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THE SILVER MINING INDUSTRY IN CANADA, 1930.

(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 generally occurs with other metals; with lead and zinc, with cobalt, nickel and arsenic; with lead and placer gold; in copper-gold ores, and in nickel-copper ores. Silver in lead and zinc ores and in cobalt-nickel-arsenic ores is usually the 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 to a less extent in Ontario and Quebec, whereas silver-cobalt mining in Canada is restricted to Ontario.

Production of silver, lead, zinc, cobalt and arsenic - In 1930 the total production of these metals from all Canadian sources was as follows: silver, 26,443,823 fine ounces valued at $10,089,376; lead, 332,894,163 pounds worth $13,102,635; zinc, 267,643,505 pounds worth $9,635,166; cobalt, 694,163 pounds worth $1,144,007; and arsenic, 4,524,220 pounds worth $129,527. The greater part of the arsenic was recovered as white arsenic at the Deloro smelter in Ontario from silver-cobalt ores and the remainder was contained in arsenical gold ores shipped from British Columbia mines to foreign smelters.

Among the metals and minerals in Canada, lead held sixth place in 1930, silver eighth place, and zinc, ninth place in point of value. In 1930 Canada ranked third among the world's silver producing countries; fourth among those producing lead, and fourth in smelter output of zinc. Canada and Central Africa produce about equal amounts of cobalt.

Producers of both silver-lead and cobalt-silver ores in Canada during 1930 suffered considerably through the almost unprecedented decline in the price of metals and in some instances it was only by efficient mining, low costs and the ability to recover and market the combined or some of the associated metals that continuity of mining operations were possible.

Suggestions have been advanced, especially in certain banking and mining circles, for an international conference to discuss the silver situation. It is also proposed to stimulate the use of silver in manufacturing and to investigate the possible

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responsibility of demonetization of silver in the Orient for much of the frozen purchasing power throughout the East.

(a) The Silver-Cobalt Mining Industry

The principal producers in this industry were the Nipissing mine, the Mining Corporation and the O'Brien at Cobalt; the Keeley, Frontier-Lorrain and Lorrain Trout Lake, at South Lorrain; and the Miller Lake O'Brien, Morrison and Castle Tretheway in the Gowganda area. Several of the older properties were worked by leasers who were able to mine silver ore, at a profit, from veins which were passed over or not exhausted when the mine was on large scale production. The recovery of cobalt from many of the veins in these areas contributed greatly to the profitable working of several deposits.

Some silver was recovered by working over old dumps.

The Nipissing Mining Company was the only company in this group producing silver bullion in 1930. Other mines in the district shipped ore to the mill of the Cobalt Reduction Company, to the Deloro smelter, to the Noranda smelter and to smelters in foreign countries.

During 1930 this group of mines produced 223,432 tons of ore and milled 202,565 tons to produce 3,392 tons of concentrates; ore cyanided amounted to 40,406 tons and silver bullion production reached 1,544,766 fine ounces.

Shipments of ores and concentrates to the Canadian smelters amounted to 5,332 tons and to European and United States smelters, 1,696 tons, making a total of 7,028 tons in 1930 as against 5,195 tons in 1929. The total value of all shipments, including bullion, was $3,637,181 as against $3,918,316 in 1929.

Capital employed in the silver-cobalt mining industry in 1930 amounted to $12,268,322 of which $6,799,087 was invested in lands, buildings, plant, machinery and tools; $417,551 represented the cost of supplies and stock on hand, and $5,051,684 was in cash, trading and operating accounts and bills receivable.

Salaried officials numbered 77 in 1930 as against 96 in 1929. Wage-earners averaged 966 persons of whom 598 were employed underground, 230 on the surface and 138 in the mills. Salaries and wages totalled $1,488,591. Fuel cost $352,344 at the mines and included $225,053 for electric power. Power equipment employed, exclusive of boilers, consisted of 160 units having a total rating of 8,640 h.p. Boilers numbered 13 with a total rating of 795 h.p.

PRINCIPAL STATISTICS OF THE SILVER-COBALT MINING INDUSTRY IN CANADA, 1926-1930.

Year	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
			$		$	$	$
1926 ...	33	37	40,504,721	1,779	2,815,930	518,907	5,470,433
1927 ...	23	26	30,123,645	1,458	2,178,163	472,548	4,760,546
1928 ...	15	19	22,027,683	1,166	1,809,486	430,683	3,938,884
1929 ...	27	32	15,830,435	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

STATISTICS OF THE SILVER-COBALT MINES AND MILL OPERATIONS IN CANADA, 1929 and 1930.

	1929	1930
Number of mines in operation (x)	32	28
Ore mined.....tons	242,591	223,432
Ores treated.....tons	235,546	202,565
Tailings treated.....tons	...	4
Concentrates produced.....tons	3,996	3,392
Quantity of material cyanided.....tons	45,421	40,406
Bullion recovered.....fine oz.	1,546,165	1,544,766
Silver recovered by direct smelting.....fine oz.	...	...
Bullion sold.....fine oz.	1,367,063	1,321,643
Net value of bullion sold..... $ ..	736,294	701,747

(x) All plants of this industry are located in Ontario.

