CANADA

DEPARTMENT OF TRADE AND COMMERCE

DOMINION BUREAU OF STATISTICS

SUMMARY REVIEW

OF

THE SILVER MINING INDUSTRY

IN

CANADA

1933

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DEPARTMENT OF TRADE AND COMMERCE
DOMINION BUREAU OF STATISTICS
MINING, METALLURGICAL AND CHEMICAL BRANCH
OTTAWA - CANADA

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THE SILVER MINING INDUSTRY IN CANADA, 1933.

(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 in as much as silver or silver-bearing minerals usually occur in association with other metals of economic value; with lead and zinc; with cobalt, 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 uranium and radium. Silver-lead-zinc mining is a very important industry in British Columbia and to a lesser extent in the Yukon Territory. There is no production of silver-lead-zinc ores in eastern Canada at the present time; this industry, however, has attained a position of importance during past years in the provinces of Ontario, Quebec and Nova Scotia.

Production of Silver, Lead, Zinc, Cobalt and Arsenic - In 1933 the total primary production of these metals from all Canadian sources was as follows:- silver, 15,187,950 fine ounces valued at $5,746,027; lead, 266,475,191 pounds valued at $6,372,998; zinc, 199,131,984 pounds valued at $6,393,132; cobalt, 466,702 pounds valued at $597,752; and arsenic, 1,468,022 pounds at $56,534.

Among the metals produced in Canada during 1933 zinc held fourth position, lead fifth and silver sixth in point of value. This represents for silver and zinc values a complete reversal of positions as compared with those held in 1932.

The year under review witnessed a distinct improvement in lead and zinc production, the output of the former metal experiencing a 4.1 per cent increase over 1932 while zinc production was 15.6 per cent higher. An analysis of the statistics pertaining to silver production reveals that the recession in output from the previous year was largely attributable to a pronounced decline in the metal recovered from the cobalt-silver-arsenic ores of Northern Ontario and, to a lesser extent, to the smaller recoveries of the metal from argentiferous blister copper produced in British Columbia and Quebec and reduced exports of silver-lead ores from the Yukon Territory. The reduced output of cobalt and arsenic reflected decreased activities in the mining of cobalt-silver ores in Northern Ontario camps.

Prices - Silver prices on the New York market in 1933 showed a steady increase from a monthly average of 25.400 cents in January to 37.630 cents in July, the price fell off to 36.074 cents in August. However, for the remainder of the year it realized almost continuous increases to attain an average of 43.550 cents in December. The average price of silver in Canadian funds based on the New York market in 1933 was 37.8328 cents per fine ounce.

Pig lead prices based on the London market opened the year with an average value of £10.458 per long ton, a considerable recession from the £11.144 for the previous month of December. The market remained steady at approximately the January price until April; May, June, July and August quotations showed a decided improvement with a high monthly average for the year of £13,411 in July. Prices for the last quarter of the year remained fairly steady, ranging from £11.932 for September to a closing monthly average of £11.431 for December. Transposed into Canadian funds the average price of lead on the London market was 2.3916 cents per pound for 1933.

London zinc prices for the year under review were distinctly better on the whole than those of the preceding year. The average monthly price for January was £14.381 per long ton; the highest average monthly price was realized for July when the metal reached £17.795 per long ton. Prices gradually declined to a monthly average for the closing month of the year of £14.826. The average price of zinc in Canadian funds based on the London market in 1933 was 3.2105 cents per pound.

Quotations for white arsenic on the New York market remained as during recent years at a nominal price of 4 cents per pound. Cobalt metal prices showed a slight improvement over 1932 while the oxide remained at the previous year's quotation of $1.35 per pound.

PRICES (IN CANADIAN FUNDS) 1929-1933.

	1929	1930	1931	1932	1933
	$	$	$	$	$
Cobalt (x) ..... lb.	2.52	2.50	2.50	2.50	2.80
Cobalt oxide (x) ..... lb.	2.10	2.00	1.75	1.35	1.35
Lead (London) ..... lb.	0.05054	0.03927	0.027101	0.021136	0.23916
Silver (New York) ..... oz.	0.52993	0.38154	0.2987	0.31672	0.378328
Zinc (London) ..... lb.	0.05387	0.03600	0.02554	0.024056	0.32105

(x) of a nominal nature.

THE SILVER-COBALT MINING INDUSTRY

The mining of Canadian silver-cobalt-arsenic ores is confined to Northern Ontario and their output has revealed an almost continuous decline during recent years, the tonnage hoisted in 1933 being 14.4 per cent less than in 1932 and 70 per cent under 1931. The reason for this diminishing production is largely attributable to depletion of deposits or the low prices for silver.

In the Cobalt camp proper during 1933 the Cross Lake mine of M. J. O'Brien Limited was the only property remaining in operation by the original owners. In addition to work at this property several lessees, companies or syndicates produced silver or cobalt from the Beaver, Foster, Kerr Lake, Temiskaming, Coniagas, Silver Queen, Agaunico, Peterson Cobalt, McKinley, Townsite-City and Buffalo mines. The Nipissing Mining Company Ltd., although not in operation, made shipments of silver and cobalt ores and silver bullion. The silver ore and base bullion were obtained from a clean-up of the mill and the refinery when they ceased operations in April, 1932. There were no shipments of residue or fine bullion from the Nipissing stocks at Cobalt. The well-known mill of this company was destroyed by fire in August. At Gowganda the Miller Lake O'Brien mine of M. J. O'Brien Limited was in steady production throughout the year.

The Department of Mines, Ontario, report that "while a further advance in the price of silver would enable a number of properties to re-open and increase considerably the present output from the silver-cobalt areas, the fact remains that the major portion of the metals has been won and future operations will centre around the recovery of ore overlooked in previous operations."

PRINCIPAL STATISTICS OF THE SILVER-COBALT MINING INDUSTRY IN CANADA, 1928-1933.

Years	Number of active operators	Number of operating mines	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Net value of bullion, ore, concentrates and residues sold
			$		$	$	$
1928 ...	15	19	22,027,683	1,166	1,809,466	430,683	3,938,884
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

STATISTICS OF THE SILVER-COBALT MINES AND MILL OPERATIONS IN CANADA, 1931, 1932 and 1933.

		1931	1932	1933
Number of mines in operation (x)		26	20	14
Ore mined	tons	200,729	70,442	60,326
Ore treated	tons	97,747	68,363	59,304
Tailings treated	tons	...	23	...
Concentrates produced	tons	6,535	1,514	1,063
Quantity of material cyanided.....	tons	39,173	4,567	...
Bullion recovered	fine oz.	1,025,015	120,777	...
Bullion sold or shipped	fine oz.	201,662	...	39,781(a)
Value of bullion, ore, concentrates and residues sold	$	1,925,593	1,735,708	1,071,602

(x) All mines located in Northern Ontario.
(a) Base bullion from clean-up.

FUEL AND ELECTRICITY USED IN THE SILVER-COBALT MINING INDUSTRY, 1931, 1932 and 1933.

	1931	1932	1933
Bituminous coal - (a) From Canadian mines	...	...	...
(b) Imported	34,328	15,258	12,445
Anthracite	2,438	4,042	4,610
Gasoline (exclusive of that used in motor vehicles).	1,066	2,093	459
Fuel oil and diesel oil	4,500	1,779	1,200
Woods (cords of 128 cubic feet)	4,476	3,781	2,472
Electricity purchased including service charges	155,225	80,903	51,019
Other fuel	25,434	16,622	11,360
TOTAL (Cost only)	227,467	124,478	83,565

NUMBER OF WAGE-EARNERS ON PAYROLL OR TIME RECORD ON THE 15th OF EACH MONTH OR NEAREST REPRESENTATIVE DATE

Month	1932	1933
January	489	208
February	435	203
March	370	201
April	344	204
May	333	204
June	343	206
July	339	205
August	312	228
September	281	236
October	266	236
November	257	233
December	237	225

ARSENIC - Arsenic in the native state is a metallic mineral but is produced at the present time in Canada only in the oxide form. The entire production is recovered at Deloro, Ontario, in the smelting of the silver-cobalt arsenides of Northern Ontario by the Deloro Smelting and Refining Company.

The arsenic of commerce is arsenious oxide (white arsenic) and the United States Bureau of Mines reports that in 1932 of the United States arsenic output 71 per cent was used in the manufacture of insecticides, which requires arsenic of the highest grade; 11 per cent for weed killers (used principally by railroads), fungicides, and wood preservatives; and about 2 per cent in glass manufacture; and the balance (about 16 per cent) sold for export. Due to its extensive use for boll-weevil control in the cotton fields of the South, calcium arsenate has become the leading product made from white arsenic, more important even than lead arsenate, which finds its chief use in poison sprays and dusts for destruction of the codling moth, plum curculio, cabbage worm, potato bug, tobacco hornworm and other pests that attack fruits and vegetables. The removal of arsenical spray residues from fruits and other food products for human consumption is receiving a great deal of consideration both in the United States and abroad.

