CANADA

DEPARTMENT OF MINES

HON. LOUIS CODERRE, MINISTER; R. G. MCCONNELL, DEPUTY MINISTER.

MINES BRANCH

EUGENE HAANEL, PH. D., DIRECTOR.

THE

Production of Copper, Gold, Lead, Nickel, Silver, Zinc, and Other Metals

IN

CANADA

During the Calendar Year

1914

Advance Chapter of Annual Report on the Mineral Production of Canada, 1914

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ADVANCE CHAPTER OF THE ANNUAL REPORT ON THE MINERAL PRODUCTION OF CANADA, DURING THE CALENDAR YEAR 1914.

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

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ALUMINIUM.

No commercial ores of aluminium have as yet been found in Canada. Aluminium is, however, made in extensive works at Shawenegan Falls, Quebec, from bauxite ores imported from France, Germany, and the United States, by the Northern Aluminium Company. A wire mill for the manufacture of aluminium wire and cables is also operated by the same firm.

There being but one firm engaged in the manufacture of aluminium, we are precluded from publishing statistics of production.

Imports of alumina, probably including bauxite, and exports of aluminium are, however, published in the reports of the Department of Customs.

During the twelve months ending December 31, 1914, the imports of alumina were 28,557,000 pounds, or 14,279 tons valued at $571,419. The imports of aluminium in ingots, bars, etc., were 3,812,128 pounds, or 1,906 tons, valued at $752,753, besides manufactures of aluminium valued at $107,598. During the same period exports of aluminium in ingots, bars, etc., amounted to 14,510,800 pounds valued at $2,364,907 together with manufactures of aluminium valued at $5,571.

The imports of alumina and exports of aluminium during the past ten years, and the imports of aluminium during the past five years, are shown in tabular form as follows:—

Annual Imports of 'Alumina' and Exports of Aluminium.

Calendar Year.	Imports of alumina.		Exports of aluminium.		
			Ingots, bars, etc.		Manufactures
	Lbs.	Value. $	Lbs.	Value. $	Value. $
1905	5,360,800	138,765	2,535,386	508,219	1,588
1906	8,975,400	239,136	4,521,486	899,113	2,244
1907	12,705,300	268,502	5,478,203	1,109,353	1,499
1908	1,485,500	29,752	1,713,800	399,785	1,727
1909	11,794,100	234,544	6,134,500	918,195	3,453
1910	19,464,400	403,283	7,722,400	1,160,242	3,741
1911	18,607,200	372,009	4,990,100	747,587	1,555
1912	22,400,500	448,061	18,285,700	2,002,363	10,898
1913	30,704,200	614,713	13,015,000	1,762,214	8,203
1914	28,557,000	571,419	14,510,800	2,364,907	5,571

The price of aluminium No. 1 ingots in New York did not fluctuate much during the whole year, the lowest average weekly quotation was 16½ cents in May, and the highest was 20½ cents in September; the average for the year being 18¾ cents.

In Europe, prices for aluminium for several years have been considerably lower than in the United States. In 1914 the prices, as reported by the London Mining Journal, ranged from £81 to £94 per long ton, or otherwise from 17½ to 20½ cents per pound.

The average yearly prices as reported by the "Metallgesellschaft" are shown in tabular form.

Annual Imports of Aluminium.

Calendar Year.	Ingots, blooms, bars.		Tubing.		Manufactures.	Total.
	Lbs.	Value.	Lbs.	Value.		
		$		$	$	$
1910	3,180,250	674,683	10,019	4,203	77,664	756,550
1911	2,527,120	531,273	3,594	1,495	115,278	648,046
1912	2,396,375	410,022	11,624	3,654	120,029	533,705
1913	3,455,686	604,582	19,856	9,174	131,938	745,694
1914	3,796,353	745,855	15,775	6,898	107,598	860,351

Average Monthly Price of Ingot Aluminium.[1]

(At New York in cents per pound).

	1911.	1912.	1913.	1914.
January	20·13	19·13	26·31	18·81
February	21·25	19·44	26·04	18·81
March	21·15	19·58	27·05	18·50
April	20·75	20·38	27·03	18·16
May	20·55	21·69	26·44	17·95
June	20·03	22·83	24·68	17·75
July	20·20	23·50	23·38	17·66
August	20·02	24·38	22·70	19·88
September	19·34	25·13	21·69	19·94
October	18·75	26·25	20·13	18·50
November	18·79	26·56	19·35	18·00
December	18·85	25·75	18·88	18·96
	20·07	22·01	23·64	18·63

[1] As quoted by the Engineering and Mining Journal.

Yearly Average Prices of Aluminium at European Works.[1]

Year.	In marks per Kg.	In cents per pound.	Year.	In marks per Kg.	In cents per pound.
1902	2·25–2·50	24½–27	1908	1·30–2·00	14 –21½
1903	2·25–2·50	24½–27	1909	1·25–1·50	13½–16
1904	2·25–2·50	24½–27	1910	1·30–1·60	14 –17½
1905	3·25–3·75	35 –40½	1911	1·05–1·25	11 –13½
1906	3·25–3·75	35 –40½	1912	1·25–1·75	13½–18½
1907	3·25–4·00	35 –43½	1913	1·60–1·80	17½–19½

[1] From Statistical report of the Metallgesellschaft.

The "Mineral Industry" reports the estimated production of aluminium in principal countries during 1914, as follows, in metric tons: United States 42,270; Canada 6,820 (exports); Germany, Austria-Hungary 4,000; Switzerland 10,000; France 12,000; England 8,000; Italy 800 and Norway 2,500; or a total of 86,390 metric tons.

ANTIMONY.

The production of antimony in Canada has been not only small, but spasmodic.

The last production reported was in 1909 and consisted of 364 tons of antimony concentrates, valued at $13,906, shipped from West Gore, Nova Scotia.

The auriferous antimony property at West Gore, formerly operated by the Dominion Antimony Company, Limited, was taken over in July, 1909, by the West Gore Antimony Company.

The mines and works of the Canadian Antimony Company, Limited, at Lake George, New Brunswick, have not been in operation since 1909.

In British Columbia, some of the lead ores contain a small percentage of antimony—about one-third of one per cent. Some refined antimony was recovered at Trail in 1907 and 1909.

Annual Shipments of Antimony Ore.*

Calendar Year.	Tons.	Value.	Calendar Year.	Tons.	Value.
		$			$
1886	665	31,490	1905 (a)	527	.....
1887	584	10,860	1906 (a)	782	.....
1888	345	3,696	1907	2,016	65,000
1889	55	1,100	*Refined antimony	.....	5,108
1890	26½	625	1908 (b)	148	5,443
1891	10	60	1909	35	1,575
1892 to 1897	Nil.	Nil.	*Refined antimony	.....	4,285
1898	1,344	20,000	1910	364	13,906
1899 to 1904	Nil.	Nil.	1911	.....	.....

(a) As recorded by the Nova Scotia Department of Mines; no value given.
(b) Exports.
* Refined antimony: 63,850 pounds in 1907 and 61,207 pounds in 1909.

Exports of Antimony Ore.

Calendar Year.	Tons.	Value.	Calendar Year.	Tons.	Value.
		$			$
1880	40	1,948	1899	6¾	190
1881	34	3,308	1900	210	3,441
1882	323	11,673	1901	10	1,643
1883	165	4,200	1902	90	13,658
1884	483	17,875	1903	33	4,332
1885	758	36,250	1904	160	7,237
1886	665	31,490	1905	525	27,118
1887	229	9,720	1906	420	17,064
1888	352½	6,894	1907	1,327	37,807
1889	30	695	1908	148	5,443
1890	38	1,000	1909	4	120
1891	3½	60	1910	239	14,095
1892–1897	Nil.	Nil.	1911	57	4,946
1898	1,232	15,295	1912–1914	Nil.	Nil.

Imports of Antimony.

Fiscal Year.	Lbs.	Value.	Fiscal Year.	Lbs.	Value.
		$			$
1880	42,247	5,903	1898	156,451	12,350
1881	.....	7,060	1899	289,066	16,851
1882	183,597	15,044	1900	186,997	20,001
1883	105,346	10,355	1901	350,737	24,714
1884	445,600	15,564	1902	504,822	39,276
1885	82,012	8,182	1903	868,146	65,434
1886	89,787	6,951	1904	418,943	27,112
1887	87,827	7,122	1905	186,454	12,828
1888	120,125	12,242	1906	403,918	56,297
1889	119,034	11,206	1907 (9 mos.)	321,385	71,493
1890	117,066	17,439	1908	484,899	66,484
1891	114,084	17,483	1909	444,254	32,133
1892	180,308	17,680	Calendar year.		
1893	181,823	14,771	1910	483,282	34,488
1894	139,571	12,249	1911	579,466	38,823
1895	79,707	6,131	1912	1,053,728	67,653
1896	163,209	9,557	1913	690,699	51,829
1897	134,661	8,031	1914	694,150	57,715

				$
1914	Antimony, or regulus of, not ground, pulverized or otherwise manufactured	Duty free.	648,516	47,498
	Antimony salts	„	45,634	10,217
	Total		694,150	57,715

The average prices of antimony, as quoted by the Engineering and Mining Journal, are shown in the following table:—

Average Prices of Antimony.

	1912.			1913.			1914.		
	Cookson's.	U.S.	Ordinaires.	Cookson's.	U.S.[1]	Ordinaires.[2]	Cookson's.	U.S.	Ordinaires.
January	7·53	7·47	6·88	9·94	9·53	8·97	7·388	7·110	6·125
February	7·27	7·44	6·83	9·47	9·09	8·25	7·250	7·057	6·100
March	7·65	7·56	6·86	9·28	8·85	8·18	7·315	7·073	6·053
April	8·05	7·75	6·94	9·13	8·50	7·98	7·363	7·048	6·006
May	8·02	7·75	7·10	8·88	8·37	7·79	7·365	7·020	5·845
June	8·09	7·78	7·21	8·79	8·27	7·64	7·250	7·000	5·825
July	8·42	7·96	7·50	8·54	8·08	7·55	7·210	6·940	5·638
August	8·59	7·98	7·70	8·38	7·91	7·39	17·250	15·800	13·800
September	9·12	8·50	8·26	8·37	7·93	7·37	11·830	.....	9·940
October	10·30	9·62	9·30	7·60	7·27	6·49	14·680	.....	12·060
November	10·39	9·86	9·30	7·62	7·30	6·45	17·750	.....	14·450
December	10·21	9·62	9·18	7·50	7·25	6·13	16·130	.....	13·310
	8·90	8·26	7·76	8·73	8·22	7·52	10·732	.....	8·763

[1] United States brands.
[2] Hungarian, Chinese, or other "Foreign" brands.

The weekly quotations showed that the price of antimony, ordinary brands, was 5½ cents at the beginning of August, rose to 18 cents in the middle of the same month, gradually declining again to 9 cents in October. During the last months of the year, however, the price again rose to 12 and 14 cents.

COBALT.

The silver-cobalt-nickel-arsenides of Coleman and adjacent townships, more familiarly known as the Cobalt district, in the Province of Ontario, are now the principal sources of the world's production of cobalt.

The recovery of this metal in Canada has been in the form of cobalt-oxide and mixed oxides of cobalt and nickel, produced by the smelters treating the above ores, together with cobalt residues produced at the high grade mill of the Nipissing Mining Company. While these residues have been chiefly exported, a portion has been shipped to the Canadian smelters producing cobalt-oxide.

According to direct returns there were produced during 1914, 899,027 pounds of cobalt-oxide, valued at $571,710, and 392,512 pounds of nickel-oxide valued at $34,883. The production of mixed oxides of cobalt and nickel, together with the shipments abroad of cobalt residues, amounted to 2,079,001 lbs., valued at $79,995, and containing 242,572 pounds of metallic cobalt. Assuming the cobalt-oxide to average 70 per cent cobalt the total production of the metal would approximate 871,891 pounds in 1914.

No record is available as to the recovery of cobalt from silver ores exported but it is stated that cobalt speiss has been accumulated at United States smelters treating these ores.[1]

The production of cobalt-oxide, nickel-oxide and cobalt material during the past three years has been as follows:—

Production of Cobalt and Nickel-Oxides.

Year.	Cobalt oxide.		Nickel oxide.		Mixed oxides of cobalt and nickel and other cobalt material.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
1912	257,677	$128,843	91,377	$ 9,137	1,285,280	$163,988
1913	660,079	525,028	268,304	30,122	3,216,000	90,266
1914	899,027	571,710	392,512	34,883	2,079,001	79,995

The following table shows the ore shipments and estimated cobalt content, as published by the Ontario Bureau of Mines:—

Shipments of Silver and Cobalt Ores and Estimated Cobalt Content

Year.	Ores shipped.	Estimated total cobalt content.	Per cent.	Year.	Ores shipped.	Estimated total cobalt content.	Per cent.
	Tons.	Tons.			Tons.	Tons.	
1904	158	16	10·1	1910	34,282	1,098	3·2
1905	2,144	118	5·5	1911	26,653	852	3·2
1906	5,335	321	6·0	1912	21,933	934	3·2
1907	14,788	739	5·0	1913	20,877	821	3·2
1908	25,624	1,224	4·7	1914	.....	.....	.....
1909	30,677	1,533	5·0				

[1] Mineral Resources of the United States, 1913, p. 340.

The result of researches on cobalt and cobalt alloys, undertaken for the Mines Branch, by Dr. H. T. Kalmus, at Queens University, have been published in two reports.[1]

Under the provisions of the "Metal Refining Bounty Act," passed by the Ontario Legislature in 1907, bounties amounting to $26,038.02 were paid to the refineries on cobalt-oxide, and $8,978.70 on nickel-oxide in 1913; and $26,744.75 on cobalt-oxide and $10,280.28 on nickel-oxide, in 1914.

The bounty is at the rate of six cents per pound on the metallic contents of the oxides. The "Act" which expires in April, 1917, is quoted with the amendment, as follows:—

An Act to Encourage the Refining of Metals in Ontario.

Whereas, it is desirable to encourage the refining of nickel, cobalt, copper and arsenic ores within the Province;

Therefore His Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:—

1. This Act may be cited as 'The Metal Refining Bounty Act.'

2. The treasurer of the Province may, under the authority of such regulations as may from time to time be made in that behalf by the Lieutenant-Governor in Council, pay in each year to the refiners of the metals or metal compounds hereinafter specified, when refined in the Province from ores raised and mined in the Province, a bounty upon each pound of such metal or compound so refined as follows:—

Class 1.—On refined metallic nickel or on refined oxide of nickel, 6 cents per pound on the free metallic nickel or on the nickel contained in the nickel-oxide; but nickel upon which a bounty has already been paid in one form of product shall not be entitled to any further bounty in any other form; and the amount to be paid as bounty on the nickel products herein mentioned is not to exceed in all $60,000 in any one year.

Class 2.—On refined metallic cobalt or on refined oxide of cobalt 6 cents per pound on the free metallic cobalt or on the cobalt contained in the oxide of cobalt; but cobalt upon which a bounty has already been paid in one form of product shall not be entitled to any further bounty in any other form; and the amount to be paid as bounty on the cobalt products herein mentioned is not to exceed in all $30,000 in any one year.

Class 3.—On refined metallic copper or on refined sulphate of copper, $1\frac{1}{2}$ cents per pound on the free metallic copper or on the copper contained in the sulphate of copper; or on any copper product carrying at least 95 per cent of metallic copper, one-half cent per pound; but copper upon which a bounty has already been paid in one form of product shall not be entitled to any further bounty in any other form; and the amount to be paid as

[1] Mines Branch No. 259 "Preparation of Metallic Cobalt by Reduction of the Oxide." Report on, by H. T Kalmus, B.Sc., Ph.D.
Mines Branch No. 309 "The Physical Properties of the Metal Cobalt." Report on, by H. T. Kalmus, B.Sc., Ph.D.

bounty on the copper products herein mentioned is not to exceed in all $60,000 in any one year.

Class 4.—On white arsenic, otherwise known as arsenious acid, produced from mispickel ores and not from ores carrying smaltite or niccolite or cobaltite, one-half cent per pound; but the amount to be paid as bounty on the arsenic compound herein mentioned is not to exceed in all $15,000 in any one year.

(1) Provided, however, that if so much of any of the above-mentioned classes of refined products is refined in the Province in any one year that the amount hereby set apart in respect of the said class would be insufficient to pay the bounties herein provided therefor, then the bounty payable to the refiners of such class of refined products shall abate and be payable upon a *pro rata* basis so that not more than the maximum amount herein specified for any of the said classes shall be paid in respect of said class in any one year.

(2) Provided, also, that the bounties herein provided for shall cease and determine with the payment of any sum or sums which shall have been earned during the period of five years from the passing of this Act.

(3) No person, firm or company shall be entitled to claim or receive any of the bounties in this Act provided for unless such person, firm or company shall have been at all times prepared and ready and willing during the period for which the bounty is claimed, to smelt, treat and refine ores from which the same product as that on which the bounty is claimed can be produced, belonging to any other person, firm or company, at rate and on terms and conditions approved by the Lieutenant-Governor in Council, or shall have been ready to purchase such ores at rates approved by the Lieutenant-Governor in Council at current market rates.

An Act to Amend the Act to Encourage the Refining of Metals in Ontario.

His Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:—

1. Subsection 2 of section 2 of The Metal Refining Bounty Act is amended by striking out the word 'five' where the same appears in the last line of the said subsection, and substituting therefor the word 'ten.'

COPPER.

The total production of copper in Canada in 1914 estimated on the basis of smelter recovery from ores treated, was 75,735,960 pounds, which, at the average price of copper for the year in New York 13·602 cents per pound, would be worth $10,301,606.

Since 1912 there has been a gradual falling off in quantity, and owing to the decrease in the price of the metal, a still greater falling off in value.

Statistics showing the annual copper production of Canada since 1886 are given in the following table, which shows the yearly increase or decrease as the case may be and also the yearly price per pound in New York:—

Annual Production of Copper.

Calendar Year.	Lbs.	Increase or Decrease.		Value.	Increase or Decrease.		Average price per pound.
		Lbs.	%		$	%	
				$			Cts.
1886	3,505,000	.....	.....	385,550	.....	.....	11·00
1887	3,260,424	(d) 244,576	6·99	366,798	(d) 18,752	4·86	11·25
1888	5,562,864	2,302,440	70·60	927,107	560,309	152·70	16·66
1889	6,809,752	1,246,888	22·40	936,341	9,234	0·99	13·75
1890	6,013,671	(d) 796,081	11·69	947,153	10,812	1·15	15·75
1891	9,529,401	3,515,730	58·46	1,226,703	279,550	29·51	12·87
1892	7,087,275	2,442,126	25·63	818,580	(d) 408,123	33·27	11·55
1893	8,109,856	1,022,381	14·40	871,809	53,229	6·50	10·75
1894	7,708,789	(d) 401,067	4·94	736,960	(d) 134,849	15·46	9·56
1895	7,771,639	62,850	0·81	836,228	99,268	13·47	10·76
1896	9,393,012	1,621,373	20·86	1,021,960	185,732	22·21	10·88
1897	13,300,802	3,907,790	41·60	1,501,660	479,700	46·94	11·29
1898	17,747,136	4,446,334	33·43	2,134,980	633,320	42·17	12·03
1899	15,078,475	(d) 2,668,661	15·04	2,655,319	520,339	24·37	17·61
1900	18,937,138	3,858,663	25·59	3,065,922	410,603	15·46	16·19
1901	37,827,019	18,889,881	99·75	6,096,581	3,030,659	98·84	16·117
1902	38,804,259	977,240	2·58	4,511,383	(d) 1,585,198	26·00	11·626
1903	42,684,454	3,880,195	10·00	5,649,487	1,138,104	25·23	13·235
1904	41,383,722	(d) 1,300,732	3·05	5,306,635	(d) 342,852	6·07	12·823
1905	48,092,753	6,709,031	16·21	7,497,660	2,191,025	41·29	15·590
1906	55,609,888	7,517,135	15·63	10,720,474	3,222,814	42·98	19·278
1907	56,979,205	1,369,317	2·46	11,398,120	677,654	6·32	20·004
1908	63,702,873	6,723,668	11·80	8,413,876	2,984,244	26·18	13·208
1909*	52,493,863	.....	.....	6,814,754	.....	.....	12·982
1910	55,692,369	3,198,506	6·09	7,094,094	279,340	4·10	12·738
1911	55,648,011	(d) 44,358	0·79	6,886,998	(d) 207,096	2·92	12·376
1912	77,832,127	22,184,116	28·50	12,718,548	5,831,550	45·85	16·341
1913	76,976,925	(d) 855,202	1·10	11,753,606	(d) 964,942	7·59	15·269
1914	75,735,960	(d) 1,240,965	1·64	10,301,606	(d) 1,452,000	14·10	13·602

*The decrease is not as large as the figures would indicate because of the calculation of part of the 1909 production on a different basis from previous years. (See explanation in text).

In the case of British Columbia the metal is mainly derived from ores low in copper content, and since in smelting the copper, losses are necessarily high, running as high in some cases as 25 per cent and over, the difference between the copper content of the ore as shipped by the mine, and the metal recovered from the ore at the smelter, is considerable.

Statistics of the copper production for the years previous to 1909 include for British Columbia a record of the copper production in that Province as collected by the Provincial Bureau of Mines. These are compiled on the basis of the total metal content of the ores received at the smelters, for which smelter returns were received during the year, and show a relatively higher copper production than the figures published for the Province of Ontario, which are based on copper content of matte produced.

Since 1909 the method of compilation of statistics of copper production by the Provincial Bureau of Mines in British Columbia, provides for a deduction of five pounds of copper per ton of ore shipped on account of smelter losses, a method which gives a result closely approximating that obtained by this Branch.

Production of Copper by Provinces 1912, 1913, and 1914.

Provinces.	1912.		1913.		1914.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
		$		$		$
Quebec	3,282,210	536,346	3,455,887	527,679	4,201,497	571,488
Ontario	22,250,601	3,635,971	25,885,929	3,952,522	28,948,211	3,937,536
British Columbia	50,526,656	8,256,561	45,791,579	6,991,916	41,219,202	5,606,636
Other districts*	1,772,660	289,670	1,843,530	281,489	†1,367,050	185,946
Total	77,832,127	12,718,548	76,976,925	11,753,606	75,735,960	10,301,606

*Includes Nova Scotia and Yukon. †Yukon only.

Prices:—The price of copper in New York varied between a maximum of 14·70 cents in February and a minimum of 11·05 cents in November. For three months following the declaration of war there were no market quotations. By the end of December prices had increased again to 13 cents.

Monthly Average Prices of Electrolytic Copper in New York.

(In cents per pound.)

