufactures of emery, carborundum, etc., $104,170; pumice stone, $18,779; also iron sand, $8,340; sandpaper, $164,474. The 1910 imports comprised: grindstones, valued at $71,394; burrstones, $854; emery in bulk crushed or ground, $40,400; manufactures of emery, carborundum, etc., $92,890, and pumice stone, $14,829.

Gypsum.—The total shipments of gypsum crude and calcined, in 1911, were 518,583 tons valued at $993,394, as compared with shipments of 525,246 tons valued at $934,446 in 1910. The tonnage of gypsum mined or quarried in 1911 was 495,979 tons, and the quantity calcined 76,718 tons. In 1910, 548,019 tons of gypsum were mined or quarried and 69,889 tons calcined. The shipments in 1911 included: crude gypsum, 429,488 tons valued at $448,542; ground gypsum, 27,484 tons valued at $55,660, and calcined gypsum, 61,411 tons valued at $489,192. In 1910 shipments comprised: crude gypsum, 469,573 tons valued at $508,686; ground gypsum, 6,121 tons valued at $17,390, and calcined gypsum, 49,552 tons valued at $408,370. The exports of gypsum in 1911 were: 362,102 tons of crude gypsum valued at $425,161, and gypsum ground or calcined valued at $4,429. The 1910 exports were: 346,081 tons of crude gypsum valued at $416,727, and gypsum ground or calcined valued at $12,306.

The imports of gypsum in 1911 were valued at $205,782, including: crude gypsum, 2,035 tons valued at $11,192; ground gypsum, 11,208 tons valued at $3,619, and plaster of Paris, 28,518 tons valued at $190,371. The total value of imports in 1910 was $139,798, made up of: crude gypsum, 12,271 tons valued at $21,073; ground gypsum, 6,690 tons valued at $13,242, and plaster of Paris, 19,045 tons valued at $135,483.

Magnesite.—Shipments of magnesite in 1911 were 991 tons valued at $5,531, and in 1910, 323 tons valued at $2,160.

Manganese.—There was a shipment of 5½ tons valued at $300 in 1911—no shipment reported in 1910. The exports in 1911 were 4 tons valued at $225, as against 4 tons valued at $160 in 1910. The 1911 imports included 962 tons manganese oxide valued at $22,612, as compared with 649 tons valued at $17,133 in 1910.

Mica.—The value of the mica production in 1911 as reported by mine operators was $128,677, as compared with $190,385 in 1910. The exports of mica in 1911 were 633,940 pounds valued at $212,518, as against 937,263 pounds valued at $330,963 in 1910.

Mineral Pigments.—Shipments of barytes in 1911 were 50 tons valued at $400—no production was reported in 1910. The production of iron ochres in 1911 was 3,622 tons valued at $28,333, as compared with 1,813 tons valued at $33,185 in 1910.

The exports of iron oxides in 1911 were 2,080 tons valued at $27,070, as against 1,746 tons valued at $29,839 in 1910. The imports in 1911 were: ochres and ochrey earth and raw siennas, 1,477 tons valued at $32,032; and oxides, dry fillers, fireproof umbers, and burnt siennas, 722 tons valued at $21,060, as compared with imports in 1910, comprising: ochres and ochrey earth and raw siennas, 1,246 tons valued at $31,926; and oxides, dry fillers, fireproof umbers, and burnt siennas, 868 tons valued at $23,467.

Mineral Water.—The value of the production of mineral water in 1911 for which returns were received was $223,758, as compared with a value of $199,563 in 1910. The imports of mineral and aerated waters in 1911 were valued at $229,367, as against a value of $202,306 in 1910.

Natural Gas.—The value of the production of natural gas in 1911 was $1,917,678, as compared with a value of $1,316,471 in 1910.

Peat.—Shipments of peat for fuel purposes in 1911 were 1,467 tons valued at $3,817, as compared with 811 tons valued at $2,601 in 1910.

Petroleum.—The production of crude petroleum shows a further falling off in 1911, the production being 291,092 barrels or 10,188,219 gallons valued at $357,073; as compared with 315,895 barrels or 11,056,337 gallons valued at $388,550, in 1910.

Exports of refined oil in 1911 were 23,959 gallons valued at $4,427, and 2,818 gallons valued at $462 in 1910. There was an export in 1911 of naphtha and gasoline of 23,959 gallons valued at $4,427, and also an export of other oils, N.E.S. of 745,318 gallons valued at $85,634, which may have included products of petroleum.

While the production has been decreasing the imports have been increasing; the total import of petroleum oils, crude and refined, in 1911, was 116,892,689

gallons valued at $6,009,730, in addition to 1,959,787 pounds of paraffin wax and candles valued at $106,424. The oil imports included: crude oil, 71,653,251 gallons valued at $2,188,870; refined and illuminating oils, 13,690,962 gallons valued at $722,403; gasoline, 23,338,773 gallons valued at $1,976,032; lubricating oils, 5,308,917 gallons valued at $806,452, and other petroleum products, 2,900,786 gallons valued at $315,973.

The total imports in 1910 were 84,629,334 gallons valued at $4,826,763, in addition to 1,362,235 pounds of paraffin wax and candles valued at $80,106. The oil imports in 1910 included: crude oil, 53,604,053 gallons valued at $1,639,358; refined and illuminating oils, 7,656,727 gallons valued at $502,364; gasoline, 16,679,691 gallons valued at $1,693,296; lubricating oils, 4,081,257 gallons valued at $718,381, and other petroleum products, 2,607,606 gallons valued at $273,364.