Occurrences of arsenical minerals are fairly numerous in Canada and arsenical gold-bearing ores have been worked in Nova Scotia, Ontario, Manitoba and British Columbia.

PRODUCTION IN CANADA, IMPORTS AND EXPORTS OF ARSENIC, 1932 and 1933.

	1932		1933	
	Quantity	Value	Quantity	Value
	lb.	$	lb.	$
PRODUCTION(x) -				
White arsenic and arsenic in other forms	...	98,714	...	56,534
TOTAL	...	98,714	...	56,534
IMPORTS -				
White arsenic (arsenious oxide)	425,995	16,694	164,642	5,674
Sulphide of arsenic	111,106	4,277	27,694	3,117
Soda, arseniate, biarseniate and stamnate of	5,603	1,159	390	101
Arsenate of lead	830,120	80,488	498,673	44,256
Arsenate of lime	521,546	27,852	287,420	17,426
TOTAL	...	130,470	...	70,574
EXPORTS Arsenic - TOTAL	1,788,600	65,287	934,400	33,778

(x)Production in 1932 and 1933 came entirely from Ontario.

The consumption of arsenic acid and arsenious acid in the production of insecticides in Canada during 1932 amounted to 1,721,044 pounds valued at $69,250 as compared with 210,289 pounds at $9,211 in 1931. The consumption of calcium arsenate in the same industry during 1932 totalled 204,296 pounds worth $11,600 as against 64,300 pounds valued at $4,244 in 1931. Canadian Chemistry and Metallurgy quote prices in June, 1934, for white arsenic at $3\frac{3}{4}$ cents to 4 cents per pound and for black metallic, 95%, 25 cents to 28 cents per pound.

OUTPUT OF PRINCIPAL ARSENIC PRODUCING COUNTRIES, 1931 and 1932.
(Supplied by Imperial Institute)

(Long tons)

	1931	1932
BRITISH EMPIRE -		
Canada - white arsenic	1,596	1,082
Australia - white arsenic	1,070	1,964
FOREIGN COUNTRIES -		
Belgium - white arsenic (exports)	2,462	2,013
France -		
Ore (As content)	5,680	(a)
White arsenic	4,300	(a)
Germany - ore (As content)	1,821	193
Sweden - ore (As content)	11,005	19,719
Mexico - white arsenic	7,829	5,707
United States - white arsenic	15,301	11,343
Japan - white arsenic	2,547	2,596

(a) Information not available.

COBALT - Since the discovery of the Cobalt camp in 1903, and until recent years, the greater part of the world's supply of cobalt was derived from the treatment of cobalt-silver-arsenic ores mined in Northern Ontario. During the past few years Canada's production of cobalt decreased sharply in contrast to the totals for earlier years. This was due largely to depleted ore reserves and to new competition in the world's markets arising from the development of cobaltiferous deposits in Central Africa. There is at present only one metallurgical works in Canada treating cobalt ores; this is the plant of the Deloro Smelting and Refining Company, Ltd., situated at Deloro, Ontario. This company conducted continuous operations throughout 1933 producing cobalt metal, cobalt salts and cobalt oxide.

The use of cobalt - in the United States at least - reports the United States Bureau of Mines, is "about evenly divided between the metallurgical industry, which employs the metal, and the glass, porcelain, enamel, chemical and paint industries which purchase the oxide and other compounds. The leading use of the metal is in stellite alloys --- cobalt --- tungsten-chromium combinations for high-speed tools, hard-facing and wear-resisting metal, and sundry corrosion-resisting purposes. Permanent magnets of cobalt steel account for some quantity of the metal and cobalt finds its way into a variety of other steels, including high-speed steel."

An interesting new cobalt alloy for dental purposes is described in "Iron Age." It is an alloy of cobalt, tungsten and chromium and is claimed to be particularly non-corrosive to the action of food acids. It has unusual strength and elasticity and is quite wear-resistant, even more so than the gold alloys, when polished it has beauty and brilliancy.

According to a recently issued D.O.T. report (No. 563 of 1934) by the British Consul-General at Leopoldville, the production of cobalt in the Belgian Congo has been deliberately stopped during the past two years to help to stabilize the market for this product. Total average annual consumption of cobalt metal is calculated at about 1,000 tons, but in 1930 no less than 1,202 tons of copper-cobalt alloy were produced in the Katanga alone. (Chemical Trade Journal).

The Union Minière du Haut-Katanga state in its 1933 annual report that the demand for cobalt was greater than for the previous year and could be met easily.

An alloy containing about 50 per cent cobalt was being produced in 1933 by Rhokana Corporation, Ltd., Northern Rhodesia. This was being made at the rate of 40 tons per month and arrangements have been made to refine the product. The annual report of the Corporation states that sales on a commercial scale have been taking place since September 1, 1933.

"Metal and Mineral Markets" report cobalt prices, New York, July, 1934, as follows:- per pound - metal imported from Belgium, 97 to 99 per cent, $2.50 less 35 per cent for cash. On yearly requirements, usual rebate of 5 to 10 per cent, as to quantity. London quotes 4s. 6d. per pound. Cobalt ore - per pound of cobalt, 12 to 14 per cent grade, 45 cents, f.o.b. cars, Ontario. Cobalt oxide - per pound, (N.Y.), black oxide, 70 to 71 per cent grade, $1.35.

PRODUCTION OF COBALT IN CANADA, 1923 - 1933.

Years	Pounds	Years	Pounds
1923	760,105	1928	956,590
1924	948,704	1929	929,415
1925	1,116,492	1930	694,163
1926	664,778	1931	521,051
1927	880,590	1932	490,631
		1933	466,702

PRODUCTION IN CANADA, IMPORTS AND EXPORTS OF COBALT, 1932 and 1933.

		1932		1933	
		Quantity	$	Quantity	$
PRODUCTION (in terms of metallic cobalt contained in metal and oxides sold and in ores and residues exported	pounds	490,631	587,957	466,702	597,752
IMPORTS -					
(x) Oxide of cobalt, tin and copper, n.o.p.	pounds	119,969	33,636	...	...
(a) Oxide of cobalt	pounds	4,458	1,035	764	601
EXPORTS -					
Cobalt, contained in ore	cwt.	1,247	58,121	537	19,147
Cobalt, metallic	pounds	58,439	63,779	48,168	49,516
Cobalt alloys	pounds	20,394	77,436	27,347	53,941
Cobalt oxide and cobalt salts	pounds	377,250	389,998	467,012	429,846

(x) To October 12, 1932.
(a) From October 12, 1932.

WORLD PRODUCTION OF COBALT, 1930-1932.

(Taken from the Imperial Institute's Publication "The Mineral Industry of the British Empire and Foreign Countries")

(Cwt.)

Producing Country	1930	1931	1932
BRITISH EMPIRE			
Canada (c)	6,198	4,652	4,381
India (b)	2,200	2,000	2,400
Australia (metal)	70	...	60
FOREIGN COUNTRIES			
Belgian Congo (d)	14,000	7,280	6,590
French Morocco (ore)	...	...	11,220

Note:- Complex ores containing cobalt are also found in Germany and China, but cobalt content is not available.

(b) Estimated cobalt content of nickel-speiss exported to Hamburg.

(c) Metal recovered from smelter products plus cobalt contained in cobalt residues exported.

(d) Content of metal, oxide and salts produced at Oolen (Belgium) from ores raised in the Belgian Congo.

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D I R E C T O R Y

OPERATORS IN THE CANADIAN SILVER-COBALT MINING INDUSTRY, 1933.

Name	Head Office Address	Mine Location
ONTARIO -		
Beaver Mine	Box 386, Cobalt	Coleman Tp.
Brocklebank, A.	c-o Kerr Lake Mining Co., 61 Broadway, New York City, U.S.A.	Cobalt
Cobalt Properties Ltd.	Cobalt	Cobalt
Jemmet, D.L., Estate of	1305 Metropolitan Bldg.,Toronto	Bucke Tp.
McKinley Mines Securities Co. Ltd.	12th Floor, 80 King St.W.,Toronto	Cobalt
Mining Corporation of Canada, Ltd.	350 Bay St., Toronto	Cobalt
The Nipissing Mining Co. Ltd.	Excelsior Life Bldg., Toronto	Cobalt
O'Brien, M. J., Ltd.	Victoria Bldg., Ottawa	Cobalt and Gowganda
Peterson Cobalt Mines Ltd.	301 Royal Bank Bldg., Toronto	Cobalt
Pioutkowski, J., and Powletti, Arnaldo	Box 65, Cobalt	Cobalt
Price, C. W.	Box 388, Cobalt	Cobalt
Sandoe & Moyle	Box 382, Cobalt	Cobalt

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THE SILVER-LEAD-ZINC MINING INDUSTRY

No silver-lead-zinc ores were shipped in Eastern Canada during 1933. Ore of this type occurs at several places in this part of the Dominion and have been mined on a commercial basis at Sterling, Cape Breton Island; Notre Dame des Anges, Quebec; and at Galetta, Sudbury and other places in Ontario.

