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CENSUS OF INDUSTRY

MINING, METALLURGICAL & CHEMICAL BRANCH

SUMMARY REVIEW

OF

THE SILVER MINING INDUSTRY

IN

CANADA

1944

OTTAWA
1945

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THE SILVER MINING INDUSTRY IN CANADA, 1944

(a) The Silver-Cobalt Mining Industry.

(b) The Silver-Lead-Zinc Mining Industry.

Definition of the Industry - Silver mining in Canada is not a distinct mining industry inasmuch as silver-bearing minerals usually occur in association with other metals of economic value--with lead and zinc; with copper, nickel and arsenic; with lode and placer free gold; in copper-gold and nickel-copper ores, and at Great Bear Lake, N.W.T., with pitchblende. Silver-lead-zinc mining is a very important industry in British Columbia and, to a lesser extent, in the Yukon Territory. In Eastern Canada, lead and zinc ores have been mined in Ontario, Quebec and Nova Scotia.

It is to be noted that, in addition to its recovery from silver-lead ores, zinc is now produced in large quantities from copper-gold-silver ores mined in Quebec, Manitoba and Saskatchewan.

General statistical data contained in this report are essentially those pertaining only to the mining of silver-cobalt and silver-lead-zinc ores.

(a) THE SILVER-COBALT MINING INDUSTRY

The mining of silver-cobalt ores in Canada is confined almost entirely to the district of Temiskaming in northern Ontario. Veins containing these metals were discovered at or near the present town of Cobalt in 1903 and shipments of ores from this area have been continuous since 1904. Depletion and exhaustion of ore reserves during recent years have resulted in a relatively great decline in the production of metals from these deposits. In most instances, operations at properties, some of which were prominent as producers in the past, are conducted by lessees and shipments range from one to several hundred tons. The increased demand for cobalt as an alloying metal has, for some years, stimulated operations of a salvage nature at several of the older mines.

In order to encourage the production of cobalt for war requirements, United States and Canadian government agencies co-operated during a considerable period of the present war in the purchase of Canadian cobalt ores. Ores thus acquired were consigned in 1942 and 1943 to a United States Government agency stock pile located at Deloro, Ontario. These government purchases were discontinued early in 1944.

The only straight custom plant at Cobalt was the old O'Brien 100-ton mill, operated until late in 1943 by C. W. J. O'Shaughnessy. In August of 1943 the concentrating plant at Cobalt of Cobalt Products Ltd. was taken over by Silanco Mining & Smelting Company; this mill was operated in 1944. The Temiskaming Testing Laboratories, recently destroyed at Cobalt by fire, have been rebuilt by the Ontario Department of Mines; this plant renders a valuable service to many operators who depend on it for the sampling, valuation and often marketing of ores. Shipments of cobalt ore were also made since 1942 from a deposit located at Werner Lake, some 40 miles north of Minaki near the Ontario-Manitoba boundary.

The number of operators reported officially as actively engaged in the mining or shipping of silver-cobalt ores in 1944 totalled 10; employees numbered 165 and salaries and wages paid amounted to $260,575. The gross value of mine and mill shipments totalled $422,860 and the net value of sales was estimated at $323,260; these figures include the value of concentrates and ores placed on the stock pile of the Metals Reserve Company located at Deloro, Ontario.

Table 1 - PRINCIPAL STATISTICS OF THE SILVER-COBALT MINING INDUSTRY IN CANADA, 1929-1944

Year	Number of active operators (/)	Number of operating mines (a)	Capital employed $	Number of employees	Salaries and wages $	Cost of fuel and electricity $	Value of bullion, ore, concentrates or residues sold $
1929	27	32	15,820,435	1,149	1,532,333	407,952	3,918,316
1930	23	28	12,268,322	1,043	1,488,591	352,844	3,637,181
1931	22	26	9,352,520	786	1,149,689	227,467	1,925,593
1932	17	20	3,005,872	369	551,255	124,478	1,735,708
1933	12	14	3,365,755	242	322,281	83,565	1,071,602
1934	15	16	5,102,491	286	361,726	85,685	1,380,318
1935	27	28	6,380,731	402	494,791	114,439	1,070,716 (x)
1936	24	25	5,946,702	363	458,546	104,372	915,376 (x)
1937	23	25	2,655,060	300	394,386	90,134	540,762 (x)
1938	34	30	2,696,217	297	386,851	73,549	288,293 (x)
1939	36	43	2,461,556	323	412,728	63,436	653,032 (x)
1940	48	44	337,080	123	158,024	10,900	809,263 (x)
1941	24	14	439,877	182	229,984	40,875	662,443 (x)
1942	13	14	358,691	192	283,980	68,349	600,207 (x)(b)
1943	20	21	587,039	221	290,654	74,691	578,861 (x)(b)
1944	10	11	(c)	165	260,575	48,323	323,260 (x)(b)

(/) Includes leasers shipping from dumps.
(x) Net value.
(a) Includes properties on which operations were of a salvage nature only, and the number of mines as recorded is based partially on data of a conjectural nature.
(b) Includes value of ores consigned to the United States Government stock pile at Deloro, Ontario.
(c) Not recorded in 1944.

NOTE: The cost of process supplies used--explosives, etc.--was recorded for the first time in 1935 and, beginning with 1935, this cost together with the cost of fuel and electricity purchased, freight and smelter charges were deducted from the gross value of sales.

Table 2 - NUMBER OF WAGE-EARNERS ON PAYROLL OR TIME RECORD AT END OF MONTH IN THE SILVER-COBALT MINING INDUSTRY, 1939-1944

Month	1939	1940	1941	1942	1943	1944 Mine Surface Male	1944 Mine Surface Female	1944 Mine Underground Male	1944 Mill Male
January	296	63	140	144	170	41	...	64	22
February	281	72	144	109	179	42	...	64	10
March	281	79	159	115	181	39	...	72	10
April	293	84	97	141	177	44	...	77	27
May	312	122	139	179	191	50	1	79	29
June	349	138	146	183	181	51	1	76	31
July	325	144	186	200	176	50	1	74	29
August	308	133	193	200	174	48	1	71	30
September	268	128	181	195	216	33	1	72	27
October	235	127	184	180	167	40	1	68	27
November	190	88	161	172	185	36	1	74	31
December	180	74	154	150	145	33	1	83	28

Table 3 - STATISTICS OF THE SILVER-COBALT MINES AND MILL OPERATIONS IN CANADA(b), 1941-1944

		1941	1942	1943	1944
Number of mines in operation (x)		14	14	21	11
Ore mined	tons	11,507	25,550	39,184	27,184
Ore salvaged from surface (e)	tons	(c)	18,532	395	2,189
Ore treated (milled)(a)	tons	38,715	43,851	39,625	30,190
Tailings treated	tons	...	...	8,865	...
Concentrates produced	tons	1,396	1,415	1,346	862
Gross value of bullion, ore, concentrates and residues sold	$	788,815	750,250(d)	721,173(d)	422,860(d)
Cost of freight	$	7,017	1,439	4,192	3,138
Smelter charges	$	18,719	16,255	15,361	12,330
Cost of fuel and purchased electricity used	$	40,875	68,349	74,691	48,323
Cost of process supplies used	$	59,761	64,000	48,068	35,809
Net value of sales	$	662,443	600,207	578,861	323,260

(x) All mines located in northern Ontario and includes properties on which the operations consisted only in salvaging of ore from dumps, etc.
(a) Does not include crude ore shipped.
(b) Partly estimated or conjectural as data are unobtainable from some shippers.
(c) Data not available.
(d) Includes value of ore consigned to United States Government stock pile at Deloro, Ontario.
(e) Complete data not available.

Table 4 - MINE AND MILL SHIPMENTS OF CANADIAN SILVER COBALT ORES AND CONCENTRATES IN 1944

	Gross Weight	Metal Content			
		Silver	Cobalt	Nickel	Copper
	lb.	oz.	lb.	lb.	lb.
To Canadian smelters and to Government stock pile at Deloro, Ontario	1,734,460	489,614	176,813	43,424	16,678
To foreign plants	183,143	2,216	25,951	6,006	710
TOTAL	1,917,603	491,830	202,764	49,430	17,388

Table 5 - FUEL AND ELECTRICITY USED DURING 1944

Kind		Quantity	Cost at Plant
			$
Bituminous coal - (a) From Canadian mines	short ton	553	8,903
(b) Imported	short ton	357	3,934
Anthracite coal - (a) From United States	short ton	75	1,301
(b) Other	short ton	66	690
Gasoline (including gasoline used in cars and trucks)	Imp.gal.	2,615	993
Kerosene or coal oil	Imp.gal.	21	6
Fuel oil and diesel oil	Imp.gal.	7,406	1,068
Wood (cords of 128 cubic feet of piled wood)	cord	107	759
Compressed air	cu. ft.	54,613,700	14,149
Electricity purchased (including service charge)	K.W.H.	1,641,789	16,520
TOTAL	...	...	48,323
Electricity generated (a) For own use	K.W.H.	...	...
(b) For sale	K.W.H.	...	...

Table 6 - POWER EQUIPMENT, 1944

	Ordinarily in Use		In Reserve or Idle	
	Number of units	Total horse power	Number of units	Total horse power
Steam engines	1	175	1	20
Steam turbines	...	...	...	...
Diesel engines	...	...	1	120
Gasoline, gas and oil engines, other than Diesal engines	1	45	5	124
Hydraulic turbines or water wheels	...	...	...	...
Electric motors operated by purchased power	38	851	15	516
TOTAL	40	1,071	22	780
Stationary boilers	5	140	1	65
Motor-generator sets	...	...	...	...

ARSENIC - Canadian production of arsenic (As_2O_3) during 1944 from domestic ores totalled 2,627,022 pounds valued at $180,866 compared with 3,153,538 pounds worth $254,009 in 1943. The output in 1944 consisted entirely of refined arsenic, of which 2,268,067 pounds valued at $153,944 represented recoveries from auriferous quartz ores mined in the province of Quebec; refined arsenic was produced in that province at the Beattie gold mine and crude arsenic produced at the O'Brien mine was refined by the Deloro Smelting and Refining Co. Ltd. at Deloro, Ontario; the balance of Canadian output in 1944 consisted of refined arsenic produced at the Deloro smelter from Ontario silver-cobalt ores. In addition to the arsenic recovered from Quebec and Ontario ores, there is a very considerable quantity of arsenic contained in auriferous quartz ores exported to the United States from British Columbia mines; no data are available on the possible recovery of this arsenic, and the Canadian gold mines receive no payment for any part of the arsenic content; it is therefore not credited as commercial production. Deposits containing arsenopyrite in association with gold occur in various other parts of Canada.

The following information is from the annual 1944 report on Arsenic as prepared by the United States Bureau of Mines:

"Roughly, three-quarters of the consumption of white arsenic has been for the preparation of agricultural insecticides used mainly to combat the cotton boll weevil, the codling and gypsy moths that cause widespread damage to apples and pears, and as herbicides. Of the remainder, the glass industry is the largest user. For the immediate future a good market for all probable United States output of arsenic at or near the current price level seems assured, especially as world needs for foods and fibres will be at a high level. The major one of price will be determined by the cost of imported arsenic and its relation to the cost of the by-product material obtained principally in copper and lead smelting. After Atlantic shipping becomes available, prices cannot be expected to rise substantially because of the huge stocks of arsenic that have accumulated in Sweden as a by-product from the treatment of the Boliden copper-gold-silver ores. The wartime development of effective new organic insecticides, such as DDT, may be strong competitors of arsenicals, although not yet sanctioned for commercial use."

The principal arsenic producing countries are: United States, Mexico, Sweden, France, Belgium, Australia, Japan, Brazil and Canada. Complete data on world production of arsenic are not available at present.

Arsenic is used chiefly in the manufacture of insecticides. It is also used in the preparation of weed killers, sheep and cattle dip, wood preservatives, and in the manufacture of glass, minor uses being in pigments, tannery supplies, and pharmaceutical preparations. Arsenic salts are used to replace creosoting in the preservation of wood. The use of arsenic to manufacture chemical warfare materials has notably increased its consumption. Calcium arsenate and, to a much lesser extent, lead arsenate are the arsenicals ordinarily used in insecticides. Paris green, which is a copper acetoarsenite, is also used as an insecticide. Magnesium arsenate and manganese arsenate have also been used for this purpose. A considerable tonnage of white arsenic, in the form of crude arsenic or as sodium arsenite is used in the manufacture of weed killers. High-grade white arsenic is used in glass as a decolorizer, opacifier and refining agent. Small quantities of arsenic are used in the paint industry, as realgar or arsenic disulphide (As_2S_2) and as orpiment or arsenic trisulphide (As_2S_3).

Although the world consumption of white arsenic has varied greatly during the past ten years, the quoted price remained steady at 3½ cents a pound up to the middle of 1941. As most of it is a by-product of metal recovery, through necessity rather than choice, and as the potential supply is far in excess of any normal demand, there seems to be little likelihood of any sustained increase in price. The New York price remained fixed at 4 cents a pound since 1942. The Canadian price of white arsenic, as given by Canadian Chemistry & Process Industries in May, 1945 was 7 3/4 to 8¼ cents per pound.

