CANADA

DEPARTMENT OF TRADE AND COMMERCE

DOMINION BUREAU OF STATISTICS

SUMMARY REVIEW

OF

THE SILVER MINING INDUSTRY

IN

CANADA

1932

(including The Silver - Cobalt - Arsenic Mining Industry,
The Silver - Lead - Zinc Mining Industry,
and Related World Data)

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THE SILVER MINING INDUSTRY IN CANADA, 1932.

(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 as silver or silver bearing minerals usually occur in association with those of other metals; with lead and zinc; with cobalt, nickel, arsenic; with lode and placer gold; in copper-gold and nickel-copper ores, and at Great Bear Lake, N.W.T., with uranium and radium. Silver in lead and zinc ores and in cobalt-nickel-arsenic ores is generally an important or predominating factor in determining the marketability of such ores. Silver-lead-zinc mining is a very important industry in British Columbia, the Yukon Territory, and sometimes to a less extent in Ontario and Quebec.

Production of Silver, Lead, Zinc, Cobalt and Arsenic - In 1932 the total primary production of these metals from all Canadian sources was as follows:- silver, 18,349,450 fine ounces valued at $5,811,569; lead, 255,947,378 pounds worth $5,409,704; zinc, 172,283,558 pounds worth $4,144,454; cobalt, 490,631 pounds worth $587,957; and arsenic worth $98,714. The arsenic was recovered as white arsenic and arsenate of lime at the Ontario smelter of the Deloro Smelting and Refining Company from silver-cobalt ores mined in Northern Ontario.

Among the metals produced in Canada during 1932 silver held fourth place, lead fifth place, and zinc sixth place in point of value. The Belgian Congo and Canada are the two largest producers of cobalt, the production from the former has, during recent years, considerably surpassed that of the Dominion.

Producers of both silver-lead and cobalt-silver ores in Canada during 1932 continued to feel adversely the almost unprecedented low prices prevailing for silver, lead and zinc and it is indeed of great credit to the miners and smelters of these ores that their operations were so generally continued and much needed employment provided.

Prices - Silver prices on the New York exchange in 1932 ranged from a high of 30.136 cents per fine ounce for the February average to a low of 25.010 for the month of December. The average yearly price of silver, in Canadian funds, computed from daily New York quotations was 31.67163 cents per troy ounce.

Quotations for lead were higher in January, 1932, than for any other month; the low points were reached in June and July, the December average being 3 cents per pound in New York, 2.877 cents in St. Louis, and 11.144 pounds sterling per long ton in London. The average price of lead for the year, based on daily quotations in London and transposed to Canadian funds was 2.1136 cents per pound. The prices for zinc were lower during the summer months than at the beginning of the year and the average December quotations showed a slight improvement over those for January. The London price of zinc, on the basis of which the greater part of the Canadian production is sold, when converted to Canadian funds averaged 2.4056 cents per pound in 1932.

PRICES (IN CANADIAN FUNDS) 1929 1932.

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

THE SILVER-COBALT MINING INDUSTRY

The mining of silver-cobalt arsenic ores in Canada is confined to Northern Ontario. In 1932 extraction of ores of this type showed a decline of 65 per cent from the previous year while the tonnage treated was 30 per cent less. The value of bullion, ores, concentrates and residues sold totalled $1,735,708, a decrease of 10 per cent as compared with 1931.

The greater part of the 1932 silver output was recovered from ores mined at the O'Brien mine, Cobalt; Miller Lake O'Brien mine, Gowganda; and the properties of the Mining Corporation of Canada. Smaller quantities of silver were produced from ores shipped from the Beaver, Kerr Lake, Temiskaming, McKinley-Darragh-Savage, Hudson Bay, Nipissing, Mann, Right-Of-Way, Aladdin Cobalt, and Foster mines.

Nipissing Mines Co. Ltd., discontinued mining operations at the Nipissing mine about March 1st, 1932. The company report that although certain unimportant silver ore remained there was no incentive for continuing further detailed exploration unless silver prices increased very materially. The Mining Corporation of Canada, Ltd., produced 1,177,791 ounces of silver in 1932. At the beginning of the year the bulk of the remaining silver ore at Cobalt was contained in old stope backs in proximity to the bottom of Cobalt Lake, such ore being overlain with tailings, an opening was blasted through from the underground workings and 400,000 tons of the overlying tailings flowed into the worked out sections of the mine. This permitted the removal of all available tonnage of ore and by the end of the year the long productive record of the Corporation at Cobalt came to an end. The properties of the Corporation in South Lorraine were idle throughout the year and will remain so until silver and cobalt prices justify their re-opening and further exploration. Both the Miller Lake O'Brien and O'Brien Mine at Cobalt were in continuous operation throughout 1932. It is interesting to note that a shipment of cobalt ores was made by Kenora Prospectors and Miners, Ltd., from a property located at Werner Lake in the Kenora district of Ontario.

PRINCIPAL STATISTICS OF THE SILVER-COBALT MINING INDUSTRY IN CANADA, 1927 - 1932.

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
			$		$	$	$
1927 ...	23	26	30,123,645	1,458	2,178,163	472,548	4,760,546
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

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

	1931	1932
Number of mines in operation (x)	26	20
Ore mined ....tons	200,729	70,442
Ore treated ....tons	97,747	68,363
Tailings treated ....tons	...	25
Concentrates produced ....tons	6,535	1,514
Quantity of material cyanided ....tons	39,173	4,567
Bullion recovered .... fine oz.	1,025,015	120,777
Bullion sold .... fine oz.	201,662	...
Value of bullion, ore, concentrates, and residues sold .... $	1,925,593	1,735,708

(x) All mines located in Northern Ontario.