BRITISH COLUMBIA - British Columbia is by far the most important producer of silver-lead-zinc ores in Canada and the 1933 report of the British Columbia Department of Mines contains the following information:- "The Sullivan and Premier mines remained the principal producers of silver, however, an increased output was made by the mines of the Beaverdell area, where several small, but high-grade, silver mines continued production. Should the price for silver be advanced to 50 or 60 cents per ounce in conjunction with increased lead and zinc prices, expansion in the silver mining industry would materialize quickly ... The bulk of the lead produced came from the Sullivan mine of the Consolidated Mining and Smelting Company of Canada, Ltd. This was supplemented by renewal of production at the Monarch mine of the Base Metals Corporation at Field in August of 1933. There should be an important production from the Monarch in 1934 as it is being operated at a capacity of 300 tons of ore per day. The Slocan and northern producers of lead-zinc-silver ores are still inactive for the most part, although the gradual betterment in metal prices is having a tendency to stimulate operations by leasers and small companies. Much of the improvement in lead prices is due to the favourable position of the exchange markets between Canada and Great Britain. The main zinc production was from the Sullivan mine. The Monarch mine, also an important producer of zinc, was operated for the last four or five months of 1933. Production of zinc concentrates was started during 1933 at the Britannia mine."

The 1933 Directors' Report of the Consolidated Mining and Smelting Company of Canada, Ltd., states:- "After providing for current development, adding $17,731.75 to employees' pension fund (besides taking care of the year's disbursements on this account) and paying taxes ($175,171.91) there was a surplus of $3,989,037.36. Deducting the write-offs for depletion and depreciation, $535,940.87 and $2,396,822.97, respectivaly, there remained $1,056,273.52 compared with a deficit of $2,908,107.49 in 1932. The year's results permitted the payment of a dividend of six per cent, or $1.50 a share, without drawing on the profit and loss account.

Production of the company during 1932 and 1933 was as follows:-

		1932	1933
Lead	pounds	253,237,783	254,639,548
Copper	pounds	767,026	541,459
Gold	ounces	33,346	22,393
Bismuth	pounds	57	70,724
Zinc	pounds	130,567,785	137,619,895
Cadmium	pounds	65,425	246,041
Silver	ounces	5,522,366	5,551,349

At the Sullivan mine the mining costs in 1933 have set a new low record, beating the previous record which was made in 1932 by about 7 per cent. Total production for the year amounted to 1,413,418 tons comprising 12,532 tons of crude lead ore shipped to Tadanac and 1,400,886 tons of lead-zinc ore to the concentrator at Kimberley; a reduction of 34,030 tons from the shipments of 1932. The concentrator treated 1,401,061 tons from which were produced 172,386 tons of lead concentrates and 175,110 tons of zinc concentrates. Very favourable developments are reported in a lower level of the Sullivan and many years of profitable mining are assured."

Ore reserves at the Monarch mine when re-opened in August, 1933, were:-

	Tons of Ore	Ounces Silver per ton	Per cent Lead	Per cent Zinc
West Monarch	318,100	2.4	18.0	18.0
East Monarch	41,500	1.1	6.2	15.2
Kicking Horse	75,000	3.0	5.0	15.0
	434,600	2.4	14.6	17.2

Since operations were resumed, development work has put more ore in sight than has been extracted. The cost of mining at the Monarch, including all overhead, office, depreciation on equipment, insurance and contingencies was $38,448.05, equivalent to $1.04 per ton of ore trammed to the mill. The total cost of milling, including overhead, office, depreciation on equipment, insurance and contingencies was $40,425.05, or $1.52 per ton of ore.

NORTH WEST TERRITORIES - In the Great Bear Lake area of the North West Territories, Eldorado Gold Mines Limited erected a concentrating mill with a crushing and grinding capacity of at least 75 tons per 24 hours and a concentrating capacity of 25 tons. Milling of ore was commenced during the year under review. The annual report of the company states that milling has been of an experimental nature and the mill is proving to be a valuable adjunct to the mine for concentration of pitchblende as well as silver. The process used is gravity concentration on Wilfley tables followed by flotation. The policy of the company during 1933 was to confine its efforts to the development of the LaBine Point property and particularly to the most favourable pitchblende areas; this because of the low price of silver and of the necessity of having available pitchblende to keep the Port Hope radium extraction plant working to capacity.

The Consolidated Mining and Smelting Company of Canada, Ltd., report that in the course of the development of its Great Bear Lake property, shipments of high grade ore were made and gave satisfactory returns. Indications are so favourable that plans are under way for the installation of further equipment during the summer of 1934. Development is being continued.

Considerable prospecting and exploration was accomplished in the district and important development work conducted on some of the more important properties including those of the White Eagle Silver Mines Ltd. and Bear Exploration and Radium. It has been announced that Great Bear Lake Mines Ltd. will conduct extensive development work in 1934 on its Hottah Lake silver claims.

YUKON - The Department of the Interior, Ottawa, states in a report respecting mining activities in the Territory during the past fiscal year:- "Owing to the low price of silver and the suspension of requirements of section 54 of the Yukon quartz Mining Act re representation work, many of the claim owners moved to other parts of the Territory to seek employment, consequently very little development work was done on quartz claims in the Mayo district. A few financially able to remain in the district developed their ground and discovered some very rich deposits, further demonstrating the possibilities of this camp whenever the price of silver becomes stabilized. The Treadwell Yukon Company Ltd. closed down their operations at Keno Hill in the fall of 1932, and transferred their operations to the "Elsa" claim on Galena Hill. Considerable high grade ore was mined and shipped from this property during the summer and fall of 1933, when this camp was closed down. A small crew of twenty odd men were moved to the old "Silver King" mine where exploratory work is being carried on at the present time."

PRINCIPAL STATISTICS OF THE SILVER-LEAD-ZINC MINING INDUSTRY IN CANADA, 1929 - 1933.

Year	Number of active operators	Number of operating plants or mines	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Net value of ores and concentrates sold
			$		$	$	$
1929 ...	149	168	50,573,661	4,153	6,482,392	793,139	22,748,089
1930 ...	86	95	42,053,674	2,866	4,263,961	654,685	13,000,415
1931 ...	39	40	31,152,078	1,299	2,149,921	485,106	6,351,975
1932 ...	32	32	9,791,422	1,067	1,688,507	354,736	5,146,690
1933 ...	38	39	13,080,224	1,024	1,369,510	260,621	7,569,867

WAGE-EARNERS, BY MONTHS, IN THE SILVER-LEAD-ZINC MINING INDUSTRY, 1932 and 1933.

Month	1932	1933
January	1,012	832
February	1,016	820
March	1,031	830
April	1,019	797
May	1,003	795
June	980	839
July	973	853
August	973	942
September	966	976
October	919	1,007
November	905	1,017
December	886	944

FUEL AND ELECTRICITY USED IN THE SILVER-LEAD-ZINC MINING INDUSTRY, 1932 and 1933.

		1932		1933	
		Quantity	Value	Quantity	Value
			$		$
Bituminous coal - Canadian ..	short ton	15,097	72,907	16,921	71,229
Imported ..	short ton	10	320	4	98
Coke	short ton	6	69	...	...
Gasoline (exclusive of that used in motor cars)	Imp. gal.	5,101	4,327	9,726	3,231
Kerosene	Imp. gal.	1,345	671	348	102
Fuel oil and diesel oil	Imp. gal.	348,170	90,936	167,547	21,837
Wood (cords of 128 cu.ft.)...	cords	473	9,932	60	263
Electricity purchased including service charges	K.W.H.	37,570,680	179,487	39,040,970	163,861
TOTAL	xxx	...	358,649	...	260,621

ORE MINED AND MILLED IN THE SILVER-LEAD-ZINC MINING INDUSTRY IN CANADA, 1932 and 1933.

		Yukon	British Columbia	CANADA
1932				
Ore mined	tons	40,119	1,492,453	1,532,572
Ore milled	tons	38,614	1,467,066	1,505,680
Concentrates produced - Lead	tons	3,298	167,424	170,722
Zinc	tons	...	200,156	200,156
Copper	tons	...	...	...

		Yukon and North West Territories	British Columbia	CANADA
1933				
(x) Ore mined	tons	4,909	1,451,078	1,455,987
Ore milled	tons	...	1,435,357	1,435,357
Concentrates produced - Lead	tons	...	178,379	178,379
Zinc	tons	...	182,142	182,142
Others (data not available)		...	...	...