Months.	1910.	1911.	1912.	1913.	1914.
	cts.	cts.	cts.	cts.	cts.
January	13·620	12·295	14·094	16·488	14·223
February	13·332	12·256	14·084	14·971	14·491
March	13·255	12·139	14·698	14·713	14·131
April	12·733	12·019	15·741	15·291	14·211
May	12·550	11·989	16·031	15·436	13·996
June	12·404	12·385	17·234	14·672	13·603
July	12·215	12·463	17·190	14·190	13·223
August	12·490	12·405	17·498	15·400	*
September	12·379	12·201	17·508	16·328	*
October	12·553	12·189	17·314	16·337	*
November	12·742	12·616	17·326	15·182	11·739
December	12·581	13·552	17·376	14·224	12·801
Yearly average	12·738	12·376	16·341	15·269	13·602

*No quotations.

Monthly Average Prices of Standard Copper in London.

(In £ Sterling per ton of 2,240 pounds.)

Months.	1910.	1911.	1912.	1913.	1914.
	£	£	£	£	£
January	60·923	55·604	62·760	71·741	64·304
February	59·388	54·970	62·893	65·519	65·259
March	59·214	54·704	65·884	65·329	64·276
April	57·238	54·035	70·294	68·111	64·747
May	56·313	54·313	72·352	68·807	63·182
June	55·310	56·368	78·259	67·140	61·336
July	54·194	56·670	76·636	64·166	60·540
August	55·733	56·264	78·670	69·200	*
September	55·207	55·253	78·762	73·125	*
October	56·722	55·176	76·389	73·383	*
November	57·634	57·253	76·890	68·275	53·227
December	56·069	62·063	75·516	65·223	56·841
Yearly average	57·054	55·973	72·942	68·335	61·524

*No quotations.

With the exception of a small output of copper sulphate at Trail, B.C., the copper production of Canada is exported for refining. The exports of copper in ore, matte, regulus, etc., during the calendar year 1914 were 68,830,059 pounds valued at $7,130,778, of which 57,923,363 pounds valued at $6,287,439 were exported to the United States, and 10,906,696 pounds valued at $843,339 to Great Britain. The exports of copper black or coarse and in pigs, to the United States amounted to 6,581,564 pounds valued at $908,201. There was also an export of "old and scrap" copper amounting to 19,871 cwt. and valued at $231,710, distributed as follows: to the United States 16,604 cwt. valued at $189,793; to Great Britain, 2,751 cwt. valued at $35,918; and to other countires 516 cwt. valued at $5,999.

The following tables give, in detail, the exports for 1913 and 1914:—

Exports of Copper 1913 and 1914.

1914.	Fine in ore, matte, regulus, etc.		Black or coarse and in pigs.		"Old and Scrap."	
	Pounds.	Value. $	Pounds.	Value. $	Cwt.	Value. $
United States	57,923,363	6,287,439	6,581,564	908,201	16,604	189,793
Great Britain	10,906,696	843,339	.....	.....	2,751	35,918
Other countries	.....	.....	.....	.....	516	5,999
Total	68,830,059	7,130,778	6,581,564	908,201	19,871	231,710
1913.						
United States	76,552,312	9,079,167	771,280	123,431	18,432	237,678
Great Britain	5,325,468	400,163	.....	.....	6,071	80,647
Other countries	1,300	150	.....	.....	469	6,578
Total	81,879,080	9,479,480	771,280	123,431	24,972	324,903

Exports of Copper in Ore, Matte, etc., from 1885—1914.

Calendar Year.	Lbs.	Value.	Calendar Year.	Lbs.	Value.
		$			$
1885		262,600	1900	23,631,523	1,741,885
1886		249,259	1901	32,488,872	3,404,908
1887		137,966	1902	26,094,498	2,476,516
1888		257,260	1903	38,364,676	3,873,827
1889		168,457	1904	38,553,282	4,216,214
1890		398,497	1905	40,740,861	5,443,873
1891		348,104	1906	42,398,538	7,303,366
1892		277,632	1907	54,688,450	8,749,609
1893	4,792,201	269,160	1908	51,136,371	5,934,559
1894	1,625,389	91,917	1909	54,447,750	5,832,246
1895	3,742,352	236,965	1910	56,964,127	5,840,553
1896	5,462,052	281,070	1911	55,287,710	5,467,725
1897	14,022,610	850,336	1912	78,488,564	9,036,479
1898	11,572,381	840,243	1913*	85,147,560	9,927,814
1899	11,371,766	1,199,908	1914*	77,398,723	8,270,689

*Includes "Old and Scrap."

The total imports of copper during the calendar year were valued at $4,256,901 and include crude and manufactured copper to the extent of 26,280,815 pounds valued at $3,983,322. Copper sulphate 1,143,039 pounds valued at $53,802, and other manufactures of copper valued at $219,777.

In 1913 the total value of the imports was $7,414,610 and included 41,011,961 pounds of crude and manufactured copper valued at $6,935,822; copper sulphate 2,037,714 pounds valued at $107,960; and other copper manufactures valued at $370,828.

Imports of Copper 1913 and 1914.

	1913.		1914.	
	Pounds.	Value.	Pounds.	Value.
		$		$
Copper, old and scrap	596,700	87,790	127,800	15,717
Copper in pigs, ingots or in blocks	5,314,200	845,095	3,733,300	507,499
Copper in bars, and rods, in coils, or otherwise, in lengths, not less than 6 feet, unmanufactured	29,387,900	4,886,846	18,212,300	2,689,940
Copper, in strips, sheets or plates, not planished or coated, etc	4,255,900	782,974	3,373,100	574,783
Copper tubing in lengths not less than 6 feet and not polished, bent or otherwise manufactured	884,920	205,797	696,444	159,602
Copper rollers, for use in calico printing		11,704		22,301
Copper and Manufactures of:—				
Nails, tacks, rivets and burrs or washers		3,479		4,445
Wire, plain, tinned or plated	572,341	127,320	137,871	35,781
Wire cloth, etc		5,844		4,433
All other manufactures of, n.o.p		349,286		188,270
Copper precipitate of crude	4,743	515	2,017	328
Copper sulphate	2,037,714	107,960	1,143,039	53,802
Total value		7,414,610		4,256,901

Imports of Copper 1910 to 1914 inclusive.

Year.	Pigs, ingots or in blocks.		Old and scrap.		Manufactures of copper.			Crude precipitate.		Copper sulphate.		Total value.
					Bars, rods, sheets, tube and wire.		Other manufactures.					
	Lbs.	$	Lbs.	$	Lbs.	$	$	Lbs.	$	Lbs.	$	$
1910.....	4,640,500	609,111	273,700	31,070	25,322,906	3,579,270	150,322	4,847	595	1,925,557	77,782	4,448,150
1911.....	5,650,400	705,598	265,300	28,748	29,244,210	3,898,416	215,289	2,608	299	2,191,899	88,419	4,936,769
1912.....	5,121,800	806,705	400,500	56,748	35,198,208	5,776,003	305,680	5,703	570	2,105,419	101,650	7,047,356
1913.....	5,314,200	845,095	596,700	87,790	35,101,061	6,002,937	370,313	4,743	515	2,037,714	107,960	7,414,610
1914.....	3,733,300	507,499	127,800	15,717	22,419,715	3,460,106	219,449	2,017	328	1,143,039	53,802	4,256,901

Copper:—Imports of Pigs, Old, Scrap, etc.

Fiscal Year.	Lbs.	Value.	Fiscal Year.	Lbs.	Value.
		$			$
1880	31,900	2,130	1898	1,050,000	80,000
1881	9,800	1,157	1899	1,655,000	246,740
1882	20,200	1,984	1900	1,144,000	180,990
1883	124,500	20,273	1901	951,500	152,274
1884	40,200	3,180	1902	1,767,200	325,832
1885	28,600	2,016	1903	2,038,400	252,594
1886	82,000	6,969	1904	2,115,300	270,315
1887	40,100	2,507	1905	1,944,400	266,548
1888	32,300	2,322	1906	2,627,700	441,854
1889	32,300	3,288	1907 (9 mos.)	2,616,600	520,971
1890	112,200	11,521	1908	3,612,400	650,597
1891	107,800	10,452	1909	2,732,300	383,441
1892	343,600	14,894	Calendar year.		
1893	168,300	16,331	1910	4,914,200	640,181
1894	101,200	7,397	1911	5,915,700	734,346
1895	72,062	6,770	1912	5,522,300	863,453
1896	86,905	9,226	1913	5,910,900	932,885
1897	49,000	5,449	1914	3,861,100	523,216

Imports of Manufactures of Copper.

Fiscal Year.	Value.	Fiscal Year.	Value.	Fiscal Year.	Value.
	$		$		$
1880	123,061	1892	422,870	1904	1,191,610
1881	159,163	1893	458,715	1905	1,775,881
1882	220,235	1894	175,404	1906	2,660,303
1883	247,141	1895	251,615	1907 (9 mos.)	2,545,600
1884	134,534	1896	285,220	1908	2,713,060
1885	181,469	1897	264,587	1909	2,086,205
1886	219,420	1898	786,529	Calendar year.	
1887	325,365	1899	551,586	1910	3,729,592
1888	303,459	1900	1,090,280	1911	4,113,395
1889	402,216	1901	951,045	1912	6,081,464
1890	472,668	1902	1,281,522	1913	6,373,250
1891	563,522	1903	1,291,635	1914	3,679,555

Quebec.

The mines of the Eastern Townships were still more active during 1914 with an increased copper production therefrom. This amounted to 4,206,497 pounds, valued at $571,488, representing the estimated recovery from 117,699 tons of ore and concentrates. Statistics of the copper production of Quebec province since 1886 are shown in the table following:—

Quebec:—Production of Copper.

Calendar Year.	Lbs.	Value.	Calendar Year.	Lbs.	Value.
		$			$
1886	3,340,000	367,400	1901	1,527,442	246,178
1887	2,937,900	330,514	1902	1,640,000	190,666
1888	5,562,864	927,107	1903	152,000	152,467
1889	5,315,000	730,813	1904	1,760,000	97,455
1890	4,710,606	741,920	1905	1,621,243	252,752
1891	5,401,704	695,469	1906	1,981,169	381,930
1892	4,883,480	564,042	1907	1,517,990	303,659
1893	4,468,352	480,348	1908	1,282,024	169,330
1894	2,176,430	208,067	1909	1,088,212	141,272
1895	2,242,462	241,288	1910	877,347	111,757
1896	2,407,200	261,903	1911	2,436,190	301,503
1897	2,474,970	279,424	1912	3,282,210	536,346
1898	2,100,235	252,658	1913	3,455,887	527,679
1899	1,632,560	287,494	1914	4,201,497	571,488
1900	2,220,000	359,418			

Ontario.

The copper production from Ontario comes mainly from the nickel-copper ores of Sudbury district.

The chief companies are: The Canadian Copper Co., Limited, shipping from the Creighton, Crean Hill, the No. 2 and the No. 3, or Frood mines; and the Mond Nickel Co., Limited, operating the Garson, Victoria No. 1, North Star and Worthington. The Alexo mine, near Porquis Junction, on the Timiskaming and Northern Ontario Railway, shipped a considerable tonnage of nickel-copper ore to the Mond Nickel Company's smelter.

The British America Nickel Corporation did some development work at the Murray and Whistle mines, but made no production.

A small shipment was made of copper ore from Dane to United States smelters, and payments were made for a small amount of copper in shipments from the Cobalt district to American smelters.

The total tonnage of nickel-copper ores smelted in 1914 was 947,053 tons. There were produced during the year 46,396 tons of bessemer matte, containing 14,448 tons of copper and 22,759 tons of nickel, the shipping value of the matte being approximately $7,189,031. Details of the production of these ores are given more completely and in tabular form in the article on "Nickel."

The Ontario Government offers a bounty on copper over 95 per cent pure metal, and on copper-sulphate produced from ore mined and refined in the Province. The text of the Act will be found in the chapter on cobalt under the heading "Metal Refining Bounty Act."

Statistics of the copper production of Ontario since 1886 are given in the table following:—

Ontario:—Production of Copper.

Calendar Year.	Lbs.	Value.	Calendar Year.	Lbs.	Value.
		$			$
1886	165,000	18,150	1901	8,695,831	1,401,507
1887	322,524	36,284	1902	7,408,202	861,278
1888	Nil.	Nil.	1903	7,172,533	949,285
1889	1,466,752	201,678	1904	4,913,594	630,070
1890	1,303,065	205,233	1905	8,779,259	1,368,686
1891	4,127,697	531,234	1906	10,638 231	2,050,838
1892	2,203,795	254,538	1907	14,104,337	2,821,432
1893	3,641,504	391,461	1908	15,005,171	1,981,883
1894	5,207,679	497,854	1909	15,746,699	2,044,237
1895	4,576,337	492,414	1910	19,259,016	2,453,213
1896	3,167,256	344,598	1911	17,932,263	2,219,297
1897	5,500,652	621,023	1912	22,250,601	3,635,971
1898	8,375,223	1,007,539	1913	25,885,929	3,952,522
1899	5,723,324	1,007,877	1914	28,948,211	3,937,536
1900	6,740,058	1,091,215			

British Columbia.

According to returns received from the smelters, the total quantity of copper contained in matte, blister, and copper-sulphate produced in British Columbia during 1914, and including an estimate of smelter recovery for copper ores exported, was 41,219,202 pounds, after deducting the amount of copper produced from foreign ores. The production of 1913 on a similar basis was 45,791,579 pounds, and in 1912—50,526 656 pounds.

Returns of smelter production in this Province were not collected by this Department previous to 1908, and a complete record of statistics of production on this basis is not available.

The production of copper in this Province, according to statistics collected and published by the Provincial Department of Mines, reached a total of 45,009,699 pounds in 1914, as compared with 46,460,305 pounds in 1913. Statistics of the annual production since 1894, as ascertained by the Provincial Department of Mines, and the production by districts since 1908 are shown in the tables following:—

British Columbia:—Copper Content of Ores Shipped.†

Calendar Year.	Copper contained in ores shipped.	Increase.		Value.
	Lbs.	Lbs.	%	
				$
1894	324,680	.....	.....	31,039
1895	952,840	628,160	193·00	102,526
1896	3,818,556	2,865,716	301·00	415,459
1897	5,325,180	1,506,624	39·00	601,213
1898	7,271,678	1,946,498	36·00	874,783
1899	7,722,591	450,913	6·00	1,359,948
1900	9,977,080	2,254,489	29·00	1,615,289
1901	27,603,746	17,626,666	177·00	4,448,896
1902	29,636,057	2,032,311	7·00	3,445,488
1903	34,359,921	4,723,864	16·00	4,547,735
1904	35,710,128	1,350,207	3·7	4,579,110
1905	37,692,251	1,982,123	5·6	5,876,222
1906	42,990,488	5,298,237	14·1	8,287,706
1907	40,832,720	*2,157,768	*5·02	8,168,177
1908	47,274,614	6,441,894	15·8	6,244,031
1909	45,597,245	*1,677,369	*3·6	5,918,522
1910‡	38,243,934	.....	.....	4,871,512
1911‡	36,927,656	*1,316,278	*3·4	4,571,644
1912‡	51,546,537	14,618,881	39·6	8,408,513
1913‡	46,460,305	*4,996,232	9·7	7,094,489
1914‡	45,009,699	*1,450,606	3·1	6,121,319

*Decrease. †As published by British Columbia Bureau of Mines. ‡Allowing 5 pounds copper per ton of ore for smelter losses.

British Columbia:—Production of Copper by Districts.

——	1909.*	1910.†	1911.†	1912.†	1913.†	1914.†
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Cariboo	.....	.....	.....	.....	1,838	6,000
Cassiar	137,651	.....	19,151	88,403	1,336	11,123,376
West Kootenay—						
Nelson	186,572	231,936	.....	26,257	815,126	586,764
Trail creek	3,509,909	3,577,745	3,429,702	2,539,900	2,538,661	3,779,830
Yale—						
Boundary	40,603,042	31,354,985	22,327,359	33,372,199	28,621,973	16,428,959
{Ashcroft {Kamloops	.....	1,178	152,723	.....	37,578	14,525
Coast districts	1,160,071	3,078,090	10,998,721	15,429,778	14,443,793	13,070,245
Totals	45,597,245	38,243,934	36,927,656	51,456,537	46,460,305	45,009,699

*Copper content of ores shipped. †After deducting five pounds of copper per ton of ore for slag losses.

According to the direct returns in 1914, the ores of the Boundary district produced 42·9 per cent of the total against 63·5 per cent of the total for 1913; the Trail Creek and Nelson divisions came in for about 11·3 per cent; and the Coast and Cassiar districts for 45·8 per cent—compared with 29·8 per cent of the total for 1913.

In the Boundary the production was mainly from the mines of three of the large smelting companies; the Granby Consolidated Mining, Smelting and Power Co., Limited; the British Columbia Copper Co., Limited, and the New Dominion Copper Co., Limited. The two first named operate their own smelters and convert their matte to blister copper. The low grade

ores of this district are self-fluxing and very uniform in character, averaging a little over 1 per cent in copper, and from $1 to $2 in gold and silver.

The chief producing mines of the district were the Granby mines at Phoenix, the Mother Lode of the British Columbia Copper Company at Deadwood, and Rawhide of the New Dominion Copper Company, near Phoenix.

The British Columbia Copper Company have been steadily developing their properties at Princess Camp in the Similkameen, employing a large number of men. The properties were producing during 1914 and we may look forward to the eventual establishment in that part of the country of another important copper producing centre.

In the interior the main shippers were, at Rossland, the Centre Star, Le Roi groups, owned by the Consolidated Mining and Smelting Co., and the Le Roi II (Josie) mine. Besides these, shipments were made from the Nelson district by the Queen Victoria mine of the British Columbia Copper Co., and the Silver King of the Consolidated Mining and Smelting Company.

Much development was done in the neighbourhood of New Hazelton in the Omineca mining division.

The Montana Continental Development Co., did extensive improvements and much work on the Rocher de Boule property, and will likely be an important producer in 1915.

The decrease in production in the Boundary district was more than offset by the large increase in production of the Coast district, which now ranks as the principal producer of copper ores in British Columbia with heavy shipments from the Hidden Creek mine on Observatory inlet; the Britannia mines on Howe Sound and the Marble Bay mines on Texada island.

Yukon.

The main shipments from this Territory were from the Pueblo mine at Whitehorse. Some smaller properties also shipped, and the owners of the Pueblo have re-opened the War Eagle in the same neighbourhood.

GOLD.

The production of gold in Canada in 1914 reached a total of 773,178 fine ounces valued at $15,983,007 as compared with 802,973 fine ounces valued at $16,548,923 in 1913. The production was made up as follows: (a) gold derived from alluvial workings $5,687,501 or 35·6 per cent of the total; (b) gold obtained from the crushing of free milling quartz ores, i. e. stamp mill bullion $6,051,968, or 37·9 per cent; and (c) gold obtained from ores and concentrates sent to the copper and lead smelters $4,243,538 or 26·5 per cent of the total production.

Statistics of the annual gold production of Canada are shown in the following table:—

Annual Production of Gold in Canada, 1858-1914.

Calendar Year.	Ozs. (fine†)	Value.	Calendar Year.	Ozs. (fine†)	Value.
		$			$
1858	34,104	705,000	1886	70,782	1,463,196
1859	78,129	1,615,072	1887	57,460	1,187,804
1860	107,806	2,228,543	1888	53,145	1,098,610
1861	128,973	2,666,118	1889	62,653	1,295,159
1862	135,391	2,798,774	1890	55,620	1,149,776
1863	202,498	4,186,011	1891	45,018	930,614
1864	199,605	4,126,199	1892	43,905	907,601
1865	192,898	3,987,562	1893	47,243	976,603
1866	152,555	3,153,597	1894	54,600	1,128,688
1867	145,775	3,013,431	1895	100,798	2,083,674
1868	134,169	2,773,527	1896	133,262	2,754,774
1869	102,720	2,123,405	1897	291,557	6,027,016
1870	83,415	1,724,348	1898	666,386	13,775,420
1871	105,187	2,174,412	1899	1,028,529	21,261,584
1872	90,283	1,866,321	1900	1,350,057	27,908,153
1873	74,346	1,536,871	1901	1,167,216	24,128,503
1874	97,856	2,022,862	1902	1,032,161	21,336,667
1875	130,300	2,693,533	1903	911,559	18,843,590
1876	97,729	2,020,233	1904	796,374	16,462,517
1877	94,304	1,949,444	1905	684,951	14,159,195
1878	74,420	1,538,394	1906	556,415	11,502,120
1879	76,547	1,582,358	1907	405,517	8,382,780
1880	63,121	1,304,824	1908	476,112	9,842,105
1881	63,524	1,313,153	1909	453,865	9,382,230
1882	60,288	1,246,268	1910	493,707	10,205,835
1883	53,853	1,113,246	1911	473,159	9,781,077
1884	51,202	1,058,439	1912	611,885	12,648,794
1885	55,575	1,148,829	1913	802,973	16,598,923
			1914	773,178	15,983,007

†Calculated from the value: one dollar = 0·048375 oz.

Gold was first discovered in various provinces about 1858 and the production gradually increased, reaching over four million dollars in 1863, to decrease again, so that in 1892 the production amounted only to $907,601. The discovery of gold in the Yukon and other discoveries in 1896 gave the mining industry a new impetus, resulting in a rapid increase in the gold production, which, in 1900, reached the high mark of nearly twenty million

dollars, from which it decreased again until 1907, and after a stationary period around the ten million mark, with the discovery of the Porcupine mines in Ontario, it has rapidly increased again, suffering a slight decrease in 1914, due to the unsettled conditions caused by the European war.

The imports during the calendar year 1914 were: gold bullion valued at $14,534,482; gold coins $117,700,824; and manufactures of gold and silver valued at $614,043.

The exports of gold in dust, nuggets, etc., during the same period were valued at $15,242,200.

Refined Metal:—The Dominion Assay Office in Vancouver, operated in connexion with this Department, receives, assays, and purchases crude bullion, amalgam, nuggets, and dust, the resultant bullion being re-sold. The total quantity of bullion thus received during the twelve months ending December 31, 1914 was 163,523·61 ounces, being the weight after melting, valued at $2,029,251.31, after deducting office charges.

A refinery is in operation at the Royal Mint at Ottawa and shipments of gold have been received from various provinces.

There is but one other refinery in Canada producing fine gold; that of the Consolidated Mining and Smelting Co. of Canada, Limited, at Trail, B.C., where the gold is mainly recovered from the high grade silver-lead ores and the "dry" ores shipped to the smelter. Its annual output is given below.

Production of Refined Gold at Trail, B.C.

Year	Ozs.	Year.	Ozs.	Year.	Ozs.
1904	4,336	1908	15,346	1912	12,118
1905	8,602	1909	18,241	1913	11,977
1906	9,993	1910	13,298	1914	11,088
1907	10,395	1911	15,270		

The production of gold by provinces is shown in the following table:—

Production of Gold by Provinces, 1912, 1913, and 1914.