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

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

ARSENIC

PRODUCTION IN CANADA, IMPORTS AND EXPORTS OF ARSENIC, 1931 and 1932.

	1931		1932	
	Quantity lb.	Value $	Quantity lb.	Value $
PRODUCTION -				
White arsenic and arsenic in other forms	...	135,170	...	98,714
TOTAL	...	135,170	...	98,714
IMPORTS -				
White arsenic (arsenious oxide)	167,015	5,824	425,995	16,694
Sulphide of arsenic	10,412	1,347	111,106	4,277
Soda, arseniate, biarseniate and stannate of	704	202	5,603	1,159
Arsenate of lead	1,248,460	116,996	830,120	80,488
Arsenate of lime	821,509	42,107	521,546	27,852
TOTAL	...	166,476	...	130,470
EXPORTS -				
Arsenic, n.o.p. .... TOTAL	3,092,500	116,044	1,788,600	65,287

WORLD PRODUCTION OF ARSENIC
(Supplied by Imperial Institute)
(Long tons)

Producing Country and Description	1929	1930	1931
BRITISH EMPIRE			
United Kingdom -			
Arsenical pyrites	20	...	...
White arsenic and arsenic soot	953	579	177
Southern Rhodesia -			
White arsenic	51	49	...
Union of South Africa -			
White arsenic	33	15	9
Canada (Sales) -			
Gold concentrates (As_2O_3 content)	684	903	...
White arsenic	1,651	1,116	($135,170)(x)
Federated Malay States -			
Arsenic	304	225	133
Australia	251	796	1,070
FOREIGN COUNTRIES			
Czechoslovakia -			
Arsenical pyrites, etc. (As. content)	14	2	...
France -			
Ore (As. content)	4,163	5,060	(a)
White arsenic	3,319	3,800	(a)
Germany -			
Ore (As. content)	1,728	1,829	1,821
Greece -			
White arsenic	751	828	(a)
Jugoslavia -			
Ore	...	7	...
Portugal -			
Ore	123	...	156
Sweden -			
Ore (As. content)	4,512	4,281	4,500
Algeria -			
Arsenate of lead (As. content)	750	347	(a)
Mexico -			
White arsenic (As. content)	9,512	9,819	6,406
United States -			
White arsenic	14,826	15,229	15,301
China -			
White arsenic	2,349	967	500
Japan -			
White arsenic	1,932	1,627	(a)
Turkey -			
Ore (As. content)	6	22	22

NOTE:- About 5,000 tons of ore were recorded as produced in Russia during 1927. Later figures are not available.

(a) Information not available; complete data for 1932 not available.

(x) Includes arsenic in all forms.

The "Mineral Industry" states that the "arsenic" of commerce is arsenious oxide, or white arsenic. Of the United States output of this product more than two-thirds is used in the manufacture of insecticides, about one-fifth for weed killers and wood preservatives which are made from crude arsenic and the remainder principally in the glass industry. 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 potato bugs and other pests that attack fruits and vegetables. Developments at the Boliden mine and smelter in Norway indicate the possibility of this enterprise supplying very large quantities of by-product arsenic, while in Western Australia, Wiluna Gold Mines have installed an electrical precipitating unit at its mine and will now recover arsenic trioxide at the rate of 3,500 tons annually. About half this quantity will be exported; the trioxide is given off during the roasting of the pyritic, auriferous, flotation concentrate.

It is noteworthy that on April 2, 1933, the United States Department of Agriculture issued an order announcing that not only apples but all other food would have to meet the limitation of 0.014 grain of lead per pound to avoid seizure. This may result, states "Chemical and Metallurgical Engineering" in an entire change in insecticide demand and there is even some talk about synthetic organic insecticides to replace lead arsenate.

COBALT

PRODUCTION IN CANADA, IMPORTS AND EXPORTS OF COBALT, 1931 and 1932.

		1931		1932	
		Quantity	$	Quantity	$
PRODUCTION (in terms of metallic cobalt contained in metal and oxides sold and in ores and residues exported	pounds	521,051	651,179	490,631	587,957
IMPORTS					
Oxide of cobalt, tin and copper, n.o.p.	xxx	...	58,640	...	47,203
EXPORTS					
Cobalt contained in ore	cwt.	2,730	165,909	1,247	58,121
Cobalt, metallic	pounds	58,510	79,313	58,439	63,779
Cobalt alloys	pounds	16,508	75,008	20,394	77,436
Cobalt oxide and cobalt salts	pounds	322,146	416,995	377,250	389,998

WORLD PRODUCTION OF COBALT, 1929-1931
(Supplied by Imperial Institute)

Country	1929	1930	1931
BRITISH EMPIRE	Pounds	Pounds	Pounds
Union of South Africa (ore)	336	...	...
Canada (c)	929,415	694,163	521,051
India (b)	246,400	246,400	224,000
Australia (metal)	44,800	7,840	...
FOREIGN COUNTRIES			
Belgian Congo (d)	1,560,832	1,568,000	815,360

(b) - Estimated cobalt content of nickel speiss exported to Hamburg
(c) - Metal recovered from smelter products and cobalt contained in cobalt residues, ores, etc., exported
(d) - Content of metal, oxide and salts produced at Oolen (Belgium)
1932 data not complete

WORLD IMPORTS OF COBALT, ETC. (LESS RE-EXPORTS)
(Data supplied by Imperial Institute)
(Cwt. - 112 lb.)

