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CANADA

DEPARTMENT OF TRADE AND COMMERCE

DOMINION BUREAU OF STATISTICS

CENSUS OF INDUSTRY

MINING, METALLURGICAL & CHEMICAL BRANCH

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THE NON-FERROUS SMELTING and REFINING INDUSTRY IN CANADA, 1937.

The Non-Ferrous Smelting and Refining Industry, as defined by the Dominion Bureau of Statistics, Ottawa, comprises those firms engaged primarily in the smelting of non-ferrous ores or concentrates and the refining of metals recovered therefrom.

The gross value of products from all plants in 1937, totalling $318,278,251, was the highest ever recorded for the industry. Refined products included gold, silver, copper, lead, zinc, aluminium, cobalt, cadmium, selenium, tellurium, radium salts, uranium compounds, and sulphur; other end products of individual plants or companies were copper-nickel matte, cobalt salts, nickel and cobalt oxides, arsenious oxide, sulphur in sulphuric acid, platinum metals residues, silver sulphide, silver-bismuth bullion, zinc dust, zinc oxide (fume), blister and anode copper, and copper matte.

The cost of ores, concentrates and other material treated during 1937 was estimated at $191,303,251; fuels and purchased electricity consumed totalled $14,607,421; chemicals and various other process supplies used amounted to $10,559,714, and the net value of production, or the value added by processing, was estimated at $101,807,865, an increase of 42.83 per cent over the corresponding value recorded for the preceding year.

The industry reported $162,696,595 as the amount of capital employed in 1937. This figure includes value of land, plant, materials on hand and in process, finished products and operating funds. Employees totalled 11,570 and salaries and wages paid aggregated $17,990,947, representing increases over 1936 of, respectively, 15.53 and 25.41 per cent.

As a world producer of metals in 1937, Canada ranked third in production of copper in all forms and fourth in smelter output of the metal; in both mine and smelter production of lead Canada was surpassed in 1937, in the order of output, by only the United States, Mexico, and Australia. In output of zinc in all forms during 1937 the Dominion was exceeded by only the United States and in output of refined metal by the United States, Belgium and Germany. As a gold and silver producer Canada stood third in 1937 and fourth in output of aluminium; in production of nickel and the platinum metals Canada retains a premier world position.

The Internal Trade Branch of the Dominion Bureau of Statistics reported that the international price outlook changed rapidly during 1937, with early fears of excessive inflation in the spring months giving way to uneasiness regarding sharp declines in basic commodity markets during the fourth quarter. The most vigorous phase of the price recovery extending over the past five years occurred in the latter half of 1936 and the first quarter of 1937. International commodity markets reacted abruptly in April, and then displayed somewhat hesitant behaviour in the summer months, before recording further severe losses in the final quarter of 1937.

In Canada, iron and steel products were firm in both 1936 and 1937 but non-ferrous metals dropped sharply in the latter part of 1937, following speculative interest which collapsed in April; the average prices for copper, lead and zinc for the calendar year 1937 were, however, considerably higher than during the immediately preceding years.

Fluctuations in base metal stock prices were the most violent in many years. The net decline for 1937 indicated by comparison of 1936 and 1937 December averages was 33 per cent, as compared with 12 per cent for gold issues. Although the year's peak in base metals came later in February, major turning points for the group coincided closely with those for the gold section. They were marked by the following daily price indexes: 321.8 on January 4, 372.6 on February 22, 234.9 on June 25, 299.8 on August 7, 168.7 on October 19, and 214.7 on December 31. The closing rise in stock prices anticipated later improvement in commodity markets.