	1912.		1913.		1914.	
	Ozs. (fine‡)	Value.	Ozs. (fine‡)	Value.	Ozs. (fine‡)	Value.
		$		$		$
Nova Scotia...........	4,385	90,638	2,174	44,935	2,904	60,031
Quebec...............	642	13,270	701	14,491	1,292	26,708
Ontario...............	86,523	1,788,596	219,801	4,543,690	268,264	5,545,509
Alberta...............	73	1,509	....	....	48	992
British Columbia.......	(a) 251,815	5,205,485	(a) 297,459	6,149,027	(a) 252,730	5,224,393
Yukon...............	268,447	5,549,296	282,838	5,846,780	247,940	5,125,374
Totals...........	611,885	12,648,794	802,973	16,598,923	773,178	15,983,007

‡Calculated from the value: one dollar=0·048375 oz.

	1912.	1913.	1914.
	$	$	$
(a) As follows: Gold from placer mining.......................	555,500	510,000	565,000
Gold from vein mining.......................	4,649,985	5,639,027	4,659,393
	5,205,485	6,149,027	5,224,393

The exact value of fine gold is $\frac{8000}{387}$ dollars per ounce equivalent to $20·671834. (United States Standard.) In most cases, statistics of gold production are stated as crude bullion with value thereof. The fine ounces given in the tables in this report are calculated from the values by mutliplying these by $\frac{387}{8000}$ or 0·048375.

Nova Scotia.

The gold production of this Province, which is derived almost entirely from quartz ores, is reported by the Provincial Department of Mines as 2,904 fine ounces valued at $60,031, compared with 2,174 fine ounces valued at $44,935 for the year 1913; i.e., an increase of 33 per cent.

The production of Nova Scotia, which was 6,863 fine ounces in 1862, reached a maximum of 30,348 fine ounces in 1902; then decreased gradually, reaching in 1913 a minimum of 2,174 fine ounces.

Statistics of the annual production since 1862 are given in the following table:—

Nova Scotia:—Annual Production of Gold.

Cal. Year.	Tons. treated.	Ozs. (fine).	Value.	Yield of gold per ton.	Cal. Year.	Tons treated.	Ozs. (fine).	Value.	Yield of gold per ton.
			$	$				$	$
1862.....	6,473	6,863	141,871	21·91	1888..	36,178	21,137	436,939	12.08
1863.....	17,000	13,180	272,448	16.02	1889..	39,160	24,673	510,029	13.02
1864.....	21,431	18,883	390,349	18.21	1890..	42,749	22,978	474,990	11.11
1865.....	24,421	24,011	496,357	20.32	1891..	36,351	21,841	451,503	12.42
1866.....	32,157	23,776	491,491	15.28	1892..	32,552	18,865	389,965	11.98
1867.....	31,384	25,763	532,563	16.96	1893..	42,354	18,436	381,095	8.99
1868.....	32,259	19,377	400,555	12.41	1894..	55,357	18,834	389,338	7.04
1869.....	35,144	16,855	348,427	19.91	1895..	60,600	21,919	453,119	7.47
1870.....	30,824	18,740	387,392	12.56	1896..	69,169	23,876	493,568	7.13
1871.....	30,787	18,139	374,972	12.17	1897..	73,192	27,195	562,165	7.68
1872.....	17,089	12,352	255,349	14.94	1898..	82,747	26,054	538,590	6.50
1873.....	17,708	11,180	231,122	13.05	1899..	112,226	29,876	617,604	5.50
1874.....	13,844	8,623	178,244	12.87	1900..	87,390	28,955	598,553	6.85
1875.....	14,810	10,576	218,629	14.76	1901..	91,948	26,459	546,963	5.32
1876.....	15,490	11,300	233,585	15.08	1902..	93,042	30,348	627,357	6.68
1877.....	17,369	15,925	329,205	18.95	1903..	103,856	25,533	527,806	5.08
1878.....	17,989	11,864	245,253	13.63	1904..	45,436	10,362	214,209	4.71
1879.....	15,936	12,980	268,328	16.83	1905..	57,774	13,707	283,353	4.90
1880.....	13,997	12,472	257,823	18.42	1906..	66,059	12,223	252,676	3.82
1881.....	16,556	10,147	209,755	12.66	1907..	58,550	13,675	282,686	4.82
1882.....	21,081	13,307	275,090	13.04	1908..	61,536	11,842	244,799	3.97
1883.....	25,954	14,571	301,207	11.60	1909..	56,790	10,193	210,711	3.71
1884.....	25,186	15,168	313,554	12.44	1910..	43,006	7,928	163,891	3.81
1885.....	28,890	20,945	432,971	14.98	1911..	18,328	7,781	160,854	8.78
1886.....	29,010	22,038	455,564	15.70	1912..	14,360	4,385	90,638	6.51
1887.....	32,280	20,009	413,631	12.81	1913..	7,324	2,174	44,935	6.13
					1914..	13,156	2,904	60,031	4.56

Total fine ounces gold..... 893,197
Total value.....$18,464,102

The production of gold by districts during the twelve months ending September 30, 1914, as collected and published by the Provincial Mines Department, and the production from 1862 to 1914, by districts, according to the same authority, are shown in tabular form, as follows:—

Nova Scotia:—District Details of Gold Production, Year Ending September 30, 1914.

District.	Tons crushed.	Total yield of gold.			Average yield of gold per ton.		
		oz.	dwt.	grs.	oz.	dwt.	grs.
Caribou.....	789	483	10	2	.....	12	6
Caribou (Moose River).....	405	94	13	0	.....	4	16
Fifteen Mile Brook.....	120	44	15	18	.....	7	11
Lake Catcha.....	1,106	387	13	23	.....	7	0
Millers Lake.....	6	1	6	0	.....	4	8
Montagu.....	118	40	12	23	.....	6	21
Oldham.....	358	182	10	0	.....	10	5
Sherbrooke.....	6,806	895	14	0	.....	2	15
Stormont.....	2,257	707	14	0	.....	6	7
Tangier.....	416	56	17	3	.....	2	18
Wagamatkook.....	775	262	17	13	.....	6	19
Totals.....	13,156	3,158	4	10	.....	4	19

Nova Scotia:—Production of Gold from 1862 to 1914.

District.	Tons crushed.	Total yield of gold.			Average yield of gold per ton.			Valued at $19 per oz.
		oz.	dwt.	grs.	oz.	dwt.	grs.	
								$
*Caribou and Moose River	222,233	61,319	11	14	.....	5	12	1,165,072
Montagu	29,740	42,232	12	8	1	8	10	802,420
Oldham	59,348	67,687	18	22	1	2	19	1,286,071
Renfrew	61,795	48,699	7	19	.....	15	18	925,288
Sherbrooke	307,019	153,985	15	4	.....	10	1	2,925,729
Stormont	527,514	121,265	18	13	.....	4	14	2,304,053
Tangier	67,428	28,965	8	12	.....	8	14	550,343
†Uniacke	63,351	43,983	4	17	.....	13	21	835,679
Waverley	155,520	69,980	10	16	.....	9	0	1,329,630
‡Brookfield	93,527	38,709	2	2	.....	8	7	735,473
‡‡Salmon River	118,819	41,852	5	20	.....	7	1	795,193
††Whiteburn	6,907	9,800	0	2	1	8	9	186,200
Lake Catcha	31,928	28,209	14	17	.....	17	16	535,985
¶Rawdon	12,189	9,606	5	10	.....	15	18	182,519
Wine Harbour	77,396	34,992	15	11	.....	9	1	664,863
**Fifteenmile Stream	36,878	17,363	0	5	.....	9	10	329,897
Malaga Barrens	22,926	20,305	12	6	.....	17	17	385,807
§West Gore (from Stibnite ore)	3,240	4,512	15	10	1	7	20	85,743
Other districts	145,836	75,670	2	5	.....	10	9	1,437,846
	2,043,594	919,147	18	21	.....	9	0	17,463,811

*From 1869, †from 1868, ‡from 1887, ‡‡from 1883, ††from 1882, ¶from 1887, **from 1883, §from 1905.

Quebec.

The gold production in Quebec during 1914 was 1,292 fine ounces valued at $26,708, against 701 fine ounces valued at $14,491, in 1913, an increase of 84 per cent. This production is derived from the pyritic mines of the Eastern Townships, which are worked chiefly for the sulphur and copper contents of the ore.

No alluvial production has been reported for the last two years. The following table gives the production for Quebec from 1877 to 1914:—

Quebec:—Annual Production of Gold.

Calendar Year.	Ozs. (fine*).	Value.	Calendar Year.	Ozs. (fine*).	Value.
		$			$
1877	583	12,057	1896	145	3,000
1878	868	17,937	1897	44	900
1879	1,160	23,972	1898	295	6,089
1880	1,605	33,174	1899	238	4,916
1881	2,741	56,661	1900	Nil.	Nil.
1882	827	17,093	1901	145	3,000
1883	860	17,787	1902	391	8,073
1884	422	8,720	1903	180	3,712
1885	103	2,120	1904	140	2,900
1886	193	3,981	1905	191	3,940
1887	78	1,604	1906	165	3,412
1888	181	3,740	1907	Nil.	Nil.
1889	58	1,207	1908	Nil.	Nil.
1890	65	1,350	1909	193	3,990
1891	87	1,800	1910	124	2,565
1892	628	12,987	1911	613	12,672
1893	759	15,696	1912	642	13,270
1894	1,412	29,196	1913	701	14,491
1895	62	1,281	1914	1,292	26,708
			Total	18,191	376,001

*Calculated from the value: one dollar=0·048375 oz.

Ontario.

The gold production in Ontario which in 1913 had exceeded the total of all the other years since 1886, showed a further increase in 1914 of about one million dollars, amounting to 268,264 fine ounces valued at $5,545,509.

The Porcupine district was the main producer. Other producing districts being Kirkland Lake, Larder Lake, and Long Lake.

Statistics of the production of gold in Ontario since 1887 are shown in the following table:—

Ontario:—Annual Production of Gold.

Calendar Year.	Ozs. (fine*).	Value.	Calendar Year.	Ozs. (fine*).	Value.
		$			$
1887	327	6,760	1901	11,844	244,837
1888	Nil.	Nil.	1902	11,118	229,828
1889	Nil.	Nil.	1903	9,096	188,036
1890	Nil.	Nil.	1904	1,935	40,000
1891	97	2,000	1905	4,402	91,000
1892	344	7,118	1906	3,202	66,193
1893	708	14,637	1907	3,212	66,399
1894	1,917	39,624	1908	3,212	66,389
1895	3,015	62,320	1909	1,569	32,425
1896	5,563	115,000	1910	3,089	63,849
1897	9,157	189,294	1911	2,062	42,625
1898	12,863	265,889	1912	86,523	1,788,596
1899	20,394	421,591	1913	219,801	4,543,690
1900	14,391	297,495	1914	268,264	5,545,509
			Total	698,105	14,431,104

*Calculated from the value: one dollar = 0·048375 oz.

It may be noted from the table "Production of Gold by Provinces" that Ontario from third rank, has become the largest producer of gold in Canada.

The remarkable increase of these last three years was brought about by the successful development of the Porcupine district and recently by the extension of milling facilities in that camp.

The following extracts from the "Report of the Timiskaming and Northern Ontario Railway Commission," gives an idea of the development going on in Northern Ontario:—

Porcupine Gold Production 1914.

Mines and Mills.	Tonnage milled.	Bullion.	Value.
		Ozs.	$
Acme	2,910	1,500·00	31,000.00
Dome	221,390	51,016·12	1,054,503.24
Dome Lake	1,638	556·00	8,832·32
Hollinger	208,936	134,000·00	2,688,354.80
Porcupine Crown	40,857	57,213·00	671,177.06
Porcupine Pet	1,433	580·40	8,264.00
Rea	11,607	6,444·00	125,000.00
McIntyre	62,209	27,500·00	549,583.00
Vipond	9,559	3,217·95	66,514.58
Total	560,539	282,327·47	5,203,229.00

Porcupine Gold Production 1910—1914.

Year.	Ore treated.	Gold bullion.	Value.
	Tons.	Ounces.	$
1910	1,060	1,947	35,539
1911	707	851	17,187
1912	.....	83,726	1,730,628
1913	.....	207,583	4,284,928
1914	560,539	282,327	5,203,229
Total	562,296	576,434	11,271,511

Cyanide:—"It was feared that those mines using cyanide might have to curtail their output, because much of the world's production of cyanide was of German manufacture, the buying of which is now contrary to the laws of Canada. As a matter of fact it was found on inquiry that all the mines of this district with two exceptions, were using cyanide manufactured in Great Britain by the Cassel Cyanide Co., Ltd., of Glasgow, Scotland."

"Owing to increased cost of raw materials, due directly or indirectly to the war, the price of cyanide has risen to 18 cents per pound, which is a rise of three cents above the price immediately before the war. The offer that the Cassel Cyanide Company is now making to the mines is to keep them supplied with cyanide on the following terms: 18 cents per pound to June 1915; 16 cents per pound to the end of 1916; and 15 cents, or the normal price during 1917 providing that the mines on their part will give the Company an exclusive cyanide contract for two years, giving an estimate now of what their requirements are likely to be during that time."

"The mining companies now using cyanide in the district are:—Cobalt—Buffalo, Dominion Reduction, Nipissing, and O'Brien. Porcupine—Dome, Hollinger, McIntyre, Porcupine Crown, Vipond."

"The normal monthly consumption of cyanide in the district is about 50 tons in Cobalt and 20 tons in Porcupine. This may be expected to gradually increase till the consumption a year from now should run over 100 per month, i.e., nearly half the 1913 consumption of the United States."

Zinc Dust:—"Since the outbreak of war the zinc dust situation has also been creating some uneasiness. Before August last, the main supplies came from Belgium and Silesia, but these being cut off, the mines now have to look to the United States."

"The Belgian price was 6¾ cents, but now the price is 11 cents f.o.b. Cobalt. The method of preparation adopted in the United States is different from that of the Belgian furnaces, the American product carrying a slightly higher percentage of oxide and more lead, and therefore having a proportionately smaller precipitating power."

Pebbles:—"The supply of pebbles for pebble mills, formerly came from Denmark and France. Shipments from these points are now practically cut off, but an adequate supply can be obtained from Newfoundland and Sweden. The European pebbles are flint, but those from Newfoundland are a greywacke."

"At the close of 1914 the price per ton of pebbles was $21.17 at Cobalt and $21.69 at Porcupine—practically the same price as before the war."

"The annual consumption of pebbles is about 600 tons for Cobalt and 1400 tons for Porcupine."

The mills now using pebbles in this district are:—

Cobalt: Beaver, Buffalo, Cobalt Lake, Dominion Reduction, McKinley-Darragh, Nipissing, O'Brien, and Penn-Canadian. Kirkland Lake: Tough Oakes. Larder Lake: Huronia. Porcupine: Dome, Dome Lake, Hollinger, McIntyre, Porcupine Crown, and Vipond.

The principal producers during 1914 were:—

Operator.	Mine.	District.
Canadian Exploration Co.	Long Lake	Algoma.
The Dome Mines Co., Ltd.	Dome	Timiskaming.
The Dome Lake Mines, Ltd.	Dome Lake	"
Hollinger Gold Mines, Ltd.	Hollinger	"
Acme Gold Mines	Acme	"
Porcupine Vipond Mines Co., Ltd.	Porcupine Vipond	"
The McIntyre Porcupine Mines, Ltd.	McIntyre	"
The Porcupine Crown Mines, Ltd.	Porcupine Crown	"
Wm. C. Offer, et al	Porphyry Hill	"
Mines Leasing and Dev. Co.	Rea	"
Tough Oakes Gold Mines	Tough Oakes	"
La Mine d'Or Huronia, Ltd.	Huronia	"

The following notes are taken from the respective company's reports:—

The Dome Mines Co., Ltd.

Year ending March 31, 1914.

"Record of production for twelve months ending March 31, 1915.

Tons of ore milled	248,550
Total value of ore treated	$1,163,954.80
Average value per ton	$ 4.68
Bullion recovered by amalgamation	$ 671,054.44
Bullion recovered by cyanidation	$ 384,442.34
Per cent of value recovered by amalgamation	57·60
Per cent of value recovered by cyanidation	33·00
Total value recovered	$1,055,496.78
Per cent of value recovered	90·60
Per cent of possible running time	93·70

The Company is expecting that the mill's highest crushing capacity—about 28,000 tons per month—will be reached by July, 1915.

The Dome is essentially a low-grade proposition.

Hollinger Gold Mines, Limited.

Year ending December 31, 1914.

	Hollinger.	Acme.	Total.
Tons of ore milled	208,936	2,910	211,846
Average value per ton	$ 13,676	$11,176	.....
Total values sent to mill	$2,857,397.54	$32,521.93	$2,889,919.47
Average tons per day			583.59
Per cent of possible running time			92·2
Average tons per 24 hours of running time			632·97
Stamp duty tons per 24 hours of running time			13·30

"Unrecovered values:—

Concentrates stored for re-treatment	$53,686.00
Lost in filter tails	116,879.00
Total	$170,565.00
Values recovered	$2,719,354.47
Value per ton in tailings	$ 0·56
Cyanide consumed per ton of ore	0·525 lbs.
Lime " " " "	1·557 "
Zinc " " " "	0·532 "
Acid " " " "	0·216 "
Lead acetate " " " "	0·0031 "
Tons of solution precipitated per ton of ore	2·315
Zinc added per ton of solution	0·230
Average value of pregnant solution	$5·698
Per cent of gold extracted	94·089

"The average working cost per ton during 1914 amounted to $4.42 (exclusive of amounts written off for depreciation), as against $5.21 in 1913. Further reductions will follow, and it is hoped that by the end of 1915 the working cost will be found not to exceed $4.00 per ton.

"The estimated ore reserves are 1,162,960 tons, with a gross value of $13,358,420, or a value per ton of $11.49."

Porcupine Crown Mines, Limited.

Year ending December 31, 1914.

"Tons of ore milled	40,857
Average value of heads	$17.18
" " " tails	0.47
" extraction	97·26%
Cost per ton of ore milled	$7.09
Gross value of production	$691,394.29
Mint charges	2,242.83
Mine operation expense	339,196.99
" " net profit	349,954·47
Dividends paid in 1914	240,000.00

"The development of the property during the past year has been most satisfactory. The operating costs during the year were appreciably reduced, and by the increase in tonnage can be still further reduced. The ore reserves are valued at 1½ million dollars and amount to 85,000 tons."

McIntyre Porcupine Mines.

Year ending December 31, 1914.

"Tons of ore milled	62,209
Average value	$9·262
Extraction per ton	8·828
Tailing loss " "	0.434
Gross value	$576,217.60
Bullion produced and by-products obtained	$549,255.42
Total loss in tails	$ 26,962.18
Extraction	95·3%
Cost per ton of ore milled	$6·406

"The estimated ore reserves, as of March 31, 1915, were 109,693 tons valued at $854,436."

Manitoba.

There was no production in Manitoba during 1914, but development work was reported from Star Lake, near the eastern boundary of the Province, and from Rice Lake, east of Lake Winnipeg.

Saskatchewan.

In the autumn of 1913 considerable interest was created in the reported gold discoveries at Beaver Lake. A number of prospectors went in with the opening of navigation. A good deal of prospecting was done during 1914, but no shipments have been reported.

The Consolidated Gold Mines (Beaver Lake) Limited, with the Beaver Lake Mining Co., are the two principal operators in the Beaver Lake district. There is talk of the latter Company erecting a 10-stamp mill which would serve as an aid to the general development of the district.

Alberta.

In past years there has been a small production of gold from the gravels of the Saskatchewan river. A very small recovery was reported for 1914 amounting to 48 ounces valued at $992.

Statistics of the production from the above mentioned source since 1887, are shown in the table following:—

Alberta:—Annual Production of Gold.

Calendar Year.	Ozs. (fine*).	Value.	Calendar Year.	Ozs. (fine*).	Value.
		$			$
1887	102	2,100	1901	726	15,000
1888	58	1,200	1902	484	10,000
1889	967	20,000	1903	48	1,000
1890	193	4,000	1904	24	500
1891	266	5,500	1905	121	2,500
1892	508	10,506	1906	39	800
1893	466	9,640	1907	33	675
1894	726	15,000	1908	50	1,037
1895	2,419	50,000	1909	25	525
1896	2,661	55,000	1910	89	1,850
1897	2,419	50,000	1911	10	207
1898	1,209	25,000	1912	73	1,509
1899	726	15,000	1913	.....	.....
1900	242	5,000	1914	48	992
			Total	14,732	304,541

*Calculated from the value: one dollar=0·048375 oz.

British Columbia.

The gold production of British Columbia in 1914, amounted to $5,224,393, comprising: placer gold $565,000; bullion from milling ores $549,437, and smelter recoveries $4,109,956.

The statistics for lode gold represent, as closely as can be ascertained, the actual gold recovery based on smelter recoveries and bullion shipments.

There was an increase of 10 per cent in the placer production over that of 1913; a decrease of about 16 per cent in the bullion from milling ores, and a decrease of over 17 per cent in smelter recoveries.

This reduction in production is due to a large extent to the heavy decrease in the output of the Boundary and Nelson districts brought on by the European war, but was made up to some extent by a considerable increase in the Cassiar district, due to the commencement of smelter operations by the Granby Company at Anyox, and by an increase in output from the Trail Creek division.

Of the 1914 production, 10·7 per cent was from alluvial workings; 10·5 per cent from mill bullion, and the balance or 78·8 per cent from smelter recoveries.

Statistics of the production by districts in 1914, as published by the British Columbia Bureau of Mines, and the total annual production since 1858 are given in the following tables:—

British Columbia:—Annual Production of Gold.