(x) Includes silver-pitchblende ores mined in North West Territories.

DESTINATION OF SHIPMENTS FROM SILVER-LEAD-ZINC MINES OF CANADA, 1932 and 1933.

Products shipped	Tons Shipped	Net value at Shipping Point	Total metal content as determined by settlement assay: Gold	Silver	Lead	Zinc
		$	fine oz.	fine oz.	lb.	lb.
1932						
To Canadian smelters -						
Lead ore	18,609	266,598	1,516	745,831	5,548,630	818,876
Lead concentrates.	167,538	2,980,395	18,582	4,140,209	236,446,355	15,257,708
Zinc ore	...	...	...	...	...	...
Zinc concentrates.(x)	200,156	914,713	...	357,934	13,666,316	198,993,788
Dry ore	454	10,989	535	40,103	...	...
Total	386,757	4,172,695	20,633	5,284,077	255,661,301	215,070,372
To foreign smelters -						
Lead ore	229	38,701	7	107,049	302,903	...
Lead concentrates.	3,807	935,294	228	2,959,962	3,753,231	...
Zinc ore	...	...	...	...	...	...
Zinc concentrates.	...	...	...	...	...	...
Dry ore	...	...	...	...	...	...
Total	4,036	973,995	235	3,067,011	4,056,134	...
1933						
To Canadian smelters -						
Lead ore	17,315	351,754	2,563	747,107	8,960,712	1,561,005
Lead concentrates.	172,882	4,598,533	4,749	4,312,318	245,193,821	14,803,258
Zinc ore	...	...	...	...	...	...
Zinc concentrates(x)	175,240	1,767,130	2	344,193	11,969,713	179,473,005
Dry ore (a)	596	23,207	183	54,457	23,787	...
Total	366,033	6,740,624	7,497	5,458,075	266,148,033	195,837,268

(x) Does not include zinc concentrates produced from copper-gold-zinc ores in Manitoba

(a) Includes shipments of silver ores and pitchblende from North West Territories. Information relating to radium content of pitchblende is not available for publication.

DESTINATION OF SHIPMENTS FROM SILVER LEAD ZINC MINES OF CANADA, 1932 and 1933 (concluded)

Products shipped	Tons Shipped	Net value at shipping point	Total metal content as determined by settlement assay: Gold fine oz.	Silver fine oz.	Lead lb.	Zinc lb.
1933 - (concluded)						
To foreign smelters -						
Lead ore	2,619	371,363	253	1,273,199	1,764,243	...
Lead concentrates.	7,274	411,563	67	1,018,241	10,580,155	...
Zinc ore	...	...	...	...	...	...
Zinc concentrates.	6,966	46,317	...	...	...	8,408,405
Dry ore	...	...	...	...	...	...
Total	16,859	829,243	320	2,291,440	12,344,398	8,408,405

GOVERNMENT ACTION REGARDING SILVER.

At the London Monetary and Economic Conference of July, 1933, important action was taken with a view to mitigating fluctuations in the price of silver. The Monetary and Financial Sub-Commission unanimously adopted a resolution recommending to all Government parties to the Conference that, among other things, they refrain from further debasement of their silver coinage below a fineness of 800/1000 and that where possible they substitute silver coins for low-value paper currency.

In addition to the above recommendations of general applicability, definite agreements were entered into between the chief silver holding countries and the main silver producing nations. Under the Eight Power Agreement, signed July 22, 1933, India and Spain agree to limit total sales during the ensuing four years to 140 million and 20 million ounces respectively, while China undertakes during the same period to cease entirely selling silver from demonetized coins. On the other hand, the chief producing countries, Australia, Canada, Mexico, Peru and the United States, agreed not to sell any silver but to make aggregate purchases from (or otherwise arrange for withholding from market) domestic production totalling 35 million ounces annually. Under a separate Five Power Agreement, of the same date, Canada accepted the quota of 1,671,802 ounces as her share of the total amount to be so purchased (or otherwise withheld from sale). The action of the delegate of Canada in signing this agreement at London was approved by Parliament on February 26.

Silver to the above amount is, in the first instance, to be purchased by the Minister of Finance from domestic mine production at the market price and, in accordance with amendment to the Dominion Notes Act of June 26, 1934, will be held as additional security for the redemption of Dominion Notes. Subsequent instalments for the years 1935, 1936 and 1937 will be purchased by the Bank of Canada when directed to do so by the Minister of Finance. The silver thus purchased under the agreement may, by Section 26 of the Bank of Canada Act, constitute a part of the reserves which the Bank is to hold against its outstanding note and deposit liabilities.

The first step toward implementing the silver purchase agreement has recently been taken by the Minister of Finance in his notice calling for tenders as of August 20, 1934, for the delivery of silver bullion up to an amount of 250,000 ounces.

The President of the United States in an executive order issued December 21, 1933, ratified the silver agreement adopted at the World Economic Conference in London and provided for the purchase of newly mined domestic silver, half to be coined and half to be retained as seigniorage. President Roosevelt signed the Silver Purchase Act of 1934 on June 19. The Act declares it to be the policy of the United States to increase the proportion of silver to gold in the nation's monetary stocks until one fourth of the monetary value of such stocks shall be represented by silver. A tax of 50 per cent on profits from speculative activities is imposed and the government under the Act may completely control silver stocks held in the United States. Federal control of monetary metals in the United States was extended to silver with the issuance by President Roosevelt on August 9, 1934, of an executive order and proclamation nationalizing silver and providing for surrender of all silver stocks to the government within ninety days at a fixed price of 50.01 cents an ounce.

It is interesting to note that by decree 244 of May 23, 1934, and 256 of May 26, 1934, the Cuban Government has modified its currency. The gold content of the Cuban peso has been reduced to 59.06 per cent of that contained in the former coin, and silver pesos have been made legal tender for any sum. (The Cuban peso is at present approximately at par with the United States dollar).

In their annual review of the silver market, Handy and Harmon, New York, state that data available indicates that during 1933 about 24,000,000 ounces of silver were used in the United States and Canada by the arts and industries, which is an increase of 2,000,000 ounces over the previous year's consumption. As usual, more metal was employed in the manufacture of silverware than in any other one product, and 1933 figures showed a gain of 12 per cent to 15 per cent over those of 1932. Sterling silver flatware increased 15 per cent to 18 per cent; sterling silver hollowware remained practically unchanged; and plated ware increased 18 per cent to 20 per cent. The chemical industry, which includes photographic film, absorbed about 15 per cent more ounces in 1933 than in 1932, and gains were also recorded in the use of silver for industrial purposes such as chemical equipment and special alloys for brazing and soldering. On the other hand, less silver was used for dental products and jewellery.

Handy and Harmon also report as follows:- "That although supplies of newly mined metal will probably increase somewhat under stimulus of higher prices prevailing in certain countries, we do not anticipate an annual output of anything like the pre-depression figures of 250,000,000 ounces. Our reasons for this contention are the previously (x) mentioned situation in Mexico; the probability that industrial demand for the base metals, of which silver is a by-product, will not for some time assume the proportions of the prosperity era; and the fact that a large part of the future copper production will be derived from ores which contain little or no silver."
(x) "In the United States the price of silver itself is not the determining factor in its production, because so large a proportion of the white metal is mined as a by-product; and in Mexico production may well have been retarded as a result of the Mexican Government's insistence that mining companies maintain their output throughout the years of low prices This policy necessitated the working of the richest ores; but now the higher quotations for silver permit the use of poorer ores, it would seem as if the consequent smaller recovery would tend to offset the stimulating effect of higher prices."

It was reported in June, 1934, by the Mining Journal, London, that "owing presumably to the shutting down of the Mt. Isa plant towards the end of the year, due to a labour dispute, the lead production in Queensland, Australia, was inferior to that of 1932, amounting to 45,150 tons, as compared with 47,716 tons. The silver output was also slightly less at 2,248,804 ounces against 2,301,872 ounces. Plumbism

seems to have developed somewhat widely as 92 certificated cases were reported up to the closing of the plant, 80 of which were fresh cases."

That the annealing or softening temperature of cold-worked copper is appreciably increased by almost unbelievably small amounts of silver has been known since 1916; silver-bearing copper finds considerable use in industry as it retains its strength in operations involving soldering or tinning. Silver is effective in raising the softening temperature of high-conductivity, tough pitch, cold-worked material for very short anneals and also for heating times of months. Cold-worked copper containing almost no silver is completely softened on heating for a few days at 150 degrees C., whereas copper of the same hardness containing 10 ounces of silver per ton is not greatly softened when maintained at this temperature for a year.