SHIPMENTS OF ORES, CONCENTRATES AND RESIDUES FROM THE COBALT DISTRICT, ONTARIO, 1929 and 1930.

Kind	Quantity	Net(x) value	Metal content paid for: Silver	Cobalt	Copper
	Tons	$	fine oz.	lb.	lb.
1929					
To Canadian smelters -					
Ores.....	576	624,786	1,381,029	280,043	...
Concentrates.....	2,356	2,185,493	4,405,742	196,441	...
To foreign smelters -					
Concentrates and residues.....	2,263	371,743	635,602	164,542	26,731
TOTAL.....	5,195	3,182,022	6,422,373	641,026	26,731
1930					
To Canadian smelters -					
Ores.....	2,942	980,940	2,181,383	635,102	...
Concentrates.....	2,390	1,670,240	4,861,547	300,934	24,077
To foreign smelters -					
Concentrates and residues.....	1,696	284,254	367,513	289,314	22,964
TOTAL.....	7,028	3,637,181	9,232,086	1,225,350	47,041

(x) Net value means the actual amount received by the operator.

(b) The Silver-Lead-Zinc Mining Industry

Silver-lead-zinc ores are found in commercial quantities in the provinces of Nova Scotia, Quebec, Ontario, British Columbia, and in the Yukon and North West Territories. Zinc is produced in Manitoba from copper-gold-zinc ores mined in the northwest part of that province. In 1930 development and exploration work were carried on at the Stirling mine in Richmond county, Nova Scotia, owing to adverse metal market conditions operations were discontinued at this property; the Federal Lead and Zinc Company continued the exploration of galena and zinc blend deposits in Gaspe county, Quebec, and in the same province mining development of lead-zinc ores progressed at the Tetreault property located at Montauban les Mines.

Galena ore from the Kingdon mine at Galetta, Ontario, was concentrated and smelted at the mine; in the Sudbury area the Treadwell Yukon Company mined and milled a mixed sulphide ore, shipping lead and copper concentrates to metallurgical plants in the United States and zinc concentrates to Belgium. During 1930 metal recovery by slag, fuming was introduced in the Trail works. Blast furnace slag, containing approximately 16 per cent zinc and considerable lead, is treated with a coal laden air blast, the combustion of which heats the slag and volatilizes the zinc and lead, the resulting oxides being recovered in a flue and bag house system. This fuming treatment recovers 85 per cent of the zinc and nearly all the lead. Tadanac largely developed this salvage method through its own research. It is estimated that in the United States approximately 25.88 per cent of the annual lead production is consumed in the manufacture of cable sheathing; 21.63 per cent in storage batteries; 11.13 per cent in white lead; 6.89 per cent in building, and 4.42 per cent in ammunition.

Electrolytic zinc is now produced in Canada by the Consolidated Mining and Smelting Company at Trail, B.C. and at Flin Flon, Manitoba, by the Hudson Bay Mining and Smelting Company, Ltd. In the latter part of September, 1930, the roasters in the new Flin Flon plant were started and the entire works gradually brought into operation with the production of the first high grade zinc slabs in November.

According to the American Bureau of Metal Statistics, the consumption of zinc during 1930 in the United States for the manufacture of galvanized sheets, tubes, wire, wire cloth, pole line hardware, and other shapes, amounted to 217,000 tons; brass and castings, 145,000 tons; rolled zinc, 51,400 tons; die castings, 21,500 tons; lithopone, zinc dust and other products, 41,000 tons. Electrolytic cadmium is produced in the refining of zinc by the Consolidated Mining and Smelting Company at Trail, B.C.; the metal id cast in bars, pencils and balls.

Among the Canadian provinces, British Columbia was the leading producer of silver, lead and zinc. In this province, 45 per cent of Canada's silver, 97 per cent of the lead, and 93 per cent of the zinc, were produced. The Sullivan mine, noted the world over for its output of lead and zinc, is the largest individual silver producing mine in Canada.

The silver-lead-zinc mining industry in Canada was represented by 93 mines operated by 86 firms in 1930. One mine in Nova Scotia was active part of the year. In Quebec 7 properties were in operation. In Ontario, 6 mines were in operation, 2 of which were producing. In British Columbia, 74 mines were worked, 37 of which were producing and in the Yukon 5 were reported in production.

During the year 2,244,970 tons of ore were mined and 2,198,086 tons were milled. Shipments of lead ores, lead concentrates, zinc ore, zinc concentrates, dry ores, and a small tonnage of copper concentrates produced in the treatment of ores from one Ontario copper-lead-zinc mine, amounted to 504,198 tons valued at $13,000,415. As determined by settlement assay the total metal content of these shipments included 5,991 ounces of gold, 10,645,726 ounces of silver, 352,127,086 pounds of lead, 263,707,308 pounds of zinc, and 1,169,221 pounds of copper.