Calendar Year.	Ozs. (fine‡).	Value.	Calendar Year.	Ozs. (fine‡).	Value.
		$			$
1858	34,104	705,000	1887	33,558	693,709
1859	78,129	1,615,072	1888	29,834	616,731
1860	107,806	2,228,543	1889	28,489	588,923
1861	128,973	2,666,118	1890	23,918	494,436
1862	128,528	2,656,903	1891	20,792	429,811
1863	189,318	3,913,563	1892	19,327	399,525
1864	180,722	3,735,850	1893	18,360	379,535
1865	168,887	3,491,205	1894	25,664	530,530
1866	128,779	2,662,106	1895	61,289	1,266,954
1867	120,012	2,480,868	1896	86,504	1,788,206
1868	114,792	2,372,972	1897	131,805	2,724,657
1869	85,865	1,774,978	1898	142,215	2,939,852
1870	64,675	1,336,956	1899	203,295	4,202,473
1871	87,048	1,799,440	1900	228,916	4,732,105
1872	77,931	1,610,972	1901	257,292	5,318,703
1873	63,166	1,305,749	1902	288,383	5,961 409
1874	89,233	1,844,618	1903	284,108	5,873,036
1875	119,724	2,474,904	1904	275,975	5,704,908
1876	86,429	1,786,648	1905	285,529	5,902,402
1877	77,796	1,608,182	1906	269,886	5,579,039
1878	61,688	1,275,204	1907	236,216	4,883,020
1879	62,407	1,290,058	1908	286,858	5,929,880
1880	49,044	1,013,827	1909	250,320	5,174,579
1881	50,636	1,046,737	1910	261,386	5,403,318
1882	46,154	954,085	1911	238,496	4,930,145
1883	38,422	794,252	1912	251,815	5,205,485
1884	35,612	736,165	1913	297,459	6,149,027
1885	34,527	713,738	1914	252,730	5,224,393
1886	43,714	903,651			
			Total	7,344,540	151,825,155

‡Calculated from the value: one dollar = 0·048375 oz.

British Columbia:—Production of Gold by Districts, 1914.*

Districts.	Gold placer.		Gold lode.	
	Ozs.	Value.	Ozs.	Value.
		$		$
Cariboo:—				
Cariboo	8,250	165,000	.....	.....
Quesnel	1,750	35,000	.....	.....
Omineca	300	6,000	203	4,196
Cassiar:—				
Atlin	16,100	322,000	1,000	20,670
All other	1,150	23,000	2,884	59,612
East Kootenay:—				
Fort Steele	50	1,000	.....	.....
West Kootenay:—				
Ainsworth	.....	.....	100	2,067
Nelson	.....	.....	15,298	316,210
Slocan	.....	.....	13	269
Trail creek	.....	.....	138,568	2,864,201
Others	100	2,000	8	165
Lillooet	150	3,000	231	4,775
Yale:—				
Grand Forks, Greenwood and Osoyoos	50	1,000	84,908	1,775,048
Similkameen, Nicola, and Vernon	150	3,000	35	724
Yale, Ashcroft and Kamloops	150	3,000	14	289
Coast	50	1,000	3,908	80,778
	28,250	565,000	247,170	5,109,004

*From Annual Report of the Minister of Mines for British Columbia.

Yukon.

The production of the Yukon in 1914 was $5,125,374, as compared with $5,846,780 in 1913, a decrease of $721,406, or 12·3 per cent. In this is included the production from the lode mines.

The statistics of production of gold in the Yukon district during the years between 1898 and 1906, as given in the table showing the annual production, are based primarily on the receipts of gold at the United States mints and receiving offices credited to the Canadian Yukon. Although a royalty was exacted on the gold output, it seems certain that considerable amounts of gold were produced which escaped royalty payment especially during the years of high production.

Since 1906 the statistics of gold production of the Yukon have been based on the royalty of 2½ per cent which is collected by the Interior Department. For the purpose of collecting the royalty, a fixed value of $15 per ounce is placed on the crude gold. The actual value of the deposits for a number of years, has been about $16.50 per ounce. At the Dominion Government assay office at Vancouver, B.C., there were deposited during the twelve months ending December 31, 1914, 56,564·83 ounces from the Yukon, valued, after all charges had been deducted, at $916,914.44, showing an average of $16.21 per ounce.

The production of crude placer gold in the Yukon during the past six years, as ascertained by the Interior Department, and upon which a royalty of 2½ per cent has been collected, is shown in the accompanying table:—

Production of Crude Gold in the Yukon District.

Month.	1909.	1910.	1911.	1912.	1913.	1914.
	Ozs.	Ozs.	Ozs.	Ozs.	Ozs.	Ozs.
January	69·50	16·68	.....	5·25	19·30	136·50
February	115·33	749·28	435·66	525·29	56·90	325·50
March	848·39	193·81	13·30	0·50	.....	6·75
April	3·75	0·50	.....	.....	1,293·69	1,572·65
May	117·33	43·83	16,719·16	26,158.66	5,557·35	11,668·10
June	62,254·92	54,301·17	38,499·39	54,243·03	67,594·39	67,604·85
July	52,126·43	37,942·31	42,783·38	58,283·29	57,873·50	45,067·31
August	47,440·83	47,673·06	47,677·49	56,975·55	63,315·92	49,458·17
September	44,466·20	57,695·65	48,383·63	53,225·29	58,641·62	62,744·69
October	26,572·23	51,888·18	58,690·82	66,518·01	66,798·37	63,365·22
November	4,858·69	21,404·29	11,097·51	11,648·08	26,565·50	4,308·00
December	892·75	3,563·75	13,130·63	7,432·72	5,183·50	3,433·43
	239,766·35	275,472·51	277,430·97	335,015·67	352,900·04	309,691·17

The placer production of the Yukon in 1914 is estimated at 247,753 fine ounces of gold valued at $5,121,509, and 55,744 fine ounces of silver, valued at $30,554, making the total valuation of the Yukon placer output $5,153,063. The placer production in 1913 was estimated at 282,320 fine ounces of gold valued at $5,836,072 and 63,522 fine ounces of silver valued at $37,980 or a total valuation of $5,874,052.

A small amount of gold was derived from lode mining.

The Mines Branch has published in 1914 a report on lode mining in the Yukon,[1] being an investigation of the quartz deposits in the Klondike division.

Statistics of the annual production of gold in Yukon since 1885, are shown in the following table:—

Annual Production of Gold in Yukon.

Calendar Year.	Ozs. (fine‡).	Value.	Calendar Year.	Ozs. (fine‡).	Value.
		$			$
1885}.....	4,837	100,000	1900.....	1,077,553	22,275,000
1886}			1901.....	870,750	18,000,000
1887.....	3,386	70,000	1902.....	701,437	14,500,000
1888.....	1,935	40,000	1903.....	592,594	12,250,000
1889.....	8,466	175,000	1904.....	507,938	10,500,000
1890.....	8,466	175,000	1905.....	381,001	7,876,000
1891.....	1,935	40,000	1906.....	270,900	5,600,000
1892.....	4,233	87,500	1907.....	152,381	3,150,000
1893.....	8,514	176,000	1908.....	174,150	3,600,000
1894.....	6,047	125,000	1909.....	191,565	3,960,000
1895.....	12,094	250,000	1910*.....	221,091	4,570,362
1896.....	14,513	300,000	1911*.....	224,197	4,634,574
1897.....	120,937	2,500,000	1912*.....	268,447	5,549,296
1898.....	483,750	10,000,000	1913*.....	282,838	5,846,780
1899.....	774,000	16,000,000	1914*.....	247,940	5,125,374
				7,617,895	157,475,886

‡Calculated from the value: one dollar=0·048375 oz.
*Including a small production from lode mines.

Since 1898 a royalty to the extent of $4,248,459.47 has been collected on the gold production of this district. The yearly amounts collected, as well as the annual production of gold as ascertained by the Interior Department, are shown in the accompanying table. The difference between these figures and those shown in the table of annual production of the district which are based on mint receipts of Yukon gold, has already been mentioned, and is probably due to three factors: (1) the fixing of the value of the gold for royalty purposes at $15 per ounce, a figure probably slightly less than the actual value of the gold, (2) the probability that in the earlier years of royalty collection, considerable quantities of gold dust left the camps unrecorded and escaped royalty payments, and (3) the fact that in the last few years there has been a small but growing production from the lode mines.

[1]Mines Branch No. 222. "Lode Mining in Yukon." Report by T. C. MacLean, M.E.

Gold Production in the Yukon, and Royalty Collected.‡

Fiscal Year.	Total gold production.	Total exemption.	Royalty collected on.	Royalty paid.
	$	$	$	$ cts.
1898	3,072,773	339,845	2,732,928	273,292.82
1899	7,582,283	1,699,657	5,882,626	588,262.37
1900	9,809,464	2,501,744	7,307,720	730,771.99
1901	9,162,082	1,927,666	7,236,522	592,660.98
1902	9,566,340	1,199,114	8,367,225	331,436.79
1903	12,113,015	.....	12,113,015	302,893.48
1904	10,790,663	.....	10,790,663	272,217.96
1905	8,222,054	.....	8,222,054	206,760.87
1906	6,540,007	.....	6,540,007	163,963.25
1907 (9 months)	3,304,791	.....	3,304,791	82,622.42
1908	2,820,162	.....	2,820,162	70,505.65
1909	3,260,282	.....	3,260,282	81,507.07
1910	3,594,251	.....	3,594,251	89,844.10
1911	4,126,728	.....	4,126,728	103,168.19
1912	4,024,237	.....	4,024,237	100,606.29
1913	5,018,412	.....	5,018,412	125,460.52
1914	5,299,389	.....	5,299,389	132,484.72

‡From the Report of the Yukon and Mining Lands Branch of the Department of the Interior.

LEAD.

The production of lead in Canada in 1914 amounted to 36,337,765 pounds, valued at $1,627,568 as compared with 37,662,703 pounds valued at $1,754,705 in 1913, being a decrease in production of 3·5 per cent.

The statistics of lead production since 1909 as given in the accompanying table represent the quantity of refined lead produced in Canada from domestic ores, together with a small quantity of lead contained in lead ores exported. The production has been mainly from British Columbia with occasionally small amounts from Ontario. During 1914 there were no shipments from Ontario but there was a small production in the Yukon.

Annual Production of Lead.

Calendar Year.	Lbs.	Price per lb.	Value.	Calendar Year.	Lbs.	Price per lb.	Value.
		Cts.	$			Cts.	$
1887.....	204,800	5·400	9,216	1901.....	51,900,958	4·334	2,249,387
1888.....	674,500	4·420	29,812	1902.....	22,956,381	4·069	934,095
1889.....	165,100	3·930	6,488	1903.....	18,139,283	4·237	768,562
1890.....	105,000	4·480	4,704	1904.....	37,531,244	4·309	1,617,221
1891.....	88,665	4·350	3,857	1905.....	56,864,915	4·707	2,676,632
1892.....	808,420	4·090	33,064	1906.....	54,608,217	5·657	3,089,187
1893.....	2,135,023	3·730	79,636	1907.....	47,738,703	5·325	2,542,086
1894.....	5,703,222	3·290	187,636	1908.....	43,195,733	4·200	1,814,221
1895.....	16,461,794	3·230	531,716	1909.....	45,857,424	*3·690	1,692,139
1896.....	24,199,977	2·980	721,159	1910.....	32,987,508	*3·687	1,216,249
1897.....	39,018,219	3·580	1,396,853	1911.....	23,784,969	†3·480	827,717
1898.....	31,915,319	3·780	1,206,399	1912.....	35,763,476	†4·467	1,597,554
1899.....	21,862,436	4·470	977,250	1913.....	37,662,703	†4·659	1,754,705
1900.....	63,169,821	4·370	2,760,521	1914.....	36,337,765	†4·479	1,627,568

*In 1909 and 1910, average prices at Toronto as quoted by *Hardware and Metal*, in previous years average prices at New York, as quoted by *Engineering and Mining Journal*.
†Average price at Montreal. Quotations furnished by Messrs. Thos. Robertson & Co., Montreal, Que

Previous to 1904 lead ores mined in Canada were either exported as ore or smelted in Canadian furnaces and exported in the form of base bullion to be refined abroad. A lead refinery employing the Betts electrolytic process is in operation at Trail, B.C., at the smelter there, treating the base bullion produced by the lead blast furnaces.

The North American Smelting Company erected a plant at Kingston, Ontario, which started operations during the latter part of 1912, treating scrap and lead dross as well as ores from the United States, British Columbia, and Ontario. This plant closed down November 1, 1913, and did not resume operations during 1914.

The production of refined lead, including pig lead and lead pipe, has been as follows:—

Year.	Refined lead produced.	Year.	Refined lead produced.
	Lbs.		Lbs.
1904	7,519,440	1910	32,987,508
1905	15,804,509	1911	23,525,050
1906	20,471,314	1912	37,008,490
1907	26,607,461	1913	39,663,766
1908	36,549,274	1914	36,443,706
1909	41,883,614		

A small tonnage of lead ores from British Columbia and the Yukon was treated at the Tacoma Smelting Works, Tacoma, Washington, during 1914.

During the past two or three years there has been a very wide divergence between the record of lead recovery and the statements of lead contained in ores shipped from the mines. While the difference is due in part to smelter losses there was also during 1912 and 1913 especially, a considerable accumulation of lead ores at the Trail smelter.

The shipments of lead ores from mines and the metallic contents thereof have been, during the past three years, as follows:—

Year.	Lead ores shipped.	Lead contents.	Silver contents.
	Tons.	Pounds.	Ounces.
1912	59,814	45,896,537	2,366,294
1913	85,978	53,807,570	2,564,155
1914	70,207	50,537,130	2,501,820

Prices:—The average price for soft lead in 1914 on the London market was £18 13s. 9d. per long ton, as compared with £18 6s. 2d. in 1913, and £17 15s. 11d. in 1912.

The price of lead at Montreal, the main Canadian market, was higher in 1914 than the New York and London values.

The Toronto price in winter is about the same as that at Montreal, but the latter falls during the period of summer freight rates, about 10 cents per 100 pounds below the former.

The average prices of lead in Montreal in 1914 was 4·479 cents per pound, against 4·146 in London and 3·862 in New York.

The yearly average prices of lead in Montreal, London, and New York, for the last few years, is given in the following table:—

Yearly Average price of Lead in Montreal, London, New York, and St. Louis.

(Values in cents per pound.)

	1908.	1909.	1910.	1911.	1912.	1913.	1914.
Montreal	3·364	3·268	3·246	3·480	4·467	4·659	4·479
London	2·897	2·803	2·775	2·992	3·921	4·072	4·146
New York	4·200	4·273	4·446	4·420	4·471	4·370	3·862
St. Louis	.....	4·133	4·312	4·286	4·360	4·238	3·737

The monthly and yearly average prices for lead in Montreal for the past six years are given in the following table:—

Monthly Average Prices of Pig Lead at Montreal.*

(Value in cents per pound.)

Month.	1909.	1910.	1911.	1912.	1913.	1914.
January	3·35	3·48	3·31	3·93	4·32	4·78
February	3·38	3·40	3·32	3·97	4·18	4·73
March	3·42	3·34	3·34	4·03	4·05	4·57
April	3·35	3·21	3·26	4·10	4·42	4·41
May	3·26	3·13	3·20	4·08	4·66	4·54
June	3·23	3·15	3·27	4·34	4·98	4·55
July	3·12	3·13	3·33	4·57	4·93	4·49
August	3·08	3·11	3·45	4·84	5·02	4·48
September	3·14	3·11	3·63	5·47	5·02	4·42
October	3·26	3·23	3·77	5·07	4·99	4·07
November	3·28	3·31	3·93	4·53	4·82	4·29
December	3·34	3·35	3·95	4·55	4·52	4·41
Average	3·268	3·246	3·480	4·467	4·659	4·479

*Producers' prices for car-load quantities ex cars Montreal as furnished by Messrs. Thos. Robertson & Co., Ltd., of Montreal.

The average prices of lead in New York as quoted by the "Engineering and Mining Journal," are shown in the following table:—

Monthly Average Prices of Lead in New York.

(Values in cents per pound.)

Month.	1904.	1905.	1906.	1907.	1908.	1909.	1910.	1911.	1912.	1913.	1914.
January	4·347	4·552	5·600	6·000	3·691	4·175	4·700	4·483	4·435	4·321	4·111
February	4·375	4·450	5·464	6·000	3·725	4·018	4·613	4·440	4·026	4·325	4·048
March	4·475	4·470	5·350	6·000	3·838	3·986	4·459	4·394	4·073	4·327	3·970
April	4·475	4·500	5·404	6·000	3·993	4·168	4·376	4·412	4·200	4·381	3·810
May	4·423	4·500	5·685	6·000	4·253	4·287	4·315	4·373	4·194	4·342	3·900
June	4·196	4·500	5·750	5·760	4·466	4·350	4·343	4·435	4·392	4·325	3·900
July	4·192	4·524	5·750	5·288	4·447	4·321	4·404	4·499	4·720	4·353	3·891
August	4·111	4·665	5·750	5·250	4·580	4·363	4·400	4·500	4·569	4·624	3·875
September	4·200	4·850	5·750	4·813	4·515	4·342	4·400	4·485	5·048	4·698	3·828
October	4·200	4·850	5·750	4·750	4·351	4·341	4·400	4·265	5·071	4·402	3·528
November	4·200	5·200	5·750	4·376	4·330	4·370	4·442	4·298	4·615	4·293	3·683
December	4·600	5·422	5·900	3·658	4·213	4·560	4·500	4·450	4·303	4·047	3·800
Average	4·309	4·707	5·657	5·325	4·200	4·273	4·446	4·420	4·471	4·370	3·862

The average monthly prices of soft lead in London, England, as published by Julius Matton, of London, were, from 1905 to 1914 inclusive, as follows:—

Average Monthly Prices of Lead in London.

(£ per Long Ton.)

Month.	1905.			1906.			1907.			1908.			1909.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
January	12	17	6	16	17	6	19	16	0	14	10	6	13	3	6
February	12	9	3	16	0	4	19	11	8	14	5	6	13	5	5
March	12	5	11	15	17	9	19	14	6	14	1	4	13	8	8½
April	12	13	2	15	16	6	19	16	7	13	13	10	13	7	0
May	12	15	3	16	13	6	19	17	7	13	2	7	13	5	3
June	13	0	0	16	15	6	20	6	0	12	15	7	13	2	4
July	13	12	2	16	11	7	20	8	2	12	19	6	12	13	3
August	13	19	2	17	1	3	19	0	3	13	9	10½	12	10	6
September	13	19	0	18	4	4	19	17	6	13	3	6	12	15	3
October	14	13	7	19	7	9	18	13	0	13	7	3	13	4	4
November	15	6	9	19	5	6	17	4	11	13	12	2	13	1	4½
December	17	1	0	19	12	6	14	9	4	13	3	6	13	2	11½
Yearly average	13	14	5	17	7	0	19	1	10	13	10	5	13	1	8

Month.	1910.			1911.			1912.			1913.			1914.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
January	13	3	11	13	0	8	15	11	3	17	1	11	18	19	10
February	13	7	3	13	1	11	15	13	9	16	8	5	19	2	8
March	13	2	9	13	2	11	15	19	8	15	19	8	19	2	3
April	12	13	9	12	18	5	16	6	6	17	8	10	17	19	8
May	12	11	8	12	19	2	16	10	2	18	14	3	18	4	8
June	12	13	9	13	5	5	17	11	8	19	10	8	18	13	11
July	12	11	8	13	10	11	18	8	9	19	7	10	18	8	6
August	12	10	10	14	1	4	19	5	8	19	15	8	20	9	9
September	12	12	6	14	15	1	21	9	0	19	14	10	18	16	3
October	13	2	0	15	6	1	20	8	0	19	9	5	17	9	8
November	13	4	6	15	15	5	18	4	7	18	13	9	17	19	9
December	13	3	9	15	13	4	18	1	6	17	8	8	18	18	6
Yearly average	12	19	0	13	19	3	17	15	11	18	6	2	18	13	9

The exports of lead contained in ore and concentrates during the calendar year 1914 were 246,100 pounds valued at $2,681 against 329,960 pounds valued at $9,136 in 1913.

The exports of pig lead in 1914 amounted to 510,573 pounds valued at $19,507. The following tables give the details of exports from 1909 to 1914 and the total exports of lead since 1873 to 1914:—

Exports of Lead, 1909 to 1914.

	Lead in ore, concentrates, etc.		Pig lead.	
	Lbs.	Value.	Lbs.	Value.
		$		$
1909.				
To United States	6,096,852	126,478	280	8
To other countries	129,216	6,100	11,301,680	361,056
Total	6,226,068	132,578	11,301,960	361,064
1910.				
To United States	46,800	1,308	59,605	2,295
To other countries	.....	.....	7,652,648	245,879
Total	46,800	1,308	7,712,253	248,174
1911.				
To United States	65,100	1,826	71,961	2,806
To other countries	.....	.....	.....	.....
Total	65,100	1,826	71,961	2,806
1912.				
To United States	299,240	8,193	.....	.....
To other countries	.....	.....	.....	.....
Total	299,240	8,193	.....	.....
1913.				
To United States	329,960	9,136	.....	.....
To other countries	.....	.....	.....	.....
Total	329,960	9,136	.....	.....
1914.				
To United States	246,100	2,681	510,573	19,507
To other countries	.....	.....	.....	.....
Total	246,100	2,681	510,573	19,507

The annual exports of lead since 1873 are shown in the following table:—

Exports of Lead, 1873 to 1914.

Calendar Year.	Lbs.	Value.	Calendar Year.	Lbs.	Value.
		$			$
1873	.....	1,993	1894	5,792,700	144,509
1874	.....	127	1895	23,075,892	435,071
1875	.....	7,510	1896	26,480,320	462,095
1876	.....	66	1897	43,802,697	925,144
1877	.....	720	1898	37,375,678	885,485
1878	.....	.....	1899	15,799,518	466,950
1879	.....	230	1900	57,642,029	1,917,690
1880	.....	.....	1901	45,590,995	1,804,687
1881	.....	.....	1902	17,761,484	457,170
1882	.....	32	1903	18,624,303	426,466
1883	.....	5	1904	25,868,823	559,461
1884	.....	36	1905	41,657,403	1,046,541
1885	.....	.....	1906	21,436,022	736,007
1886	.....	.....	1907	25,591,883	1,029,898
1887	.....	724	1908	18,454,594	622,454
1888	.....	18	1909	17,528,028	493,642
1889	.....	18	1910	7,759,053	249,482
1890	.....	.....	1911	137,061	4,632
1891	.....	5,000	1912	299,240	8,193
1892	.....	2,509	1913	329,960	9,136
1893	.....	3,099	1914	756,673	22,188

The production of lead as already shown was in 1914, 18,169 tons, while the exports were 378 tons, leaving a balance of 17,791 tons, as the consumption of Canadian lead.

The imports of lead in 1914 amounted to 10,924 tons valued at $1,042,538 against 10,884 tons valued at $1,215,433 in 1913. There was included herein certain manufactures of lead valued at $99,285 in 1914 and at $155,178 in 1913 for which no equivalent quantity is given.

Thus it will be found that the consumption of lead in 1914 exceeded 29,000 tons, and was about one thousand less than in 1913.

The principal imports of lead during 1912, 1913, and 1914 were as follows:—

Imports of Lead 1912, 1913, and 1914.