Table 7 - PRODUCTION IN CANADA, IMPORTS AND EXPORTS OF ARSENIC, 1943 and 1944

	1943		1944	
	Quantity	Value	Quantity	Value
	Pounds	$	Pounds	$
Production -				
White arsenic	3,153,538	254,009	2,627,022	180,866
Imports -				
Arsenic acid	(a)	(a)	4,202,829	156,652
White arsenic (arsenious oxide)(b)	400	124)	2,405	1,749
Sulphide of arsenic (b)	3,373	1,123)		
Soda, arseniate of, binarseniate	83,329	18,712	86,475	24,488
Arsenate of lead	4,432	484	...	...
Arsenate of lime	9,664	665	...	...
Total	...	21,108	...	182,889
Exports - Arsenic - Total	6,617,100	353,484	5,997,500	306,891

(a) Not classified separately prior to 1944.
(b) Data combined in 1944.

Table 8 - CONSUMPTION OF ARSENIOUS OXIDE AND ARSENIC ACID IN THE MANUFACTURE OF CANADIAN INSECTICIDES, 1932-1943

Year	Pounds	$	Year	Pounds	$
1932	1,721,044	69,250	1938	3,029,145	93,873
1933	3,116,401	110,011	1939	4,287,435	132,584
1934	4,709,443	168,185	1940	3,607,444	122,265
1935	2,736,089	86,985	1941	5,707,499	212,687
1936	3,368,956	106,132	1942	6,106,887	273,919
1937	3,296,559	102,651	1943	4,807,049	211,998

Note: In addition, the following calcium arsenate was used: 1940, 342,452 pounds valued at $21,671; 1941, 509,381 pounds at $34,704; 1942, 394,978 pounds worth $26,773, and 383,059 pounds at $26,373 in 1943.

COBALT - Output of Canadian cobalt comes entirely from cobalt-bearing deposits located in northern Ontario and usually includes the cobalt recovered and sold in the metallic state, the cobalt content of oxides and salts sold and the metal content of cobaltiferous ores exported. No cobalt metal, oxides or salts were produced in Canada from Canadian ores in either 1943 or 1944, and the 36,283 pounds valued at $34,106 credited as Canadian cobalt production during the year under review, represents the metal content of Canadian ores exported. Included in these exports is the cobalt content of ores and concentrates reshipped from the stock pile of the Metals Reserve Company, located at Deloro, Ontario. Ores placed on this stock pile are not credited as commercial production until reshipped from Deloro.

Deloro Smelting and Refining Company, Limited, has the only plant in Canada that treats ores for the recovery of cobalt. The plant is located at Deloro, Ontario, and produces cobalt metal, oxides, and salts, chiefly for the British market. For the past three years the company has been treating cobalt residues from Africa and has processed little or no Canadian ores. The Canadian production of cobalt ore from 1942 to 1944 was largely purchased by Deloro Smelting and Refining Company as agent for the Department of Munitions and Supply, acting for Metals Reserve Company of the United States, and was stockpiled for this account. The purchase of these ores for the Metals Reserve Company was discontinued February 22, 1944.

In the United States, most of the cobalt produced is obtained from cobalt residues imported from Africa. These are converted to metal at Niagara Falls, N.Y., and to oxide at New Brighton, Wilmington, and Canonsburg, in Pennsylvania, and at Cleveland, Ohio.

The total annual world output is estimated to approximate 6,000 metric tons. The greater part of the world's requirements are now supplied from the extensive deposits of the Belgian Congo and Northern Rhodesia, the remainder being contributed mainly by India, French Morocco, and Canada. Other producing countries are Australia, Japan, Germany, and Russia.

The Bureau of Mines, Ottawa, reported recently that about 75 per cent of the world production of cobalt is used in the metallurgical industry and most of the remainder in the ceramic industry. The metallurgical uses are for high-speed cutting steels; for making stellite or stellite-type alloys, which contain 45 to 50 per cent cobalt, 30 to 37 per cent chromium, and 12 to 17 per cent tungsten. There are various modifications of this composition, but all contain high percentages of cobalt. Stellite is used for cutting metals at high speed and for making permanent magnets. The use of stellite continues to spread and it is of great value in the manufacture of valves for aeroplane engines. Small quantities of cobalt used with other chemicals in nickel-plating solutions are said to produce a bright nickel electro deposit as an undercoating for later chromium plating. A certain amount of cobalt is used in electroplating and as a catalyst. Cobalt oxide is used mainly in the ceramic industry owing to its fine colouring properties. Other compounds of cobalt are used as driers in paints and varnishes.

Consumption of cobalt, chiefly in the production of high-speed cutting tools and permanent magnets, increased substantially during the war years.

The price of cobalt has remained fairly steady in recent years. The nominal New York price for cobalt metal remained at $1.50 a pound and for black oxide for the ceramic industry $1.85 a pound. The nominal Canadian price for cobalt ore, 10 per cent grade, f.o.b. cars, Ontario, was approximately $0.94 a pound of cobalt in 1944.

Since 1904, the first year for which cobalt production was recorded in Canada, there were produced, to the end of 1944, in all forms, 34,417,386 pounds of Canadian cobalt valued at $33,726,917.

A detailed investigation was made recently, by the University of British Columbia, of deposits of cobalt ore which have been known for years to exist on Nickel Plate Mountain and at the Little Gem mine; an average concentrate from the Kelowna Exploration Company's mill averaged 0.88 per cent cobalt.

COBALT-SILVER ORES DURING 1944

(A. A. Cole, Manager, Temiskaming Testing Laboratories, Cobalt, Ontario)

In July 1942 the United States Government, through a subsidiary purchasing agency (Metals Reserve Company), completed a contract with the Canadian Government through a similar Canadian purchasing agency (War Supplies Limited) for the purchase of cobalt ores for stock-piling purposes. The first shipment of cobalt ore left Cobalt on this contract in July 1942. This contract was operating during the year 1943 and the year 1944 opened with the market for cobalt ore active, as all cobalt ore purchased was immediately absorbed by this contract at a good price. The contract terminated on the 22nd February 1944 and by that date every available pound of cobalt ore had been shipped from the district.

The uncertainty as to the intentions of the United States Government regarding the stock-pile of accumulated cobalt ore unsettled the market to such an extent that a number of operators closed their mines till the market was more settled. This is reflected in the fact that only one car of cobalt ore was shipped from Cobalt during the balance of the year. It went to the Shepherd Chemical Co., Cincinnati, Ohio, U.S.A. The year closed with the market still uncertain.

Ores of the Cobalt District - The Metals contained in the ores from this district are principally cobalt and silver, with sometimes payment also being made for nickel. The silver content varies from zero up to several thousand ounces per ton. But for contract purposes the ores are generally divided into Silver Ores and Cobalt Ores, an arbitrary point of division being chosen. Ores containing 500 ozs. silver per ton or over are called silver ores.

Cobalt ores - Cobalt ores to be marketable have to assay at least 8 per cent cobalt, but the average of the shipments that have been made will run about 10 per cent. The movement of cobalt ores during 1944 has been covered in the above paragraph.

Silver ores - The main producer of silver ore during the year was the Cross Lake Lease, whose ore for the most part was crude ore and not concentrates. The other shipper of importance was the Ausic Mining & Reduction Co., working its own mill on the Silver Cliff Property, the mill-feed being obtained mostly from the Genesee Mine.

Since the Deloro Smelting & Refining Co.,of Deloro, Ontario gives the most attractive contract for silver-cobalt ores, all the silver ores shipped from the district go to Deloro. As the aggregate shipments are small, the Deloro Company only runs its silver smelter when sufficient ore is accumulated to make the run worth while. This amount they set at 300 tons. A furnace run was made early in 1944 and the next run was a year later in March, 1945.

COBALT 1944

(United States Bureau of Mines)

The United Nations did not lack supplies of cobalt in 1944. Indeed with the output of Finland available, the United Nations control virtually the entire world cobalt supply, except that of Burma (1944). On the other hand, with Germany's loss of cobalt production from French Morocco in 1943 and Finland in 1944, its remaining source of supply was limited to a small domestic output. Presumably, Japan was in a more favourable position than Germany, with respect to cobalt because of a small domestic output and the Burmese production. However, Burmese speiss, which is obtained by smelting lead ore, is difficult to refine. In the United States, despite the fact that cobalt was free from allocation and that imports were 32 per cent less than in 1943, available supplies were more than adequate for requirements in 1944. Maximum prices for cobalt metal, fines, powder, oxides and other alloys and compounds established by the Office of Price Administration on November 2, 1943, continued in effect in 1944. The maximum price for metal containing 97 per cent cobalt was fixed at $1.50 to $1.57 a pound on contract and $1.60 to $1.67 on spot sales. The maximum prices for other cobalt products were the highest charged by the seller on a delivery made during January, February or March 1942. Cobalt ores, concentrates and crudes are exempt from the provisions of the price regulation. Production of cobalt ore in the United States was 13 per centgreater in 1944 than in 1943, but shipments were 27 per cent less. The Bethlehem Steel Co., Bethlehem, Pa., was again the chief producer, but during the last quarter of 1944 it was exceeded by the St. Louis Smelting and Refining Co., Fredericktown, Mo., which began producing cobalt commercially at its property near Fredericktown, Mo., in July 1944; the complex ore yields a lead concentrate, a copper concentrate containing some lead, and a nickel-cobalt concentrate. Production by the Bethlehem Steel Company represents the cobalt (averaging 1.37 per cent in 1944) contained in the sulphides that accompany the magnetite mined at Cornwall, Pa. Belgian Congo has been the chief source of cobalt imports into the United States; in 1944 it supplied 8,500,516 pounds in the form of an alloy containing 3,737,000 pounds of cobalt.

Table 9 - PRODUCTION OF DOMESTIC COBALT IN CANADA, 1913-1919 and 1929-1944

Year	Pounds	Year	Pounds
1913	1,642,000	1933	466,702
1914	702,000	1934	594,671
1915	412,000	1935	681,419
1916	800,000	1936	887,591
1917	674,000	1937	507,064
1918	760,000	1938	459,226
1919	596,000	1939	732,561
		1940	794,359
1929	929,415	1941	263,257
1930	694,163	1942	83,871(x)
1931	521,051	1943	175,961(x)
1932	490,631	1944	36,283(x)

(x) Exclusive of cobalt in ores placed on United States Government stock pile at Deloro, Ontario, but includes metal in ores reshipped from this stock pile.

Table 10 - PRODUCTION IN CANADA FROM DOMESTIC ORES, IMPORTS AND EXPORTS OF COBALT, 1943 and 1944

		1943		1944	
		Quantity	$	Quantity	$
Production (In terms of metallic cobalt and cobalt in oxides and salts sold and in ores exported)	pounds	175,961(x)	191,407	36,283(x)	34,106
Imports - Cobalt ore	pounds	2,236,300	785,721	3,676,400	1,327,755
Oxide of cobalt	pounds	55	130	1,720	2,595
Exports - Cobalt, contained in ore	pounds	163,100	188,510	25,900	24,379
Cobalt, metallic	pounds	911,107	1,507,635	1,009,068	1,665,984
Cobalt, alloys	pounds	214,202	1,021,663	176,589	789,202
Cobalt oxides and cobalt salts	pounds	67,040	135,630	462,656	829,469

(x) Exclusive of cobalt in ores placed on United States Government stock pile at Deloro, Ontario, but includes metal in ores reshipped from this stock pile.

Table 11 - COBALT SALTS USED IN THE MANUFACTURE OF CANADIAN PIGMENTS AND PAINTS, 1932-1943

Year	Pounds	$	Year	Pounds	$
1932	17,021	10,960	1938	43,703	17,993
1933	10,885	7,463	1939	52,979	21,638
1934	26,300	14,069	1940	89,332	28,111
1935	110,419	33,292	1941	74,445	39,349
1936	170,932	43,230	1942	200,228	145,433
1937	37,258	17,062	1943	179,995	75,233

WORLD PRODUCTION

(U.S. Bureau of Mines)

As cobalt production data for many countries are lacking, it is impossible to prepare an accurate statement of present world output. The following table shows world production by countries in 1938 insofar as statistics are available.

Country (a)	Cobalt-bearing Material	Cobalt Content Metric Tons
Australia	Cobalt ore	(b)
Belgian Congo	Cobalt alloy	1,532
Bolivia (exports)	Cobalt ore	...
Burma	Cobaltiferous nickel speiss	238(c)
Canada	Cobalt ores, oxide, and metal	208
Morocco, French	Cobalt ore	720
Northern Rhodesia	Cobalt alloy	1,073(c)
United States	Cobalt ore	(d)

(a) In addition to countries listed, Brazil, Chile, China, Finland, Germany, Italy, Japan and Mexico produce cobalt, but production data are not available.
(b) Data not available.
(c) Year ended June 30 of year stated.
(d) Bureau of Mines not at liberty to publish figures.

OPERATORS IN CANADIAN SILVER-COBALT MINING INDUSTRY, 1944

(x) Active but no shipments made.