	1929	1930	1931
BRITISH EMPIRE			
United Kingdom -			
Cobalt and cobalt alloys	4,263	2,262	3,723
Cobalt oxide	4,788	5,838	3,751
Canada -			
Oxides of cobalt, tin and copper	2,578	2,173	2,082
FOREIGN COUNTRIES			
Belgium-Luxemburg E.U.-			
Cobalt salts	274	252	148
Czechoslovakia -			
Zaffre and smalt	250	315	335
France -			
Cobalt ore	85	533	500
Cobalt oxide, including zaffre and smalt	2,011	2,029	1,277
Cobalt salts	18	4	12
Italy -			
Cobalt oxide	429	276	262
Poland -			
Cobalt	6	2	2
Cobalt salts	87	63	35
Roumania -			
Cobalt oxide	(a)	12	(a)
Sweden -			
Cobalt oxide	93	(a)	(a)
United States -			
Cobalt ore and metal	11,081	5,892	2,222
Cobalt oxide	4,249	3,803	2,843
French Indo-China -			
Cobalt oxide	6	2	4
Japan - (Total Imports) -			
Cobalt oxide	1,212	1,039	722

(a) Information not available.

In the years immediately preceding the war the average annual world production of cobalt in terms of metal was 400 tons of which 99 per cent came from Canada and about 1 per cent from Germany. In the post war years the German cobalt industry further declined and came practically to an end about 1928. Germany has, however, preserved its leading position as a manufacturer of cobalt compounds from imported raw materials. In 1931 about 53 per cent of the world cobalt supplies came from the Belgian Congo, about 33 per cent from Canada, and about 14 per cent from Burma. New Caledonia, which occupied the leading position as a world cobalt supplier in the early years of the present century has ceased producing since 1927. Shortly after the war a rich cobalt ore deposit was discovered in Queensland, Australia. This was developed in 1921; owing to the competition of other and cheaper producers the industry declined here and accounted for only 3 tons in 1930. It is believed that about 200 to 300 tons a year of high-grade cobalt ores are worked up in China and that the cobalt oxide thus produced is used entirely in the Chinese porcelaine industry. The most important

factor today in the world cobalt market is the Belgian Congo, in which the production of cobalt bearing ores from the Katanga mines commenced about 1922, the cobalt containing material is shipped from Katanga to Belgium where it is worked up in metal and compounds in plants at Oolen. "Die Chemische Industrie".

A small carload of cobalt-manganese ore was shipped from Rock Run, Cherokee county, Ala., in 1931, the first production of cobalt ore in the United States since 1921. Development work was reported to be in progress during 1931 at cobalt deposits in Arizona, California, Colorado, Nevada and Oregon.

Development work was carried on at the Kruis River cobalt mine in the Transvaal by Mineral Holdings (Ltd.) a subsidiary of Transvaal Estates Ltd. During two months in the early part of 1931, 50 tons of development ore, estimated to contain 2 per cent cobalt, were brought to the surface.

D I R E C T O R Y

Operators in the Silver Cobalt Mining Industry in Canada, 1932.

Name	Head Office Address	Mine Location
Aladdin Cobalt Co. Ltd.	Cobalt, Ont.	Cobalt, Ont.
Beaver Mine	Box 386, Cobalt, Ont.	Cobalt, Ont.
Brockelbank, A.	Box 929, Cobalt, Ont.	Coleman Tp.
Hudson Bay Mines Ltd.	New Liskeard, Ont.	Cobalt, Ont.
Jemmet, D.L., Estate	1305 Metropolitan Bldg., Toronto, Ont.	Cobalt, Ont.
Kenora Prospectors & Miners Ltd.	100 Adelaide St. W., Toronto, Ont.	Werner Lake
Laurentian Mines Ltd.	50 Albert St., Ottawa, Ont.	Cobalt, Ont.
Ludwig & Tremboth	Cobalt, Ont.	Gowganda Dist.
McKinley Mines Securities Co. Ltd.	Old Mill, Ont.	Coleman Tp.
Mining Corporation of Canada, Ltd.	350 Bay St., Toronto, Ont.	Cobalt and Silver Centre, Ont.
Morrison Mines Ltd.	105 Sparks St., Ottawa, Ont.	Gowganda Dist.
Nipissing Mining Co. Ltd.	Excelsior Life Bldg., Toronto, Ont.	Cobalt, Ont.
O'Brien, M.J., Ltd.	Victoria Bldg., Ottawa, Ont.	Cobalt and Gowganda Dist., Ont.
Penn-Canadian	Cobalt, Ont.	Cobalt, Ont.
Price, C. W.	Box 388, Cobalt	Coleman Tp.
Sandoe & Moyle	Box 362, Cobalt	Coleman Tp.
(x) Yorkshire Cobalt Mining Co.	Box 722, Cobalt	Bucke Tp.

(x) Operating but not producing.

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THE SILVER-LEAD-ZINC MINING INDUSTRY

Silver-lead-zinc deposits occur in the provinces of Nova Scotia, Quebec, Ontario, British Columbia and in the Yukon and North West Territories. Zinc is also a constituent of some of the copper-gold ores found in the Rouyn district of Northwestern Quebec. In Manitoba the Hudson Bay Mining and Smelting Company produces refined zinc from ores mined by the company at Flin Flon.

PRINCIPAL STATISTICS OF THE SILVER-LEAD-ZINC MINING INDUSTRY IN CANADA, 1928 - 1932.