	Calendar year 1912.		Calendar year 1913.		Calendar year 1914.	
	Tons.	Value.	Tons.	Value.	Tons.	Value.
		$		$		$
Old scrap, pig, and block	14,089	940,583	5,600	464,117	7,722	590,557
Bars and sheets	961	93,702	747	62,527	481	41,244
Pipe	344	32,423	233	21,679	283	26,282
Shot and bullets	239	23,163	215	19,582	90	10,542
Manufactures of lead	.....	144,571	.....	155,178	.....	99,285
Tea lead	1,606	167,716	1,737	217,009	844	108,097
Litharge	1,296	113,941	500	50,734	543	52,525
Total	18,535	1,516,099	9,032	990,826	9,963	928,532
Metallic lead contained in imported lead pigments	2,345	290,122	1,852	224,607	961	114,006
	20,880	1,806,221	10,884	1,215,433	10,924	1,042,538

Details of the annual imports since 1880 are given in the following tables:—

Imports of Lead in Pigs, Bars, Sheets, etc.

Fiscal Year.	Old, scrap, and pig.		Average price.	Bars, blocks, sheets.		Average price.	Total.	
	Cwt.	Value.		Cwt.	Value.		Cwt.	Value.
		$	$ cts.		$	$ cts.		$
1880							30,298	124,117
1881	16,236	56,919	3 51	18,222	70,744	3 88	34,458	127,663
1882	36,655	120,870	3 30	10,540	35,728	3 39	47,195	156,598
1883	48,680	148,759	3 06	8,591	28,785	3 35	57,371	177,544
1884	39,409	103,413	2 62	9,704	28,458	2 93	49,113	131,871
1885	36,106	87,038	2 41	9,362	24,396	2 61	45,468	111,434
1886	39,945	110,947	2 78	9,793	28,948	2 96	49,738	139,895
1887	61,160	173,477	2 84	14,153	41,746	2 95	75,313	215,223
1888	68,678	196,845	2 87	14,957	45,900	3 06	83,635	242,745
1889	74,223	213,132	2 87	14,173	43,482	3 07	88,396	256,614
1890	101,197	283,096	2 80	19,083	59,484	3 12	120,280	342,580
1891	86,382	243,033	2 81	15,646	48,220	3 08	102,028	291,253
1892	97,375	254,384	2 61	11,299	32,368	2 86	108,674	286,752
1893	94,485	215,521	2 28	12,403	32,286	2 60	106,888	247,807
1894	70,223	149,440	2 13	8,486	20,451	2 41	78,709	169,891
1895	67,261	139,290	2 07	6,739	16,315	2 42	74,000	155,605
1896	72,433	173,162	2 39	8,575	23,169	2 70	81,008	196,331
1897	65,279	158,381	2 43	10,516	29,175	2 77	75,795	187,556
	Old, scrap, pig, and block.*			Bars, and sheets.†			Total.	
1898	88,420	260,779	2 95	22,214	39,041	1 76	110,634	299,820
1899	114,659	283,432	2 47	44,796	39,833	0 89	159,455	323,265
1900	62,361	207,819	3 33	15,493	53,506	3 45	77,854	251,325
1901	(a) 85,321	97,011	1 14	16,295	78,316	4 81	101,616	175,327
1902	(a) 122,279	104,672	0 86	18,596	49,261	2 65	140,875	153,933
1903	(a) 98,530	67,821	0 69	11,535	35,398	3 07	110,065	103,219
1904	(a) 94,602	121,165	1 28	14,102	39,644	2 81	108,704	160,809
1905	(a) 57,074	133,775	2 34	17,792	51,972	2 92	74,866	185,747
1906	82,729	271,105	3 28	16,106	57,185	3 55	98,835	328,290
1907	79,575	277,470	3 49	13,710	56,630	4 13	93,285	334,100
1908	63,921	284,604	4 45	17,253	75,186	4 36	81,174	359,790
1909	50,110	151,173	3 02	13,754	46,093	3 35	63,864	197,266
Calendar year.								
1910	120,591	346,516	2 87	17,697	45,674	2 58	138,288	392,190
1911	199,774	495,923	2 48	30,837	55,458	1 80	230,611	551,381
1912	281,787	940,583	3 34	19,212	93,702	4 88	300,999	1,034,285
1913	111,995	464,117	4 14	14,944	62,527	4 18	126,939	526,644
1914	154,441	590,557	3 82	9,615	41,244	4 29	164,056	631,801

*Duty 15 per cent.
†Duty 25 per cent.
(a) Includes Canadian lead ore sent to the United States for refining, imported at price of refining only.

Imports of Lead Manufactures.

Calendar Year.	Pipe Lead.		Shot and Bullets.		Tea Lead.		Other manufactures of lead.
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Value.
		$		$		$	$
1910	403,012	15,365	6,903	311	2,371,136	117,399	107,688
1911	512,737	19,426	8,912	1,053	2,688,211	134,160	108,012
1912	688,383	32,423	477,047	23,163	3,212,861	167,716	144,571
1913	466,753	21,679	429,656	19,582	3,475,171	217,009	155,178
1914	565,762	26,282	180,639	10,542	1,687,029	108,097	99,285

Imports of Litharge.

Fiscal Year.	Cwt.	Value.	Fiscal Year.	Cwt.	Value.	Fiscal Year.	Cwt.	Value.
1880	3,041	$14,334	1893	7,685	$24,401	1906	10,165	$ 39,836
1881	6,126	22,129	1894	38,547	28,685	1907	11,311	49,183
1882	4,900	16,651	1895	11,955	32,953	1908	19,052	90,785
1883	1,532	6,173	1896	10,710	32,817	1909	12,117	43,597
1884	5,235	18,132	1897	12,028	34,538	Calendar year:—		
1885	4,990	16,156	1898	10,446	32,904			
1886	4,928	16,003	1899	9,530	32,518	1910	15,541	56,049
1887	6,397	21,865	1900	9,139	29,176	1911	17,979	65,743
1888	7,010	23,808	1901	11,132	51,944	1912	25,925	113,941
1889	8,089	31,082	1902	13,002	47,021	1913	10,009	50,734
1890	9,453	31,401	1903	13,921	47,761	1914	10,863	52,525
1891	7,979	27,613	1904	9,894	32,633			
1892	10,384	34,343	1905	17,865	57,736			

Imports of White and Red Lead in 1912, 1913, and 1914.

	Calendar Year 1912.		Calendar Year 1913.		Calendar Year 1914.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
		$		$		$
Lead, white, dry	2,499,725	138,627	1,162,082	61,424	363,136	20,279
Lead, white, ground in oil	714,362	37,916	1,057,683	59,444	546,961	31,654
Lead, red, dry and orange mineral	2,539,767	113,579	2,389,460	103,739	1,451,264	62,073
	5,753,854	290,122	4,609,225	224,607	2,361,361	114,006

Imports of Dry White and Red Lead and Orange Mineral, and White Lead Ground in Oil.

Fiscal Year.	Lbs.	Value.	Average price.	Fiscal Year.	Lbs.	Value.	Average price.
		$	Cts.			$	Cts.
1885.....	5,540,753	198,913	3·69	1901.....	10,241,601	461,368	4·50
1886.....	6,703,077	213,258	3·18	1902.....	15,584,164	603,582	3·87
1887.....	6,998,820	233,725	3·34	1903.....	19,208,786	758,371	3·95
1888.....	6,361,334	216,654	3·41	1904.....	16,925,585	662,098	3·91
1889.....	7,066,465	267,236	3·78	1905.....	17,376,588	638,381	3·67
1890.....	10,859,672	381,959	3·52	1906.....	10,412,891	417,444	4·01
1891.....	8,560,615	337,407	3·94	1907.....	5,956,626	290,629	4·88
1892.....	10,288,766	351,686	3·42	1908.....	7,830,860	420,537	5·37
1893.....	10,865,183	364,680	3·36	1909.....	4,687,416	195,258	4·17
1894.....	10,958,170	353,053	3·22	Calendar year:			
1895.....	8,780,052	282,353	3·22	1910.....	3,769,927	144,741	3·84
1896.....	11,711,496	367,569	3·14	1911.....	4,072,433	169,501	4·16
1897.....	10,310,463	347,539	3·37	1912.....	5,753,854	290,112	5·04
1898.....	12,682,808	448,659	3·54	1913.....	4,609,225	224,607	4·87
1899.....	14,507,945	514,842	3·55	1914.....	2,361,361	114,006	4·83
1900.....	14,679,920	634,492	4·32				

British Columbia.

Almost all of the lead ore mined in British Columbia is smelted and refined at Trail, B.C.

The production of refined lead together with a small quantity of lead in ores exported amounted, in 1914, to 36,289,845 pounds as against 37,626,899 pounds in 1913, a decrease of about 8·5 per cent.

According to the Provincial Department of Mines, 50,625,048 pounds of lead were contained in the lead ores shipped to the smelters during 1914.

The record given in the following table for the year 1909 to 1914 inclusive represents the recovery of lead at smelter or refinery as distinguished from the figures given for the same years in the table next succeeding, which indicate the quantities of lead contained in ore sent to the smelters.

British Columbia:—Production of Lead.

Calendar Year	Lbs.	Value.	Price per lb.	Calendar Year.	Lbs.	Value.	Price per lb.
		$	Cts.			$	Cts.
1887.....	204,800	9,216	4·40	1901.....	51,582,906	2,235,603	4·334
1888.....	674,500	29,813	4·42	1902.....	22,536,381	917,005	4·069
1889.....	165,100	6,488	3·93	1903.....	18,089,283	766,443	4·237
1890.....	Nil.	.....		1904.....	36,646,244	1,579,086	4·309
1891.....	Nil.	.....		1905.....	56,580,703	2,663,254	4·707
1892.....	808,420	33,064	4·09	1906.....	52,408,217	2,964,733	5·657
1893.....	2,131,092	79,490	3·73	1907.....	47,738,703	2,542,086	5·325
1894.....	5,703,222	187,636	3·29	1908.....	43,195,733	1,814,221	4·200
1895.....	16,461,794	531,716	3·23	1909.....	45,857,424	1,692,139	*3·690
1896.....	24,199,977	721,159	2·98	1910.....	32,987,508	1,216,249	*3·687
1897.....	38,841,135	1,390,513	3·58	1911.....	23,784,969	827,717	†3·480
1898.....	31,693,559	1,198,017	3·78	1912.....	35,763,476	1,597,554	†4·467
1899.....	21,862,436	977,250	4·47	1913.....	37,626,899	1,753,037	†4·659
1900.....	62,158,621	2,760,031	4·37	1914.....	36,337,765	1,627,568	†4·479

*Average prices at Toronto for years 1909 and 1910. For previous years average prices at New York.
†Average price at Montreal. Quotations furnished by Messrs, Thos. Robertson & Co., Montreal, Que.

British Columbia:—Production of Lead by Districts.*

Shipments of Lead contained in Ore from Mines.

	1908.	1909.	1910.	1911.	1912.	1913.	1914.
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Cassiar	.....	.....	1,695	238,578	41,512	6,579	.....
East Kootenay—							
Fort Steele	30,204,788	27,004,528	23,874,562	17,158,069	18,238,238	18,525,083	24,863,105
Other districts	358,270	18,724	66,010	.....	2,249,237	2,495,355	.....
West Kootenay—							
Ainsworth	4,790,216	10,298,343	2,558,353	289,009	4,863,894	9,027,861	8,069,525
Nelson	345,424	1,097,069	1,245,844	1,928,836	2,293,000	1,936,418	2,004,436
Slocan	6,572,268	4,976,199	6,406,358	6,705,571	16,944,811	22,648,766	15,233,910
Other districts	903,552	979,916	470,241	522,615	240,762	521,771	128,912
Yale	21,215	21,567	35,683	29,719	.....	45,982	1,678
Cariboo—							
Omineca	.....	.....	.....	.....	.....	156,862	323,482
	43,195,733	44,396,346	34,658,746	26,872,397	44,871,454	55,364,677	50,625,048

*From the Report of the Minister of Mines, B.C.

It will be noted that the Fort Steele district produced over 49 per cent of the total; Slocan 30 per cent; Ainsworth nearly 16 per cent, and Nelson nearly 4 per cent. The shipments from New Hazelton were over double those of the previous year.

Yukon.

A few small shipments of lead-bearing ores were made from the Yukon in 1914. Although not important contributors to the tonnage of lead produced, they draw attention to the possibilities of the Territory, where as yet little lode mining has been done.

Some activity was shown in the Windy Arm section, and also near Minto Bridge, Duncan Mining Division.

During the last few years several properties have been developed and have shipped occasionally, but they have been handicapped by the high cost of development and supplies and by the heavy transportation charges.

Bounties.—In 1901, and again in 1903, the Dominion Government, to encourage the lead industry, authorized the payment of a bounty on the production of lead. The Act of 1903 provided for the payment, under certain restrictions, of 75 cents per hundred pounds on lead contained in ore mined and smelted in Canada, provided that when the standard price of pig lead in London, England, exceeded £12 10s. per ton of 2,240 pounds, such bounty should be reduced proportionately by the amount of such excess. Thus, when the price of lead in London rose to £16, or over, per long ton, the bounty ceased. As the price of lead exceeded £16 sterling on the London market for a considerable period during 1906 and 1907 the bounty paid during those years was comparatively small.

The Act of 1903 provided that payment of bounty should cease on June 30, 1908, and as only a portion of the funds provided had been used, a new Act was passed in the latter year providing for further bounty payments at

the rate of 75 cents per hundred pounds, or approximately £3 10s. per ton of 2,240 pounds, subject to the restriction that when the price of lead in London exceeds £14 10s. the bounty shall be reduced by such excess.

The Act of 1908 expired in 1913, and a new Act was passed extending the bounty for a further period of five years, with the same provisions. The text of this Act follows:—

3-4 GEORGE V, CHAPTER 29.

An Act Respecting the Payment of Bounties on Lead Contained in Lead-bearing Ores Mined in Canada.

(*Assented to June 6, 1913.*)

Whereas, under the provisions of chapter 31 of the statutes of 1903 and of chapter 43 of the statutes of 1908, as amended by chapter 37 of the statutes of 1910, the amount of bounty payable on lead contained in lead-bearing ores mined in Canada was not to exceed two million four hundred and fifty thousand dollars; and whereas, the time within which the said amount is payable for the purpose aforesaid expires, under the provisions of the said chapter 43, on the thirtieth day of June, nineteen hundred and thirteen, and there will then remain unexpended of the said sum approximately six hundred thousand dollars: Therefore His Majesty, by and with the advice and consent of the Senate and House of Commons of Canada, enacts as follows:—

1. This Act may be cited as *The Lead Bounties Act, 1913.*

2. The Governor in Council may authorize the payment of a bounty of seventy-five cents per one hundred pounds on lead contained in lead-bearing ores mined in Canada, on and after the first day of July, nineteen hundred and thirteen, such bounty to be paid to the producer or vendor of such ores: Provided that the sum to be paid as such bounty shall not exceed two hundred and fifty thousand dollars in any year ending on the thirtieth day of June; provided also that when it appears to the satisfaction of the Minister charged with the administration of this Act that the standard price of pig lead in London, England, exceeds fourteen pounds ten shillings sterling per ton of two thousand two hundred and forty pounds, such bounty shall be reduced by the amount of such excess.

2. The total amount of bounty payable under the provisions of chapter 31 of the statutes of 1903, chapter 43 of the statutes of 1908 (as amended by chapter 37 of the statutes of 1910), and of this Act, shall not exceed two million four hundred and fifty thousand dollars.

3. Payment of the said bounty may be made from time to time to the extent of sixty per cent upon smelter returns showing that the ore has been delivered for smelting at a smelter in Canada. The remaining forty

per cent may be paid at the close of the fiscal year, upon evidence that all such ore has been smelted in Canada.

2. If at the close of any year it appears that during the year the quantity of lead produced on which the bounty is authorized, exceeds sixteen thousand six hundred and sixty-seven tons of two thousand pounds, the rate of bounty shall be reduced to such sum as will bring the payments for the year within the limit mentioned in section 2 of this Act.

4. If at any time it appears to the satisfaction of the Governor in Council that the charges for transportation and treatment of lead ores in Canada are excessive, or that there is any discrimination which prevents the smelting of such ores in Canada on fair and reasonable terms, the Governor in Council may authorize the payment of bounty at such reduced rates as he deems just, on the lead contained in such ores mined in Canada, and exported for treatment abroad.

5. If at any time it appears to the satisfaction of the Governor in Council that products of lead are manufactured in Canada direct from lead ores mined in Canada without the intervention of the smelting process, the Governor in Council may make such provision as he deems equitable to extend the benefits of this act to the producers of such ores.

6. The Governor in Council may make regulations for carrying out the intention of this Act.

7. The bounties payable under the provisions of this Act shall cease and determine on the thirtieth day of June, one thousand nine hundred and eighteen.

The regulations under which the Act is administered are as follows:

1. The Minister of Trade and Commerce is charged with the administration of this Act.

2. All producers or vendors of lead-bearing ores who desire to avail themselves of the provisions of the Act above quoted, and to be paid bounty, shall, before making claim for such bounty, notify the Minister of their intention to claim under the provisions of the Act, and shall declare the name of the mine producing such ore, its situation, the names of the president, secretary, and manager, as well as the name of the official authorized to make claim. Notice shall be given the Minister of changes in ownership and management. Where the bounty is claimed by lessees, the consent of the owner shall be shown.

3. All claims for the payment of bounty shall be made and substantiated under the oath of the manager of the mine or of the official authorized to make the claim.

4. Claims may be made monthly, that is, immediately after the close of each calendar month, and be in such form, and contain such evidence, as may seem to the Minister, from time to time, necessary.

5. No claims made otherwise than in conformity with these regulations, and in form required by the Minister, shall be recognized, allowed or paid by the Minister.

6. The smelting of all such ore shall at all times be under the supervision of the officers of the Department of Trade and Commerce, appointed or detailed for the purpose.

7. The supervising officer may at any time demand and receive a portion of the floor sample of any ore delivered at the smelter for smelting purposes.

8. The rate of bounty shall be computed according to the London quotation upon the day the ore is taken into stock at the smelter, such day not to be later than the last day of the calendar month during which the ore was unloaded from cars at the smelter grounds.

9. The lead contents of ore shall, for the purpose of this Act, be ascertained by fire assay, as used in ordinary commercial assaying.

10. The books of the claimants, and those of the smelting works at which the ore is smelted, shall be at all times open to the inspection of such supervising officer, and of any officer of the Department of Trade and Commerce who may be detailed by the Minister for the purpose.

11. All claims shall be substantiated by the oath of the Manager of the smelting works at which the ores are smelted, and shall be verified and certified to by the officer of the Department of Trade and Commerce appointed to supervise the smelting at the works where it has been carried on.

12. The cost of the supervision shall be paid by the claimants and may be deducted pro rata according to the quantity smelted during the fiscal year, from the amount payable to such claimants at the close of each fiscal year.

Throughout nearly the whole of 1914 the London price for lead was above that at which the Dominion Government bounty on lead ceases to be paid.

The Bounties paid on lead since 1899 are given in the following table:—

Statement of Bounties Paid on Lead during the Fiscal Years 1899 to 1915.

Year ending.	Bounty paid.	Year ending.	Bounty paid.
	$		$
June 30, 1899	76,665	March 31, 1907 (9 mos.)	1,995
" 30, 1900	43,335	" 31, 1908	51,001
" 30, 1901	30,000	" 31, 1909	307,433
" 30, 1902	.....	" 31, 1910	340,542
" 30, 1903	4,380	" 31, 1911	248,534
" 30, 1904	195,627	" 31, 1912	179,288
" 30, 1905	330,645	" 31, 1913	68,065
" 30, 1906	90,196	" 31, 1914	8,179
		" 31, 1915	3,217
		Total	1,979,102

MERCURY.

There has been no production of mercury since 1897. The small production reported in 1895 and 1897 was derived from the deposits at the western end of Kamloops lake, B.C. These deposits consist of quartz veins containing pockets of cinnabar in a zone of decomposed Tertiary volcanic rocks.

Elsewhere in Canada mercury has been reported as occurring also in ores of the Cobalt district, and in the neighbourhood of Field, B.C., and Sechart on the west coast of Vancouver island.

The imports of mercury during the calendar year 1914 were 204,229 pounds valued at $97,449.

Production of Mercury.

Calendar Year.	Flasks. (76½ lbs.)	Price per flask.	Value.
		$ cts.	$
1895	71	33 00	2,343
1896	58	33 44	1,940
1897	9	36 00	324

Imports of Mercury.

Fiscal Year.	Lbs.	Value.	Fiscal Year.	Lbs.	Value.	Fiscal Year.	Lbs.	Value.
		$			$			$
1882	2,443	965	1893	50,711	22,998	1904	151,107	80,658
1883	7,410	2,991	1894	36,914	14,483	1905	103,330	48,412
1884	5,848	2,441	1895	63,732	25,703	1906	150,364	69,505
1885	14,490	4,781	1896	77,869	32,353	1907 (9 mos.)	98,368	45,662
1886	13,316	7,142	1897	76,058	33,534	1908	178,411	76,549
1887	18,409	10,618	1898	59,759	36,425	1909	92,220	46,217
1888	27,951	14,943	1899	103,017	51,695	Calendar year:		
1889	22,931	11,844	1900	85,342	51,987	1910	107,888	63,450
1890	15,912	7,677	1901	140,610	94,564	1911	118,336	67,416
1891	29,775	20,223	1902	97,283	56,615	1912	137,474	72,171
1892	30,936	15,038	1903	164,968	91,625	1913	219,442	109,493
						1914	204,229	97,449

MOLYBDENUM.

The commercial production of molybdenum in Canada has been practically negligible, nevertheless the mineral has been found in numerous localities and in many of these in sufficient quantity to make its possible recovery a question of considerable interest, an interest which doubtless has been greatly stimulated by the high price which the ore, concentrated to 85 or 90 per cent molybdenite (MoS_2), has commanded.

During 1913 and 1914 some work was done on a number of properties in Ontario, Quebec, and British Columbia.

Shipments were made during 1914 from Ontario and British Columbia. The Ontario shipments consisted of one-half ton of molybdenite hand picked from the ore, while from British Columbia 16 tons[1] of ore were reported as shipped to Denver, Col., where it was concentrated, producing 2,814 pounds of concentrates for which 20 cents a pound was received. The total shipments in the form of molybdenite were 3,814 pounds valued at $2,063.

In 1902, about 6,500 pounds of molybdenum ore valued at $400, were reported as having been taken from a deposit in the township of Laxton, county of Victoria, by John Webber of Toronto.

In 1903, Mr. A. W. Chisholm of Kingston, reported the shipment to the United States, and elsewhere, of 85 tons of molybdenum ore valued at $1,275, culled from about 500 or 600 tons of rock taken from the east half of lot 5, concession XIV, Sheffield township, Addington county.