Name of Operator	Head Office Address	Location
Ontario -		
Augener Mines Ltd. (x)	Box 643, Cobalt	Coleman Tp.
Ausic Mining & Reduction Co. Ltd. (x) (Genesee & Silver Cliff)	Box 643, Cobalt	Coleman Tp.
Cross Lake Lease (O'Brien)	Box 390, Cobalt	Coleman Tp.
Cross Lake Lease (Miller Lake O'Brien)	Box 390, Cobalt	Haultain Tp.
Davis, Norman B. (Werner Lake)	512 Victoria Bldg., Ottawa	Kenora Dist.
McCready, W. E. (Hudson Bay)	Cobalt	Cobalt
Mercier, Raoul (Foster)	Box 547, Cobalt	Coleman Tp.
O'Shaughnessy, C. V. J. (O'Brien mill)	Box 319, Cobalt	Cobalt
Presse, Albert (Nipissing)	215 Lang St., Cobalt	Cobalt
Price, C. H. (Kerr Lake)	Cobalt	Kerr Lake
Silanco Mining & Smelting Corp. Ltd.	45 Richmond St. W., Toronto	Cobalt Dist.
Silco Mines Ltd. (x)	suite 501 .. 67 Yonge St., Toronto	Gillies Limit
Sutherland, J. H. (Lawson)	Cobalt	Coleman Tp.

NOTE: In addition to the names listed, there were some small shippers from whom official reports were unobtainable. Mine names shown in brackets.

(b) THE SILVER-LEAD-ZINC MINING INDUSTRY

In 1944 the silver-lead-zinc mining industry of Canada reported 20 operators or firms as being actively engaged in the mining, exploration or development of silver-lead-zinc deposits, and of these operators 17 reported commercial shipments during the year under review. Employees numbered 2,769 and salaries and wages paid amounted to $5,810,290. The cost of explosives and other process supplies consumed totalled $1,752,087 and fuel and electricity used was recorded at $860,231. The gross value of production, as reported by the entire industry, totalled $21,291,957 and the net value of same was estimated at $16,802,759.

A report prepared by the Lands, Parks and Forests Branch of the Department of Mines and Resources, Ottawa, contains the following information relating to lode mining in the Yukon in 1944:

"The only production from lode mining has been in the Mayo District. A very small tonnage of high-grade silver-lead ore was shipped in 1944.

"Considerable interest was shown in prospecting for lode during 1944. The Consolidated Mining and Smelting Company, International Nickel, Pioneer and Bralorne Companies, and Hudson's Bay Mining and Smelting Company all had engineers and prospectors in the areas adjacent to the Alaska Highway, Canol Access Road, Haines Cut-off Highway and Airport Access roads.

"There was some prospecting for lode in the Dawson District.

"New locations in the Territory for which Quartz Mining Grants were issued were as follows:

Whitehorse Mining District ...	78 Claims
Dawson Mining District	93 "
Mayo Mining District	20 "
Total	191 "

Renewals of Quartz Claims were: Whitehorse District 26; Dawson District 117; Mayo 264, and in addition 132 claims were held in the Mayo District under 21-year leases.

"The Territorial Assay Office at Keno was kept busy making assays for individual prospectors for which no charge is made."

The annual report "Lead in 1944", as prepared by the Bureau of Mines, Ottawa, contains the following information:

"In British Columbia the lead and zinc concentrates produced in the 8,000-ton concentrator of the Sullivan mine are shipped by rail 185 miles to the company's smelter and refinery at Trail. A total of 2,141,400 tons of ore was milled in 1944, a decrease of about 15 per cent compared with 1943. The grade of ore treated was also lower, due largely to the cleaning out of stope bottoms in preparation for filling, and to the curtailment of development work in the early years of the war so that greater attention could be given to production.

"Western Exploration Company at Silverton produced zinc and lead concentrates for export.

"Reco Mountain Base Metal Mines, Limited, near Sandon, operated the renovated Noble Five concentrator until May, when the plant was destroyed by fire.

"Retallack Mines, Limited, at Retallack, completed the renovation of its 300-ton mill in April. A contract for sale of the zinc concentrate, made in December, 1943, with United States Commercial Company, a United States Government subsidiary company, was replaced in April, 1944, by a contract for the sale of lead and zinc concentrates to American Smelting and Refining Company in the United States.

"The Kootenay Florence mine at Ainsworth was operated by Wartime Metals Corporation as the Kootenay Florence Project from early in 1943 until May, 1944, when the contract for sales to Metals Reserve Company (United States) was cancelled.

"Base Metal Corporation's power house was destroyed by fire in January and as a result there was no production from the company's Kicking Horse zinc-lead mine at Field from then until June 12. The mine was in continuous production during the remainder of the year, and until near the end of November, when a small crew was placed in the Monarch zinc-lead mine, also at Field, to complete salvage operations. The company's concentrator treated an average of 122 tons a day during the period of regular operation, compared with a daily average of 169 tons in 1943. Development work was carried on at the Kicking Horse mine during

the time that production was suspended.

"The Tyee zinc-lead-copper property, near Chemainus, Vancouver Island, was in production until May when the contract with Metals Reserve Company was cancelled. The property was acquired in 1942 by Twin "J" Mines, Limited, and was operated by the company under the supervision of Wartime Metals Corporation. Zinc, lead, and copper concentrates were produced in the 125-ton mill. The Reeves McDonald zinc-lead mine on the Pend-d'Oreille River remained idle in 1943.

"Several small lead-zinc properties, mainly in the Ainsworth-Slocan area shipped crude ore to the Trail smelter.

"In Ontario, Lake Geneva Mining Company's property in Hess township, Sudbury district, was operated by Wartime Metals Corporation. The sales contract with Metals Reserve Company was cancelled, effective April 30, and operations ceased near the end of May, following which the plant was dismantled and sold.

"In Quebec, New Calumet Mines, Limited, with mine and 500-ton concentrator at Calumet Island, Pontiac county, operated at capacity. The lead and zinc concentrates are shipped to American smelters designated by Metals Reserve Company, with which New Calumet has a contract.

"The Tetreault property near Notre-Dame-des-Anges, Portneuf county, was operated by Siscoe Gold Mines, Limited, under the general supervision of Wartime Metals Corporation until May, when activities were discontinued. The lead and zinc concentrates were sold under contract to Metals Reserve Company.

"Aldermac Copper Corporation, Limited equipped its property at Moulton Hill, 4 miles from Sherbrooke, with a complete mining plant and a 250-ton concentrator, which was put into operation on July 15. The mill produces lead, copper, and zinc concentrates for shipment to the United States. In due course, a pyrites concentrate may also be produced. The ore contains appreciable amounts of gold and silver."

Table 12 - PRINCIPAL STATISTICS OF THE SILVER-LEAD-ZINC MINING INDUSTRY(x) IN CANADA, 1935-1944

Year	Number of active operators (a)	Number of operating plants or mines (a)	Capital employed $	Number of employees	Salaries and wages $	Cost of fuel and electricity $	Value of ores and concentrates sold (b) $
1935	69	70	16,596,941	1,657	2,431,110	438,126	10,553,086
1936	88	89	19,372,600	1,870	2,917,832	680,677	13,814,645
1937	128	130	29,637,739	2,220	3,914,643	845,898	22,740,582
1938	107	108	30,386,714	1,640	3,027,915	702,571	18,483,945
1939	82	83	23,664,620	1,646	2,803,057	667,661	13,555,609
1940	82	83	19,969,198	1,585	3,052,532	468,157	16,439,530
1941	63	64	17,717,334	1,666	3,452,199	610,168	20,653,212
1942	44	44	19,484,442	2,185	4,730,370	791,772	23,504,642
1943	31	32	20,603,191	3,097	6,423,724	986,519	21,932,644
1944 -							
Quebec	6	6	(c)	714	1,350,153	195,000	2,658,477
Ontario	1	1	(c)	38	75,626	14,218	50,884
British Columbia	12	12	(c)	2,017	4,384,511	651,013	14,080,473
Yukon	1	1	(c)	...	...	...	12,925
TOTAL	20	20	(c)	2,769	5,810,290	860,231	16,802,759

(x) Includes data relating to mining of any silver-pitchblende ores in the Northwest Territories.
(a) Usually includes a number of small shippers from whom no particulars were received relating to wages, etc.
(b) The value of fuel, purchased electricity and process supplies have been deducted.
(c) Data not recorded in 1944.

NOTE: For value of process supplies used in 1943 and 1944, see Table 15, also the statistics shown in this report do not include those relating to smelting and refining.

Table 13 - NUMBER OF WAGE-EARNERS, BY MONTHS, IN THE SILVER-LEAD-ZINC MINING INDUSTRY, 1943 and 1944

Month	1943	1944				
		MINE			MILL	
	Total	Surface		Underground		
		Male	Female	Male	Male	Female
January	2,484	600	13	1,524	485	33
February	2,560	576	13	1,548	479	33
March	2,533	557	15	1,469	481	34
April	2,522	598	16	1,368	467	36
May	2,568	592	16	1,336	456	42
June	2,725	571	24	1,266	431	41
July	2,790	542	24	1,271	425	40
August	2,780	547	25	1,218	418	39
September	2,730	498	25	1,223	402	41
October	2,790	487	25	1,249	397	41
November	2,946	469	23	1,401	395	39
December	2,827	457	25	1,403	399	39
AVERAGE	2,690	542	21	1,358	436	38

Table 14 - NUMBER OF WAGE-EARNERS WHO WORKED THE NUMBER OF HOURS SPECIFIED, DURING ONE WEEK IN MONTH OF HIGHEST EMPLOYMENT, 1944

Hours	Male	Female	Hours	Male	Female
30 hours or less	59	...	55 hours	62	...
31-43 hours	94	...	56-64 hours	336	5
44 hours	14	8	65 hours and over	48	...
45-47 hours	10	...	GRAND TOTAL	2,688	62
48 hours	1,933	49			
49-50 hours	29	...	Total wages paid in		
51-54 hours	103	...	that week $	107,287	2,113

Table 15 - FUEL AND ELECTRICITY USED IN THE SILVER-LEAD-ZINC MINING INDUSTRY, 1943 and 1944

	Unit of measure	1943		1944	
		Quantity	Value	Quantity	Value
			$		$
Bituminous coal—Canadian	short ton	46,516	215,144	42,256	231,366
Imported	short ton	3,002	32,659	2,143	24,847
Anthracite coal—United States	short ton	387	4,082	1	54
Other	short ton	...	...	...	...
Lignite coal	short ton	338	2,409	...	...
Coke	short ton	...	...	37	601
Gasoline	Imp. gal.	55,422	19,582	53,110	17,736
Kerosene	Imp. gal.	1,728	815	1,637	501
Fuel oil and diesel oil	Imp. gal.	1,104,269	201,789	483,987	85,053
Wood (cords of 128 cu. ft.)	cord	1,608	29,571	1,170	6,259
Other fuel	...	...	...	...	...
Electricity purchased, including service charges	K.W.H.	81,712,950	480,468	83,025,582	493,834
TOTAL	...	...	986,519	...	860,231
Electricity generated for own use.	K.W.H.	33,763,446	...	22,534,785	...
Process supplies used, explosives, etc.	...	...	2,044,367	...	1,752,087

Table 16 - POWER EQUIPMENT INSTALLATION IN THE SILVER-LEAD-ZINC MINING INDUSTRY, 1944

	Ordinarily in Use		In Reserve or Idle	
	Number of units	Total horse power (x)	Number of units	Total horse power (x)
Steam engines	...	...	...	...
Steam turbines	3	6,000	...	...
Diesel engines	19	3,248	3	242
Gasoline, gas and oil engines, other than Diesel engines	8	351	4	430
Hydraulic turbines or water wheels	5	1,070	...	...
Electric motors (a) Operated by purchased power.	947	22,670	127	4,457
TOTAL	982	33,339	134	5,129
(b) Operated by power generated by the establishment	471	8,362	42	824
Stationary boilers	35	2,837	3	76
Motor-generator sets	29	3,047	2	300

(x) According to manufacturers' rating.

Table 17 - ORE MINED AND MILLED IN THE SILVER-LEAD-ZINC MINING INDUSTRY IN CANADA -- 1943 and 1944

		Yukon and Northwest Territories	British Columbia	Quebec and Ontario	CANADA
1943 - Ore mined	ton	37,371	2,708,886	506,400	3,252,657
Ore milled	ton	32,186	2,714,329	499,380	3,245,895
Concentrates produced--Lead	ton	...	292,407	5,383	297,790
Zinc	ton	...	331,563	55,894	387,457
Pitchblende-silver	ton	(x)	...	...	(x)
Gold precipitate..	ton	...	...	20	20
1944 - Ore mined	ton	101	2,359,839	551,884	2,911,824
Ore milled	ton	...	2,355,675	549,891	2,905,566
Concentrates produced--Lead	ton	4	201,417	9,831	211,252
Zinc	ton	...	286,754	64,763	351,517
Pitchblende-silver	ton	(x)	...	...	(x)
Gold precipitate..	ton	...	...	18	18

(x) Data not available for publication.