Phosphate.—Shipments of phosphate or apatite in 1911 were 621 tons valued at $5,206, as compared with 1,478 tons valued at $12,578 shipped in 1910. The exports in 1911 were 3 tons valued at $100 and no exports reported for 1910. There was also an export of phosphorus, in 1911, of 524,370 pounds valued at $76,608. The imports of phosphate rock (fertilizer) in 1911 were valued at $46,217; phosphorus, 14,818 pounds valued at $4,384, and manufactured fertilizers valued at $386,645. The imports in 1910 included phosphate rock (fertilizer), valued at $72,950; phosphorus, 6,752 pounds valued at $2,065, and manufactured fertilizers valued at $388,467.

Pyrites.—The production of pyrites in 1911 was 82,666 tons valued at $365,820, as compared with 53,870 tons valued at $187,064 in 1910. The exports of pyrites in 1911 were 32,102 tons valued at $120,585, as against exports of 30,434 tons valued at $110,071 in 1910. The imports of brimstone or sulphur in 1911 were 21,931 tons valued at $446,491, as against 22,835 tons valued at $474,619 in 1910.

Quartz.—The production of quartz in 1911 was reported as 60,526 tons valued at $83,865, compared with a production in 1910, of 88,205 tons valued at $91,951. There were imported during 1911, 394 tons of silex or crystallized quartz, valued at $7,518, and 3,766 tons flint valued at $49,106; and in 1910, 628 tons of silex, valued at $11,996.

Salt.—The total sales of salt in 1911 were 91,582 tons valued at $443,004 (exclusive of packages). The value of the packages used was $198,789. In 1910 the sales were 84,092 tons valued at $409,624, and value of packages used, $173,446.

Exports of salt in 1911 were 454,600 pounds, valued at $5,055, and in 1910, 275,200 pounds, valued at $2,618. The total imports of salt in 1911 were valued at $436,118, and included: 23,176 tons valued at $109,793, subject to duty; and 101,174 tons valued at $326,325, duty free. The 1910 imports were valued at $462,061 and comprised 20,174 tons valued at $97,326 subject to duty; and 108,794 tons duty free valued at $364,735.

Among the imports of soda products in 1911 are included: soda ash or barilla, 44,682,937 pounds valued at $375,132; soda bichromate, 327,307 pounds valued at $19,193; caustic soda in packages of 25 pounds or more, 13,708,922 pounds valued at $253,612; sal soda, 10,202,422 pounds, valued at $64,107; nitrate of, 58,808,637 pounds, valued at $867,778, and sulphate of soda, 13,782,241 pounds, valued at $88,761.

Talc.—The production of talc in 1911 was 7,300 tons valued at $22,100, as against 7,112 tons valued at $22,308, in 1910. Imports of talc for the nine months ending December, 1911, were 263 tons valued at $6,413.

Tripolite.—Twenty tons of tripolite valued at $122 were shipped in 1911, and 22 tons valued at $134 in 1910.

STRUCTURAL MATERIALS AND CLAY PRODUCTS.

Cement.—The total sales of cement in 1911 were 5,692,915 barrels, valued at $7,644,537, as against 4,753,975 barrels, valued at $6,412,215, sold in 1910, showing an increase of 938,940 barrels. The exports of cement in 1911 were valued at $4,067, as compared with exports valued at $12,914 in 1910.

The imports of cement in 1911 included: manufactures of cement valued at $7,430; hydraulic cement, 26,655 hundredweight, valued at $6,107; and Portland cement, 2,316,707 hundredweight (661,916 barrels), valued at $834,879. The imports in 1910 were: manufactures of cement, valued at $7,718; hydraulic cement, 365 hundredweight, valued at $349; and Portland cement, 1,222,586 hundredweight (349,310 barrels), valued at $468,046.

The consumption of Portland cement in Canada in 1911 was approximately 6,354,831 barrels, as compared with 5,103,285 barrels in 1910.

Clay Products.—The total value of the production of clay products in Canada in 1911 was $8,359,933, as compared with a total value of $7,629,956 in 1910. Brick and tile products alone were valued in 1911 at $6,946,009, as against $6,377,728 in 1910. The value of sewerpipe production in 1911 was $812,716, as compared with $774,110 in 1910. The only clay products exported in 1911 were 394,000 building brick, valued at $3,977, and manufactures of clay valued at $2,[illegible]; against 390,000, valued at $2,762, in 1910, and manufactures valued at $9,061. The total imports of clay products in 1911 were valued at $5,156,544, and included: brick and tile valued at $2,369,761; earthenware and chinaware, $2,516,536, and clays valued at $270,247. The total imports in 1910 were valued at $4,331,397, comprising: brick and tile, $1,755,773; earthenware and chinaware, $2,283,116, and clays, $292,508.

Lime.—The total production of lime in 1911 was 7,533,525 bushels, valued at $1,517,756, as compared with 5,848,146 bushels, valued at $1,137,079, in 1910.

The exports of lime in 1911 were valued at $39,536, as against exports valued at $44,762, in 1910. The imports of lime in 1911 were 228,538 barrels, valued at $161,985, and in 1910, 212,502 barrels valued at $138,847.