Quebec:—During the year 1914, some development work was done by Mr. Charles Higgerty, of Ottawa, on a deposit of molybdenite situated in Eardley township, on lot 6, range XI. A vein is said to have been uncovered for a distance of 200 feet, and a few hundred pounds of molybdenite is said to have been produced from preliminary work.

The Aldfield Mineral Syndicate did a little work on lots 1 and 2, range III of Aldfield township.

Ontario:—The same Syndicate did a considerable amount of development on lots 16 and 17, concession XI of Brougham township, Renfrew county. A shipment of half a ton of cobbed ore valued at $1,500 was reported.

The Algunican Development Co., Ltd., was preparing to operate at Mount St. Patrick in the same district, Brougham township, concession XI, lot 8. Machinery had been purchased and the Company was preparing to install a mill with an output of 1,000 lbs. of concentrates per day when the declaration of war terminated negotiations.

The property of Mr. James Legree was under option to an American Syndicate.

[1] The Gold Commissioner of the district reports the shipment as 23½ tons.

In the county of Haliburton, lot 11, concession X of Cardiff township, a property known as the "Treasure Hill" mine, was worked. Some ore was recovered and concentrated by special process, but no record of tonnage was obtained.

British Columbia:—The molybdenite claims of Lost Creek, 14 miles from Salmo, are owned by Messrs. Ross, Bennett and Benson, and have been operated under lease by Bell Bros. of Salmo. The Gold Commission reports[1]:—

"Open-cuts have been run in on the dyke at intervals for a distance of 1,400 feet and ore encountered in all."

"In August a car of 23½ tons of the ore was shipped to the Henry E. Wood Ore Testing Company, Denver, Colorado. This, for testing purposes, was divided into three different lots secured from separate portions of the dyke: No. 1, of 822 lb., going 30·175 per cent; No. 2, 29,895 lbs., 10·25 per cent.; and No. 3, 17,119 lbs., 9·33 per cent. At 20 cents a pound, the rate it was agreed to sell for early in the year, the car netted the owners $815 clear of the cost of treatment and transportation."

"Another car of 25½ tons is now about ready for shipment at Salmo, and a table test shows same to run about 14 per cent. The owners expect to receive 70 cents a pound on this shipment, having already had several bids on same from different points in the United States."

"There is estimated to be about 1,000 tons of lower-grade ore on the dump at the present time."

Prices:—There has been a small annual production of molybdenite in Australia since 1900 and previous to 1914 the price varied generally between $400 and $600 per ton for ore containing a minimum of 85 per cent MoS_2.

In January of 1914 according to the Engineering and Mining Journal of New York "Such ore would be worth from $8 to $10 per unit, providing the ore be free from copper, arsenic, bismuth and tungsten. Any one of these elements will reduce the price of the ore. For instance: 90 per cent ore free from these elements is at present worth $12.50 per unit, practically twice the price of tungsten ore. Lower grade ores are worth much less."

In July the London Mining Journal on the 25th inst., quoted the London market at from £500 to £550 per ton for first grade ore.

In September molybdenite containing a minimum of 90 per cent MoS_2 was quoted in London at from 115s. to 120s. per unit (120s. per unit = £540 per ton for 90 per cent ore.)

During December as high as 135s. per unit was quoted (= £607 per gross ton or $1.32 per pound for 90 per cent ore).

A special Report[2] describing the principal Canadian molybdenite occurrences discovered prior to 1910 has been published by the Mines Branch. The Department through its ore testing division has also under

[1] "Annual Report of the Minister of Mines, 1914, in the Province of British Columbia." pp. 328-329.
[2] No. 93, "Report on the Molybdenum Ores of Canada," by T. L. Walker, Ph.D., Mines Branch, Department of Mines, Ottawa, 1911.

taken an investigation of the concentration of these ores. This work is still in progress although a preliminary Report[1] has already been published in the Summary Report of the Mines Branch for 1913.

The following firms are believed to be purchasers of molybdenite; The Electro Metallurgical Company of America, New York; Primos Chemical Company, Primos, Penn.; DeGobia and Atkins, San Francisco, Cal.; Geo. G. Blackwood Sons & Co., The Albany, Liverpool, England; W. C. Willis & Co., 90 Mitchell St., Glasgow; J. Cameron, Swan & Co., 4 St. Nicholas Bldgs., Newcastle-on-Tyne, England; Sir A. G. Armstrong, Whitworth & Co., 8 Great George St., Westminster, London, England.

The annual production of molybdenite in Australia (Queensland and New South Wales) is shown in the accompanying table:—

Annual Production of Molybdenite in Australia.

Year.	Queensland (a).		New South Wales (b).	
	Long tons.	£	Long tons.	£
1900	11·00	561	.....	.....
1901	*26·00	1,609	.....	.....
1902	*41·00	5,502	15·00	1,841
1903	*24·00	2,100	29·00	4,458
1904	21·65	2,746	25·25	2·726
1905	*84·75	10,454	19·40	2,507
1906	*129·15	17,034	32·65	4,798
1907	*17·15	9,660	21·65	3,564
1908	*168·85	14,686	.....	.....
1909	*156·75	13,820	.....	.....
1910	*139·90	16,914	.....	.....
1911	*228·50	24,842	.....	.....
1912	*197·50	19,261	56·55	3,706
1913	66·00	.....	78·80	6,802
1914 (c)	78·00	38,190	61·00	11,451

[1] No. 285, "Summary Report, Mines Branch, Department of Mines," 1913, pp. 66-71.
(a) From the Annual Report of the Dept. of Mines, New South Wales.
(b) From the Annual Report of the Under-Secy. for Mines, Queensland.
(c) From the London Mining Journal, Oct. 16th, 1915.
*Includes bismuth and wolfram.

NICKEL.

The industry based on the mining and metallurgical treatment of the nickel-copper ores of the Sudbury district, Ontario, ranks among the most important of Canada. Not only is there a considerable production of copper but the nickel, which is the most important product, supplies a very large proportion of the world's consumption of the metal.

The past three years' development has very largely increased the known ore reserves of the district. These nickel-copper deposits have been the subject of special reports by the Mines Branch and Geological Survey at Ottawa, and by the Ontario Bureau of Mines, Toronto.[1]

The production of nickel ore, very active during the first six months of 1914, was checked on the declaration of war. Towards the end of the year the output was greatly increased, due no doubt to the great demand for nickel for war supplies, so that the production in 1914 was but little less than that of 1913, when the production of ore and its reduction to a Bessemer matte was the highest on record.

There were mined in 1914, 1,000,364 tons of ore, and smelted 947,053 tons; from which were produced 46,396 tons of Bessemer matte, carrying approximately 22,759 tons of nickel and 14,448 tons of copper, the net value of the matte being $7,187,031. Thus, in 1914, the matte showed an increase in copper content and a falling off in nickel due to the great increase in production of ores by the Mond Nickel Co., and their reduction in the Coniston Smelter and the curtailment of the Canadian Copper Company's output of ores which are relatively lower in copper content.

The nickel-copper ore is reduced in smelters and converters to a Bessemer matte containing from 77 to 82 per cent of the combined metals, having averaged for the past year 49·0 per cent nickel and 31·1 per cent copper, against 52·7 per cent nickel and 27·4 per cent copper in 1913.

For the production of monel metal, a special matte is produced with contents of about 22 per cent copper and 58 per cent nickel, which is included in the total given above. Monel metal is produced directly from this matte without the intermediate refining of either the nickel or the copper.

[1] Report on Nickel and Copper Deposits of Sudbury, Ont., by A. E. Barlow, Geological Survey, Canada. No. 873, 1901.
The Sudbury Nickel Region, by A. P. Coleman, Ph.D., Bureau of Mines, Vol. XIV, Part III, 1904.
The Nickel Industry, with special reference to the Sudbury Region, Ont. Report by A. P. Coleman, Ph.D., Mines Branch, Ottawa, No. 170, 1913.

The following were the aggregate results of the production and treatment of nickel-copper ores in Ontario during the past four years:—

	1911. Tons of 2,000 lbs.	1912. Tons of 2,000 lbs.	1913. Tons of 2,000 lbs.	1914. Tons of 2,000 lbs.
Ore mined	612,511	737,726	784,697	1,000,364
Ore smelted	610,834	725,065	823,403	947,053
Bessemer matte produced	32,607	41,925	47,150	46,396
Copper content of matte	8,966	11,116	12,938	14,448
Nickel " "	17,049	22,421	24,838	22,759
Spot value of matte	$4,945,592	$6,303,102	$7,076,945	$7,189,031
Wages paid miners and smelters	$1,830,526	$2,626,609	$3,291,956	$3,096,911
Men employed	1,885	3,110	3,486	3,379

The annual production of nickel since 1889 is shown in the following table:—

Annual Production of Nickel.

Calendar Year.	Pounds of nickel in matte shipped.	Average price per lb.	Value.	Calendar Year.	Pounds of nickel in matte shipped.	Average price per lb.	Value.
		Cts.	$			Cts.	$
1889	*830,477	60	498,286	1902	10,693,410	47	5,025,903
1890	1,435,742	65	933,232	1903	12,505,510	40	5,002,204
1891	4,035,347	60	2,421,208	1904	10,547,883	40	4,219,153
1892	2,413,717	58	1,399,956	1905	18,876,315	40	7,550,526
1893	3,982,982	52	2,071,151	1906	21,490,955	42	8,948,834
1894	4,907,430	38½	1,870,958	1907	21,189,793	45	9,535,407
1895	3,888,525	35	1,360,984	1908	19,143,111	43	8,231,538
1896	3,397,113	35	1,188,990	1909	26,282,991	36	9,461,877
1897	3,997,647	35	1,399,176	1910	37,271,033	30	11,181,310
1898	5,517,690	33	1,820,838	1911	34,098,744	30	10,229,623
1899	5,744,000	36	2,067,840	1912	44,841,542	30	13,452,463
1900	7,080,227	47	3,327,707	1913	49,676,772	30	14,903,032
1901	9,189,047	50	4,594,523	1914	45,517,937	30	13,655,381

*Calculated from shipments made by rail.

The companies engaged in mining and smelting nickel ores are: The Canadian Copper Company, subsidiary to the International Nickel Company, with smelter at Copper Cliff, Ontario, and refinery at Bayonne, New Jersey; the Mond Nickel Company, Coniston, of London, England, with smelter at Coniston, Ont., and refinery at Clydach, Swansea, Wales. The British America Nickel Corporation continued development work. The Alexo mine, on the Porcupine Branch of the Timiskaming and Northern Ontario Railway, was again a producer, shipping nickel-copper ore to the Mond smelter at Coniston.

The above figures of the production of nickel do not include that recovered from the silver-cobalt ores of the Cobalt district. Returns are

received of the recovery as nickel-oxide at Canadian works, but a considerable amount of nickel is contained in ores exported for smelting for which no payment is received by the mines shipping and the amount finally recovered is impossible to ascertain.

The production of nickel-oxide during 1914 was reported as 392,512 pounds.[1]

The total quantity of ore contained in ores shipped from this district has been estimated by the Ontario Bureau of Mines as follows:—

Nickel content of Ores shipped from Cobalt District.

(Estimated by Ontario Bureau of Mines).

Calendar Year.	Ore and concentrates shipped.	Nickel content (estimated.)
	Tons	Tons.
1904	158	14
1905	2,144	75
1906	5,335	160
1907	14,788	370
1908	25,624	612
1909	30,677	766
1910	34,282	604
1911	26,653	392
1912	21,933	429
1913	20,877	377

Prices:—The price of refined nickel in New York during 1914 was quoted at 40 to 45 cents per pound for nickel shot, blocks or plaquettes, and electrolytic nickel 5 cents higher per pound.

The price of nickel in Europe in 1914, as given by London Mining Journal, was, from January until August, £167, 10s. to £171 per long ton. No quotations were given during August, but in September the price started at £185 for the home trade, and was firm for the rest of the month at from £200 to £206 per long ton. In November quotations dropped to £186 (40½ cents per lb.) rising again at the end of December to from £186 to £206 per long ton.

[1] See chapter on "Cobalt."

Statistics of the average yearly prices in Europe, as given by the "Metallgesellschaft" are as follows:—

Yearly Average Prices of Nickel in Europe in Cents per Pound, and Marks per Kilogram.

Year.	Prices in marks. per kilo.	Cents per lb.	Year.	Prices in marks per kilo.	Cents per lb.
1889	4·50	48·6	1902	3·20	34·6
1890	4·50	48·6	1903	3·30	35·6
1891	4·50	48·6	1904	3·30	35·6
1892	4·50	48·6	1905	3·30	35·6
1893	3·80	41·0	1906	3·80	41·0
1894	3·60	38·9	1907	3·50	37·8
1895	2·60	28·1	1908	3·25	35·2
1896	2·50	27·0	1909	3·25	35·2
1897	2·50	27·0	1910	3·25	35·2
1898	2·50	27·0	1911	3·25	35·2
1899	2·50	27·0	1912	3·25	35·2
1900	3·00	32·4	1913	3·25	35·2
1901	3·00	32·4			

As a result of the increased capacity of the Mond Nickel Co's. smelter, the exports of nickel to Great Britain in 1914 were almost double those of 1913. The exports to the United States fell off nearly 20 per cent.

The exports by countries during the past four years and the annual exports since 1890 are shown in the accompanying tables:—

	1911. Lbs.	1912. Lbs.	1913. Lbs.	1914. Lbs.
To Great Britain	5,023,393	5,072,867	5,164,512	10,291,979
To United States	27,596,578	39,148,993	44,224,119	36,015,642
To other countries	.....	.....	70,386	220,706
	32,619,971	44,221,860	49,459,017	46,528,327

Exports of Nickel Contained in Ore, Matte, or Other Product.

Calendar Year.	Value.	Calendar Year.	Lbs.	Value.	Average price.
	$			$	Cts.
1890	89,568	1903	12,699,227	1,116,099	8·78
1891	667,280	1904	11,233,869	1,091,349	9·71
1892	293,149	1905	17,318,059	1,569,693	9·06
1893	629,692	1906	20,653,845	2,042,965	9·89
1894	559,356	1907	19,376,335	2,280,374	11·76
1895	521,783	1908	19,419,893	1,866,624	9·61
1896	658,213	1909	25,616,398	2,676,483	10·45
1897	723,130	1910	36,014,782	4,030,040	11·19
1898	1,019,363	1911	32,619,971	3,676,396	11·27
1899	939,915	1912	44,221,860	4,661,758	10·54
1900	1,031,030	1913	49,459,017	5,195,560	10·50
1901	751,080	1914	46,528,327	5,149,427	11·07
1902	1,007,211				

The imports of nickel are classed with those of nickel-silver and German silver and manufactures of these metals. There is also a considerable import of nickel-plated ware.

The imports of nickel, nickel-silver, German silver, etc.,during 1913 and 1914 have been as follows:—

Imports of Nickel, Nickel-Silver and German Silver, 1913 and 1914.

	1913.		1914.	
	Lbs.	$	Lbs.	$
Nickel, nickel-silver & German silver in ingots or blocks	42,726	14,705	70,564	25,362
Nickel, nickel-silver and German silver in bars and rods and also in strips, sheets or plates	549,765	147,815	549,288	130,065
Manufactures of German, Nevada and nickel-silver, not plated	.....	86,672	.....	83,185

In view of the large export of nickel from Canada to the United States and its refinement in that country, a record of the imports into and exports of nickel from the United States, may be of special interest and is shown below as compiled from the "Foreign Commerce of the United States." The values of the United States exports which are not quoted in the tables, range from 31 to 39 cents per pound, and averaged about 34 cents in 1914.

United States:—Imports and Exports of Nickel.

Imports of Nickel into United States.	1911.	1912.	1913.	1914.
Gross tons of ore and matte.....Tons	23,993	33,101	37,623	29,564
Nickel contents.....Lbs.	29,545,967	42,168,769	47,194,101	35,006,700
Exports of nickel from United States—				
To France.....Lbs.	5,463,358	5,083,947	3,631,858	3,457,157
To Netherlands..... "	9,101,150	7,387,447	6,622,811	855,168
To United Kingdom..... "	7,196,259	8,191,364	8,221,640	10,836,369
To other countries..... "	3,338,819	5,152,258	10,096,779	12,446,458
Total..... "	25,099,586	25,815,016	29,173,088	27,595,152

Bounty on Refined Nickel and Nickel-oxide:—Under the terms of "The Metal Refining Act, 1907" of the Province of Ontario (7 Edward VII, Chap. XIV) a bounty is authorized to be paid on nickel, cobalt, copper, and arsenic under certain conditions and restrictions during a period of five years following the passing of the Act (April, 1907). In March, 1912, the Act was amended to cover a further period of five years.

The sections affecting nickel ore are as follows:—

"The Treasurer of the Province may under the authority of such regulations as may from time to time be made in that behalf by the Lieu-

tenant Governor in Council pay in each year to the refiners of the metals or metal compounds hereinafter specified when refined in the Province from ores raised and mined in the Province, a bounty on each pound of such metal or compound so refined as follows:"—

"Class 1. On refined metallic nickel or on refined oxide of nickel, 6 cents per pound on the free metallic nickel or on the nickel contained in the nickel-oxide, but nickel on which a bounty has already been paid in one form of product shall not be entitled to any further bounty in any other form, and the amount to be paid as bounty on the nickel products herein mentioned is not to exceed in all $60,000 in any one year."

The full text of the Act will be found in the chapter on "Cobalt."

Nickel Production in Other Countries.

New Caledonia.

The only other important producer of nickel ore outside of Canada is the French Colony, New Caledonia. The exports from this source since 1898 have been as follows, in metric tons:—

Exports of Nickel Ore and Matte from New Caledonia.*

Year.	Nickel ore. Metric tons	Year.	Nickel ore. Metric tons	Year.	Nickel ore. Metric tons	Nickel matte. Metric tons.
1898.....	74,614	1904.....	98,655	1909 (*a*).....	86,000	.....
1899.....	103,908	1905.....	125,289	1910 (*b*).....	115,342	768
1900.....	100,319	1906 (*a*).....	118,890	1911 (*b*).....	120,059	2,993
1901.....	132,814	1907 (*a*).....	120,106	1912 (*b*).....	74,314	5,908
1902.....	129,653	1908 (*a*).....	108,000	1913 (*b*).....	93,190	5,893
1903.....	77,360			1914 (*c*).....	94,154	5,287

*Statistique de l'Industrie Minérale en France et en Algérie, Paris.
(*a*) The figures represent production.
(*b*) Statistics are taken from Mining Journal, London, May 14th, 1914.
(*c*) From the "Mineral Industry," 1914, Vol. XXIII, p. 545.

Assuming the nickel in the ore to average 6 per cent, and in the matte 45 per cent, the production of nickel metal from New Caledonia ores since 1909 has been approximately as follows:—

Year.	*Metric tons* (2204 pounds).
1909	5,160
1910	7,267
1911	8,550
1912	7,117
1913	8,243
1914	8,028

Norway.

The following statistics showing the production of nickel ore and of nickel metal in Norway, from 1901 to 1911, have been compiled from the Annual Reports on "Mines and Quarries," published by the Home Office, London, Eng.

Year.	Production of Nickel ore.	Ore smelted at Evje, Norway, and Nickel and Copper produced.		
	Metric tons.	Ore smelted. Tons.	Nickel produced. Tons.	Copper produced. Tons.
1901	2,018	.....	.....	.....
1902	4,040	.....	.....	.....
1903	5,670	.....	.....	.....
1904	5,352	.....	.....	.....
1905	5,477	4,639	78	51
1906	6,081	4,809	81	53
1907	5,781	5,493	81	53
1908	5,190	4,820	62	39
1909	5,770	5,400	60	37
1910	19,639	.....	172	.....
1911	27,743	.....	488	.....
*1912	30,692	.....	390	.....
**1913	.....	.....	600	.....
***1914	.....	.....	800	.....

* *In 1912.* According to "Mineral Industry," New York, 29,500 tons of ore from two mines in Norway, and 3,000 tons of ore imported from Greece were smelted at Evje and the matte refined at Christiansand producing 400 tons of nickel and 200 tons of copper.

** *In 1913.* The production has been officially reported as 600 metric tons of nickel.

*** *In 1914.* The London Mining Journal of Sept. 19th, 1914, reports that "the Evje nickel works, near Christiansand which were temporarily shut down have with a new supply of raw material been started again on their former scale." The production is reported to have exceeded that of 1913, and is estimated on reliable authority at 800 tons.

Prussia.

The annual production of nickel ore in Prussia from 1902 to 1911, as compiled from the "Mines and Quarries," Home Office Report is given herewith:—

Year.	Metric tons.	Year.	Metric tons.
1902	11,816	1908	8,238
1903	14,058	1909	10,095
1904	13,518	1910	10,053
1905	10,743	1911	9,608
1906	7,472	1912*	12,091
1907	7,557	1913*	13,538

*Engineering and Mining Journal, Dec. 26, 1914.

This production is obtained chiefly from one mine the ore from which is reported to average less than 2 per cent in nickel.

Greece.

The production of nickel ore in Greece from 1909 to 1912 is reported as follows by the same authority:—

Year.	*Metric tons.*
1909	104
1910	110
1911	7,983
1912	15,111

"In Greece in 1909 garnierite was discovered at Thebes and Lokeis. The ore contained 4 to 5½ per cent nickel and altogether 24,000 tons were exported." (Probably total exports 1909 to 1912 inclusive).‡

The production of raw nickel at smelting works (partly estimated) is given by "Metallgesellschaft," as follows:—

Production of Raw Nickel at Smelting Works, in Metric Tons.

Producing country.	1906.	1907.	1908.	1909.	1910.	1911.	1912.	1913.	1914.
United States of North America and Canada	6,500	6,500	7,000	9,000	10,000	12,000	15,000	.....	.....
England	3,200	3,200	3,000	3,200	3,500	4,500	5,200	.....	.....
Germany*	2,800	2,600	3,000	3,500	4,500	5,000	5,000	.....	.....
France	1,800	1,800	1,400	1,200	1,500	2,000	2,100	.....	.....
Other countries	.....	.....	200	400	600	1,000	1,200	.....	.....
Total production†	14,300	14,100	14,600	17,300	20,100	24,500	28,500	30,000	.....

*The figures of production stated for Germany only cover the output in the Kingdom of Prussia; nickel is also produced in the Kingdom of Saxony, but no data are obtainable of this production which is, however, not important.

†The entire production of nickel, apart from quite insignificant quantities obtained in Germany, Norway, and the United States of America, comes from New Caledonia and Canadian ores.

‡From the "Mineral Industry," 1912, p. 617.

PLATINUM AND PALLADIUM.

In past years the chief source of the platinum production of Canada was the placer gravels of British Columbia, principally in the Similkameen district. During 1913 operators in the Cariboo district of British Columbia report a recovery of 18 crude ounces of platinum valued at $489. More attention is being paid to the recovery of this metal especially in the Similkameen where it is proposed to re-work some of the old placers.