Table 18 - DESTINATION OF SHIPMENTS FROM SILVER-LEAD-ZINC MINES OF CANADA, 1943 and 1944

	Tons shipped	Gross value at shipping point	Total Metal Content as Determined by Settlement Assay			
			Gold fine oz.	Silver fine oz.	Lead pounds	Zinc pounds
		$				
1943						
To Canadian smelters -						
Lead ore	3,033	178,543	481	341,528	193,202	11,483
Lead concentrates (f)	308,379	15,246,727	37	6,630,217	406,083,211	30,559,105
Pyrites concentrates	509	19,245	471	6,054	...	...
Zinc concentrates	306,769	6,253,860	13	620,190	28,129,985	303,830,945
Dry ore	1,899	31,685	408	54,674	29,926	60,212
TOTAL	620,589	21,730,060	1,410	7,652,663	434,436,324	334,461,745
To Foreign smelters -						
Lead ore	228	41,341	3	57,442	266,853	...
Lead concentrates	8,268	937,075	7,600	492,222	10,289,890	235,785
Zinc concentrates (x)	82,627	3,751,444	86	283,606	145,593	90,270,160
Gold precipitate	20	612,962	10,408	378,797	...	...
TOTAL	91,143	5,342,822	18,097	1,212,067	10,702,336	90,505,945
GRAND TOTAL (Gross)	...	27,072,882	...	...	...	...

Table 18 - DESTINATION OF SHIPMENTS FROM SILVER-LEAD-ZINC MINES OF CANADA, 1943 and 1944 (Concluded)

	Tons shipped	Gross value at shipping point	Total Metal Content as Determined by Settlement Assay			
			Gold fine oz.	Silver fine oz.	Lead pounds	Zinc pounds
		$				
1943 (Con.)						
Cost of freight	...	1,655,637	...	...	...	...
Cost of fuel and purchased electricity	...	986,519	...	...	...	...
Smelter charges	...	453,715	...	...	...	...
Cost of process supplies ..	...	2,044,367	...	...	...	...
NET VALUE	...	21,932,644	...	...	...	...
1 9 4 4						
To Canadian smelters -						
Lead ore	1,440	131,446	110	292,413	162,521	16,920
Lead concentrates	202,014	9,294,664	...	4,087,122	272,917,775	21,932,674
Pyrites concentrates	...	...	...	...	...	...
Zinc concentrates (x) ...	256,303	5,218,329	...	535,010	27,172,583	247,806,425
Dry ore	700	37,415	494	48,814	20,465	27,071
TOTAL	460,457	14,681,854	604	4,963,359	300,273,344	269,783,090
To Foreign smelters -						
Lead ore	97	19,045	2	26,976	106,144	...
Lead concentrates	15,178	1,192,527	3,562	1,094,099	15,294,423	...
Zinc concentrates (x) ...	96,029	4,831,603	47	93,490	47,078	106,422,436
Gold precipitates	18	566,928	9,940	376,353	...	...
TOTAL	111,322	6,610,103	13,551	1,590,918	15,447,645	106,422,436
GRAND TOTAL (Gross)	...	21,291,957	...	...	...	...
Cost of freight	...	1,070,103	...	...	...	...
Cost of fuel and purchased electricity	...	860,231	...	...	...	...
Smelter charges	...	806,777	...	...	...	...
Cost of process supplies ..	...	1,752,087	...	...	...	...
NET VALUE	...	16,802,759	...	...	...	...

(x) Does not include any zinc concentrates produced from copper-gold-zinc ores in Quebec, Manitoba, Saskatchewan or British Columbia.

(✓) Includes shipments of silver-pitchblende concentrates from Northwest Territories. Information relating to content of pitchblende is not available for publication.

NOTE: In addition to the metals contained in shipments listed in Table 18, there are considerable quantities of lead and silver contained in ores shipped from certain gold mines in British Columbia. Cadmium, bismuth, antimony, tin and sulphur are also recovered from these ores (silver-lead-zinc).

Table 19 - DRILLING COMPLETED ON SILVER-LEAD-ZINC DEPOSITS IN CANADA, 1943 and 1944

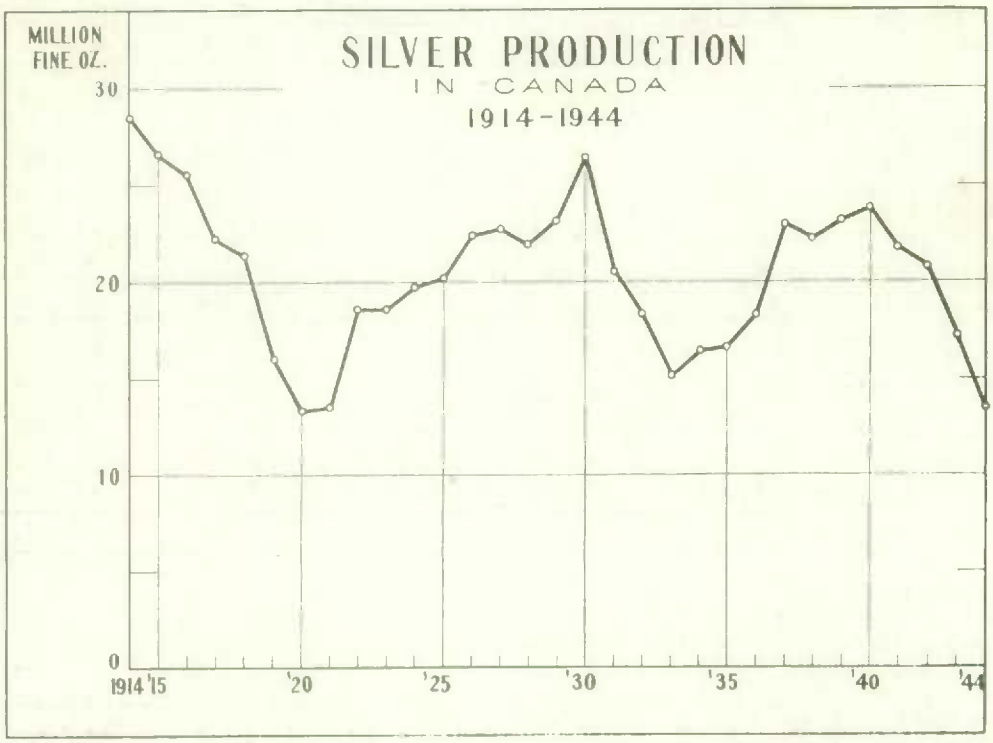
	Footage Drilled	
	1 9 4 3	1 9 4 4
Diamond drilling for exploration and testing -		
By mining companies with their own personnel and equipment	5,591	1,283
By diamond drilling contractors	64,425	86,466
Other diamond drilling -		
Blast hole diamond drilling:		
By mining companies with their own personnel and equipment ...	...	...
By diamond drilling contractors	96,963	280,447
Drilling by percussion or other machines	1,871,957(x)	2,660,574(x)

(x) Not complete as records are unobtainable at certain mines.

Table 20 - TAXES PAID IN 1943 and 1944 BY CANADIAN SILVER-LEAD-ZINC, NICKEL-COPPER AND COPPER-GOLD-SILVER MINING AND SMELTING COMPANIES (x)

Tax Paid	1943	1944
	$	$
Dominion income tax	12,565,039	9,947,447
Dominion excess profits tax	17,059,904	13,610,741
Provincial tax	3,177,194	2,737,249
Municipal tax	624,862	739,680

(x) Subject to revision.



SILVER - Production of fine new silver from all types of Canadian ores totalled 13,627,109 troy ounces valued at $5,859,656 in 1944 compared with 17,344,569 troy ounces worth $7,849,111 in 1943. The average estimated price of the fine metal in Canadian funds was 43 cents per troy ounce in 1944 as against 45.254 cents in 1943. Of the total Canadian production in 1944, the mines of British Columbia contributed 5,631,572 ounces, Ontario 3,143,275 ounces, Quebec 2,500,681 ounces, Saskatchewan 1,735,773 ounces, Manitoba 569,873 ounces, with lesser quantities from Yukon, Northwest Territories and Nova Scotia. The greatest annual production of silver in Canada occurred in 1910 in which year an output of 32,869,264 fine ounces was recorded; the highest average annual Canadian price per fine ounce for silver was 111.122 cents in 1919. Production of silver in Canada since 1887, the first year for which data are available, to the close of 1944, totalled 880,919,928 troy ounces valued at $494,565,826.

The following information is taken from the review of the 1944 silver market by Handy & Harman, New York:

"For the fifth successive year the silver markets of the world have operated under governmental control. Price ceilings, import and export embargoes and exchange restrictions created artificial conditions in silver dealings everywhere, but this was necessary in order that the white metal might function to best advantage in the war effort. As in 1943 the London spot and forward quotations were pegged at 23⅞d. throughout the year . . . . While rigid stabilization of silver at a fixed level was not attempted in India, nevertheless the authorities exercised considerable price control in a market which was extremely sensitive and subject to wide fluctuations; industrial consumption of silver in India is practically nil. Therefore that country's absorption of silver represents merely the peoples' desire to accumulate a store of value. . . . . The United States OPA import price ceiling of 45 cents per ounce was maintained, but imports declined as compared with 1943. Nevertheless, supplies of foreign origin were more than sufficient to meet requirements for the uses specified by the War Production Board. . . . . During 1944 less than 200,000

ounces of the United States silver production were acquired by the U.S. Treasury Department under the Domestic Silver Purchase Act of 1939; all the rest of such newly-mined metal was bought by industry for civilian purposes as permitted by the War Production Board. . . . .

"United States Treasury disposals during the eleven-month period were comprised as follows: the minting of 'silver' nickels accounted for 8,489,000 ounces; sales under the Green Act absorbed 43,672,000 ounces; lend-lease procedure made 202,807,000 ounces available to foreign governments, a total of 255,000,000 ounces. The governments receiving lend-leased silver were Australia, Ethiopia, Great Britain, India, the Netherlands and Saudi-Arabia. There were 1,175,700,000 ounces of silver pledged as backing for U.S. silver certificates and 868,700,000 ounces which remained unpledged. . . . . England's industrial consumption of silver, restricted entirely to war purposes, is estimated at 14,000,000 to 18,000,000 ounces. Canadian arts and industries absorbed an estimated 5,000,000 ounces, a new high record. An estimate for the arts and industries in the United States in 1944 is 125,000,000 ounces; of this, 65 per cent was for war and other essential purposes. Among war purposes in the United States, solders and brazing alloys moved into first place, followed in order of quantity by photographic products and processes, electrical parts, airplane engine bearings and military insignia. There was a marked growth in the employment of silver for electrical purposes, including Radar and a continued heavy rate of use in aircraft engine bearings. . . . ."

On January 2, 1945, the London silver market commenced to quote bar silver in pence per troy ounce .999 fine instead of in pence per ounce standard, that is, per ounce troy .925 fine.

INCREASE IN SILVER PRICE IN UNITED STATES 1945

(E & M J Metal & Mineral Markets, New York)

"The office of United States Price Administration raised the ceiling price of foreign silver in September 1945 from 45 cents a fine ounce to 71.111 cents. The higher level became effective on September 21, 1945. In taking this action OPA established a uniform maximum price for both foreign and domestic silver.

"Foreign silver is defined by the pricing organization as 'all silver other than newly mined domestic silver or silver sold by the United States Treasury under the Green Act'. The measure, sponsored by Senator Green, which became law in 1943, permitted the sale of Treasury silver for war purposes and other uses at a price equivalent to the domestic price of 71.111 cents.

"Use of foreign silver had been restricted under the war program to essential war needs. Consumers of silver who could not qualify to obtain the lower-priced foreign metal, such as manufacturers of silverware and jewellery, had to purchase the higher-priced domestic or Treasury silver.

"WPB Order M-199, which limited and controlled the uses of silver, was revoked August 20, 1945, and continuance of different maximum prices for foreign and domestic silver after that date was no longer practicable, OPA said. Foreign consumers were paying higher prices than 45 cents for silver and the flow of foreign metal into the United States market threatened to decline appreciably. . . . ."

Table 21 - PRODUCTION OF SILVER IN CANADA, BY PROVINCES AND METHOD OF COMPUTATION, 1943 and 1944

	1943		1944	
	Quantity	Value	Quantity	Value
		$		$
Nova Scotia -				
In gold bullion	144	65	188	81
Quebec -				
In anode copper	1,509,610	683,159	1,255,790	539,990
In gold bullion made and in concentrates exported	702,505	317,912	1,244,891	535,303
Total	2,212,115	1,001,071	2,500,681	1,075,293
Ontario -				
In silver recovered in Canada from cobalt ores	97,411	44,082	684,092	294,160
In gold bullion	339,640	153,701	278,413	119,717
In blister copper	1,608,787	728,040	1,812,447	779,352
In ores, concentrates, residues, matte, etc., exported	625,482	283,056	368,323	158,379
Total	2,671,320	1,208,879	3,143,275	1,351,608

Table 21 - PRODUCTION OF SILVER IN CANADA, BY PROVINCES AND METHOD OF COMPUTATION, 1943 and 1944 (Con.)

	1943 Quantity	1943 Value	1944 Quantity	1944 Value
		$		$
Manitoba -				
In blister copper	533,906	241,614	519,707	223,474
In gold bullion (gold mines) and ores exported	53,373	24,153	50,166	21,571
Total	587,279	265,767	569,873	245,045
Saskatchewan -				
In blister copper	2,812,623	1,272,825	1,735,773	746,382
In gold bullion and in crude alluvial gold	1	...	...	...
Total	2,812,624	1,272,825	1,735,773	746,382
Alberta -				
In alluvial gold	1	..	4	2
British Columbia -				
In alluvial gold	2,628	1,189	2,000	860
In gold bullion	30,431	13,771	17,725	7,622
In base bullion and in ores, etc., exported	8,962,429	4,055,858	5,611,847	2,413,094
Total	8,995,488	4,070,818	5,631,572	2,421,576
Yukon -				
In alluvial gold	8,810	3,987	5,124	2,203
In silver-lead ores exported	43,538	19,703	26,942	11,585
Total	52,348	23,690	32,066	13,788
Northwest Territories -				
In pitchblende-silver ores shipped to smelters (x) and in gold bullion	13,250	5,996	13,677	5,881
CANADA--TOTAL	17,344,569	7,849,111	13,627,109	5,859,656

(x) Complete data relating to recovery of silver from pitchblende ores are not available since 1942.