Capital employed in this industry in 1930 amounted to $42,053,674, and included over 38 million dollars invested in lands, buildings, plant machinery and tools. 2.1 million dollars in the value of supplies and stock on hand, and almost 1 million dollars in cash, trading and operating accounts and bills receivable.

Salaries totalling $579,089 were paid to 238 employees and wages amounting to $3,684,872 were distributed among 2,628 wage-earners. Fuel used amounted to $654,685 of which $295,982 was spent for electric power. Primary power employed consisted of 583 units with a combined rating of 31,058 h.p. Secondary power included 102 motors rated at 2,368 h.p. There were 25 boilers in use rated at 3,982 h.p.

PRINCIPAL STATISTICS OF THE SILVER-LEAD-ZINC MINING INDUSTRY IN CANADA, 1926-1930.

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
			$		$	$	$
1926 ...	108	127	22,699,417	2,924	4,431,730	658,679	26,190,034
1927 ...	157	173	28,036,330	3,106	4,807,817	588,520	17,520,130
1928 ...	150	132	38,894,892	3,680	5,531,634	671,564	17,123,455
1929 ...	149	168	50,573,661	4,153	6,482,392	793,139	22,748,089
1930 ...	86	93	42,053,674	2,866	4,263,961	654,685	13,000,415

ORE MINED AND MILLED IN THE SILVER-LEAD-ZINC MINING INDUSTRY IN CANADA, 1929 and 1930.

Production		Ontario and Quebec	British Columbia	Yukon	CANADA
1929					
Ore mined	tons	263,611	1,899,534	45,125	2,208,270
Ore milled	tons	309,315	2,000,722	42,402	2,352,439
Concentrates produced - Lead	tons	9,189	210,031	5,942	225,162
Zinc	tons	29,338	242,479	...	271,817
Copper	tons	3,245	...	...	3,245
1930		Ontario and Nova Scotia			
Ore mined	tons	153,428	2,042,926	48,616	2,244,970
Ore milled	tons	151,342	2,001,173	45,571	2,198,086
Concentrates produced - Lead	tons	2,455	226,939	4,210	233,604
Zinc	tons	6,092	235,852	...	241,944
Copper	tons	3,691	...	...	3,691

DESTINATION OF SHIPMENTS FROM SILVER-LEAD-ZINC MINES OF CANADA, 1929 and 1930.

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.
1929						
To Canadian smelters -						
Lead ore	20,529	782,200	684	906,103	11,370,340	2,271,267
Lead concentrates	222,226	12,506,654	518	5,503,611	301,462,774	24,353,427
Zinc ore	2,752	50,002	22	22,512	303,584	1,403,502
Zinc concentrates	255,224	5,665,667	97	592,413	18,109,563	251,589,680
Dry ore	19,008	105,213	117	252,051	...	...
Total	519,739	19,109,736	1,438	7,276,695	331,246,261	279,617,876
To foreign smelters -						
Lead ore	2,714	661,352	45	1,032,508	2,853,625	18,805
Lead concentrates	12,734	2,039,911	4,053	2,735,699	13,190,497	...
Zinc ore	...	...	...	...	...	...
Zinc concentrates	31,127	806,556	1,590	140,976	371,840	30,150,566
Copper concentrates	3,277	130,534	857	39,599	...	...
Dry ore	...	...	...	...	...	...
Total	49,852	3,638,353	6,545	3,948,782	16,415,962	30,169,371
1930						
To Canadian smelters -						
Lead ore	17,949	472,086	1,105	888,687	9,764,629	1,113,877
Lead concentrates	219,972	8,310,013	3,411	5,104,002	304,573,617	21,720,825
Zinc ore	561	12,250	4	29,210	148,263	245,901
Zinc concentrates (x)	224,806	1,828,533	34	409,729	15,002,749	223,214,713
Dry ore	37	1,262	68	44	...	...
Total	463,325	10,624,144	4,622	6,431,672	329,489,258	246,295,316
To foreign smelters -						
Lead ore	6,500	460,144	186	1,066,101	2,556,564	...
Lead concentrates	15,209	1,782,269	573	3,112,051	20,081,264	...
Zinc ore	...	...	...	...	...	...
Zinc concentrates (x)	15,719	61,950	...	...	...	17,411,992
Dry ore	...	...	...	...	...	...
Copper concentrates	3,445	71,908	610	36,902	...	...
Total	40,873	2,376,271	1,369	4,215,054	22,637,828	17,411,992

To foreign smelters - 1930: Copper in lead concentrates, 101,137 pounds; copper in copper concentrates, 999,424 pounds; a total of 1,100,561 pounds. 68,660 pounds of copper were contained in lead concentrates and zinc ore shipped to Canadian smelters.

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

To foreign smelters - 1929: Copper in lead concentrates, 146,038 pounds; copper in copper concentrates, 996,781 pounds; a total of 1,142,819 pounds.