One or two companies operating in the Quesnel River district report small quantities of platinum with placer gold but the information is not sufficiently definite for record.

Annual Production of Platinum.

Calendar Year.	Value.	Calendar Year.	Value.	Calendar Year.	Crude Ozs.	Value.
	$		$			$
1887	5,600	1894	950	1901		457
1888	6,000	1895	3,800	1902		46,502
1889	3,500	1896	750	1903		33,345
1890	4,500	1897	1,600	1904		10,872
1891	10,000	1898	1,500	1905		500
1892	3,500	1899	825	1906		*
1893	1,800	1900	Nil.	1907-1912		**
				1913	18	489

*See under Palladium.
**See explanation in text.

Annual Production of Palladium.

	Ozs.	Value.
1902 Palladium	4,411	$ 86,014
1903 "	3,177	61,952
1904 "	952	18,564
1905 Metals of the platinum group	1,562	28,116
1906 " "	314	5,652
1907-1914	*	.....

*See explanation in text.

The nickel-copper ores of the Sudbury district also carry small quantities of the metals of the platinum group, and since 1902 considerable quantities of these metals have been recovered from the residues resulting from the treatment of the mattes from Sudbury.

The International Nickel Company have been good enough to inform us that the recovery of gold, silver, platinum, and palladium at their works in New Jersey for the six years ending December 31, 1912, was as follows:—

Year.	Gold.	Silver.	Platinum.	Palladium.
	Ozs.	Ozs.	Ozs.	Ozs.
1907	993·572	63,400·70	226·800	607·300
1908	5,238·181	139,329·29	172·316	382·287
1909	2,113·669	63,138·66	546·627	1,270·598
1910	2,649·799	60,256·83	258·325	522·804
1911	2,203·052	70,954·38	665·552	753·363
1912	2,476·558	62,169·66	496·850	680·130
	15,674·831	459,249·52	2,366·470	4,216·482

In view, however, of the fact that other material has been treated in the Company's works in addition to the nickel-copper mattes from Copper Cliff, Ontario, it is impossible to state what proportion of the above recoveries was from Canadian sources, although it is, of course, safe to assume that part of these metals has been derived from the Sudbury District mattes. The Company reported there had been no production in 1913 and 1914 from Canadian ores.

Average Prices of Platinum.[1]

(In dollars per ounce troy).

	1910.	1911.	1912.	1913.	1914.
	$	$	$	$	$
New York refined platinum	32·70	43.12	45.55	44.88	45.14
St. Petersburg, Russia, 83%	26.96	35.21	37.08	36.54	.....
Ekaterinburg Crude Metal Platinum	26.37	35.09	37.05	36.25	.....

[1] From quotation in Engineering and Mining Journal, p. 77, January 9th, 1915.

Annual Imports of Platinum.

Fiscal Year.	Value.	Fiscal Year.	Value.	Fiscal Year.	Value.
	$		$		$
1883	113	1894	7,151	1905	61,719
1884	576	1895	3,937	1906	54,494
1885	792	1896	6,185	1907 (9 mos.)	113,485
1886	1,154	1897	9,031	1908	60,390
1887	1,422	1898	9,781	1909	45,534
1888	13,475	1899	9,671	Calendar Year.	
1889	3,167	1900	57,910	1910	102,318
1890	5,215	1901	20,263	1911	176,101
1891	4,055	1902	19,357	1912	232,163
1892	1,952	1903	21,251	1913	145,674
1893	14,082	1904	28,112	1914*	79,614

*Platinum wire and platinum in bars, strips, sheets or plates; platinum retorts, pans, condensers, tubing and pipe, imported by manufacturers of sulphuric acid for use in their works; crucibles. Duty free.

SILVER.

In 1914 the total production of silver, including that produced as bullion, and the metal estimated as recovered from ores sent to smelters or otherwise treated, was 28,449,821 fine ounces, valued at $15,593,630, compared with 31,845,803 fine ounces, valued at $19,040,924 in 1913, showing a falling off of 3,395,982 fine ounces or 10·6 per cent in quantity, and $3,447,294, or 18·2 per cent in value.

Statistics of the annual production of silver since 1887 are given in the following table:—

Annual Production of Silver 1887-1914.

Year.	Ozs.	Value.	Average price per oz.	Year.	Ozs.	Value.	Average price per oz.
		$	Cts.			$	Cts.
1887	355,083	347,271	98·00	1901	5,539,192	3,265,354	58·95
1888	437,232	410,998	94·00	1902	4,291,317	2,238,351	52·16
1889	383,318	358,785	93·60	1903	3,198,581	1,709,642	53·45
1890	400,687	419,118	104·60	1904	3,577,526	2,047,095	57·22
1891	414,523	409,549	98·00	1905	6,000,023	3,621,133	60·35
1892	310,651	272,130	86·00	1906	8,473,379	5,659,455	66·79
1893	.....	330,128	77·00	1907	12,779,799	8,348,659	65·33
1894	847,697	534,049	63·00	1908	22,106,233	11,686,239	52·86
1895	1,578,275	1,030,299	65·28	1909	27,529,473	14,178,504	51·50
1896	3,205,343	2,149,503	67·06	1910	32,869,264	17,580,455	53·49
1897	5,558,456	3,323,395	59·79	1911	32,559,044	17,355,272	53·30
1898	4,452,333	2,593,929	58·26	1912	31,955,560	19,440,165	60·83
1899	3,411,644	2,032,658	59·58	1913	31,845,803	19,040,924	59·79
1900	4,468,225	2,740,362	61·33	1914	28,449,821	15,593,630	54·81

From 1887 to 1893 the production ranged in value between $300,000 and $400,000, and was derived chiefly from Ontario and Quebec. The next three years saw a rapid increase in production, due to the development of the silver-lead deposits of British Columbia, and in 1896 a production of over $2,000,000 is recorded. From that year until 1905 the production varied between $2,000,000 and $3,500,000 rising rapidly during the next six years to $17,580,455 in 1910, as a result of the discovery of the rich ores of the Cobalt district. Since then there has been a falling off in quantity, but owing to the higher price of the metal the total value was higher in 1912 and 1913.

Ontario in 1905 produced 40·9 per cent of the output of Canada; in 1911 its percentage was 93·8, while in 1914 its percentage was 88·4 and that of British Columbia was 11·1.

Statistics of the annual production in each province are shown in the table following:—

Production of Silver by Provinces, 1887-1914.

Calendar Year.	Ontario.		Quebec.		British Columbia.		Yukon Territory.	
	Ozs.	Value.	Ozs.	Value.	Ozs.	Value.	Ozs.	Value.
		$		$		$		$
1887	190,495	186,304	146,898	143,666	17,690	17,301	.....	.....
1888	208,064	195,580	149,388	140,425	79,780	74,993	.....	.....
1889	181,609	169,986	148,517	139,012	53,192	49,787	.....	.....
1890	158,715	166,016	171,545	179,436	70,427	73,666	.....	.....
1891	225,633	222,926	185,584	183,357	3,306	3,266	.....	.....
1892	41,581	36,425	191,910	168,113	77,160	67,592	.....	.....
1893	.....	8,689	.....	126,439	.....	195,000	.....	.....
1894	.....	.....	101,318	63,830	746,379	470,219	.....	.....
1895	.....	.....	81,753	53,369	1,496,522	976,930	.....	.....
1896	.....	.....	70,000	46,942	3,135,343	2,102,561	.....	.....
1897	5,000	2,990	80,475	48,116	5,472,971	3,272,289	.....	.....
1898	85,000	49,521	74,932	43,655	4,292,401	2,500,753	.....	.....
1899	202,000	120,352	40,231	23,970	2,939,413	1,751,302	230,000	137,034
1900	161,650	99,140	58,400	35,817	3,958,175	2,427,548	290,000	177,857
1901	151,400	89,250	41,459	24,440	5,151,333	3,036,711	195,000	114,953
1902	145,000	75,632	42,500	22,168	3,917,917	2,043,586	185,900	96,985
1903	17,777	9,502	28,600	15,287	2,996,204	1,601,471	156,000	83,362
1904	206,875	118,376	15,000	8,583	3,222,481	1,843,935	133,170	76,201
1905	2,451,356	1,479,442	19,620	11,841	3,439,417	2,075,757	89,630	54,093
1906	5,401,766	3,607,894	17,686	11,813	2,990,262	1,997,226	63,665	42,522
1907	9,982,363	6,521,178	16,000	10,452	2,745,448	1,793,519	35,988	23,510
1908	19,398,545	10,254,847	13,299	7,030	2,631,389	1,391,058	63,000	33,304
1909	24,822,099	12,784,126	13,233	6,815	2,649,141	1,364,387	45,000	23,176
1910	30,366,366	16,241,755	7,593	4,061	2,407,887	1,287,883	87,418	46,756
1911	30,540,754	16,279,443	18,435	9,827	1,887,147	1,005,924	112,708	60,078
1912	29,214,025	17,772,352	9,465	5,758	2,651,002	1,612,737	81,068	49,318
1913	28,411,261	16,987,377	34,573	20,672	3,312,343	1,980,483	87,626	52,392
1914	25,139,214	13,779,055	57,737	31,646	3,159,897	1,731,971	92,973	50,959

Prices:—The average weekly price of fine silver in New York during 1914 varied between 59 cents per ounce towards the end of April, and a minimum of 48½ cents in the last week of October, the average monthly price for the year being 54·811 cents per ounce, as against 59·791 cents in 1913, and 60·835 cents in 1912.

In London the average monthly price of silver in 1914 was 25·313 pence per standard ounce 0·925 fine, as against 27·576 pence in 1913.

The normal differential between the official prices at London and New York is about 1½ cents per ounce, but the European war caused this to run up to 6 cents per ounce and even higher.

The average monthly prices of silver in New York from 1910 to 1914 and in London during 1914 are shown in tabulated form following.

Average Monthly Prices of Silver.

Months.	New York.—Cents per fine ounce					London.—Pence per Standard ounce (a).
	1910.	1911.	1912.	1913.	1914.	1914.
January	52·375	53·795	56·260	62·938	57·572	26·553
February	51·534	52·222	59·043	61·642	57·506	26·573
March	51·454	52·745	58·375	57·870	58·067	26·788
April	53·221	53·325	59·207	59·490	58·519	26·958
May	53·870	53·308	60·880	60·361	58·175	26·704
June	53·462	53·043	61·290	58·990	56·471	25·948
July	54·150	52·630	60·654	58·721	54·678	25·219
August	52·912	52·171	61·606	59·293	54·344	25·979
September	53·295	52·440	63·078	60·640	53·290	24·260
October	55·490	53·340	63·471	60·793	50·654	23·199
November	55·635	55·719	62·792	58·995	49·082	22·703
December	54·428	54·905	63·365	57·760	49·375	22·900
Average for the year	53·486	53·304	60·835	59·791	54·811	25·313

(a) 925 parts fine.

Important quantities of silver are being produced in Canada both as fine metal and as silver bullion ranging in fineness from 850 to 998·2. Fine silver is produced at Trail, B.C., by the Consolidated Mining and Smelting Company of Canada, Limited, being derived chiefly from the silver-lead ores of that Province, and finds a market in Canada, the United States, and China.

The annual production of fine silver at Trail since 1904 has been as follows:—

Year.	Fine ozs.	Year.	Fine ozs.
1904	551,450	1910	1,798,960
1905	1,088,328	1911	1,325,601
1906	1,263,809	1912	1,896,999
1907	1,631,422	1913	2,433,002
1908	1,956,039	1914	2,043,868
1909	2,003,003	Total	17,992,481

In Ontario ores from the Cobalt district are treated by:—

The Coniagas Reduction Co., Thorold, Ont.
The Deloro Mining and Reduction Co., Deloro, Ont.
The Buffalo and Ontario Smelting and Refining Co., Kingston, Ont.
Dominion Refineries, Limited, North Bay, Ont.
Standard Smelting and Refining Co., North Bay, Ont.
Metals Chemical Co., Welland, Ont.
Canada Refining and Smelting Co., Orillia, Ont.

Silver bullion of a fineness varying from 850 to 998·2 is produced at the works, other products being white arsenic, nickel and cobalt-oxides and mixed oxides. The silver bullion as a rule finds a market in the United States and in England.

Bullion shipped by these Ontario smelters in 1907 contained 4,449,722 fine ounces of silver; in 1908, 11,168,689 ounces; in 1911, 17,753,167 ounces; in 1913, 11,356,707 ounces; and in 1914, 9,042,993 fine ounces.

The decrease is accounted for by the treatment of the greater part of the high grade ore in the camp itself.

The bullion shipped from the mines and mills in the Cobalt district in 1914, is reported as 10,335,527 fine ounces.

United States smelters report the receipt of 7,206 tons of ore containing 3,966,301 fine ounces of silver.

The imports of silver bullion into Canada in 1914 were valued at $629,279, as against imports to the value of $840,245 in 1913 and $1,100,344 in 1912.

The exports of silver during 1914 were 28,020,089 fine ounces valued at $15,584,813, as against exports of 37,371,569 fine ounces valued at $21,441,220 in 1913, and 34,911,922 fine ounces valued at $19,494,416 in 1912.

Statistics of silver contained in ore, matte or other form exported from Canada since 1886 as compiled from the reports of Trade and Navigation, and published by the Customs Department, are shown in the following table:—

Exports of Silver in Ore, etc.

Calendar Year.	Value	Calendar Year.	Value.	Calendar Year.	Value.
	$		$		$
1886	25,957	1896	2,271,959	1906	5,686,444
1887	206,284	1897	3,576,391	1907	9,941,849
1888	219,008	1898	2,902,277	1908	12,403,482
1889	212,163	1899	1,623,905	1909	15,719,909
1890	204,142	1900	2,341,872	1910	15,649,537
1891	225,312	1901	2,026,727	1911	15,807,366
1892	56,688	1902	1,820,058	1912	19,494,416
1893	213,695	1903	1,989,474	1913	21,441,220
1894	359,731	1904	1,904,394	1914	15,584,813
1895	994,354	1905	2,777,218		

Quebec.

The small quantity of silver credited to Quebec province for a number of years represents a small silver content of the pyritic ores mined at Eustis and Weedon, in the Eastern Townships. The production in 1914 was 57,737 fine ounces valued at $31,646, as against 34,573 fine ounces valued at $20,672 in 1913.

Ontario.

The production of silver in Ontario increased from 17,777 fine ounces in 1903 to 2,451,356 fine ounces in 1905 and reached a maximum of 30,540,754 fine ounces in 1911. The maximum value $17,772,352 was reached in 1912.

In 1914 the production was 25,139,214 fine ounces valued at $13,779,055, a decrease from 1913 of 11·5 per cent in quantity and 18·9 per cent in total value. The production includes 56,259 ounces contained in gold bullion in addition to the production of the Cobalt and adjacent silver camps.

The silver ores of the Cobalt district which in the early days of the camp were all exported for treatment, are being reduced to an increasing extent each year within the camp in cyanide and other mills, with recovery of silver bullion. During 1914 over 41 per cent of the output was thus recovered as bullion in the district while 36 per cent of the total was recovered by the silver smelters in Ontario, so that over 77 per cent of the Ontario production was recovered in the form of bullion within the Province.

There was shipped from the Cobalt District during 1914, as closely as could be ascertained, about 16,197 tons of ore and concentrates, containing, after deducting 5 per cent for the smelter losses, 14,747,428 ounces of silver. Over 745,000 tons of ore were treated during the year in the various mills of the district. The recovery of bullion in the district as metallics and from cyanide and high grade mills was 10,335,527 ounces.

In the following table a record of shipments since 1904 is given, the figures of the first three years being those published by the Ontario Bureau of Mines.

Silver Ore and Bullion Shipments from Cobalt Mines, 1904-1914.

Year.	Shipments.		Silver content.		Silver in ounces, per ton.		Silver bullion shipments. Fine ounces.	Total value of silver.
	Ore. Tons.	Concentrate. Tons.	Ore. Ozs.	Concentrate. Ozs.	Ore.	Concentrate.		
								$
1904	158	.....	206,875	.....	1,309	.....	.....	118,376
1905	2,144	.....	2,451,356	.....	1,143	.....	.....	1,473,192
1906	5,335	.....	5,401,766	.....	1,013	.....	.....	3,607,894
1907	14,644	.....	9,982,363	.....	682	.....	.....	6,521,178
1908	25,682	(a)	19,398,545	(a)	755	(a)	.....	10,254,847
1909	27,835	3,059	22,349,717	3,627,819	803	1,186	143,440	12,784,126
1910	28,684	6,943	23,797,111	7,111,579	830	1,024	1,003,111	16,241,755
1911	15,417	9,329	20,065,621	8,118,231	1,300	870	3,766,022	16,279,443
1912	17,899	11,217	15,929,289	9,774,697	890	871	4,778,852	17,762,384
1913	(b) 29,741	10,838	13,601,286	8,260,888	457	762	7,599,929	16,962,105
1914	5,235	12,376	7,652,374	9,261,191	1,462	732	10,335,527	13,748,219

(a) Included in ore.
(b) Includes some ore treated in customs mills in the District.

While the greater number of the mining companies, hold unrestricted titles to their properties, several are operated on a royalty basis on mining lands owned and leased by the Timiskaming and Northern Ontario Railway Commission. Mr. A. A. Cole, Mining Engineer to the Commission has in his annual report some interesting statistics from which the following tables and extracts have been drawn:—

Ore Shipments from the Cobalt District for the Years 1904 to 1914.

Mine.	1904 to 1909 Incl.	1910.	1911.	1912.	1913.	1914.	Totals 1904–1914.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Badger	.....	.....	27·10	.....	.....	.....	27·10
Bailey	155·65	.....	20·00	41·57	150·35	20·50	388·07
Beaver	51·38	140·06	790·81	402·97	292·21	392·07	2,069·50
Buffalo	3,620·90	1,185·77	1,275·19	1,251·64	66·13	.....	7,399·63
Casey-Cobalt	18·50	48·40	277·74	214·34	401·54	608·30	1,568·82
Chambers-Ferland	741·77	885·92	622·85	501·29	223·78	308·06	3,283·67
City of Cobalt	1,378·47	329·40	281·30	230·00	105·14	495·71	2,820·02
Comet Cobalt (Drummond)	2,798·33	2,194·41	714·83	458·85	610·06	587·03	7,363·51
Cobalt Lake	321·44	296·80	2,111·32	1,085·22	1,196·33	919·01	5,930·12
Cobalt Townsite	348·28	310·99	703·51	1,944·77	2,762·54	1,950·73	8,020·82
Colonial	55·38	178·60	114·10	86·48	21·56	.....	456·12
Coniagas	4,317·17	1,261·46	1,813·89	2,119·87	1,620·40	1,217·26	12,350·05
Crown Reserve	3,824·87	2,814·25	977·32	561·65	791·15	1,067·00	10,036·24
Foster	818·08	.....	.....	.....	.....	4·50	822·58
Green Meehan	135·42	.....	102·98	.....	12·96	.....	251·36
†Hargrave	28·45	343·68	102·44	17·35	.....	.....	491·92
Hudson Bay	1,987·40	260·33	898·88	694·55	609·14	647·95	5,098·25
Imperial Cobalt	14·61	.....	.....	.....	.....	.....	14·61
Kerr Lake	2,366·72	5,088·78	1,292·58	788·10	933·35	628·42	11,097·95
King Edward (Watts)	534·89	134·12	20·00	.....	87·21	.....	776·22
LaRose	15,938·35	5,131·53	3,581·54	3,511·40	3,275·14	1,582·54	33,020·50
‡Lawson	75·73	.....	.....	.....	.....	.....	75·73
Lost and Found	.....	.....	.....	65·20	8·80	.....	74·00
Lumsden	.....	.....	.....	.....	20·00	.....	20·00
McKinley-Darragh	4,154·84	2,393·39	3,238·64	2,673·40	2,865·66	2,903·50	18,229·43
Mg. Corporation of Canada	.....	.....	.....	.....	.....	756·77	756·77
Nancy Helen	347·74	.....	.....	.....	.....	.....	347·74
Nipissing	15,248·84	6,833·81	2,952·20	1,869·27	1,950·22	1,235·07	30,089·41
North Cobalt	6·87	.....	3·00	.....	.....	.....	9·87
Nova Scotia	778·90	.....	.....	.....	.....	.....	778·90
O'Brien	6,510·73	608·57	628·44	711·43	703·43	523·21	9,685·81
*Penn Canadian	604·23	285·62	22·40	126·35	332·18	460·53	1,831·41
Peterson Lake Leases	.....	.....	.....	.....	.....	122·52	122·52
Gould	.....	.....	.....	.....	9·00	50·65	59·65
(Little Nipissing)	80·29	313·76	28·45	.....	.....	.....	422·50
(Nova Scotia)	121·15	.....	.....	.....	.....	.....	121·15
Seneca Superior	.....	.....	.....	432·97	457·93	398·96	1,289·86
Provincial	75·84	52·05	100·54	22·22	.....	.....	250·65
‡Princess	3·93	.....	.....	.....	.....	.....	3·93
Red Rock	45·71	.....	.....	.....	.....	.....	45·71
Right of Way	2,534·65	981·41	666·06	243·24	146·12	184·16	4,755·64
Rochester	.....	28·30	.....	.....	.....	.....	28·30
Silver Bar	0·58	.....	2·72	.....	20·00	20·00	43·30
Silver Cliff	309·50	156·84	92·30	.....	48·05	.....	606·69
Silver Leaf	252·39	.....	.....	.....	.....	.....	252·39
Silver Queen	1,856·58	.....	.....	31·25	201·98	105·42	2,195·23
Timiskaming	1,851·66	1,119·12	855·60	967·31	406·26	417·56	5,617·51
Timiskaming-Cobalt	88·45	.....	.....	.....	.....	.....	88·45
Trethewey	3,814·83	536·64	602·98	579·10	587·54	613·28	6,734·37
‡University	231·51	.....	.....	.....	.....	.....	231·51
Victoria	0·47	.....	.....	.....	.....	.....	0·47
Violet	36·00	.....	.....	.....	.....	.....	36·00
Waldman	.....	38·81	.....	.....	.....	.....	38·81
Wyandoh	.....	24·15	.....	.....	.....	.....	24·15
Total	78,487·58	33,976·97	24,921·71	21,631·79	20,916·16	18,220·71	198,154·92

†The shipment in 1905 was made by the White Silver Mining Co., the former owner of the Hargrave property.

‡Shipments from Lawson, Princess, and University, since 1907, included with La Rose.

*Shipments up to the end of 1911 made by the Cobalt Central Mining Company former owner of the Penn Canadian.

The total amount of low grade ore treated at the concentrating and cyanide mills during 1914 was 743,531 tons, as against 664,845 tons in 1913, an increase of 11·8 per cent, while that in 1913 was 46 per cent over the previous year.