Sand-Lime Brick.—The total sales of sand-lime brick in 1911 by 16 firms reporting were 51,535,243, valued at $442,427, an average value of $8.58 per thousand. The sales in 1910 by 13 firms reporting were 44,593,541 brick, valued at $371,857, an average of $8.34 per thousand.

Slate.—The production of slate in 1911 was 1,833 squares valued at $8,248, and 3,959 squares valued at $18,492, in 1910.

The imports of slate in 1911 were valued at $169,685, and included: roofing slate valued at $83,075; school writing slate, $35,049; slate pencils, $6,036, and manufactures of slate, $45,525. The imports in 1910 were valued at $142,285, comprising: roofing slate, $67,063; school writing slate, $31,397; slate pencils, $6,948, and manufactures of slate, $36,877.

Stone.—The total value of the production of stone of all kinds in 1911 was $4,328,757, as compared with a value of $3,650,019 in 1910. The value of stone exports in 1911 was $28,335, as against $27,571 in 1910, and the total value of stone imported in 1911 was $1,140,846, as against imports valued at $845,123, in 1910.

The production in 1911 included: granite, valued at $1,119,865; limestone, $2,594,926; marble, $162,783, and sandstone, $451,183. In 1910 the production of granite was valued at $739,516; limestone, $2,249,576; marble, $158,779, and sandstone, $502,148.

Classifying the output according to the purposes for which the stone was used, the production in 1911 comprised: building stone, valued at $1,368,693; ornamental and monumental stone, $303,050; paving and curbstone, $233,723; rubble, $460,803; crushed stone, $1,509,498; and furnace flux, $452,990; while in 1910 the production included: building stone, valued at $1,504,001; ornamental and monumental stone, $147,421; paving and curbstone, $239,668; rubble, $352,000; crushed stone, $975,379, and furnace flux, $431,550.

PRODUCTION BY PROVINCES.

A summary of the mineral production by provinces in 1910 and 1911 is shown in the accompanying tables, in the first of which the total production in the several provinces, and the percentage of each, are given for the past three years. It will be observed that the largest production during each year has been from the Province of Ontario, British Columbia occupying second place. These two Provinces together contributed about 62 per cent of the total production in 1911. The Province of Alberta occupied fourth place in mineral production in 1910 but was again displaced by Quebec in 1911.

The last table shows the total mineral production of Canada by provinces for the years 1899 to 1911 inclusive.

Mineral Production by Provinces, 1909, 1910, and 1911.

Province.	1909.		1910.		1911.	
	Value of production.	Per cent of total.	Value of production.	Per cent of total.	Value of production.	Per cent of total.
	$	%	$	%	$	%
*Nova Scotia	12,504,810	13·62	14,195,730	13·29	15,409,397	14·93
New Brunswick	657,635	0·71	551,942	0·54	612,830	0·59
Quebec	7,086,265	7·72	8,270,136	7·74	9,304,717	9·01
Ontario	37,374,577	40·70	43,538,078	40·76	42,796,162	41·46
Manitoba	1,193,377	1·30	1,500,359	1·40	1,791,772	1·74
Saskatchewan	456,246	0·50	498,122	0·47	636,706	0·62
Alberta	6,047,447	6·58	8,996,210	8·42	6,662,673	6·46
British Columbia	22,479,006	24·48	24,478,572	22·92	21,299,305	20·63
North West Territories	4,032,678	4·39	4,764,474	4·46	4,707,432	4·56
Dominion	91,831,441	100·00	106,823,623	100·00	103,220,994	100·00

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

Mineral Production of Nova Scotia, 1910 and 1911.

Product.		1910.		1911.	
		Quantity.	Value.	Quantity.	Value.
			$		$
Gold	Ozs.	7,928	163,891	7,781	160,854
Iron ore sold for export	Tons.	18,134	51,330	22	50
Pig iron from Canadian ore (a)	"	4,787	57,444	.....	.....
Coal	"	6,431,142	12,919,705	7,004,420	14,071,379
Grindstones	"	3,586	43,700	380	3,382
Gypsum	"	400,455	458,638	353,999	106,457
Barytes	"	.....	.....	50	400
Manganese	"	.....	.....	5½	300
Tripolite	"	22	134	20	122
Clay products	.....	.....	204,782	.....	274,249
Stone	.....	.....	227,635	.....	292,914
Lime	Bus.	55,750	13,490	639,200	130,555
Other products	.....	.....	54,981	.....	68,735
Total	.....	.....	14,195,730	.....	15,409,397

(a) The total production of pig iron in Nova Scotia in 1910 was 350,287 tons valued at $4,203,444, and in 1911, 390,242 tons valued at $4,682,904.

Mineral Production of New Brunswick, 1910 and 1911.

Product.	1910.		1911.	
	Quantity.	Value.	Quantity.	Value.
		$		$
Iron ore sold for export	Tons.	5,336	15,075	31,120	69,464
Coal	"	55,455	110,910	55,781	111,562
Grindstones	"	387	3,496	4,186	49,560
Gypsum	"	90,236	213,579	93,205	115,044
Mineral water			16,000		19,843
Petroleum	Bls.	1,485	1,826	2,461	3,019
Clay products			56,475		38,000
Lime	Bus.	470,050	105,593	613,728	132,897
Stone			58,988		73,441
Total			584,492		612,830

Mineral Production of Quebec, 1910 and 1911.