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
			$		$	$	$
1928 ...	150	132	58,894,892	5,680	5,531,654	671,564	17,123,455
1929 ...	149	168	50,573,661	4,153	6,482,592	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

ORE MINED AND MILLED IN THE SILVER-LEAD-ZINC MINING INDUSTRY IN CANADA, 1931 and 1932.

		Ontario and Yukon	British Columbia	CANADA
1931				
Ore mined	tons	65,070	1,645,662	1,710,732
Ore milled	tons	65,044	1,614,589	1,679,633
Concentrates produced - Lead	tons	4,524	174,506	179,030
Zinc	tons	...	200,099	200,099
Copper	tons	...	...	...

		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	...	...	...

DESTINATION OF SHIPMENTS FROM SILVER-LEAD-ZINC MINES OF CANADA, 1931 and 1932.

Products shipped	Tons shipped	Net value at shipping point	Total metal content as determined by settlement assays: Gold	Silver	Lead	Zinc
		$	fine oz.	fine oz.	lb.	lb.
1931						
To Canadian smelters -						
Lead ore	13,258	203,869	555	677,809	6,009,765	976,835
Lead concentrates.	174,574	4,135,000	118	3,981,701	245,264,435	17,121,994
Zinc ore	199,949	84,578	...	341,870	13,558,857	197,535,849
Zinc concentrates.	(x)383,858	588,976	...	4,412,839	265,369,134	215,122,663
Dry ore	26	1,200	63	1,651	...	...
Total	771,665	5,013,623	736	9,415,870	528,202,191	430,757,341

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

DESTINATION OF SHIPMENTS FROM SILVER-LEAD-ZINC MINES OF CANADA, 1931 and 1932, concluded.

Products shipped	Tons shipped	Net value at shipping point	Total metal content as determined by settlement assays: Gold fine oz.	Silver fine oz.	Lead lb.	Zinc lb.
		$				
1931 - continued						
To foreign smelters -						
Lead ore	1,363	111,595	50	317,615	604,935	...
Lead concentrates	4,149	1,226,759	245	3,523,616	4,084,131	...
Zinc ore	...	...	...	...	...	...
Zinc concentrates	...	...	...	...	...	...
Dry ore	...	...	...	...	...	...
Total	5,512	1,338,352	295	3,841,231	4,689,066	...
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	914,715	...	367,934	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	...

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

No silver-lead-zinc ores were reported as being produced in Nova Scotia, Quebec or Ontario in 1932. The most important lead producing mine in Ontario, the Kingdon at Galetta, has been inactive since August, 1931.

In British Columbia the miners of ores in which lead and zinc are the chief economic constituents continued to feel the effects of abnormally low base metal prices. This was especially pronounced in the case of the smaller operators. The Consolidated Mining and Smelting Company conducted mining and smelting operations in a remarkably successful manner notwithstanding the extremely adverse financial and industrial conditions existing throughout the world in 1932. This company, one of the largest producers of lead and zinc in the world, reports that its position is sound and that operating mines are developed well ahead of current requirements and insure an adequate supply of ore for many years. The record 1931 costs at the Sullivan mine were substantially reduced and the grade of ore mined was slightly higher in lead, zinc and silver. The tonnage, however, was down about 10 per cent. The total tonnage produced at the mine in 1932 amounted to 1,447,448 tons comprising 6,403 tons of crude ore shipped to Tadanac and 1,441,045 tons of lead-zinc ore to the concentrator at Kimberley, being 175,695 tons less than in 1931. The average cost per ton of ore delivered to the concentrator was further reduced 14.3 per cent and the milling cost 15.8 per cent with a resultant reduction in the cost per pound of metal of nearly 23 per cent. In the matter of ore production, it might be of interest to note that the Sullivan mine has produced to December 31, 1932 - 55,184,466 ounces of silver, 3,192,306,[illegible] pounds of lead, and 2,522,946,412 pounds of zinc. The company states that Empire preference, effective as from the 1st of March, 1932, materially increased the sale and

distribution of their lead and zinc in the United Kingdom.

In the Atlin Mining Division energetic exploration of the Atlin-Ruffner property was continued to about the end of July at which time it was examined by engineers representing European interests. In the Portland Canal and Alice Arm areas, many prospectors owning copper and silver-lead properties carried out more constructive and intelligent work on their showings than perhaps in any other period in recent years. Important new discoveries of silver ores have been made in the American Creek area of the Portland Canal Division and in the Kitsault Valley of the Alice Arm section.

During the year the Premier mine produced 221,718 tons of ore with an average assay content of 0.56 ounces gold and 8.3 ounces of silver. In 1932 the company located and developed 125,562 tons of new ore and produced 1,713,037 ounces of silver as compared with 1,718,376 ounces in 1931 and 2,760,787 ounces in 1930. The Prosperity and Porter Idaho mines owned by the Premier Gold Mining Company have remained inactive since April, 1931. Shipments of high grade silver ore were made from the Silverado in the Marmot river section. In the same area extensive tunnelling, stripping and open-cutting by the Argentine syndicate uncovered additional showings on the Kenneth carrying silver-lead-zinc values over good widths. The main Moonlight vein in the American Creek section was further explored and high silver assays reported.

There was considerable activity in the mining of silver-lead ores in the Greenwood Mining Division where Bell Mines Ltd., operated the Bell and Highland Lass continuously throughout 1932. Sally Mines, adjoining the Bell, carried on stoping operations and ore was prepared for shipment to the smelter. Shipments of silver bearing ore were also made from the Wellington.

The smaller silver-lead-zinc operators in the West Kootenay continued to mark time pending improvement in metal prices and the only customs shipments made were by lessees at the Silversmith, Bosun, Victor, Rio and Cliff properties in the Slocan division.