The tonnage of ore milled and concentrates produced during 1914 is given in the following table.

Mills and mines.	Tons milled.	Concentrates			Concentration ratio.
		Jigs.	Tables.	Total.	
Beaver	27,069	121·2	227·8	349·0	78–1
Buffalo	55,254	.....	.....	832·0	66–1
Casey-Cobalt	24,236	21·3	534·4	555·7	43–1
Cobalt Lake	53,753	272·7	824·6	1,097·3	49–1
Cobalt Reduction	92,021	.....	.....	2,717·4	34–1
Colonial:—					
Right of Way	7,470	.....	.....	146·0	51–1
Coniagas	54,646	124·0	625·0	749·0	73–1
Hudson Bay	11,304	96·2	261·2	357·4	31–1
McKinley-Darragh	66,765	161·0	2,344·0	2,505·0	27–1
Northern Customs:—					
La Rose	52,273	.....	1,233·1	1,233·1	42–1
Chambers Ferland	10,625	.....	311·0	311·0	34–1
Cobalt Alladin	1,120	.....	38·6	38·6	29–1
Carlboo-Cobalt	1,042	.....	37·4	37·4	28–1
O'Brien	51,892	97·0	189·0	286·0	181–1
Penn Canadian	25,478	98·3	278·8	377·1	68–1
Seneca Superior	2,526	40·9	67·4	108·4	23–1
Timiskaming	18,779	82·8	292·8	375·6	50–1
Trethewey	35,215	53·2	553·4	606·6	58–1
Total	591,468			12,682·6	47–1

Cyanide mills.	Tons of ore treated.	Ozs. bullion produced.
Dominion Reduction:—		
Comet (Drummond)	20,160·2	1,586,783
Crown Reserve	31,503·0	
Drummond Fraction	3,674·0	
Kerr Lake	17,601·5	
Nipissing, Low Grade	79,125·0	2,261,023
Total	152,063·7	3,847,806

Total tons milled by water concentrating mills	591,468
Total tons milled by cyanide mills	152,063
Total tons milled, 1914	743,531

At the Buffalo mine the cyanide plant, which forms part of the low grade mill, treated 9,105 tons of slimes, producing 67,429 ounces.

The Cobalt Reduction Mill, which now forms part of the Mining Corporation of Canada, Ltd., has been extended by the addition of a cyanide plant for the treatment of slimes doing away with the use of vanners.

At the Dominion Reduction Mill, besides the silver bullion there were produced 1,764 tons of amalgamation residues, which were shipped to the smelters.

In the O'Brien Mill the jig concentrates contained 139,022 ounces and the table concentrates 278,045 ounces. The tailings from the concentrating tables amounting to 51,606 tons were cyanided, and produced 448,720 fine ounces silver.

The Buffalo High Grade Mill treats the concentrates from the Low Grade Mill, as well as metallics, and hand picked raw ore from the mines.

The residues from this mill have been stored for a possible further treatment for the nickel, cobalt, and other valuable constituents.

They have already been re-treated and the mercury extracted that was taken up in the amalgamation process used for the extraction of the silver. The mill treated 14 tons of raw ore and 792 tons of concentrates and metallics, producing 930,551 fine ounces in bullion.

The Nipissing High Grade Mill treated 1,885 tons, containing 4,454,180 ounces, and shipped 1,238 tons of residues, most of which was shipped to Birmingham, England, the value being in the cobalt contents.

British Columbia.

The chief sources of the silver production in this Province are the silver-lead ores of the East and West Kootenays, supplemented by the silver contained in the gold-copper ores of Rossland, the Boundary, and Coast districts. The production in 1914 based on smelter recoveries, was 3,159,897 ounces, valued at $1,731,971.

The leading silver producers of the Province, in order of importance were: Silver-lead mines—the Standard, Sullivan, Number One, Rambler-Cariboo, Silver Standard, Vancouver, Silver King, Slocan Star, and Blue Bell.

Among the copper-gold mines might be mentioned the Granby, at Phoenix, Hidden Creek at Anyox, and the Centre Star-Le Roi and Le Roi No. 2 groups in Rossland.

In the Minister of Mines Report for British Columbia, for 1914, it is stated that, "The Slocan District, including the Ainsworth, Slocan, Slocan City and Trout Lake Mining Divisions—produced about 59 per cent of the total provincial output of silver this year, and the Fort Steele Mining Division about 13·7 per cent, all from argentiferous galena. The remainder is chiefly derived from the smelting of copper ores carrying silver."

"The Slocan, and Slocan City Divisions, alone produced about 49·4 per cent."

The production of silver by districts, as reported by the Minister of Mines, is shown in the following table:—

Production of Silver in British Columbia by Districts, 1909-1914.*

(Silver Contents of Ores shipped.)

—	1910.	1911.	1912.	1913.	1914.
	Ozs.	Ozs.	Ozs.	Ozs.	Ozs.
Cariboo—					
Omineca division	.....	.....	.....	46,298	135,265
Cassiar	1,454	29,976	5,868	4,714	131,509
Kootenay, East—					
Fort Steele division	501,475	330,235	376,918	362,311	492,080
Other divisions	243	.....	7,405	4,756	.....
Kootenay, West—					
Ainsworth division	233,010	77,375	301,755	447,015	329,586
Nelson division	45,787	76,774	164,182	129,011	150,268
Slocan division	964,634	793,926	1,657,105	1,841,226	1,775,975
Trail Creek division	87,833	88,076	87,530	109,585	136,185
Other divisions	107,753	67,884	43,536	23,397	11,757
Yale—					
Boundary	460,945	326,849	389,341	394,048	347,981
Yale division	3	343	.....	461	.....
Coast and other districts	47,104	100,926	98,468	103,034	91,574
Total	2,450,241	1,892,364	3,132,108	3,465,856	3,602,180

*From the Minister of Mines Reports, British Columbia.

Yukon.

The figures of the silver production of the Yukon given in the second table of this article represent the silver alloyed with the placer gold, together with a small amount from the lode mines of the district. On an average about one ounce of silver is contained in each five ounces of crude bullion from the alluvial workings.

The production may be given as follows:—

Annual Production of Silver in the Yukon District.

	Placer ozs.	Value.	Lode ozs.	Value.	Total ozs.	Value.
		$		$		$
1909	45,000	23,176	.....	.....	45,000	23,176
1910	50,000	26,743	37,418	20,013	87,418	46,756
1911	50,300	26,812	62,408	33,206	112,708	60,078
1912	60,302	36,685	20,766	12,633	81,068	49,318
1913	63,522	37,980	24,104	14,412	87,626	52,392
1914	55,744	30,554	37,229	20,405	92,973	50,959

TIN.

Tin ores have not yet been found in sufficient quantities in Canada to be of economic importance.

The occurrence of tin ore has been reported from several localities, the most important, perhaps, being the discovery of cassiterite, near New Ross, Lunenburg county, Nova Scotia. Reports upon it may be found in the Summary Reports of the Geological Survey Branch of the Department of Mines, for 1907, 1908, 1910, 1911, and 1912.

Tin in Black Sands.

During 1913 a sample shipment of one ton of black sand was made from the Atlin district of British Columbia, which is reported to have assayed 6·71 per cent tin. The black sand was obtained from alluvial sluice boxes in this camp. Stream tin has also been found in some of the Yukon placer deposits and a small quantity, recovered in the gold dredging operations, is reported to have been marketed, though no direct returns of production have been obtained.

The imports of tin in 1914 included tin in blocks, pigs and bars 3,382,700 pounds valued at $1,191,466; tin foil 1,244,628 pounds valued at $173,088; tin crystals valued at $7,759; and tinware and manufactures of tin valued at $650,987.

There is also a large annual import of "tin plate," the quantity and value in 1914 being 101,581,800 pounds, valued at $3,151,385.

The annual imports of tin since 1910 are shown herewith.

Annual Imports of Tin.

Calendar Year.	Tin in blocks, pigs and bars.		Tin foil.		(a) Tinware, etc.	Tin crystals.	Bichloride of tin.	
	Pounds.	Value.	Pounds.	Value.	Value.	Value.	Pounds.	Value.
		$		$	$	$		$
1910	3,231,100	1,058,778	866,751	114,602	389,040	3,903	31,219	3,846
1911	4,047,500	1,623,670	1,531,877	176,602	461,029	4,370	25,797	3,876
1912	4,894,700	2,134,221	1,316,882	183,707	540,599	6,308	36,045	5,595
1913	5,085,700	2,252,324	1,074,131	188,779	667,158	8,077	19,114	2,422
1914	3,382,700	1,191,466	1,244,628	173,088	650,987	7,759	200	29

(a) Tinware, plain, japanned or lithographed, and all manufactures of tin n.e.s.

Prices:—The price of tin in New York was about 50 cents per pound in January of 1913 but contraction in consumption caused a gradual decline throughout the year. In January 1914 the price of tin was 37·779 cents per pound, and raised to 39·830 cents in February, decreasing to 30·284 cents in October and increasing again to 33·601 in December.

TUNGSTEN.

No production of tungsten is reported during 1914.

Scheelite was discovered in Halifax county, Nova Scotia, in 1908. Mr. Faribault, of the Geological Survey, visited this deposit again in 1909, and a preliminary report thereon will be found in the Summary Report of the Geological Survey for 1909, pages 228 to 234. During 1910 and 1912 these deposits were developed by the Scheelite Mines, Limited, who constructed a mill and made a shipment of 14 tons of tungsten concentrates—the first shipment from Nova Scotia—carrying 72 per cent tungstic acid.

The occurrence of wolframite has also been noted in association with molybdenite, by Dr. Walker, in New Brunswick, near the confluence of Burnt Hill brook and southwest Miramichi river. The property was tested by Mr. Freeze, of Doaktown, New Brunswick, and Mr. Matthew Lodge, of Moncton, who formed the Acadia Tungsten Mines Company. This Company has done a little development.

Prices:—"During the first 7 months of 1914, the price of tungsten was about $0.67 per pound. Since the war lots for immediate shipment have sold as high as $1.35 per pound."—(Engineering & Mining Journal).

ZINC.

The production of zinc ore in Canada in 1914, as obtained by direct returns from producers, was 10,893 tons, valued at $262,563, the greater part being from British Columbia. The zinc content of these shipments was returned as 9,101,460 pounds, which, if valued at the average New York price of spelter during the year, 5·213 cents, would be worth $474,459.

The ore shipped from British Columbia contains also a varying silver content, for which payment is made by the smelters, and without which, on account of the import duty to the United States and the long rail haul, it would not in many cases pay to ship.

The British Columbia shipments were heavy as a result of the activity of the Slocan mines and mills. There were also shipments from Notre Dame des Anges, Portneuf county, Quebec.

During 1913 the new United States customs tariff came into effect, considerably reducing the duties payable on Canadian ores, the new items affecting Canadian shipments being:—

Zinc ores containing 25 per cent or more zinc: 10 per cent on zinc contained therein.

Lead bearing ore: $\frac{3}{4}$ cent per pound on lead contained therein.

Although not paid for by the United States smelters, the lead in ore is considered as dutiable and as there is often a small lead content in the zinc ore or concentrates shipped, the lead duty applies. The result of the decreased duties has been a considerable increase in zinc shipments.

During 1914 there were received at American smelting works from Canadian mines 12,171·5 tons of zinc concentrates, containing 10,008,478 pounds of zinc.

In 1913 these works reported the receipt of 7,074 tons containing 5,941,727 pounds of zinc; and in 1912, 7,190 tons containing 6,393,983 pounds of zinc.

Statistics of the production of zinc since 1898 are given in the following table:—

Annual Production of Zinc.

Calendar Year.	Zinc ore shipped.		Metallic zinc in ore shipped.	
	Tons.	Spot value.	Lbs.	Final value.
		$		$
1898	1,162	11,000	788,000	36,011
1899	865	18,165	814,000	46,805
1900	261	4,810	212,000	9,342
1901				
1902	158	1,659	142,200	6,882
1903	1,000	10,500	900,000	48,660
1904	597	3,700	477,568	24,256
1905	9,413	139,200	*	*
1906	1,154	23,800	*	*
1907	1,573	49,100	*	*
1908	452	3,215	*	*
1909 (a)	18,371	242,699	16,468,204	906,245
1910	5,063	120,003	4,361,712	240,766
1911	2,590	101,072	2,346,849	135,132
1912	6,415	215,149	5,354,700	371,777
1913	7,889	186,827	7,069,800	399,302
1914	10,893	262,563	9,101,460	474,459

*Figures not available.
(a) Includes 7,424 tons shipped late in 1908.

The imports of zinc, taken as an index of consumption, show a fairly steady increase. The total imports of zinc in blocks and pigs and spelter, were in 1880 some 744 tons; in 1889 they had risen to 1,427 tons and remained fairly stationary the next ten years. In 1899 they were 1,213 tons and rose to 4,110 for the fiscal year 1909.

During the calendar year 1914 the imports were 7,003 tons valued at $740,816, in addition to which there were 4,723 tons zinc white valued at $389,796, zinc manufactures to the value of $36,355; also zinc dust 181 tons valued at $34,295; and sulphate and chloride of zinc 176 tons valued at $9,390.

The imports are given, in detail, in the following tables:—

Imports of Zinc in Blocks, Pigs, and Sheets.

Fiscal Year.	Cwt.	Value	Fiscal Year.	Cwt.	Value	Fiscal Year.	Cwt.	Value.
		$			$			$
1880	13,805	67,881	1892	21,881	127,302	1904	25,553	138,057
1881	20,920	94,015	1893	26,446	124,360	1905	25,141	141,514
1882	15,021	76,631	1894	20,774	90,680	1906	24,462	158,438
1883	22,765	94,799	1895	15,061	63,373	1907 (9 mos.)	18,427	126,221
1884	18,945	77,373	1896	20,223	80,784	1908	30,362	191,081
1885	20,954	70,598	1897	11,946	57,754	1909	26,222	141,066
1886	23,146	85,599	1898	35,148	112,785	Calendar Year:		
1887	26,142	98,557	1899	18,785	107,477	1910	31,660	191,051
1888	16,407	65,827	1900	28,748	156,167	1911	33,678	206,859
1889	19,782	83,935	1901	20,527	103,457	1912	100,095	617,836
1890	18,236	92,530	1902	34,871	141,560	1913	47,226	291,368
1891	17,984	105,023	1903	26,646	142,827	1914	31,609	189,785

Imports of Spelter.*

Fiscal Year.	Cwt.	Value.	Fiscal Year.	Cwt.	Value.	Fiscal Year.	Cwt.	Value.
		$			$			$
1880	1,073	5,301	1892	13,909	62,550	1904	33,952	164,751
1881	2,904	12,276	1893	10,721	49,822	1905	37,941	206,244
1882	1,654	7,779	1894	8,423	35,615	1906	50,137	290,686
1883	1,274	5,196	1895	9,249	30,245	1907 (9 mos.)	42,465	269,044
1884	2,239	10,417	1896	10,897	40,548	1908	65,593	314,369
1885	3,325	10,875	1897	8,342	32,826	1909	55,981	310,688
1886	5,432	18,238	1898	2,794	13,561	Calendar year:		
1887	6,908	25,007	1899	5,450	29,687	1910	109,084	561,170
1888	7,772	29,762	1900	5,836	29,416	1911	116,996	654,097
1889	8,750	37,403	1901	14,621	58,283	1912	117,845	686,585
1890	14,570	71,122	1902	18,356	80,757	1913	126,051	661,207
1891	6,249	31,459	1903	23,159	110,817	1914	108,454	551,031

*Spelter in blocks and pigs.

Imports of Manufactures of Zinc.

Fiscal Year.	Value.	Fiscal Year.	Value.	Fiscal Year.	Value.
	$		$		$
1880	8,327	1892	7,563	1904	12,682
1881	20,178	1893	7,464	1905	11,912
1882	15,526	1894	6,193	1906	12,917
1883	22,599	1895	5,581	1907 (9 mos.)	12,556
1884	11,952	1896	6,290	1908	19,240
1885	9,459	1897	5,145	1909	15,621
1886	7,345	1898	10,503	Calendar Year:	
1887	6,561	1899	14,661	1910	21,829
1888	7,402	1900	11,475	1911	30,862
1889	7,233	1901	6,882	1912	46,336
1890	6,472	1902	6,683	1913	54,898
1891	7,178	1903	9,754	1914	36,355

Imports of Zinc White, Zinc Dust, and Zinc Sulphate and Chloride.

Calendar Year.	Zinc white.		Zinc Dust.		Zinc, Sulphate and Chloride.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
		$		$		$
1910	8,496,399	312,779	97,461	4,859	237,466	6,470
1911	8,537,498	314,194	86,242	5,718	414,500	15,930
1912	10,505,944	425,714	308,239	18,944	941,780	29,104
1913	12,682,126	525,643	412,294	26,403	634,634	17,424
1914	9,445,397	389,796	362,109	34,295	352,715	9,390

Average Price of Spelter in Cents per Pound at New York.*

Month.	1904.	1905.	1906.	1907.	1908.	1909.	1910.	1911.	1912.	1913.	1914.
January	4·863	6·190	6·487	6·732	4·513	5·141	6·101	5·452	6·442	6·931	5·262
February	4·916	6·139	6·075	6·814	4·785	4·889	5·569	5·518	6·499	6·239	5·377
March	5·057	6·067	6·209	6·837	4·665	4·757	5·637	5·563	6·626	6·078	5·250
April	5·219	5·817	6·087	6·687	4·645	4·965	5·439	5·399	6·633	5·641	5·113
May	5·031	5·434	5·997	6·441	4·608	5·124	5·191	5·348	6·679	5·406	5·074
June	4·760	5·190	6·096	6·419	4·543	5·402	5·128	5·520	6·877	5·124	5·000
July	4·873	5·396	6·006	6·072	4·485	5·402	5·152	5·695	7·116	5·278	4·920
August	4·866	5·706	6·027	5·701	4·702	5·729	5·279	5·953	7·028	5·658	5·568
September	5·046	5·887	6·216	5·236	4·769	5·796	5·514	5·869	7·454	5·694	5·380
October	5·181	6·087	6·222	5·430	4·801	6·199	5·628	6·102	7·426	5·340	4·909
November	5·513	6·145	6·375	4·925	5·059	6·381	5·976	6·380	7·371	5·229	5·112
December	5·872	6·522	6·593	4·254	5·137	6·249	5·624	6·301	7·162	5·154	5·592
Year	5·100	5·822	6·198	5·962	4·726	5·503	5·520	5·758	6·943	5·648	5·213

*From the Engineering and Mining Journal, N.Y.

Average Prices of Spelter, Ordinary Brands, in London.

Month.	1905.			1906.			1907.			1908.			1909.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
January	24	19	9	28	8	2	27	7	1	20	6	3	21	6	3
February	24	10	6	26	2	4	26	1	5	21	0	7	21	8	9
March	23	13	6	24	15	3	26	4	8	21	1	5	21	8	8
April	23	14	3	25	19	3	25	17	5	21	6	1	21	10	1
May	23	11	8	27	0	2	25	14	2	20	2	10	21	19	1
June	23	16	8	27	9	9	24	10	2	19	2	2	21	19	11
July	23	19	6	26	15	11	23	18	11	18	14	1	21	18	9
August	24	14	6	27	0	5	22	1	7	19	6	9	22	0	3
September	26	8	3	27	12	5	21	0	11	19	10	3	22	17	1
October	28	1	7	27	18	10	21	12	11	19	15	1	23	3	4
November	28	5	11	27	15	1	21	8	4	20	17	1	23	2	1
December	28	14	11	27	19	3	20	3	3	20	19	2	23	1	3
Year	25	7	7	27	1	5	23	16	9	20	3	6	22	2	11

Month.	1910.			1911.			1912.			1913.			1914.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
January	23	4	3	23	16	7	26	9	11	25	19	1	21	6	6
February	23	3	1	23	3	10	26	6	5	25	4	3	21	7	6
March	23	3	7	22	19	2	25	19	11	24	11	4	21	7	7
April	22	9	11	23	13	8	25	8	11	25	2	4	21	10	2
May	22	1	1	24	6	1	25	11	2	24	10	4	21	5	9
June	22	3	2	24	9	7	25	11	11	21	19	10	21	6	0
July	22	5	6	24	13	10	25	13	1	20	11	2	21	6	7
August	22	14	0	26	11	2	26	1	2	20	14	0	29	0	0
September	23	2	7	27	12	7	26	17	0	21	3	10	25	14	9
October	23	16	6	27	4	10	27	5	10	20	13	9	23	13	6
November	24	1	9	26	13	2	26	14	3	20	14	4	24	14	10
December	23	17	7	26	13	7	26	0	4	21	6	8	27	6	10
Year	23	0	0	25	3	2	26	3	3	22	14	3	23	6	8

*From the annual publication of the "Metal Information Bureau," London, E.C.

World's Production of Spelter in Short Tons.*

Country.	1908.	1909.	1910.	1911.	1912.	1913.
Australia	1,198	.....	560	1,904	2,531	4,105
Austria and Italy	14,063	13,931	14,666	18,602	21,609	23,928
Belgium	181,851	184,194	190,233	215,050	220,678	217,928
France and Spain	61,512	61,859	65,191	70,791	79,543	78,289
Germany	239,062	242,594	251,046	276,008	298,794	312,075
Great Britain	60,029	65,422	69,531	73,803	63,086	65,197
Holland	19,017	21,548	23,121	25,059	26,380	26,811
Poland	9,740	8,758	9,514	10,952	9,659	8,389
United States	210,424	255,760	269,184	286,526	338,806	346,676
Norway	.....	.....	.....	7,363	8,959	10,237
Total	796,896	854,066	893,046	986,058	1,070,045	1,093,635

*Mineral Resources of the United States.

World's Consumption of Spelter in Short Tons.*

Country.	1908.	1909.	1910.	1911.	1912.	1913.
Austria-Hungary	35,935	36,155	37,258	47,950	51,588	44,533
Belgium	74,956	71,209	84,326	81,240	85,098	84,216
France	85,869	73,744	62,059	90,389	90,389	89,286
Germany	198,634	207,343	203,374	241,734	248,899	255,734
Great Britain	152,669	171,408	195,989	193,674	204,146	214,508
Holland	4,189	4,409	4,409	4,409	4,409	4,409
Italy	9,259	9,039	8,929	11,133	11,795	12,015
Russia	19,621	20,282	27,447	31,856	30,754	36,707
Spain	5,512	4,960	4,630	5,291	5,181	6,503
United States	214,167	270,730	245,884	280,059	340,372	295,370
Other countries	11,023	9,921	13,669	19,621	21,715	23,038
Total	811,834	879,200	887,974	1,007,356	1,094,346	1,066,319

*Mineral Resources of the United States.