Product.	1910.		1911.	
	Quantity.	Value.	Quantity.	Value.
		$		$
Iron ore sold for export	Tons.			3,616	6,479
Gold	Ozs.	124	2,565	613	12,672
Copper	Lbs.	877,347	14,757	2,436,190	301,503
Pig iron from Canadian ore (a)	Tons.	2,474	65,156	379	9,949
Silver	Ozs.	7,593	4,061	18,435	9,827
Asbestos and asbestic	Tons.	102,215	2,573,603	127,414	2,943,108
Chromite	"	299	3,734	157	2,587
Feldspar	"	90	1,800	17	255
Magnesite	"	323	2,160	991	5,531
Mica	"		87,295		69,465
Ochres	"	4,813	33,185	3,612	28,173
Mineral water	"		68,194		63,637
Peat	"	70	280	200	800
Phosphate	"	1,456	12,386	586	4,909
Pyrites	"	24,242	102,162	39,122	247,555
Quartz	"	805	1,006	548	684
Graphite	"	155	16,000	374	33,084
Cement	Bls.	1,363,714	1,954,646	1,614,730	1,963,439
Clay products			1,442,842		1,341,467
Lime	Bus.	1,227,555	299,126	1,428,392	356,453
Slate	Squares.	3,959	18,492	1,833	8,248
Stone			1,469,686		1,894,892
Total			8,270,136		9,304,717

(a) The total production of pig iron in Quebec in 1910 was 3,237 tons valued at $85,255; in 1911, 658 tons valued at $17,282.

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

Mineral Production of Ontario, 1910 and 1911.

Product.		1910.		1911.	
		Quantity.	Value.	Quantity.	Value.
			$		$
Copper	Lbs.	19,259,016	2,453,213	17,932,263	2,219,297
Gold	Ozs.	3,089	63,849	2,062	42,625
Pig iron from Canadian ore (*b*)	Tons.	97,645	1,528,249	41,807	603,456
Iron ore sold for export	"	90,979	257,781	5,379	12,577
Nickel	Lbs.	37,271,033	11,181,310	34,098,744	10,229,623
Cobalt			51,986		
Cobalt oxide and nickel oxide	Lbs.			154,174	221,680
Cobalt mineral and mixed cobalt and nickel oxide	"			1,260,832	
Silver	Ozs.	30,366,366	16,241,755	30,540,754	16,279,443
Zinc ore	Tons.	576	5,760		
Actinolite	"	30	330	67	736
Arsenious oxide	"	1,592	75,328	2,097	76,227
Corundum	"	1,870	198,680	1,472	161,873
Feldspar	"	15,719	45,867	17,706	51,684
Fluorspar	"	2	15	34	238
Graphite	"	1,257	58,087	895	36,492
Gypsum	"	15,055	67,229	27,399	98,018
Mica			103,090		59,212
Mineral water			111,369		130,778
Natural gas			1,271,393		1,807,513
Ochres	Tons.			10	160
Peat	"	771	2,324	1,263	3,017
Petroleum	Bl.	314,410	386,724	288,631	354,054
Phosphate	Tons.	22	192	35	297
Pyrites	"	29,628	84,902	43,544	118,265
Quartz	"	87,400	90,945	59,978	83,181
Salt	"	84,092	409,624	91,582	443,004
Talc	"	7,112	22,308	7,300	22,100
Cement	Bls.	2,504,650	3,150,479	3,090,786	3,741,039
Clay products			3,667,810		3,916,575
Lime	Bus.	2,988,020	476,137	3,360,265	538,902
Stone			898,788		892,305
Other products (*a*)			632,644		645,772
Total			43,538,078		42,796,162

(*a*) Includes in 1911 and 1910, sand-lime brick; sand and gravel (exports). (*b*) The total production of pig iron in Ontario in 1910 was 447,273 tons valued at $6,956,923; in 1911, 526,935 tons valued at $7,606,939.

Mineral Production in Manitoba, 1910 and 1911.

Product.		1910.		1911.	
		Quantity.	Value.	Quantity.	Value.
			$		$
Gypsum	Tons.	19,500	195,000	43,000	372,000
Clay products	....	.....	781,605	.....	834,428
Lime	Bus.	606,679	100,808	706,588	140,629
Cement	Bls.	18,561	21,995	21,350	28,289
Sand-lime brick	No.	7,817,785	69,279	9,679,985	98,376
Other products (a)	....	.....	331,672	.....	318,050
Total	....	.....	1,500,359	.....	1,791,772

(a) Includes building stone, etc.

Mineral Production in Saskatchewan, 1910 and 1911.

Product.		1910.		1911.	
		Quantity.	Value.	Quantity.	Value.
			$		$
Coal	Tons.	181,156	293,923	206,779	347,248
Brick	No.	14,733,340	160,850	21,071,660	224,758
Other products (a)	....	.....	43,349	.....	64,700
Total	....	.....	498,122	.....	636,706

(a) Includes in 1911, sand-lime brick, fireclay, etc.; in 1910, sand-lime brick.

Mineral Production in Alberta, 1910 and 1911.