Importance of maintaining purity of ice used in food products is very apparent yet methods employed have hardly been efficacious. Recently, however, difficulties seem to have been overcome by the catadyne method of sterilizing water by silver electrolysis which not only frees from bacteria but acquires germidical action. Only a small quantity of silver is needed for dissolving in the freezing water, viz., a few tenths of a gramme to 70 gallons of water. At a Dresden factory in Germany the process is worked on a large scale with 20 tons of activated ice produced daily.

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PRODUCTION OF SILVER IN CANADA, BY PROVINCES AND BY SOURCES, 1932 and 1933.

	1932		1933	
	Quantity	Value	Quantity	Value
	fine oz.	$	fine oz.	$
NOVA SCOTIA -				
In gold bullion - TOTAL	47	15	104	39
QUEBEC -				
In gold ores, in blister copper, and in copper ores exported - TOTAL ...	628,902	199,184	471,419	178,351
ONTARIO -				
In silver bullion and nuggets	4,781,174	1,514,276	2,762,748	1,045,225
In gold bullion	426,703	135,144	404,744	153,126
In blister copper produced; and in ores, concentrates, residues and matte exported or treated in smelters outside the province	1,127,911	357,228	1,368,188	517,624
TOTAL	6,335,788	2,006,648	4,535,680	1,715,975
MANITOBA -				
In gold bullion and in blister copper - TOTAL	1,036,497	328,275	1,101,578	416,758
SASKATCHEWAN -				
In ores shipped to Canadian smelters - TOTAL	14	4	114,604	43,358
ALBERTA -				
In alluvial gold - TOTAL	9	3	32	12

PRODUCTION OF SILVER IN CANADA, BY PROVINCES AND BY SOURCES, 1932 and 1933. (concluded)

	1932		1933	
	Quantity fine oz.	Value $	Quantity fine oz.	Value $
BRITISH COLUMBIA -				
In alluvial gold	3,672	1,163	4,307	1,629
In gold bullion	11,329	3,588	26,579	10,056
In blister copper	596,810	189,019	346,120	130,947
In base bullion and in ores exported	6,681,651	2,116,188	6,360,051	2,406,185
TOTAL	7,293,462	2,309,958	6,737,057	2,548,817
YUKON AND NORTH WEST TERRITORIES -				
In alluvial gold	9,084	2,877	8,814	3,335
In ores exported or shipped to Canadian smelters	3,044,104	964,117	2,218,662	839,382
TOTAL	3,053,188	966,994	2,227,476	842,717
CANADA	18,347,907	5,811,081	15,187,950	5,746,027

For 1933 fine silver was valued at 37.8328 cents per ounce, the average price for the metal on the New York market expressed in Canadian funds; for 1932 the corresponding price was 31.67163 cents.

PRODUCTION OF SILVER IN CANADA FOR YEARS SPECIFIED, 1887-1933.

Year	Ounces	Cents per ounce	Year	Ounces	Cents per ounce
1887	355,083	98.00	1924	19,736,323	66.78
1891	414,523	98.00	1925	20,228,988	69.06
1896	3,205,343	67.06	1926	22,371,924	62.11
1901	5,539,192	58.95	1927	22,736,698	56.37
1906	8,473,379	66.79	1928	21,936,407	58.18
1910 (x)	32,869,264	53.49	1929	23,143,261	52.99
1911	32,559,044	53.30	1930	26,443,823	38.15
1916	25,459,741	65.66	1931	20,562,247	29.87
1919	16,020,657	111.122(a)	1932	18,347,907	31.67
1920	13,330,357	100.90	1933	15,187,950	37.83

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

From 1887 to 1933 inclusive the silver production in Canada amounted to 663,936,087 fine ounces valued at $398,507,972.

SOURCE OF CANADIAN SILVER PRODUCTION BY PERCENTAGES, 1932 and 1933.

	1932	1933
In silver-cobalt ores	28.5	20.4
(x) In base bullion	29.2	34.6
In gold ores (bullion and placer)	2.5	3.0
In blister copper	15.5	19.5
In matte, copper ores and silver-lead ores exported, etc.	24.3	22.5
	100.0	100.0

(x) Chiefly from silver-lead ores.

COMPARATIVE COPPER, SILVER AND LEAD PRODUCTIONS IN CANADA FOR YEARS SPECIFIED

Year	TOTAL COPPER PRODUCTION CANADA	(z) SILVER ONTARIO	TOTAL LEAD PRODUCTION CANADA	TOTAL SILVER PRODUCTION CANADA
	Pounds	Fine oz.	Pounds	Fine oz.
1904	41,383,722	(x)206,875	37,531,244	3,577,526
1907	56,979,205	10,023,311	47,738,703	12,779,799
1911	55,648,011	(a)31,507,791	23,784,969	32,559,044
1915	100,785,150	24,746,534	46,316,450	26,625,960
1919	75,053,581	11,214,317	43,827,699	16,020,657
1923	86,881,537	10,377,846	111,234,466	18,601,744
1924	104,457,447	9,935,902	175,485,499	19,736,323
1925	111,450,518	10,707,235	253,590,578	20,228,988
1926	133,094,942	10,543,473	283,801,265	22,371,924
1927	140,147,440	8,543,513	311,423,161	22,736,698
1928	202,696,046	6,745,401	337,946,688	21,936,407
1929	248,120,760	7,781,429	326,522,566	23,143,261
1930	303,478,356	9,225,610	332,894,163	26,443,823
1931	292,304,390	5,998,482	267,342,482	20,562,247
1932	247,679,070	4,659,304	255,947,378	18,347,907
1933	299,982,448	2,803,756	266,475,191	15,187,950

(z) Shipments from silver-cobalt camps as recorded by Ontario Department of Mines - Total output from these fields 420,741,513 ounces - 1904-1933 inclusive.
(x) First production.
(a) Year of maximum production.

For ratio of gold to silver production see bulletin on Canadian gold mining industry, 1933, as issued by the Bureau of Statistics.

IMPORTS INTO CANADA AND EXPORTS OF SILVER, 1932 and 1933.

	1932		1933	
	Quantity	Value	Quantity	Value
	Fine oz.	$	Fine oz.	$
IMPORTS -				
Silver in bars, etc., unmanufactured ...	...	585,788	...	674,138
Silver, manufactures of, n.o.p., and articles consisting wholly or in part of sterling or other silverware	...	94,108	...	73,666
Silver and other coin except gold	...	...	...	12
TOTAL	...	679,896	...	747,816
EXPORTS -				
Silver contained in ore, concentrates, etc.	3,488,094	982,652	3,362,354	1,093,464
Silver bullion	13,504,060	3,978,438	10,738,729	3,759,387
TOTAL	16,992,154	4,961,090	14,101,083	4,852,851
Silver coin, Foreign	...	808,695	...	275,007
Silver coin, Canadian	...	86,689	...	62,943

The approximate value of silver consumed in Canada during 1933 in the manufacture of jewellery, silver nitrate, kodak film, etc., amounted to $434,000.

WORLD SILVER CONSUMPTION; PRODUCTION AND OTHER SUPPLIES(x), 1932-1933.

(In millions of fine ounces)

CONSUMPTION	1933	1932	PRODUCTION AND SUPPLIES	1933	1932
China (including Hong Kong) -			United States	21.4	24
Excess of imports over exports	..	40	Mexico	69.1	69.6
India -			Canada	15.4	18.3
Excess of production plus imports over exports	10	12	South America	13.5	12.8
Germany -			All other countries	43.6	39
Excess of production plus imports over exports	14.5	22.8	Total Production	165	163.7
Coinage -			OTHER SUPPLIES -		
Mexico	16	24.6	Demonetized coin -		
Germany	..	20	Indo-China	...	10
Cuba	..	2.8	Near East	...	1
Yugoslavia	..	.5	Russia	45	12.1
Belgium	7	..	Sales by Indian Government a/c British war debt	20	...
Turkey	4.5	..	In London	30	24
United States -			Sales by China, excess of		
a/c war debt payments	22.7	..	exports over imports	15	...
Subsidiary coinage	2	1.2			
Arts and Industries -					
In the United States and Canada	24	22			
In England	8	8			
In Mexico	1	1			
Unaccounted for	163.3	55.9			
TOTAL	275	210.8		275	210.8

(x) Supplied by Handy and Harman, New York.

SILVER PRODUCTION OF THE WORLD(a), 1931-1933.