In Yukon the Treadwell Yukon Company permanently shut down the Wernecke mill on November 16, 1932, after having been in operation since January 6, 1925. It is worthy of mention that this single unit mill, the most northerly on the American continent and operated by Diesel engine power, ran 94.05 per cent of the time between the two foregoing dates and recovered 94.7 per cent of the silver and 93.2 per cent of the lead from all ore milled. The shutdown followed complete exhaustion of all commercial ore in the Lucky Queen, Ladue and Sadie properties. The Wernecke camp has now been abandoned and equipment moved to the Elsa where operations will continue until that property is exhausted, probably some time late in 1933.

PRODUCTION OF SILVER IN CANADA, BY PROVINCES AND BY SOURCES, 1931 and 1932

	1931		1932	
	Quantity	Value	Quantity	Value
	fine oz.	$	fine oz.	$
NOVA SCOTIA -				
In gold bullion - TOTAL	48	14	47	15
QUEBEC -				
In gold ores, in blister copper, and in copper ores exported - TOTAL	530,345	158,414	628,902	199,184

PRODUCTION OF SILVER IN CANADA, BY PROVINCES AND BY SOURCES, 1931 and 1932, concluded.

	1931 Quantity fine oz.	1931 Value $	1932 Quantity fine oz.	1932 Value $
ONTARIO -				
In silver bullion and nuggets	6,100,055	1,822,086	4,781,174	1,514,276
In gold bullion	357,311	106,729	428,246	135,632
In blister copper produced; and in ores, concentrates, residues and matte exported or treated in smelters outside the province	981,585	293,199	1,127,911	357,228
Total	7,438,951	2,222,014	6,337,331	2,007,136
MANITOBA -				
In gold bullion and in blister copper - TOTAL	836,547	249,877	1,036,497	328,275
SASKATCHEWAN -				
In ores shipped to smelters - TOTAL	...	...	14	4
ALBERTA -				
In alluvial gold - TOTAL	29	9	9	3
BRITISH COLUMBIA -				
In alluvial gold	3,091	923	3,672	1,163
In gold bullion	6,843	2,044	11,329	3,588
In blister copper	820,715	245,148	596,810	189,019
In base bullion and in ores exported	7,230,950	2,159,885	6,681,651	2,116,188
TOTAL	8,061,599	2,408,000	7,293,462	2,309,958
(x) YUKON AND NORTHWEST TERRITORIES -				
In alluvial gold	9,914	2,961	9,084	2,877
In ores exported or shipped to Canadian smelters	3,684,814	1,100,654	3,044,104	964,117
TOTAL	3,694,728	1,103,615	3,053,188	966,994
CANADA	20,562,247	6,141,943	18,349,450	5,811,569

(x) Includes production from Northwest Territories in 1932 only.

IMPORTS INTO CANADA AND EXPORTS OF SILVER, 1931 and 1932.

	1931 Quantity fine oz.	1931 Value $	1932 Quantity fine oz.	1932 Value $
IMPORTS -				
Silver in bars, etc., unmanufactured	...	467,404	...	585,788
Silver, manufactures of, n.o.p., and articles consisting wholly or in part of sterling or other silverware	...	115,127	...	94,108
Silver and other coin except gold	...	260	...	...
TOTAL	...	582,791	...	679,896
EXPORTS -				
Silver contained in ore, concentrates, etc.	4,017,182	1,168,261	3,488,094	982,652
Silver bullion	14,649,185	4,230,998	13,504,060	3,978,438
TOTAL	18,666,367	5,399,259	16,992,154	4,961,090
Silver coin, Foreign	...	3,447,323	...	808,695
Silver coin, Canadian	...	17,461	...	86,6[illegible]

CANADIAN SILVER PRODUCTION BY PERCENTAGES, 1932.

In silver-cobalt ores	28.5 per cent
In base bullion	29.2 per cent
In gold ores	2.5 per cent
In blister copper	15.5 per cent
In matte, copper ores and silver-lead ores exported	24.3 per cent
	100.0 per cent.

SILVER PRODUCTION OF THE WORLD

(Taken from the American Bureau of Metal Statistics)

(Fine ounces)

	1930	1931	1932
NORTH AMERICA -			
United States	50,254,000	31,580,000	24,762,000
Canada	26,443,823	20,562,247	18,356,400
Mexico	105,204,000	86,066,000	69,301,000
Newfoundland	596,500	962,200	1,335,900
Total North America	182,478,323	139,170,447	113,755,300
CENTRAL AMERICA AND WEST INDIES.	3,900,000	4,000,000	4,000,000
SOUTH AMERICA -			
Bolivia	7,091,100	5,772,307	4,100,000
Chile	760,444	372,361	300,000(x)
Colombia	60,000	70,000	90,000(x)
Ecuador	106,127	104,762	100,000(x)
Peru	15,389,048	8,957,022	6,317,000
Other countries	46,679	20,200	20,000(x)
Total South America	23,453,398	15,296,652	10,927,000
EUROPE -			
France	652,000	650,000	600,000(x)
Czechoslovakia	892,709	839,504	835,000(x)
Great Britain	40,955	33,989	35,000(x)
Germany	5,485,433	5,784,588	6,000,000
Greece	353,400	172,500	170,000(x)
Italy	631,169	719,324	773,900
Norway	340,790	308,640	308,000
Poland	561,178	365,095	300,000(x)
Rumania	142,059	155,798	150,000(x)
Russia	1,023,000	932,900	900,000(x)
Jugoslavia	460,000	1,200,000	1,400,000
Spain and Portugal	2,819,169	3,098,713	2,500,000(x)
Other countries	201,460	372,691	500,000
Total Europe	13,603,302	14,633,742	14,471,900
OCEANIA -			
New South Wales	8,721,042	6,638,821	
Queensland	69,808	1,088,478	
Tasmania	711,619	391,732	
Other states	68,306	75,000	
New Zealand	518,864	435,010	
Total Oceania	10,089,639	8,629,041	9,700,000