Product.		1910.		1911.	
		Quantity.	Value.	Quantity.	Value.
			$		$
Gold	Ozs.	89	1,850	10	207
Coal	Tons.	2,894,469	7,065,736	1,511,026	3,979,264
Natural gas	....	.....	75,168	.....	110,165
Cement	Bls.	323,009	774,473	512,176	1,241,535
Clay products	....	.....	753,232	.....	1,052,751
Lime	Bus.	303,214	69,268	434,038	100,407
Other products (a)	....	.....	256,483	.....	178,344
Total	....	.....	8,996,210	.....	6,662,673

(a) Includes sand-lime brick and stone, 1910 and 1911.

Mineral Production in British Columbia, 1910 and 1911.

Product.		1910.		1911.	
		Quantity.	Value.	Quantity.	Value.
			$		$
Copper (*a*)	Lbs.	35,270,006	4,492,693	35,279,558	4,366,198
Gold	Ozs.	261,386	5,403,318	238,496	4,930,145
Lead	Lbs.	32,887,508	1,216,249	23,784,969	827,717
Silver	Ozs.	2,407,887	1,287,883	1,887,147	1,005,924
Zinc ore	"	4,487	114,243	2,590	101,072
Coal	Tons.	3,330,745	10,408,580	2,542,532	7,945,413
Gypsum	"	.....	.....	780	1,875
Mineral water		.....	4,000	.....	3,500
Clay products		.....	562,360	.....	675,505
Lime	Bus.	196,878	72,657	351,014	117,756
Stone		.....	422,392	.....	698,811
Other products (*c*)		.....	494,197	.....	625,389
Total		.....	24,478,572	.....	21,299,305

(*a*) Smelter recoveries of copper. (*c*) Includes cement, sand-lime brick, etc.

Mineral Production in Yukon, 1910 and 1911.

Product.		1910.		1911.	
		Quantity.	Value.	Quantity.	Value.
			$		$
Copper	Lbs.	286,000	36,431	.....	.....
Gold	Ozs.	221,091	4,570,362	224,197	4,634,574
Silver	"	87,418	46,756	112,708	60,078
Coal	Tons.	16,185	110,925	2,840	12,780
Total		.....	4,764,474	.....	4,707,432

Mineral Production by Provinces, 1899-1911.

Calendar Year.	Nova Scotia.	New Brunswick.	Quebec.	Ontario.	Manitoba.	Alberta.	Saskatchewan.	Yukon.	British Columbia.	Total.
	$	$	$	$	$	$	$	$	$	$
1899										
1900	6,817,274	420,227	2,585,635	9,819,557						
1901	9,298,479	439,060	3,292,383	11,258,099					12,482,605	19,234,005
1902	7,770,159	467,985	3,759,984	13,970,010					16,680,526	64,420,877
1903	10,686,549	607,129	3,743,636	14,619,091					20,531,833	65,797,911
1904	11,431,914	580,495	3,585,938	14,160,033					17,448,031	63,231,836
1905	11,212,746	559,913	3,688,482	12,582,843					17,899,147	61,740,515
1906	11,507,047	558,035	4,405,975	18,833,292					19,325,174	60,082,771
	12,894,303	616,328	5,242,058	25,111,682					22,386,008	69,078,999
1907									25,209,600	79,246,697
1908	14,532,040	664,647	6,205,553	30,381,638	898,775	4,657,524	533,251	3,335,898	25,656,056	86,865,262
1909	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
1910	12,504,810	657,035	7,086,265	37,374,577	1,193,377	6,047,417	456,246	4,032,673	22,479,006	91,831,441
1911	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
	*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

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

MINE PRODUCTION.

The statistics of metalliferous production published in the tables preceding show in most cases the quantities of metals recovered or probably recoverable.

A general consideration of mine operations from the viewpoint of the actual tonnage of ore mined, the quantities concentrated, and the tonnage shipped to smelters is also of much interest.

The Mines Branch has with considerable success been endeavouring to obtain from every mine operator in Canada an annual return with respect to:—

(1) The number of men employed and wages paid.

(2) The total tonnage of ores mined, the tonnage concentrated, and the quantities of concentrates produced.

(3) The tonnage of ores or concentrates shipped and the net value thereof.

(4) The quantities of metals as determined by settlement assays contained in the ores shipped, and the quantities of metals for which payment was made by the purchasing smelter or recovered by the operators' smelter.

There are unfortunately two industries in which it has not as yet been feasible to obtain a complete record. These are the production of placer gold on the one hand and of petroleum on the other. In both cases, while a record of production is available, there is no record as to the number of men employed or the amount paid in wages. With respect to the other industries, while it has not been possible to obtain returns from every mine operator, the missing returns usually represent comparatively small productions and sufficient information is available to give a fairly close estimate of results.

The metalliferous ores mined in Canada fall naturally into a number of more or less broad groups, of which iron ores constitute a distinct class.

Milling gold ores, including certain dry ores shipped to smelters, may be considered as a second group.

The silver and silver-cobalt-nickel ores of Ontario fall naturally into a separate class, as do also the nickel-copper ores of the same Province. The silver-lead, and zinc ores chiefly of British Columbia may also be considered as a separate group.

A broad class of ores mined in British Columbia chiefly may be grouped under a general class as copper-gold-silver ores.