(Supplied by the American Bureau of Metal Statistics)

(In fine ounces)

	1931	1932	1933
NORTH AMERICA:			
United States	31,580,000	24,762,000	20,955,000
Canada	20,562,247	18,347,807	15,201,265
Mexico	86,066,000	69,301,000	68,109,000
Newfoundland	962,200	1,202,000	1,085,000
TOTAL NORTH AMERICA	139,170,447	113,612,907	105,348,265
CENTRAL AMERICA AND WEST INDIES	4,000,000	4,300,000	4,600,000
SOUTH AMERICA:			
Bolivia	5,772,307	4,115,232	5,250,000
Chile	320,503	103,931	255,078
Colombia	70,000	84,000	110,000
Ecuador	104,762	114,167	(x) 115,000
Peru	8,794,407	6,735,039	7,000,000
Other countries	36,519	74,154	(x) 76,000
TOTAL SOUTH AMERICA	15,098,498	11,226,523	12,806,078

SILVER PRODUCTION OF THE WORLD(a), 1931-1933 (concluded)
(Supplied by the American Bureau of Metal Statistics)
(In fine ounces)

	1931	1932	1933
EUROPE:			
France	517,600	(x)500,000	(x)500,000
Czechoslovakia	839,504	947,139	(x)950,000
Great Britain	33,989	16,043	(x) 25,000
Germany	5,784,588	5,992,760	6,108,500
Greece	172,500	170,000	200,000
Italy	719,324	801,499	625,000
Norway	308,640	292,565	(x)250,000
Poland	365,095	69,283	(x) 79,000
Rumania	114,261	186,727	(x)190,000
Russia	932,900	(x)900,000	(x)1,000,000
Jugoslavia	1,200,000	1,500,000	1,600,000
Spain and Portugal	3,098,713	3,374,335	2,920,500
Sweden	362,491	668,849	850,000
Other Europe	14,082	40,789	(x)25,000
TOTAL EUROPE	14,463,687	15,459,989	15,323,000
OCEANIA:			
New South Wales	6,638,821	6,074,227	(x)7,000,000
Queensland	1,088,478	2,301,782	2,240,728
Tasmania	391,732	463,488	489,330
Other states	94,707	120,437	(x) 150,000
New Zealand	435,010	562,792	(x) 550,000
TOTAL OCEANIA	8,648,748	9,522,726	10,430,058
ASIA:			
India	7,211,000	6,947,000	7,280,000
China	60,000	60,000	(x)60,000
Chosen (Korea)	366,639	350,000	(x)360,000
Netherlands East Indies	1,472,991	842,365	(x)900,000
Japan	5,586,545	5,241,587	6,000,000
Turkey	155,457	(x) 100,000	(x) 100,000
Other countries	24,877	20,830	(x) 25,000
TOTAL ASIA	14,877,509	13,561,782	14,725,000
AFRICA:			
Algeria	258,000	58,899	(x)25,000
Rhodesia	76,548	114,900	112,434
Transvaal, Cape Colony and Natal	1,063,000	1,120,668	1,065,011
Other countries	988,872	303,699	(x)265,000
TOTAL AFRICA	2,386,420	1,598,166	1,467,445
TOTAL FOR WORLD	198,645,309	169,282,093	164,699,846

(a) Beginning 1930 revisions have been made particularly with regard to certain omissions. For 1933 the figures are based on actual reports or reliable estimates, except where the asterisk (x) is used indicating that the figure is conjectural.

WORLD'S MONETARY STOCKS OF SILVER AT THE CLOSE OF 1932.

(Supplied by United States Mint and subject to revision)

(stated in United States money, 000's omitted)

Country	Silver stock in banks and treasuries	Per capita
	$	$
United States	846,702	6.76
Canada	28,398	2.73 (6)
Mexico	11,436	.69 (7)
Chile	2,709	.62 (6)
Columbia	13,189	1.57 (16) (6)
Peru	6,329	1.01 (6) (16)
Austria	10,069	1.49 (6)
Belgium	9,483	1.17 (16)
France	52,480	1.25 (16)
Germany	356,168	5.51 (6)
Great Britain	256,540	5.55 (6)
Greece	3,965	.62 (6)
Irish Free State	4,889	1.65 (6)
Italy	86,488	2.10 (6) (7)
Latvia	8,299	4.32 (6)
Netherlands	54,558	6.79 (6)
Norway	6,673	2.37 (6) (7)
Poland	29,304	.91 (6)
Rumania	6,828	.37
Russia (Soviet Union)	11,733	.07 (7) (29)
Spain	116,026	4.85
Yugoslavia	7,378	.53 (6)
Ceylon	9,946	1.87 (6)
China (17)	359,788	.77 (19)
India - British	1,411,330	3.99 (6)
Indo-China - French	6,805	.32 (7) (30)
Iraq (Mesopotamia) (7)	25,000	7.58 (6)
Japan (including Chosen, Taiwan, Kwantung) (17)	36,632	.41
Netherlands East Indies	18,534	.30
Philippine Islands	18,837	1.51 (6)
Siam	54,170	4.63 (6)
Straits Settlements	21,371	19.18 (6)
Egypt	20,551	1.39 (6)
Ethiopia	9,332	.93 (6)
Kenya and Uganda (14)	14,348	2.19 (6)
Sudan-Anglo Egyptian	8,771	1.56 (6)
Union of South Africa	12,400	1.53 (6)
Australia	11,674	1.78 (16)
New Zealand	1,777	1.16
Others	87,547	...
TOTAL	4,058,457	2.05

NOTE - The amount of silver in circulation in many countries is not obtainable, and in some countries that held by private banks cannot be given.

(6) Estimated silver circulation included.
(7) Prior year's figures.
(16) Includes base metal coin.
(17) Incomplete.
(19) Dollar coins circulating estimated at 1,660,000,000.
(29) Includes platinum.
(30) Total metallic divided between gold and silver.

L E A D

Canadian lead production during 1933 represents a 4.1 per cent increase over that of the preceding year. This was accounted for solely through the expanding output in British Columbia. Decreases for the corresponding periods were recorded for both the Yukon and Ontario. Of the total Canadian production, British Columbia contributed 98.8 per cent. World production in 1933 based on data supplied by the American Bureau of Metal Statistics was 31.6 per cent under the high of 1929 but attained a 2 per cent increase over 1932. World's consumption of lead recorded a gain in 1933 of approximately 9.5 per cent over that of the previous year.

Early in 1934 "The Mining Journal," London, reported that no efforts had been made during 1933 to reform the "Lead Pool" which broke down in March, 1932, although co-operation was advocated; no big increase of lead can be booked for at the present time and the Journal states that world consumption appears only sufficient to take up the present production and that the huge accumulation of stocks will continue to depress the market price until world trade improves.

In this regard it is encouraging to note that the production of refined lead in Canada during the first half of 1934 reveals an increase of 23.2 per cent over that for the first six months of 1933.

French decrees of March 14, 1934, placed a quota on a number of foreign goods, the importation of which was not previously restricted; the total quota for lead in crude lumps, etc., non-argentiferous, permitted to enter from all countries during the period March 1 to June 30, 1934, was 75,922 quintals; rolled zinc quota for the same period was 1,876 quintals.

PRODUCTION OF NEW LEAD IN CANADA, 1924 - 1933.

Year	Pounds	$	Price per pound, (Canadian funds)
1924	175,485,499	14,221,345	8.104
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 (a)	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

(x) Year of maximum value of Canadian lead production.
(a) Year of maximum output of Canadian lead.

PRODUCTION IN CANADA, IMPORTS AND EXPORTS OF LEAD, 1932 and 1933.

	1932 Pounds	1932 Value $	1933 Pounds	1933 Value $
PRODUCTION				
Ontario	86,477	1,828	29,910	692
British Columbia	252,007,574	5,326,432	263,345,776	6,298,178
Yukon	3,853,327	81,444	3,099,505	74,128
TOTAL	255,947,378	5,409,704	266,475,191	6,372,998
IMPORTS				
Old and scrap, pig and block	28,398	1,436	15,038	1,148
Bars and sheets	159,028	6,893	88,607	3,820
Litharge	2,284,700	125,385	1,885,300	100,816
Acetate of lead	124,169	8,195	102,747	7,897
Nitrate of lead	160,483	9,693	40,385	2,120
Other manufactures	...	129,629	...	63,723
Pipe lead	31,006	1,350	10,686	658
Shots and bullets	7,480	650	5,327	340
Tea lead	...	...	200	12
Lead arsenate	830,120	80,488	498,673	44,256
Lead tetraethyl, compounds of	1,525,825	1,517,639	1,571,775	1,212,990
Lead pigments -				
Dry white lead	8,412	629	8,880	599
White lead, ground in oil	13,632	1,174	21,250	2,540
Dry red lead and orange mineral	620,520	38,065	611,696	32,596
TOTAL	...	1,921,226	...	1,473,515
EXPORTS				
Lead, contained in ore, etc. -				
To United States	3,713,300	148,518	4,062,000	161,665
Belgium	...	...	3,538,000	106,140
TOTAL LEAD IN ORE	3,713,300	148,518	7,600,000	267,805
Pig lead, refined lead, etc. -				
To United Kingdom	121,478,800	1,849 717	172,317,900	3,040,071
United States	...	...	336,000	7,156
France	6,647,700	122,441	...	...
Japan	54,627,100	844,695	72,955,200	1,190,362
Netherlands	10,682,600	152,151	4,984,200	94,113
China	5,368,300	80,129	7,760,500	125,098
Brazil	4,648,900	68,865	4,099,200	70,608
Germany	2,857,900	42,951	7,468,600	132,652
Other countries	7,679,400	108,172	14,407,800	262,454
TOTAL PIG LEAD	215,990,700	3,269,121	284,329,400	4,922,514
TOTAL LEAD EXPORTS	217,704,000	3,417,639	291,929,400	5,190,319

Production of lead from Canadian ores from 1887 to 1933 inclusive totals 4,086,061,539 pounds valued at $208,073,251.