SILVER PRODUCTION OF THE WORLD - concluded.
(Taken from the American Bureau of Metal Statistics)

(fine ounces)

	1930	1931	1932
ASIA -			
India	8,433,000	7,211,000	6,918,000
China	50,000	60,000	60,000(x)
Chosen (Korea)	67,547	366,639	300,000(x)
Dutch East Indies	2,094,251	1,472,991	805,700
Japan	5,628,308	5,586,545	5,400,000
Turkey	320,000	100,000	50,000(x)
Other countries	19,464	13,600	14,000(x)
Total Asia	16,612,570	14,810,775	13,547,700
AFRICA -			
Algeria	171,199	100,000	100,000(x)
Rhodesia	73,357	76,548	114,900
Transvaal, Cape Colony and Natal	1,050,038	1,063,000	1,120,600
Other countries	1,229,000	1,067,000	1,000,000(x)
Total Africa	2,523,594	2,306,548	2,335,500
TOTAL FOR WORLD	252,660,826	198,847,205	168,737,400

(x) For 1932 the figures are based on actual reports or reliable estimates, except where the (x) is used indicating that the figure is conjectural.

WORLD SILVER CONSUMPTION
(Handy and Harman)

(in millions of fine ounces)

	1931	1932
India	57	12
China (including Hong Kong)	59	40
German consumption	28.2	22.8
Arts and Industries -		
In the United States and Canada	30.5	22
In England	10	8
In Mexico	1	1
Coinage -		
Germany	18.7	20
Mexico	..	23.2
Cuba	..	2.8
Jugoslavia	..	.5
United States	2.4	1.2
Unaccounted for	55.5	55.7
TOTAL	262.3	207.2

A survey of a preliminary nature shows a consumption of silver for industrial or art purposes in Canada during 1932 totalling $170,834.

"Metal and Mineral Markets" report that the 20,000,000 ounces of silver paid by Great Britain on her June 15, 1933, war debt to the United States installment will be sent to the United States Mint at San Francisco. The silver has already been paid over to the account of this nation in Bombay, it is stated.

On December 29, 1932, a second low price of 24¼ cents per ounce for silver was quoted in New York. Handy and Harmon in a review of the silver market for 1932 state that the paramount factor affecting silver during 1932 was the tremendous shrinkage in demand from the Orient. Ordinarily India and China absorb approximately 75 per cent of the world production of newly mined metal. In 1929, when production reached its peak of 260,000,000 ounces, the net imports of these two countries amounted to 218,500,000 ounces or nearly 84 per cent. During the past year, although production declined to 160,000,000 ounces, India and China consumed only 52,000,000 ounces or 32 per cent.

A bulletin issued by the United States Department of Commerce states that as a result of shortage of gold reserves, various foreign countries during the past two years have made provision for the more extensive use of silver in their monetary systems. Prominent among these is Germany which in July, 1932, raised the maximum for silver coinage from 20 to 30 reichsmarks per capita. Other countries in which the monetary use of silver is being increased, the bulletin shows, include France, Colombia, Cuba, Mexico, Peru and Rumania. Important discussions relating to silver were conducted at the World Economic Conference in London in 1933.

NEW USES -- An article in "Metal and Mineral Markets" contains the following information relating to new industrial uses for silver. Fine silver is commercially available as sheet of all gauges down to thin, transparent, hand-beaten foil; tubes of all diameters, either welded or, up to about 2 in seamless drawn; and wire, either rolled or drawn down to 0.0005 inches.

The most extensive application to chemical plant evident to date is in the condensation and general handling of acetic acid, the use of silver is spreading to other allied trades and so to the food industries. Fine silver stills and condensers and silver alloy taps and cocks are being generally employed to overcome the manifold troubles experienced in these particular industries. "Chemical Age" reports that work has lately been carried out on alloys of silver with zinc, cadmium and tin respectively ..... the silver-zinc alloys containing 10 to 40 per cent of zinc are characterized by high mechanical strength. It is interesting to note that the alloy represented by the formula Ag_2Zn_3 possesses a pink color ..... good rolling properties are possessed by silver-cadmium alloys with proportions of cadmium up to 40 per cent.

"Metal and Mineral Markets" refer to a new water filter which is made by adding silver chloride to moulding clay and baking. The new filter has been tested by the Pasteur Institute in Paris and found to confer upon the filtered water the power to destroy living bacteria; the bactericidal power of the filtered water is claimed to be the result of ionization.

PRODUCTION IN CANADA, IMPORTS AND EXPORTS OF LEAD, 1931 and 1932.