Statistics covering the years 1910 and 1911 are shown in tabular form herewith. The number of metalliferous mines shipping in 1911 was about 160, the number of men employed 9,622, wages paid $7,857,580, tons of ore mined 3,195,330; tons of ore concentrates or metal shipped, 2,431,188; and total net value of shipments, including placer gold, $34,760,513.

In non-metalliferous mining exclusive of stone quarries and clay pits, there were employed an average of 34,952 men earning in wages $[illegible],382,816. The total tonnage mined, chiefly coal, was 13,890,468, tons shipped 12,247,348, having a net value of $34,405,960. In the manufacture of cement, clay products and

lime, and quarrying of stone, etc., there were employed an average of 19,004 men to whom were paid $8,827,508 in wages, the net value of products shipped being $22,709,611.

The total number of men engaged in the mining industry in 1911 was, therefore, over 63,000, and wages paid over $36,000,000. These figures, as already explained, do not include the labour employed in placer gold mining nor in the production of petroleum.

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
Concentrate	47	969		725,989	138,021	8,997	565,340
Silver-cobalt ores—							
Mine bullion shipped						35	542,034
Ore and concentrate	38	1,632	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	38,714	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.				
	No.	No.		$	Tons.	Tons.	$
Metalliferous ores—							
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	693,213
Silver cobalt ores—							
Mine bullion shipped	.....	.....		.....	.....	130	2,007,440
Ore and concentrate	36	1,794	1,448	2,722,228	254,290	25,559	14,400,245
Nickel-copper ores	7	868	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	5,727,696
Placer mining—							
Yukon	.....	.....		.....	.....	.....	4,606,812
British Columbia	.....	.....		.....	.....	.....	426,000
Other provinces	.....	.....		.....	.....	.....	8,202
Total metalliferous	160	9,622		7,857,580	3,195,330	2,431,188	34,760,513
" non-metalliferous	.....	54,952		19,382,816	13,890,468	12,247,348	34,405,960
" structural materials	.....	19,004		8,827,508	.....	.....	22,709,611
		63,578		36,067,904	.....	.....	91,876,084

SMELTER PRODUCTION.

Statistics of the production of copper and lead smelters, showing the tonnage of ore treated, the matte, blister, base bullion, or refined metal produced, etc., were collected for the first time by the Mines Branch in 1908 and were published in the report for that year. Similar returns covering each succeeding year have also been received through the courtesy of the various operating companies, a list of which follows:—

The Mond Nickel Company,	Victoria Mines, Ont.
The Canadian Copper Company,	Copper Cliff, Ont.
The Coniagas Reduction Company,	Thorold, Ont.
The Deloro Mining and Reduction Company,	Deloro, Ont.
The Canada Refining & Smelting Company, Ltd.,	Orillia, Ont.
The Consolidated Mining and Smelting Company of Canada,	Trail, B.C.
The Grandby Consolidated Mining, Smelting, and Power Company,	Grand Forks, B.C.
The British Columbia Copper Company, Ltd.,	Greenwood, B.C.
The Tyee Copper Company, Ltd.,	Ladysmith, B.C.
The Canadian Antimony Company,	St. George, N.B.

The aggregate quantity of ore and concentrates treated in these works during 1911 was 2,193,553 tons, as compared with 2,683,714 tons in 1910, and 2,376,148 tons in 1909.

The ores may be conveniently classified as shown in the following table:—

	1909.	1910.	1911.
	Tons.	Tons.	Tons.
Nickel copper ores	462,336	628,947	510,834
Silver cobalt-nickel-arsenic ores	8,384	9,466	9,330
Lead and other ores treated in lead furnaces	54,539	57,349	55,408
Copper gold-silver ores	1,850,889	1,987,752	1,517,981
Total	2,376,148	2,683,714	2,193,553

The products obtained in Canada from the treatment of these ores include: refined lead produced at Trail, B.C., and fine gold, fine silver, copper sulphate, and antimony produced from the residues of the lead refinery; silver bullion, white arsenic, nickel oxide, and cobalt oxide produced in Ontario, from the Cobalt District ores. Refined antimony was produced in New Brunswick in 1909. In addition to these refined products, blister copper, copper matte, nickel-copper matte, cobalt material or mixed nickel and cobalt oxides are produced and exported for refining outside of Canada.

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.

It should also be explained 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, 1909-1910-1911.

	1909.		1910.		1911.	
	Refined products.	Metals contained in matte, blister, base bullion, and speiss.	Refined products.	Metals contained in matte, blister, and base bullion.	Refined products.	Metals contained in matte, blister, and base bullion.
Antimony ..... Lbs.	61,207	.....	.....	.....	.....	.....
Gold ..... Ozs.	18,241	200,129	13,298	197,181	15,270	175,189
Silver ..... "	14,242,545	4,845,920	16,373,799	2,136,414	19,078,768	585,896
Lead ..... Lbs.	41,883,614	3,973,810	32,987,508	.....	23,525,050	.....
Copper ..... "	.....	53,328,583	.....	56,149,299	.....	29,855,868
Copper sulphate ..... "	51,405	.....	163,228	.....	197,187	.....
Nickel ..... "	.....	27,041,957	.....	37,587,676	.....	34,098,744
Cobalt ..... "	.....	1,321,083	.....	.....	.....	.....
White arsenic ..... "	2,258,087	.....	3,903,467	.....	4,194,209	.....
Arsenic ..... "	.....	1,074,516	.....	.....	.....	.....