WORLD PRODUCTION OF LEAD(a), 1931 - 1933.
(Supplied by American Bureau of Metal Statistics)
(In short tons - 2,000 lb.)

	1931	1932	1933
United States (d)	411,336	277,435	292,543
Canada	142,605	129,713	129,932
Mexico	233,020	143,621	139,738
Other North America (e)	9,241	9,958	...
TOTAL NORTH AMERICA	796,202	560,727	562,213
Argentina	8,392	8,982	11,017
Peru (b)	4,700	4,224	750
Other South America (b)	1,900	2,100	850
TOTAL SOUTH AMERICA	14,992	15,306	12,617
Austria	6,743	2,189	3,825
Belgium	68,490	67,844	70,543
Czechoslovakia	3,934	4,245	4,096
France	21,881	12,787	8,598
Germany	111,663	104,939	128,418
Great Britain	11,820	8,267	7,000
Greece	7,245	7,055	8,696
Italy	27,412	34,133	27,220
Jugoslavia	8,740	8,785	6,645
Poland	34,590	13,120	13,316
Russia	17,791	17,637	22,046
Spain	120,943	120,998	102,473
Other Europe	1,543	6,614	4,409
TOTAL EUROPE	442,795	408,613	407,285
Turkey	680	...	...
India (Burma)	83,705	79,748	80,694
Japan	4,486	6,614	8,818
TOTAL ASIA	88,871	86,362	89,512
AUSTRALIA	171,607	208,577	233,532
AFRICA	21,067	15,523	16,395
GRAND TOTALS	1,555,534	1,295,108	1,321,554

(a) In general, reported in terms of base bullion, allocated as far as possible according to origin of ore.
(b) Does not include lead exported to European countries, principally Belgium and Germany.
(c) Included in "Other South America."
(d) Lead in smelters' original production from domestic ore, inclusive of some secondary.
(e) Production of Newfoundland for 1933 included in Belgium and Germany as unable to allocate. In 1931 and 1932, part treated in United States and reported separately.

The following data supplied by the American Bureau of Metal Statistics is included as indicative of current trends in lead consumption:-

USE OF LEAD IN THE UNITED STATES BY PERCENTAGE

Purpose	1924	1929	1933
	%	%	%
White lead	18.48	12.31	13.44
Red lead and litharge	4.19	3.09	4.32
Storage batteries	20.93	21.60	33.43
Cable covering	16.99	22.63	7.05
Building	10.23	9.87	5.91
Automobiles	1.32	1.85	1.13
Railway equipment	.69	.59	.05
Shipbuilding	.02	.03	.02
Ammunition	3.32	4.23	7.35
Terne plate	.50	.43	.57
Foil	4.31	4.09	5.12
Bearing metal	3.94	3.39	3.41
Solder	3.69	3.81	3.64
Typemetal	1.60	1.85	2.50
Calking	3.26	3.24	2.73
Castings	1.85	1.85	1.14
Other uses	4.68	5.14	8.19
TOTALS	100.00	100.00	100.00

AVAILABLE STATISTICS ON THE CONSUMPTION OF LEAD IN SPECIFIED CANADIAN MANUFACTURING INDUSTRIES, 1931-1932.

Industries	Items (Used)	1931 Pounds	1932 Pounds
Paints and pigments	Pig lead	14,582,000	11,415,000
White metal alloys	Pig lead	12,395,000	6,362,000
White metal alloys	Scrap lead	5,007,000	3,119,000
Electrical apparatus	Pig lead	15,292,000	12,108,000
Electrical apparatus	Scrap lead	177,000	132,000
Electrical apparatus	Lead sheets	447,000	34,000
Iron and steel	Lead	773,000	633,000
GRAND TOTAL		48,673,000	33,803,000

NOTE - Corresponding data for 1933 not yet complete.

ZINC

Production of zinc in Canada during 1933 was 15.6 per cent greater than in 1932. Of the total production of the Dominion, British Columbia contributed 76.7 per cent; Saskatchewan, 1.4 per cent, and Manitoba, 21.9 per cent. Primary zinc was not produced in 1933 in any of the other provinces. World production showed an increase of 26.3 per cent over 1932 but was still 31.9 per cent under that of 1929. World consumption was up 23.3 per cent over the preceding year; it was, however, 31.4 per cent under 1929.

Early in 1934 the Mining Journal, London, in a review on the zinc situation reports as follows: "On the whole, the zinc industry may be said to have taken a definite step forward during 1933, although there have been no very outstanding features. The price of the metal was affected mostly by outside influences such as the American situation, and reacted quickly to any change in general economic sentiment. Greater stability might be reached if a longer period for the continuation of the cartel could be arranged, as the continued rumours as to its internal difficulties and the possibility of its break up have had a disturbing influence."

The United States Bureau of Mines states that sales of all lead pigments and of all zinc pigments and salts registered important increases in the United States during 1933; the increases in sales of zinc pigments and salts in comparison with 1932 showed the following increases: leaded zinc oxide, 60 per cent; zinc oxide, 36 per cent; lithopone, 16 per cent; zinc chloride, 37 per cent, and zinc sulphate, 34 per cent.

It has recently been announced that lubricants containing zinc oxide in colloidal form have been produced. The presence of the zinc oxide makes the lubricant anodic to steel and creates an electrolytic couple which forms an adherent film on the contacting surface. The zinc is described as plating out and penetrating the surface layers of the steel, producing a hard corrosion-resisting skin and it is claimed that should this ultra microscopical thickness be reduced owing to wear taking place due to slip, it is automatically built up again.

PRODUCTION OF ZINC FROM CANADIAN ORES, 1924 - 1933.

Year	Pounds	$	Price per pound (Canadian funds)
1924	98,909,077	6,274,791	6.70
1925	109,268,511	8,328,446	7.96
1926(x)	149,938,105	11,110,413	7.41
1927	165,495,525	10,250,793	6.19
1928	184,647,374	10,143,050	5.49
1929	197,267,087	10,626,778	5.39
1930 (a)	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

(x) Year of maximum value of Canadian zinc production.
(a) Year of maximum Canadian zinc production.

The total value of Canadian zinc production since the first recording of Canadian zinc statistics in 1898 and to 1933 totalled $108,629,285.

AVAILABLE STATISTICS ON THE CONSUMPTION OF ZINC IN SPECIFIED CANADIAN MANUFACTURING INDUSTRIES, 1931 and 1932.

Industry	Items used	1931 Pounds	1932 Pounds
Brass and copper products	Zinc castings	45,000	1,938,000
Brass and copper products	Zinc ingots and bars	2,488,000	172,000
Brass and copper products	Zinc plates, slabs and sheets	84,000	301,000
Brass and copper products	Zinc scrap	39,000	64,000
White metal alloys	Zinc spelter	301,000	382,000
White metal alloys	Zinc scrap	277,000	485,000
Electrical apparatus	Zinc ingots and bars	1,586,000	577,000
Electrical apparatus	Zinc sheets	1,275,000	1,143,000
Iron and steel	Zinc	19,208,000	16,785,000
GRAND TOTAL		25,303,000	21,845,000

Corresponding data for 1933 not yet available.

PRODUCTION IN CANADA, IMPORTS AND EXPORTS OF ZINC, 1932 and 1933.