NOTE: For 1944, silver was valued at 43 cents per fine ounce, the average price of domestic sales and sales on the New York market adjusted and expressed in Canadian funds; for 1943, the corresponding price was 45.254 cents.

Table 22 - PRODUCTION OF SILVER IN CANADA, BY MONTHS, 1944 and 1945

Month	1944	1945 (x)
	(Ounces)	
January	1,212,349	1,019,590
February	1,280,962	952,225
March	1,375,351	1,199,546
April	1,237,170	1,253,877
May	1,035,847	1,198,327
June	1,167,200	1,099,541
July	1,077,974	951,348
August	835,166	1,055,483
September	910,838	
October	1,060,784	
November	1,199,153	
December	1,234,315	
TOTAL - CALENDAR YEAR	13,627,109	
Total - Eight Months Ending August	9,222,019	8,729,942

(x) Subject to revision.

Table 23 - SOURCE OF CANADIAN SILVER PRODUCTION, BY PERCENTAGES, 1939-1944

Source	1939	1940	1941	1942	1943	1944
In silver-cobalt ores	6.5	5.38	2.6	4.13	0.81	5.05
In base bullion (a)	39.7(b)	44.39(b)	45.3	46.16	45.58	35.52
In gold ores (bullion and placer)	4.6	3.60	4.1	3.71	3.07	3.21
In blister and anode copper (c)	23.6	27.62	31.8	34.28	37.28	39.07
In matte, copper ores and silver-lead ores, etc., exported (other than silver-cobalt ores)	25.6	19.01	16.2	11.72	13.26	17.15
	100.0	100.0	100.0	100.0	100.0	100.0

(a) Chiefly from silver-lead ores.
(b) Includes silver recovered in Canada from pitchblende-silver ores.
(c) Made from copper-gold-silver and nickel-copper ores.

Table 24 - CANADIAN SILVER PRODUCTION ACCORDING TO NATURE OF ORES, BY PROVINCES, 1944

Province	Crude placer gold	Auriferous quartz ores	Copper-gold-silver ores	Nickel-copper ores	Silver-lead-zinc ores	Silver-cobalt and other ores	TOTAL
				(Ounces)			
Nova Scotia	...	188	...	...	...	...	188
Quebec	...	126,958	1,272,181	...	1,101,542	...	2,500,681
Ontario	...	577,516	...	1,828,978	48,526	688,255(x)	3,143,275
Manitoba	...	6,307	563,566	...	...	...	569,873
Saskatchewan	...	...	1,735,773	...	...	...	1,735,773
Alberta	4	...	...	...	...	...	4
British Columbia	2,000	140,624	223,154	...	5,265,794(/)	...	5,631,572
Northwest Territories	...	5,428	...	...	...	8,249	13,677
Yukon	5,124	...	...	...	26,942	...	32,066
CANADA	7,128	857,021	3,794,674	1,828,978	6,442,804	696,504	13,627,109

(x) Exclusive of silver in cobalt-silver ores placed on United States Government stock pile at Deloro, Ontario, but includes any silver in ores reshipped from this stock pile.
(/) Contains a relatively small quantity recovered from gold ores.

Table 25 - PRODUCTION OF SILVER FROM ALL ORES IN CANADA FOR YEARS SPECIFIED, 1887-1944

Year	Ounces	Cents per ounce	Year	Ounces	Cents per ounce
1887	355,083	98.00	1931	20,562,247	29.87
1891	414,523	98.00	1932	18,347,907	31.67
1896	3,205,343	67.06	1933	15,187,950	37.83
1901	5,539,192	58.95	1934	16,415,282	47.46
1906	8,473,379	66.79	1935	16,618,558	64.79
1910 (x)	32,869,264	53.49	1936	18,334,487	45.13
1911	32,559,044	53.30	1937	22,977,751	44.88
1916	25,459,741	65.66	1938	22,219,195	43.48
1919	16,020,657	111.122(/)	1939	23,163,629	40.49
1920	13,330,357	100.90	1940	23,833,752	38.25
1925	20,228,988	69.06	1941	21,754,408	38.26
1927	22,736,698	56.37	1942	20,695,101	42.17
1929	23,143,261	52.99	1943	17,344,569	45.25
1930	26,443,823	38.15	1944	13,627,109	43.0

(x) Year of maximum output.
(/) Highest price per ounce recorded since 1887.

Refined silver produced in Canada during 1944 totalled 12,021,146 fine troy ounces compared with 15,900,840 fine troy ounces in 1943.

Canadian refined silver is sold in Canada (September 1945) to the Canadian consumer at 40 cents per ounce. Silver, in all forms (bullion, ores, etc.), is under export permit designed to see that the Canadian consumer is protected as to his supply, after which all excess can be exported to foreign markets. Silver in ores exported to the United States is paid for by the U.S. smelter in the usual way. Export permit forms can be obtained from Canadian customs offices.

Table 26 - SILVER PRODUCTION OF THE WORLD (American Bureau of Metal Statistics) - Fine troy ounces

	1938	1944
North America -		
United States (inc. Philippine Islands)	58,736,000	57,370,000
Canada	22,219,195	15,545,905
Mexico	81,016,939	63,000,000
Newfoundland	1,645,590	1,163,000
Total North America	163,617,724	115,078,905
Central America and West Indies	4,300,000	4,000,000
South America -		
Argentina	3,755,000	1,695,000
Bolivia	6,373,660	6,797,378
Chile	1,375,498	950,000
Colombia	192,872	205,000
Ecuador	89,111	325,000
Peru	20,552,177	11,650,000
Other South America	47,000	100,000(x)
Total South America	32,385,318	21,722,378
Europe -		
Czechoslovakia	1,190,326	
France	565,000(x)	
Great Britain	107,985	
Germany	7,000,000(x)	
Greece	150,000	
Italy	812,500	
Norway	235,338	
Poland	62,244	
Romania	819,864	
Russia	7,000,000(x)	
Spain	237,653	
Sweden	1,123,835	
Yugoslavia	2,524,074	
Other Europe	140,000	
Total Europe	21,968,819	(f)
Oceania -		
New South Wales	9,558,550	
Queensland	3,533,490	
Tasmania	1,219,550	
Western Australia	271,346	103,000
New Guinea	141,760	
New Zealand	357,709	
Other Oceania	20,000	
Total Oceania	15,102,405	(f)
Asia -		
India and Burma	6,450,000	
China	150,000(x)	
Korea	3,000,000(x)	
Netherlands Indies	579,151	
Cyprus	106,522	
Japan	10,000,000(x)	
Turkey	350,000	
Other Asia	140,000	
Total Asia	20,775,653	(f)

Table 26 - SILVER PRODUCTION OF THE WORLD (American Bureau of Metal Statistics) - (Concluded)

	1938	1944
Africa -		
Algeria	90,000	
Nigeria	50,000(x)	
Rhodesia	254,654	103,800
Transvaal, Cape Colony and Natal	1,135,374	
Belgian Congo	3,122,215	
French Morocco	208,980	
Southwest Africa	636,396	
Tunis	61,149	
Other Africa	60,000	
Total Africa	5,618,768	(✓)
TOTAL FOR WORLD	263,768,687	(✓)

(x) Conjectural.
(✓) Data not available.

Table 27 - ORIGIN OF BULLION DEPOSITED AT VANCOUVER ASSAY OFFICE AND OTTAWA MINT, 1944

Source	Gross Weight	Fine Gold	Fine Silver
		(Ounces)	
From Canadian Mines and Refineries -			
Ontario	2,135,742.075	1,724,975.760	225,046.97
Quebec	1,073,876.275	880,766.502	120,627.19
British Columbia	135,588.080	109,626.768	19,824.86
Manitoba	103,842.375	84,301.336	6,297.93
Yukon	30,569.640	23,814.864	5,124.83
Nova Scotia	6,251.250	5,841.465	187.68
North West Territories	30,644.600	21,927.511	5,760.22
Alberta and Saskatchewan	79.315	57.322	5.05
Total from Mines and Refineries	3,516,593.610	2,851,311.528	382,874.73
From Jewellery and Scrap	20,200.410	9,456.454	2,784.56
Mutilated Gold Coin	.236	.213	...
GRAND TOTAL	3,536,794.256	2,860,768.195	385,659.29

Table 28 - SILVER CONSUMED IN SPECIFIED CANADIAN INDUSTRIES, 1942 and 1943

	1942		1943	
	Fine oz.	Value	Fine oz.	Value
		$		$
Electrical apparatus	...	...	15,815	8,538
Scientific equipment)	744,175(x)	295,189	702,882	279,885
Fountain pens and pencils)			54,712	25,497
Jewellery and silverware (fine silver)	...	1,476,788	...	1,421,459
Jewellery and silverware (silver alloys)	...	754,421	...	837,907
Medicinal and pharmaceutical preparations (bullion)	141,875	57,928	147,254	61,038
Miscellaneous chemicals	6,944	2,780	...	...

(x) Consumed largely in the manufacture of photographic film.

Table 29 - IMPORTS INTO CANADA AND EXPORTS OF SILVER AND FILMS, 1943 and 1944

	1943		1944	
	Quantity	Value	Quantity	Value
	oz.	$	oz.	$
Imports (x) -				
Silver, unmanufactured	...	...	...	...
Silver, manufactures of, n.o.p.	...	31,427	...	36,296
Toilet articles of which the most important component, in value, is sterling silver	...	254	...	53
Total	...	31,681	...	36,349
Exports -				
Silver contained in ore, concentrates, etc.	2,253,018	1,040,297	2,389,739	1,170,475
Silver bullion (Canadian)	9,198,617	4,517,756	3,577,243	1,762,944
Silver manufactures	...	71,300	...	208,387
Total	...	5,629,353	...	3,141,806
Imports of photograph film -				
Photographers	...	407,054	...	610,890
Cinematograph (positives) ft.	4,565,195	368,470	7,016,432	563,674
Films for aerial photography	...	65,442	...	89,342
Cinematograph (negatives)	...	76,880	...	75,763
Educational	...	338,313	...	277,289
X-Ray film	...	(x)	...	451,778
Exports -				
Film for photographers' use and for moving pictures	...	803,267	...	1,559,626

(x) Not shown separately.

Table 30 - WORLD'S MONETARY STOCKS OF SILVER AT THE CLOSE OF 1943 (Supplied by the United States Mint and Subject to Revision) Stated in United States money, 000's omitted

Country	Monetary unit	Silver stocks in banks and treasuries	Per capita
		$	$
North America -			
United States (including Alaska, Hawaii and Puerto Rico)	dollar	3,287,817	24.43
Canada	dollar	40,010	3.50
Mexico	Peso	(1)	(1)
Newfoundland and Labrador (2)	dollar	2,281	7.60
Central America and West Indies -			
British Honduras	dollar	196	3.21
British West Indies:			
Barbados	dollar	1,560	7.88
Jamaica	pound	838	0.68
Trinidad and Tobago (3)	dollar	1,200	2.37
Costa Rica	colon	128	0.19
Cuba (5)	peso	88,000	20.95
Dominican Republic (4)	dollar	489	0.28
Guatemala	qetzel	1,707	0.50
Haiti (5)	Gourde	(1)	(1)
Honduras	Lempira	4,510	3.85
Nicaragua	cordoba	103	0.07
Panama, Republic of (5)	balboa	1,010	1.60
Salvador (6)	colon	...	...

Table 30 - WORLD'S MONETARY STOCKS OF SILVER AT THE CLOSE OF 1943 (Supplied by the United States Mint and Subject to Revision) Stated in United States money, 000's omitted - (Concluded)

Country	Monetary unit	Silver stocks in banks and treasuries	Per capita
South America -			
Argentina	peso	...	...
Bolivia	Bolivian	3,873	1.12
Brazil	cruzeiro	(1)	(1)
British Guiana (3)	dollar	1,188	3.42
Chile	peso	...	...
Colombia	peso	9,503	1.01
Ecuador	sucre	438	0.15
Paraguay	peso	...	...
Peru	sol	3,538	0.50
Surinam	florin	526	2.81
Uruguay	peso	6,403	2.91
Venezuela	bolivar	(1)	(1)
Europe - (1)	...	(1)	(1)
Asia -			
British India (excluding Burma) (7)	rupee	37,050	0.10
Iran	rial	20,204	1.68
Palestine and Trans-Jordan	pound	6,698	4.23
Africa -			
British East Africa (Kenya, Tanganyika, Uganda and Zanzibar)	shilling	17,578	1.37
British West Africa (Gambia, Gold Coast, Nigeria and Sierra Leone)	pound	386	0.01
Egypt and Anglo Egyptian Soudan	pound	22,875	0.99
Portuguese East Africa (8)	escudo	240	0.06
Southwest Africa	pound	79	0.22
Oceania -			
Fiji Islands	pound	657	3.06
New Zealand	pound	7,168	4.39

(1) Data not available.
(2) Canadian coin and currency also circulate.
(3) Estimated.
(4) Dominican Republic--Silver: Dominican and United States; Paper: United States.
(5) United States coin and currency also circulate.
(6) Silver was demonetized under decree of December 23, 1941 effective February 28, 1942.
(7) Source: The Statist, January 30, 1943. Silver represents rupee coin in Reserve Bank of India.
(8) Silver escudos converted at rate of 15 per dollar ($0.0666+)

Table 31 - AVERAGE COMMERCIAL RATIO OF SILVER TO GOLD FOR EACH SPECIFIED YEAR SINCE 1700 (Supplied by United States Mint)

Year		Year		Year	
1700	14.81	1905	33.87	1935	54.19
1750	14.55	1910	38.22	1936	77.09
1800	15.68	1915	40.48	1937	77.44
1850	15.70	1920	20.28	1938	80.39
1875	16.64	1925	29.78	1939	88.84
1880	18.05	1930	53.74	1940	99.76
1885	19.41	1931	71.25	1941	99.73
1890	19.75	1932	73.29	1942	90.57
1895	31.60	1933	59.06	1943	85.08 (x)
1900	33.33	1934	72.49	1944	85.67 (x)

(x) Estimated on averages in Canadian funds.