Smelter products shipped outside of Canada for refining were: blister copper, carrying gold and silver values, 10,710 tons in 1911, as compared with 13,918

tons in 1910, and 14,239 tons in 1909; copper matte carrying gold and silver values, 11,320 tons in 1911, as against 11,519 tons in 1910, and 11,597 tons in 1909; Bessemer nickel-copper matte carrying small gold and silver values as well as metals of the platinum group, 32,607 tons in 1911, as compared with 35,033 tons in 1910, and 25,845 tons in 1909; lead bullion carrying gold and silver values, 2,010 tons in 1909.

Nickel-Copper Ores.—The smelters of the Canadian Copper Company at Copper Cliff and the Mond Nickel Company at Victoria Mines treat the nickel-copper ores of the district. These ores consist of pyrrhotite and chalcopyrite, the nickel being chiefly contained in the mineral pentlandite disseminated through the ore. The greater part of the ore is roasted in open heaps.

In 1909 the quantity of ore mined was 151,892 tons, while the quantity smelted was 462,336 tons. The quantity of Bessemer matte produced was 25,845 tons, containing 7,873 tons of copper and 13,111 tons of nickel.

In 1910 the total quantity of ore mined was 652,392 tons, while the quantity smelted was 628,947 tons. The quantity of Bessemer matte produced was 35,033 tons, containing 9,630 tons of copper and 18,036 tons of nickel.

In 1911 the total quantity of ore mined was 612,511 tons, while the quantity smelted was 610,834 tons. The quantity of Bessemer matte produced was 32,607 tons, containing 8,966 tons of copper and 17,049 tons of nickel.

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

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

Calendar Year.	Ore mined.	Ore smelted.	Matte shipped.	Value matte.	Nickel content of matte.	Copper content of matte.
	Tons.	Tons.	Tons.	$	Tons.	Tons.
1886	3,307	30,000			900	1,500
1887	567					
1888						
1889	44,996	40,146	3,274		132	73
1890					718	451
1891	83,300	72,558	10,336		2,018	2,064
1892	74,381	57,022			1,207	1,162
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	890,831	1,911	2,288
1896	94,966	71,027	10,759	416,594	1,690	1,584
1897	93,154	96,370	13,968		1,990	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	3,876
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	3,913,012	13,141	7,873
1910	652,392	628,947	35,033	5,380,064	18,036	9,630
1911	612,511	610,834	32,607	4,945,593	17,049	8,966

Silver-Cobalt-Nickel-Arsenic Ores.—The rich silver ores of the Cobalt district, the first shipments of which were made in 1904, are still to a large extent shipped out of Canada, even for first treatment.

Four Canadian smelters are treating these ores, and silver bullion, white arsenic, and nickel and cobalt oxides and mixed oxides or cobalt material are being recovered.

The Canadian Copper Company in 1906 established works for the treatment of these ores at Copper Cliff at which silver bullion, white arsenic, and cobalt material are recovered. The Coniagas Reduction Company built a plant at Thorold, Ont., in 1908, for the treatment of the ores of the Coniagas mine and also custom ore, the Deloro Mining and Reduction Company established works at Deloro, Ont., and in 1911 the Canada Refining and Smelting Company, Ltd., completed and placed in operation a plant at Orillia, Ont., for the treatment of cobalt silver ores. At each of these plants, nickel and cobalt oxides are recovered in addition to silver bullion and white arsenic.

The treatment of these ores in Ontario in 1909, 1910, and 1911 gives the following results:—

		1909.	1910.	1911.
Ore treated	Tons.	8,384	9,466	9,330
Products recovered:—				
Silver produced†	Ozs.	12,239,542	14,574,839	17,753,167
White arsenic	Lbs.	2,258,087	3,003,467	4,194,209
Speiss or residues	Tons.	2,660	3,074	.....
Cobalt oxide and nickel oxide	Lbs.	.....	13,508	154,174
Mixed cobalt and nickel oxides and cobalt material	"	.....	108,178	1,260,832

† Fine ounces contained in silver bullion, fineness ranging from 850 to 998.

Lead Ores.—There was only one lead smelting plant in operation in Canada in 1911, viz.: that at Trail, B.C., operated by the Consolidated Mining and Smelting Company of Canada, Limited. This smelter is supplemented by a lead refinery employing the Betts Electrolytic Process and having a capacity of 100 tons per day. The main ore supply has come from the St. Eugene and Sullivan mines owned by the same Company, though practically all the lead ore produced in the Sloean district is smelted as customs ore. Supplementing the lead ores is a small tonnage of gold and silver ores, with some gold concentrates from stamp mills.

In the refinery, the bullion from the smelter is cast into anodes and redeposited electrolytically upon cathode starting sheets of refined lead. The refined lead is cast into pigs of 100 pounds and 180 pounds weight, the latter being a special form for the Chinese trade.

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 recovered, though not regularly, and bearing metal is manufactured.

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

Calendar Year.	Refined lead.	Fine gold.	Fine silver.	Copper sulphate.
	Lbs.	Ozs.	Lbs.	Lbs.
1904.	7,519,440	4,336	551,450	56,000
1905.	15,[illegible]99	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	13,208	1,798,960	163,228
1911.	23,525,050	15,270	1,325,601	197,187

Gold-Silver-Copper Ores of British Columbia.—There are six copper smelters in British Columbia and one smelter at Tacoma, Wash., U.S.A., treating these complex ores.