	1931		1932	
	Pounds	Value $	Pounds	Value $
PRODUCTION -				
Ontario	985,633	41,647	86,477	1,828
British Columbia	261,902,256	7,097,812	252,007,574	5,326,432
Yukon	4,454,613	120,724	3,853,327	81,444
Total	267,342,482	7,260,183	255,947,378	5,409,704
IMPORTS -				
Old and scrap, pig and block	256,978	8,749	28,398	1,436
Bars and sheets	539,654	24,535	159,026	6,893
Litharge	3,866,100	252,280	2,284,700	125,385
Acetate of lead	102,955	9,146	124,169	8,195
Nitrate of lead	102,461	6,183	160,483	9,693
Other manufactures	...	162,436	...	129,629
Pipe lead	127,525	5,750	31,006	1,350
Shots and bullets	8,699	791	7,480	650
Tea lead	17,780	1,275	...	...
Lead arsenate	1,248,460	116,996	830,120	80,488
Lead tetraethyl, compounds of	1,205,305	1,363,269	1,525,825	1,517,639
Lead pigments				
Dry white lead	95,470	7,084	8,412	629
White lead, ground in oil	55,119	4,736	13,632	1,174
Dry red lead and orange mineral	1,491,320	98,103	620,520	38,065
Total	...	2,041,333	...	1,921,226
EXPORTS -				
Lead, contained in ore	4,421,700	176,964	3,713,300	148,518
Pig lead	216,425,800	4,482,812	213,990,700	3,269,121
Total	220,847,500	4,659,776	217,704,000	3,417,639

Production of lead from Canadian ores since 1887 amounted to 3,819,586,348 pounds valued at $201,700,253. The apparent consumption of metallic lead in Canada during 1932 totalled 28,665,566 pounds as compared with 50,020,000 pounds in 1931 and 60,285,000 pounds in 1930.

WORLD'S PRODUCTION OF LEAD (a)
(In short tons - 2,000 lb.)

Country	1930	1931	1932
United States (d)	593,129	411,336	277,435
Canada	166,017	142,605	129,713
Mexico	277,933	233,020	143,621
Other North America	...	9,241	9,958
Total North America	1,037,079	796,202	560,727
Argentina	9,926	8,392	8,982
Peru (b)	16,651	4,700	4,224
Other South America (b)	3,400	1,900	2,100
Total South America	29,977	14,992	15,306

(For remainder of table see next page)

WORLD'S PRODUCTION OF LEAD - concluded

(In short tons - 2,000 lb.)

Country	1930	1931	1932
Austria	7,644	6,743	2,189
Belgium	69,258	68,490	67,844
Czechoslovakia	4,560	3,934	4,245
France	25,011	21,881	12,787
Germany	122,135	111,663	105,270
Great Britain	11,445	11,820	8,400
Greece	7,877	7,245	6,063
Italy	26,908	27,412	34,133
Jugoslavia	11,036	8,740	8,785
Poland	44,508	34,590	13,120
Russia	11,905	17,791	9,667
Spain	135,182	120,943	120,998
Other Europe	1,543	1,543	5,732
Total Europe	477,012	442,795	399,233
Turkey	6,134	680	...
India (Burma)	89,098	83,705	79,748
Japan	3,947	4,409	6,614
Total Asia	99,179	88,794	86,362
Australia	183,744	171,607	208,577
Africa	21,079	21,067	15,523
GRAND TOTALS	1,848,070	1,535,457	1,285,728

(a) In general, output is reported in terms of base bullion, allocated as far as possible according to origin of ore.

(b) Does not include lead produced from South American ore exported to European countries, principally Belgium and Germany.

(d) Lead in smelters' original production from domestic ore, inclusive of some secondary.

The Mining Journal, London, reports that the International Association of Lead Producers ("Lead Pool") which was formed in October, 1929, was dissolved at the beginning of March, 1932, the main immediate cause of the dissolution being the introduction of the 10 per cent British tariff ..... The 15 per cent restriction of output introduced in May, 1931, and increased to 20 per cent in July had proved quite insufficient to bring production into line with consumption, let alone to enable any reduction in stocks to be effected, and efforts have been made to bring about the re-establishment of the Pool and the restriction of production by a considerably greater amount ..... Prices of fabricated lead products have not fallen (in Great Britain) by anything like the same percentage compared, say, with 1929, as that of lead itself. This fact undoubtedly underlay the decision of certain Empire producers to enter the accumulator, battery and oxide business themselves.

It is interesting to note that lead-tellurium alloys have been produced in Great Britain. Tellurium lead pipe is soft and it is stated that it possesses the property of increasing in strength on exposure to cold, vibration and bending.

PRODUCTION IN CANADA, IMPORTS AND EXPORTS OF ZINC, 1931 and 1932.

	1931		1932	
	Pounds	Value $	Pounds	Value $
PRODUCTION -				
Quebec	...	...	...	...
Ontario	...	...	...	...
Manitoba	35,173,749	898,358	41,736,600	1,004,016
British Columbia	202,071,702	5,160,911	130,546,958	3,140,438
Total	257,245,451	6,059,249	172,283,558	4,144,454
IMPORTS -				
Zinc dust	527,641	40,052	530,628	40,623
Zinc in blocks, pigs, bars and rods, and zinc plates, n.o.p.	405,205	12,798	123,476	3,248
Zinc in sheets and strips, and zinc plates for marine boilers	4,013,796	272,012	4,070,523	275,359
Zinc spelter	22,378	1,073	66,476	1,897
Zinc white	11,483,357	641,570	10,112,476	456,861
Zinc, sulphate and chloride of	2,242,204	77,278	336,685	10,907
Zinc sulphate	...	...	719,923	14,628
Zinc, chloride of	...	...	1,456,036	50,630
Zinc, manufactures of, n.o.p.	...	122,131	...	80,261
Lithopone	13,862,914	560,037	16,110,700	585,148
Total	...	1,726,931	...	1,517,562
EXPORTS -				
Zinc in ore	...	...	...	...
Zinc scrap, dross and ashes	1,093,100	10,018	827,900	9,522
Zinc spelter	238,018,000	5,554,511	175,321,800	3,852,990
Total	...	5,564,529	...	3,862,512

WORLD'S PRODUCTION OF ZINC(a) - (Taken from the American Bureau of Metal Statistics)
(In short tons - 2,000 lb.)