LEAD AND ZINC - Statistics relating to Canadian primary production of lead and zinc represent the content of these metals contained in ores exported plus the quantity of lead in base bullion produced and refined zinc made in Canada. Refined lead is produced in Canada only by the Consolidated Mining & Smelting Company of Canada Ltd. which company operates an electrolytic lead refinery at Trail, British Columbia. Refined zinc is produced at Flin Flon, Manitoba by the Hudson Bay Mining & Smelting Company Limited and at Trail, British Columbia by the Consolidated Mining & Smelting Company of Canada Ltd.

The following information is from reports on lead and zinc as prepared by the Bureau of Mines, Ottawa:

"Lead production in Canada is obtained from the various silver-lead-zinc mines of British Columbia and to a smaller extent from the few zinc-lead mines in Quebec and Ontario. The Sullivan mine at Kimberley, British Columbia, operated by Consolidated Mining and Smelting Company of Canada, is the principal source of production. Canada exports the greater part of its output of lead.

"Lead is used chiefly in the lead pigment, cable covering, storage battery, building, and ammunitions industries, and in the manufacture of tetraethyl lead for gasoline. So far in the present war it has been the least scarce of the metals, but, as a result of direct and indirect war demands and the substitution of lead for copper and brass, consumption has been increasing. There are many purposes for which lead is normally used to a greater or lesser extent in competition with other materials now critical; for example, lead in plumbing, for sheet metal work on buildings, as bearing metal to replace tin, and as chemical tank linings and pipes.

"Tetraethyl lead, which has become an important outlet for lead, plays an indispensable role in the production of aviation gasoline. Much interest has been shown in combinations of lead with iron, particularly leaded steel. A lead coating is being used as a lubricant for successive wire-drawing operations on alloy steel, the coating being removed finally with the use of solvents. Lead-base bearings are still used extensively in low-speed applications.

"The average price of pig lead (quotations on the London market, converted to Canadian funds) was 4.5 cents a pound throughout 1944. The price at New York was 6.50 cents throughout 1944.

"Close to 55 per cent of the zinc produced in Canada in 1944 came from Consolidated Mining and Smelting Company's Sullivan silver-lead-zinc mine near Kimberley, British Columbia. The remainder was from Hudson Bay Mining and Smelting Company's copper-zinc deposits at Flin Flon, which straddle the Manitoba-Saskatchewan boundary; the Sherritt-Gordon copper-zinc mine in northern Manitoba; several small lead-zinc properties in West Kootenay district, British Columbia; the Lake Geneva lead-zinc property, Sudbury district; the Normetal and Waite-Amulet copper-zinc mines in western Quebec; and the Tetreault and New Calumet lead-zinc mines in Quebec. About 77 per cent of the Canadian production of zinc in 1944 was exported, mostly in the refined form.

"Zincton Mines, Limited operated the Lucky Jim zinc mine and its 350-ton concentrator at Zincton, B.C., at a reduced rate.

"Golden Manitou Mines, Limited operated its mine and 1,000-ton concentrator near Val d'Or, Quebec. Its contract with the United States Government agencies for zinc concentrates expired January 1, 1945, but it made a new contract with American Zinc Company of Illinois for a period of 3 years. The company reports ore reserves above the 960-foot level of 983,100 tons averaging 7.74 per cent zinc, 0.045 ounce of gold, and 3.06 ounces of silver. Ore of good grade not included in the above estimate has been proved by diamond drilling down to a depth of 1,500 feet.

"Hollinger North Shore Exploration Company (Hollinger Consolidated Gold Mines) investigated occurrences of zinc that were disclosed in 1943 on its concession near the Quebec-Labrador boundary. Limited exploratory work on an outcrop indicated a width of 13 feet of zinc ore and a length, determined by trenching, of 660 feet, the grade being 6.75 per cent zinc, 1.32 per cent copper, and $2.00 in precious metals. Prior to the war, United States, Canada, Australia, Germany, Poland, Mexico, and Russia, in the order named, were the principal producers of zinc from ores of domestic origin.

"The basic uses of zinc under war conditions are the same as those in peacetime, but in all fields of use the wartime demand for the metal is exceptionally large. In peacetime, the galvanizing industry uses most of the primary and secondary output of zinc. Large quantities of the metal are used also in the brass and castings industry; as paint pigments; in radio and flashlight batteries; and in the making of zinc oxides. A large percentage of the Canadian consumption of zinc is used in the war effort in the making of brass and bronze products, for galvanizing, for die casting, in zinc oxide, in dry batteries; and for miscellaneous purposes.

"The average price of zinc in 1944, in Canadian funds (based on London quotations), was 4.3 cents per pound, compared with 4.0 cents in 1943. The St. Louis' price was 8.25 cents throughout 1944. This price has prevailed since 1942."

The Canadian prices for both lead and zinc are controlled by Wartime Prices and Trade Board (October, 1945). Permit forms for the export of non-ferrous ores can be obtained from customs offices.

The Mining Journal, London, in its annual review for 1944, stated: "It is not possible to present with any accuracy statistics of world production and consumption of lead and zinc in 1944. So far as the United Nations are concerned they have ample supplies of these metals to meet all their wartime requirements and the prospect at the end of the year was that, though stocks of zinc were tending to increase still further, stocks of lead were declining rapidly. Prices of lead in both Britain and the United States remain unchanged, British prices being £25 per long ton and the United States (New York) price 6.5 cents per pound. There was no change in zinc prices during the year. In Britain, foreign zinc, duty paid, continued to be controlled at £25.15s. per ton and electrolytic zinc at £27.5s. per ton. In the United States the price of prime western zinc was 8.25 cents per pound."

The agreement made in 1939 by the large Canadian base metal producers and the Imperial Government, by which the producers were to supply the Imperial Government with copper, lead and zinc at prices which prevailed shortly before the outbreak of the war, was continued in 1944 with some adjustments or revisions for increases in prices due to the increased cost of labour and materials. Canada can now furnish large quantities of these metals in the refined state, whereas in 1914 no refined copper, nickel or zinc and only a comparatively small amount of refined lead were produced in this country.

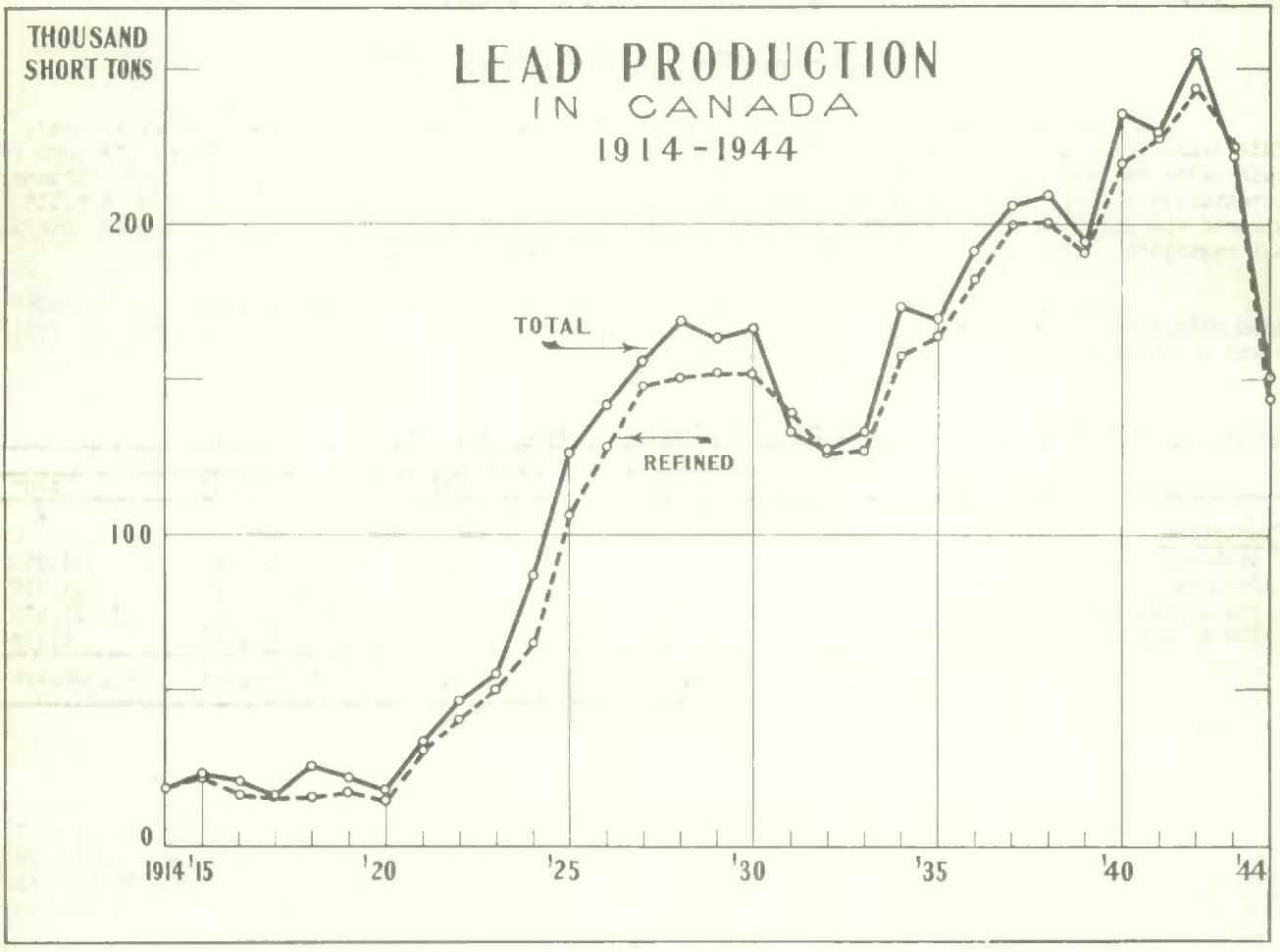


Table 32 - PRODUCTION (b) OF NEW LEAD IN CANADA, 1925-1944

Year	Pounds	$	Average Price per pound (Canadian funds)
			¢
1925 (x)	253,590,578	23,127,460	9.120
1926	283,801,265	19,240,661	6.751
1927	311,423,161	16,477,139	5.256
1928	337,946,688	15,553,231	4.576
1929	326,522,566	16,544,248	5.054
1930	332,894,163	13,102,635	3.927
1931	267,342,482	7,260,183	2.710
1932	255,947,378	5,409,704	2.114
1933	266,475,191	6,372,998	2.392
1934	346,275,576	8,436,658	2.436
1935	339,105,079	10,624,772	3.133
1936	383,180,909	14,993,869	3.913
1937	411,999,484	21,053,173	5.110
1938	418,927,660	14,008,941	3.344
1939	388,569,550	12,313,768	3.169
1940	471,850,256	15,863,605	3.362
1941	460,167,005	15,470,815	3.362
1942 (a)	512,142,562	17,218,233	3.362
1943	444,060,769	16,670,041	3.754
1944	304,582,198	13,706,199	4.500

(x) Year of maximum value of Canadian lead production.
(a) Year of maximum output of Canadian lead.
(b) Primary lead in base bullion produced plus lead in ores exported.

RESTRICTIONS ON THE PURCHASE OF LEAD IN CANADA
(Department of Munitions and Supply)

In order to conserve the supplies of lead, Order M.C.11 was put into force on May 2, 1942. This order prohibited any person acquiring virgin lead from a primary smelter. In June of the same year this order was amended to include certain Lead and Lead Alloys and effective October 1, 1943, consumers' inventories of lead were limited to sixty days' requirements. On June 23, 1945, a new order M.C.11E allowed the purchase of up to 2000 pounds of lead per month without permission from the Metals Controller, but restricted inventories to two months' requirements or 2000 pounds whichever was greater.

Although lead is still under allocation by the Combined Raw Materials Board, the Canadian lead situation was so favorable that on August 27, 1945, Order No. M.C.11E was rescinded and all restrictions on the purchase of lead in Canada were removed.