The ores of the Rossland camp, of which gold is the chief constituent value, are smelted in the Trail copper furnace of the Consolidated Mining and Smelting Company. The low grade copper ores of the Boundary district are smelted locally at Grand Forks and Greenwood, some also going to Trail.

On the coast the ores of this class are smelted at Ladysmith, but a considerable tonnage is also shipped to the United States for treatment, while the local smelters are receiving some foreign ores. The Crofton smelter, which has not been in operation during the past four years, is owned by the Britannia Copper Syndicate, Limited. The Boundary Falls smelter has been largely dismantled.

The aggregate production of the Canadian smelters in 1909, 1910, and 1911, including the foreign ores treated, was as follows:—

—		1909.	1910.	1911.
Ore smelted.	Tons.	1,850,889	1,987,752	1,517,981
Smelter products—				
Matte	"	11,597	11,519	11,320
Blister	"	14,239	13,918	10,710
Metallic content of matte and blister—				
Gold	Ozs.	198,898	197,181	175,189
Silver	"	612,164	636,140	585,896
Copper	Lbs.	37,581,884	36,890,283	29,855,868

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

Production of Trail Smelter.

Year ending June 30.	Ore smelted.	Metals contained in matte and bullion produced.			
		Gold.	Silver.	Lead.	Copper.
	Tons.	Ozs.	Ozs.	Lbs.	Lbs.
1906 (6 mos. only)	157,640	64,590	1,074,255	15,133,683	2,399,161
1907	222,573	69,168	1,100,271	20,383,083	3,443,310
1908	305,956	121,380	2,224,888	32,157,139	4,004,468
1909	347,417	114,929	2,443,475	43,675,077	4,637,631
1910	487,125	137,614	2,162,496	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
Production from 1894 to June, 1911	3,143,927	1,146,912	20,224,623	250,970,644	50,789,983

Granby Smelter.—The smelting plants of the Boundary district are of particular interest on account of the low grade ore treated. These ores vary from 1 to 3 per cent in copper, from $1 to $3 in gold and silver, and about 1,000,000 tons are now annually smelted. There are two smelters in the district, the larger being that at Grand Forks, operated by the Granby Consolidated Mining, Smelting, and Power Company. The first furnace, of 300 tons capacity, was completed in 1890, 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 capacity of about 4,500 tons per day. The converter plant, which was first installed in 1902, has now a capacity of 40,000,000 pounds per year.

The quantities of ores smelted and the total production of metals, shown in the next table, are as published in the Annual Report of the Company for the year ending June 30, 1911.

Ore Smelted and Metals Recovered at Granby Smelter.

Year ending June 30.	All material smelted.				Metals produced.		
	Granby ore.	Foreign.		Total.	Gold.	Silver.	Copper.
		Ore.	Matte.				
	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
Total	7,944,373	257,127	13,514	8,215,014	465,228	3,157,696	192,358,518

Greenwood Smelter.—At this plant, owned by the British Columbia Copper Company, there are three large furnaces having a total daily capacity of from 2,400 to 2,500 tons per day.

In the Annual Report of the Company for the year ending November 30, 1911, the Acting General Manager, the Late Mr. E. G. Warren, refers to the smelting operations as follows:—

"The Smelter.

"There were handled at the smelter during the year exclusive of coke, 608,945 tons of ore segregated as follows:—

B.C. Copper Co. Ores	385,829 tons.
Custom Ores	212,927 "
Converter Slag	10,189 "
	608,945 "

"Included in the item of the converter slag was 5,679 tons of custom ore and clay.

"The blister production amounted to 10,044,093 pounds containing:—

Fine Copper	9,944,987 lbs.
Gold	31,144 ozs
Silver	134,266 "

"On March 31 a strike was declared in the Crowsnest Pass Coal District entirely shutting off the Company's supply of coke from those fields and forcing us into the Connellsville market to prevent a suspension of operations. There were imported from Pennsylvania 41,500 tons of coke at an increased cost of $150,000 over the cost of the same tonnage of local coke."

"Apart from the use of foreign coke and the attendant inconveniences brought about through its irregular delivery, smelting operations were normal and the largest tonnages and copper production were made in the Company's history."

"Since our last Annual Report options to purchase have been secured upon certain promising mineral claims as follows:—

"Copper" and "Riverside" Claims, in Franklin Camp, B.C.

"Voight Property", near Princeton, B.C.

"L.H." Claim, in Slocan district, B.C.

"Greyhound" Claim, in Deadwood Camp, B.C."

A description of the smelting works of the British Columbia Copper Company, Ltd., at Greenwood, B.C., by the consulting engineer of the Company and late General Manager, Mr. J. E. McAllister, will be found in the "Engineering and Mining Journal" of May 20, 1911.

The Ladysmith Smelter.—This smelter is owned and operated by the Tyee Copper Company, and was the only Canadian smelter in operation on the coast during the last four years. Both domestic and imported ores are treated, but the Company has not published details of its smelter operations.

At Observatory inlet, Portland canal, the Granby Consolidated Mining, Smelting, and Power Company have under construction a smelter to treat the ores from their Hidden Creek property and also custom ores.