	1930	1931	1932
United States	504,463	300,738	213,531
Mexico	41,066	38,854	33,454
Canada	121,467	118,564	86,152
Belgium	194,258	148,502	109,104
Czechoslovakia	15,904	10,129	7,350
France	100,030	69,353	54,376
Germany	107,254	49,934	46,276
Great Britain	54,427	23,790	30,101
Italy	21,235	18,643	19,345
Jugoslavia	8,361	4,040	2,378
Netherlands	25,634	21,290	17,222
Norway	41,054	46,305	46,952
Poland	192,598	143,960	93,640
Russia	5,181	12,566	15,432
Spain	11,790	11,114	10,475
Sweden	4,548	...	...
Australia	61,397	59,996	59,144
Japan	24,669	24,504	27,337
French Indo-China	4,253	3,194	2,866
Rhodesia	20,055	7,696	...
TOTALS	1,557,644	1,113,172	875,135

(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.

Zinc produced from Canadian ores from 1898-1932 amounted in value to $102,236,153. The apparent consumption of metallic zinc in the Dominion during 1932 totalled 8,688,643 pounds as computed from refinery sales, exports and imports and does not include scrap or metal consumed from stocks held over from the previous year. The corresponding consumption in 1931 amounted to 33,924,000 pounds.

The Department of Mines, Ottawa, report that the Canadian production of zinc dust has increased to about 100 tons a year, which quantity represents approximately 40 per cent of the present apparent Canadian consumption in gold treatment plants.

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O. W. Roskill states in the Mining Journal, London, that the International Zinc Cartel is one of the few organizations which has something concrete to show as a result of a policy of severe restriction. Stocks have been reduced almost without a break from 204,000 tons at the beginning of August, 1931, when restriction to 55 per cent of the agreed basis was decided upon, to 191,194 tons in January, 1932, and 148,597 tons at the end of last November.

Mr. Roskill also remarks in a paper on the "European and World Zinc Situation" that one of the most striking features of the non-ferrous metal industries in 1932 was the intensive competition between various metals and alloys suitable for the same purpose, quite apart from competition with non-metallic materials. Other things being equal, once prejudice and conservatism have been overcome, there is usually a tendency to favour a new material, and the need for the older materials to exercise every effort to maintain their position is of paramount importance. According to Mr. Roskill the average annual increase in production of zinc over the period 1925 to 1930 was 5.9 per cent, whereas the average increase in consumption in this period was about 5.3 per cent.

"Chemical Age" reports that German official standards for zinc white prescribe a content of zinc oxide of at least 99 per cent. All impurities including moisture should not exceed 1 per cent. The content of lead oxide must not be higher than 0.4 per cent. The methods of manufacture likewise have been standardized and at present all German manufacturers operate the indirect or French method.

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OPERATORS IN THE SILVER-LEAD-ZINC MINING INDUSTRY IN CANADA, 1932.

Name		Mine Location
QUEBEC -		
(x) Federal Zinc & Lead Co. Ltd.	608 Drummond Bldg., Montreal	Gaspé County
(x) Lyall & Beidelman	608 Drummond Bldg., Montreal	Gaspé County
BRITISH COLUMBIA -		
Anderson, Ted	Silverton	Lemon Creek
(x) Atlin-Ruffner Mines Ltd.	714 M. & T. Bldg., Buffalo, N.Y., U.S.A.	Atlin District
(x) Beaver Silver Mines Ltd.	Room 708, 525 Seymour St., Vancouver	Beaverdell
Beaverdell Wellington Syndicate Ltd.	Greenwood	Beaverdell
Bell Mine Ltd.	Box 456, Penticton	Beaverdell
Campbell, C. J.	New Denver	New Denver
Consolidated Mining and Smelting Co. Ltd.	Trail	Kimberley
Crawford, E. P.	Ymir	Ymir
Crowe-Swords, R.	511 Pacific Bldg., Vancouver	Greenwood
Doney, E., and Son	Box 17, Sandon	Slocan M.D.
Goodenough Mine	Ymir	Ymir
Greenwood, John	Slocan City	Slocan City
Highland Lass Ltd.	Box 782, Kelowna	Beaverdell
(x) Ingenika Mines Ltd.	506 Pacific Bldg., Vancouver	Ingenika River
(x) Jessie Gold Mines Ltd.	Smithers	Omineca
(x) Kitsault Mines Ltd.	Room 325, 510 Hastings St. W., Vancouver	Skidegate
Kootenay Bell Syndicate	701 Rogers Bldg., Vancouver	Sheep Creek Dist.
Lundstrom and Berquist	Slocan	Slocan
Marzoli, S.	Retallack	Slocan
McCarthy, James F.	Grand Forks	Kettle River
McDonnell, Fred W.	Silverton	Silverton
McDonell, Jerome	Box 485, Greenwood	Greenwood
(x) Sally Mines Ltd.	Penticton	Beaverdell
Silversmith Mines Ltd.	Box 1772, Spokane, Wash., U.S.A.	Sandon
Sur, F. J. S.	Nelson	Ymir
Western Exploration Co.	Silverton	Silverton
Misiewish, J.	Box 700, Nelson	Sandon
YUKON -		
Treadwell Yukon Co. Ltd.	Crocker Bldg., San Francisco, Calif., U.S.A.	Yukon

(x) Operating but not producing.