Table 33 - PRODUCTION IN CANADA, IMPORTS AND EXPORTS OF LEAD, 1943 and 1944

	1943		1944	
	Pounds	Value	Pounds	Value
		$		$
Production -				
Quebec	2,435,523	91,430	10,487,842	471,953
Ontario	2,273,896	85,362	1,065,741	47,958
British Columbia	439,155,635	16,485,902	292,922,888	13,181,530
Yukon	195,715	7,347	105,727	4,758
TOTAL	444,060,769	16,670,041	304,582,198	13,706,199

Table 33 - PRODUCTION IN CANADA, IMPORTS AND EXPORTS OF LEAD, 1943 and 1944 (Concluded)

	1943		1944	
	Pounds	Value	Pounds	Value
		$		$
Imports -				
Pig and block	19,481	3,561	20,225	2,868
Old and scrap	2,183	87	6,096	282
Bars and sheets	8,862	1,379	10,156	1,504
Litharge for storage batteries	2,397,300	203,677	3,155,100	266,530
Acetate of lead	62,307	8,013	131,876	16,998
Nitrate of lead	123,163	15,453	303,265	36,658
Other manufactures	...	229,644	...	382,455
Pipe lead	59	10	2,533	528
Shots and bullets	141,484	22,176	15,721	2,479
Lead arsenate	4,432	484	...	...
Lead tetraethyl, compounds of	10,556,057	3,568,496	10,033,373	3,378,702
Lead capsules for bottles	...	25,465	...	16,019
Lead pigments -				
Dry white lead	435,835	37,606	336,000	29,890
White lead, ground in oil	...	...	180	23
Dry red lead and orange mineral	114,123	11,936	400,392	39,175
TOTAL	...	4,127,987	...	4,174,111
Exports -				
Lead, contained in ore	11,470,200	425,306	19,000,300	650,433
Pig lead	308,695,300	9,222,104	205,759,600	6,394,550
White lead	205,500	20,380	373,000	39,734
TOTAL	...	9,667,790	...	7,084,717

Production of lead in all forms and from all types of Canadian ores from 1887 to 1944 inclusive, totalled 8,566,923,587 pounds valued at $368,433,325.

The annual capacity for the production of refined lead at Trail, British Columbia, is approximately 244,000 short tons.

Table 34 - REFINED LEAD PRODUCTION IN CANADA(x) 1929-1944

Year	Pounds of refined lead produced	Year	Pounds of refined lead produced
1929	304,449,673	1937	399,394,939(/)
1930	304,471,706	1938	400,763,914(/)
1931	278,448,457	1939	381,137,424(/)
1932	253,136,522	1940	440,175,333(/)
1933	254,565,861	1941	456,054,164(/)
1934	314,457,735(/)	1942	486,612,849(/)
1935	327,515,277(/)	1943	447,742,463(/)
1936	363,449,490(/)	1944	285,162,139(/)

(x) Includes the electrolytic lead produced from Canadian and foreign ores at Trail, B.C., and also the pig lead from Galetta, Ont., until 1931. (/) Primary lead only.

Table 35 - AVAILABLE STATISTICS ON THE CONSUMPTION OF LEAD IN SPECIFIED CANADIAN MANUFACTURING INDUSTRIES 1942 and 1943

Industry	Items used	1942	1943
		Pounds	Pounds
Brass and copper products	Pig lead	1,780,402	1,689,325
	Scrap and other lead	641,465	400,760
White metal alloys	Pig lead	48,281,959	51,823,690
	Scrap lead	21,194,878	22,714,238
Electrical apparatus	Pig lead	39,690,349	42,655,554
	Scrap lead	127,733	77,422
	Other	...	...
Iron and steel	Lead	6,050,628	4,281,005
Ammunition	Pig lead	10,467,968	6,883,360
TOTAL ACCOUNTED FOR		128,235,382	130,525,354

Table 36 - LEAD PRODUCTION OF THE WORLD ON MINE BASIS, 1938 and 1944 (American Bureau of Metal Statistics)
(Tons of 2,000 pounds)

	1938	1944
United States	369,726	410,750
Canada	209,457	150,537
Newfoundland	31,856	30,000
Mexico	311,255	197,437
Total North America	922,294	788,724
Argentina	26,125	21,000
Bolivia	14,578	9,973
Chile	1,016	...
Peru	63,982	53,000
Total South America	105,701	83,973
Austria	(a)	
Bulgaria	375	
Czechoslovakia	4,409	
Finland	95	
France	5,511	
Germany	105,821	
Great Britain	33,312	
Greece	4,519	
Italy	43,541	
Norway	161	
Poland	5,842	
Romania	6,233	
Russia	76,000(b)	
Spain	35,063	30,000
Sweden	9,502	
Yugoslavia	85,649	
Total Europe	416,033	(c)
Burma	89,712	
China, including Hong Kong	7,716	
Japan	13,000(b)	
Korea	11,000(b)	
Turkey	6,173	
Total Asia	127,601	(c)
Australia	307,293	197,303
Algeria	5,071	
French Morocco	20,944	
Nigeria	332	
Southwest Africa	19,302	
Tunis	20,833	
Other Africa	7,700	
Total Africa	74,182	(c)
GRAND TOTAL	1,953,104	(c)

(a) Included with Germany.
(b) Conjectural.
(c) Data not available.
Small productions from Brazil, Ecuador and the Philippines are not included in the above table.

Table 37 - USE OF LEAD IN THE UNITED STATES, 1938 and 1944(a) (American Bureau of Metal Statistics)
(Tons of 2,000 pounds)

	1938	1944
White lead	71,000	60,000
Red lead and litharge (b)	43,000	80,000
Storage batteries	167,000	307,000
Cable covering	60,000	131,000
Building (c)	36,000	70,000
Tetraethyl	25,800	85,200
Automobiles	6,000	1,000
Ammunition	31,200	63,000
Terne plate	4,300	6,000
Foil	22,000	20,000
Bearing metal	9,000	41,000
Solder	15,000	41,000
Typemetal	12,000	25,000
Calking	12,000	32,000
Other uses (d)	31,700	127,800
TOTAL	546,000	1,090,000

(a) Includes antimonial lead.
(b) Exclusive of oxides for storage batteries.
(c) Chiefly pipe, sheet and extrusions. Includes lead used in chemical construction.
(d) Among "other uses" are lead for brass making, collapsible tubes, lead-lined pipe, and other containers, lead-headed nails, railway equipment, shipbuilding, seals, washers, weights and ballast, and castings of sundry descriptions. Probably included is more or less lead that might be distributed under the several heads listed above.

The theory of the above accounting is end-use, but there are inconsistencies. Also, in the instance of the white alloys, there is doubtless included the lead content of some that are reproduced as such besides the pig lead used for making new alloys.

NOTE: In the United States lead is largely a loan metal, i.e., one that is put into consumption with comparatively early return of the consignment, this being especially the condition in respect of storage batteries, cables, etc. In lead as in zinc there are certain dissipating uses that are not recoverable , especially in the ways of pigment use, ammunition, lead tetraethyl for gasoline, etc., etc.

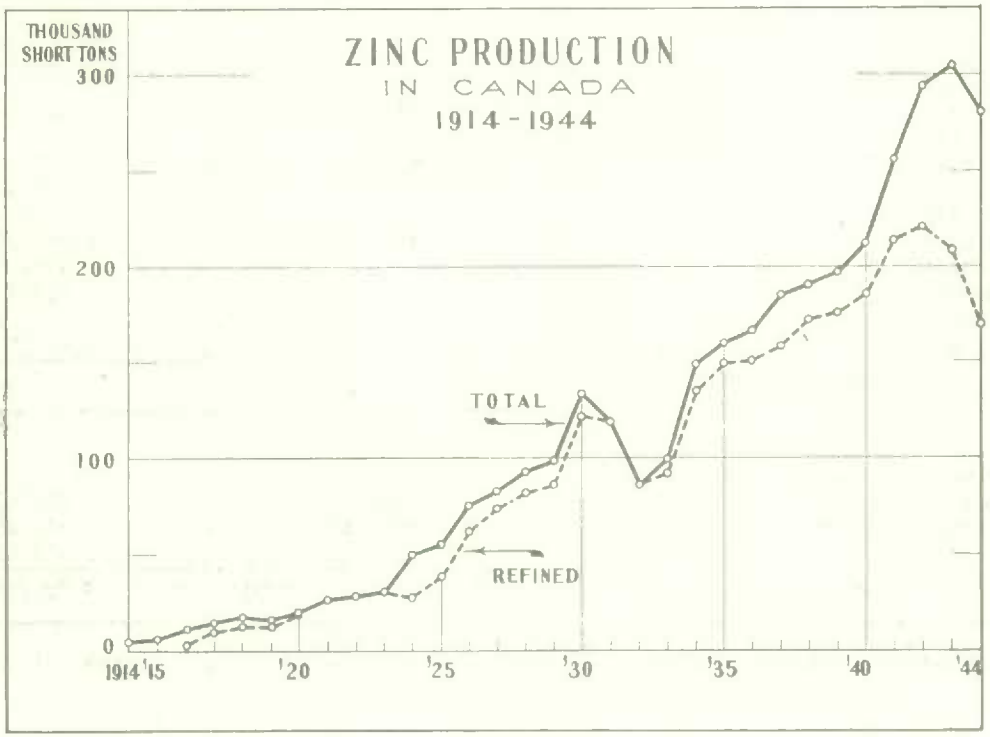


Table 38 - PRODUCTION(b) OF ZINC FROM ALL TYPES OF CANADIAN ORES, 1929-1944

Year	Pounds	$	Average price per pound (Canadian funds)
			¢
1929	197,267,087	10,626,778	5.39
1930	267,643,505	9,635,166	3.60
1931	237,245,451	6,059,249	2.55
1932	172,283,558	4,144,454	2.41
1933	199,131,984	6,393,132	3.21
1934	298,579,683	9,087,571	3.04
1935	320,649,859	9,936,908	3.10
1936	333,182,736	11,045,007	3.31
1937	370,337,589	18,153,949	4.90
1938	381,506,588	11,723,698	3.07
1939	394,533,860	12,108,244	3.07
1940	424,028,862	14,463,624	3.411
1941	512,381,636	17,477,337	3.411
1942	580,257,373	19,792,579	3.411
1943 (a)	610,754,354	24,430,174	4.00
1944	550,823,353	23,685,405	4.30

(a) Year of maximum Canadian zinc production.
(b) Comprises refined zinc made in Canada plus zinc in ores, etc., exported.

The total value of Canadian zinc production since the first recording of Canadian zinc statistics in 1898, and inclusive of 1944, totalled $280,533,781.

Table 39 - PRODUCTION IN CANADA, IMPORTS AND EXPORTS OF ZINC, 1943 and 1944

	1943		1944	
	Pounds	Value $	Pounds	Value $
Production -				
Quebec	128,169,810	5,126,792	137,378,439	5,907,273
Ontario	3,299,812	131,993	2,429,176	104,455
Manitoba	46,783,873	1,871,355	45,822,278	1,970,358
Saskatchewan	96,350,404	3,854,016	87,130,087	3,746,594
British Columbia	336,150,455	13,446,018	278,063,373	11,956,725
TOTAL	610,754,354	24,430,174	550,823,353	23,685,405
Imports -				
Zinc dust	7,500	1,014	40,200	4,089
Zinc in blocks, pigs, bars and rods, and zinc plates, n.o.p.	138,400	26,257	156,900	26,722
Zinc in sheets and strips, and zinc plates for marine boilers	987,300	141,997	991,600	153,954
Zinc spelter	27,076,400	2,429,945	8,883,000	794,865
Zinc slugs for dry batteries	...	64,385	...	86
Zinc white (zinc oxide)	2,218,564	174,075	1,745,535	137,612
Zinc sulphate	708,869	31,743	986,136	41,278
Zinc, chloride of	189,305	11,745	192,935	11,928
Zinc, manufactures of, n.o.p.	...	377,486	...	351,218
Lithopone	17,754,879	857,507	18,999,905	932,787
TOTAL	...	4,116,154	...	2,454,539
Exports -				
Zinc, manufactures of (from Jan. 1, 1944)	...	...	...	193,519
Zinc, contained in ore	222,550,300	6,097,117	226,606,900	7,046,844
Zinc, scrap, dross and ashes	4,291,000	159,218	9,144,200	301,941
Zinc, spelter	258,629,700	10,260,030	191,970,000	7,666,731
TOTAL	485,471,000	16,516,365	427,721,100	15,209,035

Canadian zinc refineries have an estimated annual capacity of 237,500 tons of cathode zinc.