	1932 Pounds	1932 Value $	1933 Pounds	1933 Value $
PRODUCTION				
Manitoba	41,736,600	1,004,016	43,516,037	1,397,082
Saskatchewan	...	...	2,789,683	89,563
British Columbia	130,546,958	3,140,438	152,826,264	4,906,487
TOTAL	172,283,558	4,144,454	199,131,984	6,393,132
IMPORTS				
Zinc dust	530,600	40,625	841,400	47,826
Zinc in blocks, pigs, bars and rods, and zinc plates, n.o.p.	123,500	3,248	16,400	1,074
Zinc in sheets and strips, and zinc plates for marine boilers	4,070,500	273,359	3,969,100	273,439
Zinc spelter	66,500	1,897	162,300	4,921
Zinc white	10,112,476	456,861	9,864,897	428,201
Zinc, sulphate and chloride of (a)	336,685	10,907	...	...
Zinc sulphate (x)	719,923	14,628	432,604	7,902
Zinc, chloride of (x)	1,456,056	50,630	1,018,954	30,871
Zinc, manufactures of, n.o.p.	...	80,261	...	72,499
Lithopone	16,110,700	585,148	11,387,409	406,598
TOTAL	...	1,517,562	...	1,273,451
(a) From January 1 to March 31, 1932.				
(x) From April 1 to December 31, 1932.				
EXPORTS				
Zinc, contained in ore				
To Belgium	...	...	6,071,600	121,241
Japan	...	...	2,254,000	14,008
Total	...	...	8,325,600	135,249
Zinc, scrap, dross and ashes				
To United Kingdom	541,100	7,154	826,800	12,549
United States	2,200	71	511,900	2,933
Japan	39,100	617	2,911,900	18,220
Other countries	245,500	1,680	2,051,500	13,358
Total	827,900	9,522	6,302,100	47,060
Zinc, spelter				
To United Kingdom	102,486,200	2,270,405	117,820,500	3,414,465
United States	...	...	56,000	2,156
British India	8,692,900	182,415	4,161,200	101,616
Argentina	2,117,400	44,489	2,354,800	68,294
Belgium	6,664,100	141,955	12,209,500	352,354
Brazil	795,600	18,904	547,400	8,548
China	1,366,200	28,242	2,940,400	90,002
France	9,942,100	224,684	1,691,800	49,739
Germany	4,862,000	115,141	2,866,300	77,726
Italy	1,120,400	25,702	1,120,400	26,665
Japan	30,475,100	674,712	25,761,500	740,398
Netherlands	5,668,600	128,406	1,691,900	47,101
Sweden	672,200	18,677	...	...
Other countries	459,000	9,278	451,700	11,641
Total	175,321,800	3,852,990	175,453,400	4,990,705
GRAND TOTAL - EXPORTS	...	3,862,512	...	5,173,014

In 1932 the Canadian zinc production was valued at 2.4058 cents per pound, in Canadian funds, while in 1933 the price used was 3.2105 cents, in Canadian funds.

WORLD PRODUCTION OF ZINC(a), 1929 and 1932 and 1933.
(Supplied by American Bureau of Metal Statistics)
(In short tons - 2,000 lb.)

Country	1929	1932	1933
United States	631,601(c)	213,531	324,705
Mexico	29,954(c)	33,454	30,712
Canada	86,049	86,152	91,227
Belgium	218,145	106,185	151,449(b)
Czechoslovakia	12,604	7,350	7,480
France	100,984	54,376	61,217
Germany	112,435	46,276	55,819
Great Britain	65,294	30,101	45,987
Italy	17,421	19,345	24,504
Jugoslavia	8,061	2,378	3,369
Netherlands	28,342	17,222	20,368
Norway	6,080	43,401	49,509
Poland	186,324	93,640	86,249
Russia	3,789	20,573	24,251
Spain	13,035	10,475	9,421
Sweden	5,201	...	...
Australia	56,001	59,144	60,425
Japan	21,807	27,337	32,537
French Indo-China	4,196	2,866	3,472
Rhodesia	13,575	...	20,767
TOTALS	1,620,898	873,806	1,103,468

(a) The statistics in this table are the summaries of production as made by the metallurgical works of the world whose principal business is the reduction of ore. Insofar as they produce slab zinc from secondary material such is included. The quantity of such inclusion is, however, relatively small. Production is not allocated according to the origin of the ore except in the instances of the United States and Mexico.
(b) Includes salable zinc dust.
(c) Slab zinc produced in the United States from Mexican ore has been separated and credited to Mexico in this year and subsequently. Other production from Mexican ore is included in figures of countries where treated.

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The following data is supplied by the American Bureau of Metal Statistics and is included as indicative of the current trend in zinc consumption:-

MANUFACTURE OF ZINC IN THE UNITED STATES BY PERCENTAGE

Purpose	1922	1932	1933
Galvanizing	46.69	42.08	42.25
Brass making	32.97	25.48	26.83
Rolled zinc	12.16	15.45	11.79
Die castings	(a)	6.56	7.42
Other purposes	8.18	10.43	11.71
TOTAL	100.00	100.00	100.00

(a) Included in "other purposes".

OPERATORS IN CANADIAN SILVER-LEAD-ZINC MINING INDUSTRY, 1933.

Name of Operator	Head Office Address	Plant Location
QUEBEC -		
(x)Federal Zinc & Lead Co. Ltd.	608 Drummond Bldg., Montreal	Gaspé Co.
(x) Lyall & Beidelman	608 Drummond Bldg., Montreal	Gaspé Co.
(x)Trinidad Mines Gas & Oil Ltd.	116 Côté de la Montagne, Quebec	Chavigny and Montauban counties.
BRITISH COLUMBIA -		
Base Metals Mining Corp. Ltd.	Suite 602, 350 Bay St.,Toronto, Ont.	Field
B. C. Cariboo Gold Fields Ltd.	919 Stock Exchange Bldg.,Vancouver	Moyie
Beaver Silver Mines Ltd.	708 - 525 Seymour St., Vancouver	Beaverdell
Beaverdell Wellington Syndicate Ltd.	Greenwood	Beaverdell
Bell Mine Ltd.	Box 464, Penticton	Beaverdell
Campbell, C. J.	New Denver	Slocan M.D.
Camp McKinney Gold Hill Mining Co. Ltd.	703 Dominion Bldg., Vancouver	Greenwood M.D.
(x)Columario Cons. Gold Mines Ltd.	507 Confederation Life Bldg., Toronto, Ont.	Usk
Consolidated Mining & Smelting Co. of Canada, Ltd.	Trail	Kimberley
Doney, E., and Son	Box 17, Sandon	Slocan
Goodenough Mines	Kaslo	Sandon
Henderson, R. G.	Slocan City	Slocan City
Highland Lass Ltd.	Box 782, Kelowna	Beaverdell
(x)Jessie Gold Mines Ltd.	Box 3, Smithers	Smithers
Jordan, Calder and Jordan	Edgewood	Lightning Peak
Keystone Mine	Erie	Nelson Dist.
McArthur, W.E., Jr.	Greenwood	Similkameen Dist.
(x)Michaely Silver-Lead Mines Ltd.	Trail	Salmon River
McCarthy, James F.	Grand Forks	Kettle River
Molly Hughes Ltd.	N.318 Division St.,Spokane,Wash., U.S.A.	New Denver
(x)Noble Five Mines Ltd.	420 Baker St., Nelson	Slocan and Nelson M.D.
Nordman, J. L.	Beaverdell	Beaverdell
Olsen, A. R., and O. J.	Box 75, Sandon	Sandon
Pool Mountain Gold Mines Ltd.	1320 Marine Bldg.,Vancouver	Camborne
Roberts W. Rees & Co.	Silverton	W. Kootenay
Ruth-Hope Mining Co. Ltd.	804 Stock Exchange Bldg., 475 Howe St., Vancouver	Sandon
Sally Mines Ltd.	Box 220, Penticton	Beaverdell
Sargeant, T.H., and Saunderson,H.	Box 1863, Trail	Nelson M.D.
Saur Marzoli	Retallack	Slocan M.D.
(x)Stemwinder Mountain Mines Ltd.	902 Birks Bldg., Vancouver	Hedley
(x)United Empire Gold and Silver Mining Co. Ltd.	Standard Bank Bldg., Vancouver	Portland Canal
Western Exploration Co. Ltd.	Silverton	Kaslo

OPERATORS IN CANADIAN SILVER-LEAD-ZINC MINING INDUSTRY, 1933. (concluded).

Name of Operator	Head Office Address	Plant Location
YUKON -		
Treadwell Yukon Co. Ltd.	920 Crocker Bldg., San Francisco, Calif., U.S.A.	Mayo M.D.
NORTH WEST TERRITORIES (a)		
(x)Bear Exploration and Radium Ltd.	217 Bay St., Toronto, Ont.	Great Bear Lake
Consolidated Mining & Smelting Co. of Canada, Ltd.	Trail, B.C.	Great Bear Lake
Eldorado Gold Mines Ltd.	Star Bldg., Toronto, Ont.	Great Bear Lake
(x)Great Bear Lake Mines Ltd.	Imperial Bank Bldg., Toronto, Ont.	Great Bear Lake
(x)White Eagle Silver Mines Ltd.	1006 Concourse Bldg., Toronto, Ont.	Camsell River area.

(x) Active but not producing.
(a) Chiefly developing pitchblende or pitchblende silver ores.

NOTE - Based on the value of the gold content of their ores some important silver-lead producers are classified as gold mines and as such are listed in the directory contained in the Bureau of Statistics bulletin on the Canadian Gold Mining Industry.