Table 40 - CANADIAN ZINC PRODUCTION (RECOVERABLE) ACCORDING TO NATURE OF ORES, BY PROVINCES, 1939-1944

Year and Province	Recovered from copper-gold-silver ores	Recovered from silver-lead-zinc and other ores	TOTAL
	Pounds	Pounds	Pounds
1939 - Nova Scotia	...	9,152,856	9,152,856
Quebec	28,758,759	...	28,758,759
Manitoba	40,302,747	...	40,302,747
Saskatchewan	37,278,001	...	37,278,001
British Columbia	...	279,041,497	279,041,497
TOTAL CANADA	106,339,507	288,194,353	394,533,860
1940 - Nova Scotia	...	4,755,502	4,755,502
Quebec	27,696,721	...	27,696,721
Manitoba	35,103,373	...	35,103,373
Saskatchewan	44,452,595	...	44,452,595
British Columbia	...	312,020,671	312,020,671
TOTAL CANADA	107,252,689	316,776,173	424,028,862
1941 - Quebec	46,389,581	...	46,389,581
Ontario	...	1,100,949	1,100,949
Manitoba	34,879,239	...	34,879,239
Saskatchewan	62,142,288	...	62,142,288
British Columbia	...	367,869,579	367,869,579
TOTAL CANADA	143,411,108	368,970,528	512,381,636
1942 - Quebec	67,064,536	6,876,275	73,940,811
Ontario	...	4,710,394	4,710,394
Manitoba	29,908,179	...	29,908,179
Saskatchewan	84,461,520	...	84,461,520
British Columbia	...	387,236,469	387,236,469
TOTAL CANADA	181,434,235	398,823,138	580,257,373
1943 - Quebec	80,401,837	47,767,973	128,169,810
Ontario	...	3,299,812	3,299,812
Manitoba	46,783,873	...	46,783,873
Saskatchewan	96,350,404	...	96,350,404
British Columbia	461,776	335,688,679	336,150,455
TOTAL CANADA	223,997,890	386,756,464	610,754,354
1944 - Quebec	78,069,636	59,308,803	137,378,439
Ontario	...	2,429,176	2,429,176
Manitoba	45,822,278	...	45,822,278
Saskatchewan	87,130,087	...	87,130,087
British Columbia	1,953,077	276,110,296	278,063,373
TOTAL CANADA	212,975,078	337,848,275	550,823,353

RESTRICTIONS ON THE PURCHASE OF ZINC IN CANADA
(Department of Munitions and Supply)

Due to a shortage of zinc for the production of munitions for war, it became necessary to restrict the use of zinc to essential purposes. Accordingly, on May 11, 1942, an Order (M.C.12) was issued which prohibited any person from buying or selling zinc without a permit from the Metals Controller.

As the war continued and munitions orders increased, amendments were made to Order M.C.12 to include Zinc Oxide and Zinc Mill Products. Not until after the cessation of the war in Europe was it possible to lift these restrictions in any way, but on June 7, 1945, the control of Zinc Oxide and Zinc Dust was removed by Order M.C.12E, and only an inventory control was retained on slab zinc.

In August, 1945, immediately following the termination of the war with Japan, Order No. M.C.12E was rescinded and restrictions on the purchase of zinc were removed.

Table 41 - CANADIAN PRODUCTION OF LEAD AND ZINC BY MONTHS, 1943-1945 (Pounds)

Month	LEAD (a)			ZINC (b)		
	1943	1944	1945	1943	1944	1945
January	38,604,106	32,857,666	25,623,743	52,578,751	49,438,642	49,506,177
February	38,807,636	29,887,544	24,578,012	48,105,936	46,551,662	44,520,588
March	46,936,027	24,373,016	35,169,939	54,101,689	47,918,693	47,697,136
April	36,773,575	25,383,726	28,172,344	50,706,472	45,119,487	43,385,577
May	40,601,268	20,583,341	25,555,454	53,667,946	47,499,582	45,427,551
June	39,579,471	19,832,745	25,175,850	53,335,891	41,373,262	43,469,170
July	36,100,126	24,633,240	25,505,404	52,585,837	42,536,604	45,197,460
August	32,113,307	18,401,675	28,127,996	52,053,564	44,843,903	41,520,357
September	32,884,233	18,993,630	29,175,590	48,129,596	46,955,939	38,459,108
October	35,272,574	18,452,002		46,836,774	43,098,175	38,859,858
November	34,635,657	35,836,191		46,989,693	44,718,272	
December	31,752,789	35,347,422		51,662,235	50,769,132	

(a) In base bullion produced in Canada plus lead in ore exported.
(b) Refined zinc produced in Canada plus zinc in ores exported; 1943 and 1944 data are finally revised.

Table 42 - REFINED NEW ZINC PRODUCED IN CANADA, 1933-1944

Year	Average price (x) per pound	Short tons	Year	Average price (x) per pound	Short tons
1933	3.21	91,946	1939	3.07	175,641
1934	3.04	134,917	1940	3.411	185,722
1935	3.10	149,523	1941	3.411	213,608
1936	3.31	151,103	1942	3.411	215,795
1937	4.90	158,542	1943	4.00	206,510
1938	3.07	171,932	1944	4.30	168,518

(x) In Canadian funds.

Table 43 - AVAILABLE STATISTICS ON THE CONSUMPTION OF ZINC IN SPECIFIED CANADIAN MANUFACTURING INDUSTRIES, 1942 and 1943

Industry	Items Used	1942 Pounds	1943 Pounds
Brass and copper products	(Zinc ingots and slabs	76,990,715	84,315,181
	(Zinc scrap	525,767	119,050
White metal alloys	(Zinc spelter	26,581,960	17,795,100
	(Zinc scrap	1,746,106	3,223,818
Electrical apparatus	(Zinc ingots and bars	2,826,831	3,227,960
	(Zinc sheets	1,477,013	1,627,460
Acids, alkalies and salts	(Zinc metal	16,033,434	20,689,824
Iron and steel	Zinc	45,378,520	35,855,555
Miscellaneous chemicals	Zinc sheets and spelter	342,000	97,578
	GRAND TOTAL.....	171,902,346	166,951,526

In addition, there are relatively large quantities of zinc oxide and lithopone used in the manufacture of paint.

Table 44 - WORLD'S PRODUCTION OF ZINC SPELTER (a) 1938 and 1944 (American Bureau of Metal Statistics)
(Tons of 2,000 pounds)

Country	1938	1944
United States (b)	446,341	866,100
United States (c)	31,613	48,600
Mexico	39,552	51,401
Canada	171,656	169,634
TOTAL NORTH AMERICA	689,162	1,135,735
Belgium	231,924	
Czechoslovakia	9,784	
France	68,532	
Germany	212,173	
Great Britain	61,938	
Italy	37,550	
Netherlands	27,888	
Norway	51,257	
Poland	122,119	
Russia	88,200(d)	
Spain	8,435	19,313
Yugoslavia	4,361	
TOTAL EUROPE	924,161	(e)
Peru	...	1,611
Australia	78,198	88,458
Japan	55,115(d)	
French Indo-China	4,900	
Rhodesia	11,441	
GRAND TOTAL	1,762,977	(e)

(a) The statistics in this table are the summaries of production as made by the metallurgical works in the several countries. The statistics for the United States are given separately in respect of the production from ore (domestic and foreign) and the production from secondary material, such as galvanizers' dross, skimmings, ashes, etc. Production from such material is included in the statistics for many of the countries of Europe, expecially Great Britain, Belgium, France and Netherlands. Such inclusion in 1938 was about 40,000 tons per annum, omitting Great Britain. Not included in the statistics for Europe is the production from old material by concerns that treat nothing else.
(b) Production from ores, foreign and domestic, as per U. S. Bureau of Mines.
(c) Production from secondary material.
(d) Conjectural.
(e) Not available.

The American Zinc Institute Inc., in its annual review of the zinc industry in 1944, stated:- "Assuming the continuance of a high rate of consumption and the probability of some increase in the demand for slab zinc, it will no doubt be found necessary to supplement our domestic mine supplies with continued imports of concentrate if we are to balance requirements and maintain present inventory and stockpile reserves.

"The most serious threat to the continuation of the well balanced zinc situation, which has so far been successfully sustained, lies in the manpower problem. More attention and practical assistance must be forthcoming from the manpower authorities if the industry, already badly handicapped by labor shortage, is to maintain present operating schedules."

Table 45 - ESTIMATED MANUFACTURE OF ZINC IN THE UNITED STATES, 1938, 1941, 1942, 1943 and 1944 (American Bureau of Metal Statistics) - (Tons of 2,000 pounds)

	1938	1941	1942	1943	1944
Galvanizing	198,000	300,000	247,500	253,200	310,400
Sheets	108,500	138,500	76,200	72,200	115,500
Tubes	29,300	55,000	47,000	51,000	55,800
Wire	23,600	37,100	35,200	37,400)	45,500
Wire cloth	5,600	8,600	7,300	9,100)	
Shapes (a)	31,000	60,800	81,800	83,500	93,600
Brass making	102,000	313,000	320,000	419,100	368,500
Rolled zinc	46,000	69,000	66,000	48,500	75,400
Die castings	48,000	125,000	80,000	76,300	84,200
Other purposes (b)	27,000	24,000	14,500	19,700	29,500
TOTAL	421,000	831,000	728,000	816,800	868,000

(a) Includes pole-line hardware, hollow ware, chains and all articles not elsewhere mentioned.
(b) Includes slab zinc used for the manufacture of French oxide, zinc for wet batteries, slush castings, the desilverization of lead, wire for metallizing, and sundries, etc.

The totals in this table for manufactures do not balance with the totals of deliveries, owing largely to changes in stocks ex-smelteries, but over a period of years the totals for delivery and manufacture are substantially in harmony. It is probable, moreover, that the above accountings are slightly underestimated and there may be some plus or minus as between brass making and die casting, especially in 1941.

The data for 1942-44 are as reported by the U.S. Bureau of Mines.

During 1944 United States controls with regard to zinc were relaxed for the greater part.

Table 46 - CADMIUM RECOVERED FROM CANADIAN ORES, 1938-1944

Year	From copper-gold-silver-zinc ores	From silver-lead-zinc ores	TOTAL
	Pounds	Pounds	Pounds
1938	188,796	510,342	699,138
1939	140,438	799,253	939,691
1940	129,336	778,791	908,127
1941	169,917	1,081,374	1,251,291
1942	176,550	972,413	1,148,963
1943	187,938	598,673	786,611
1944	140,560	386,410	526,970

NOTE: Until 1936 cadmium was produced only in British Columbia; since 1936 the metal has been produced both at Flin Flon, Manitoba and at Trail, British Columbia.

Since 1939 the Consolidated Mining and Smelting Company has produced antimony metal at the Trail smelter; the total production of the metal from British Columbia ores in 1944 totalled 1,937,933 pounds valued at $281,000. Bismuth metal is also recovered at the Trail smelter from silver-lead-zinc ores, the production in 1944 amounting to 123,875 pounds valued at $154,844. In addition to metals, there has been an increasing quantity of sulphur salvaged yearly in the smelting of silver-lead-zinc ores in the Trail plants of the Consolidated Mining and Smelting Company. This has been recovered in both the gaseous and elemental forms and is utilized in the manufacture of sulphuric acid and fertilizers.

Gold recovered from Canadian silver-lead-zinc ores in 1944 totalled 17,438 fine ounces.

PRINCIPAL OPERATORS IN THE CANADIAN SILVER-LEAD-ZINC MINING INDUSTRY, 1944

(x) Active but not producing.

Name of Operator	Head Office Address	Location of Mine
QUEBEC -		
Federal Zinc & Lead Co. Ltd. (x)	708 Drummond Bldg., Montreal	Lemieux Tp.
Golden Manitou Mines Ltd.	Room 1104 .. 330 Bay St., Toronto, Ont.	Bourlamaque Tp.
Lyall and Beidelman (x)	708 Drummond Bldg., Montreal	Lemieux Tp.
New Calumet Mines Ltd.	25 King St.W., Toronto, Ont.	Calumet Island
Perras Hermas Synd. (Tetreault mine)	4 Notre Dame St.E., Montreal	Portneuf Co.
Siscoe Metals Ltd. (Tetreault mine)	907 Dominion Square Bldg.,Montreal	Portneuf Co.
ONTARIO -		
Lake Geneva Mining Co. Ltd.	941 Dominion Square Bldg., Montreal, Que.	Hess Tp.
BRITISH COLUMBIA -		
Base Metals Mining Corp. Ltd.	350 Bay St., Toronto 1, Ont.	Field
Comara Mining & Milling Co. Ltd. (x)	815 Queen St. W., Toronto, Ont.	Ferguson
Cons. Mining & Smelting Co. of Can. Ltd.	Trail	Kimberley
Cons. Nicola Goldfields Ltd.	322 - 744 West Hastings St., Vancouver	Nicola M.D.
Doney, Ernest (Victor)	Box 414 New Denver	Slocan, M.D.
Highland Bell Ltd.	Creston	Beaverdell
Kootenay Bell Gold Mines Ltd. (a)	916 Stock Exchange Bldg.,Vancouver	Retallack
Ottawa Mining & Milling Co.	Slocan	Springer Creek
Providence Mine Synd.	Box 629 Greenwood	Greenwood
Sheep Creek Gold Mines Ltd.	616 Stock Exchange Bldg.,Vancouver	Zineton
Wartime Metals Corp. (b)	637 Craig St. W., Montreal, Que.	Ainsworth
Western Exploration Co. Ltd.	Silverton	Kaslo M.D.
YUKON -		
Berry, A.F.	Mayo	Mayo
Brefalt & Fournier	Mayo	Mayo
Gordon & Bjonnes	Mayo	Mayo
Sinyard, C.	Mayo	Mayo
Treadwell Yukon Corp. (c)	1022 Crocker Bldg., San Francisco, Cal.	---
Williamson & Butyer	Mayo	Mayo

(a) Retallack Mines project.
(b) Kootenay-Florence project.
(c) No operations; acted as shipping agent only.