REVIEW OF THE INDUSTRY BY PROVINCES

QUEBEC - The reduction of aluminium ores and the production of primary aluminium in Canada is confined to the province of Quebec. In this province the Aluminum Company of Canada, Limited, operates an ore treatment plant at Arvida and reduction plants at both Arvida and Shawinigan Falls. These three plants were in continuous operation throughout 1937. At the Arvida ore plant concentrates were made from British Guiana bauxite and aluminium ingot was produced in the two reduction works. The company also operates fabricating plants at Shawinigan Falls, Quebec, and Toronto, Ontario. Bauxite from British Guiana, used for the production of aluminium, is washed and dried before being shipped; at Arvida, Quebec, it is treated by a standard chemical process to remove impurities, and pure aluminium oxide is recovered. Cryolite, necessary in the production of the metal, is imported from Greenland. A very large amount of electrical energy is utilized in the production of new aluminium metal from bauxite concentrates.

During 1937 the smelter of Noranda Mines Limited, located at Noranda, Quebec, treated 1,155,755 tons of ore, concentrate and refinery slag and produced 89,915,813 pounds of anodes. After deducting the copper, gold and silver which was recovered from the refinery slag, the estimated production of new copper, gold and silver was 87,060,257 pounds of fine copper, 280,806 ounces of gold, and 705,494 ounces of silver. Included in the above figures is the production from 51,338 tons of customs ore and concentrate. If the estimated production from this customs ore and concentrate is deducted, the estimated recovery from the Horne mine is 80,172,108 pounds of fine copper, 274,162 ounces of gold, and 599,911 ounces of silver. The concentrator milled 1,106,609 tons of ore from the Horne mine, the average analysis of which was 2.02 per cent copper, 0.131 oz. gold per ton, and 0.35 oz. silver per ton, from which 182,837 tons of copper-gold concentrate were produced and sent to the smelter. The tailing from the copper-gold flotation circuit was retreated by flotation, and a gold-bearing pyrite concentrate produced; 150,933 tons of this pyrite were treated in the cyanide plant and 9,856 ounces of gold were recovered from it. During the year an additional roasting furnace was installed in the smelter and the second reverberatory smelting furnace was lengthened nine feet.

With increased copper production from the Horne mine an increase in receipts of copper for custom refining, the refinery of Canadian Copper Refiners, Limited, located at Montreal East, operated considerably beyond its original intended capacity in 1937. An addition to the tank room was being constructed which will raise the capacity by 6,000 tons per year, bringing the total capacity to approximately 81,000 tons per annum.

ONTARIO - In 1937 the concentrator of the International Nickel Company of Canada, Limited, operated at capacity and treated 4,583,100 tons of ore at a rate slightly in excess of 12,500 tons per day. The Copper Cliff smelter produced 188,169 tons of bessemer matte and 158,100 tons of converter copper; the Coniston smelter was operated at full capacity and ore to the amount of 891,956 tons was treated and 54,329 tons of bessemer matte produced.

Capacity having been increased the nickel refinery of the International Nickel Company of Canada, Limited, located at Port Colborne, Ontario, produced 147,264,099 pounds of refined nickel; the research staff of this plant was increased and more adequate laboratory facilities installed. In addition to being the greatest producer of nickel, the company is now the world's largest producer of platinum metals.

The Copper Cliff refinery of the Ontario Refining Company, Limited, processed 159,286 tons of converter copper that was produced at the Copper Cliff smelter of the International Nickel Company and produced 145,600 tons of refined copper. The converter copper received during the year was largely in the form of metal which was transported in molten form from the Copper Cliff smelter and charged directly to the anode furnaces; in future, all converter copper will be transferred to the refinery as molten metal. The research department was engaged actively in development work and in studies of processes. The results of its work in co-operation with the operating staff were reflected in increased efficiencies, particularly in important advances in electric furnace refining.

In 1937 the ore dressing plant of Falconbridge Nickel Mines, Limited operated on a six day week basis while the reduction plants lost only 3 per cent of full operating time, accounted for by periodic repair campaigns. Ore treated totalled 458,629 tons of which 195,658 tons were milling ore and 242,971 tons smelting ore. The company produced 15,384.2 short tons of matte, containing 7,584.4 short tons of nickel and 5,522.8 short tons of copper. The indicated grate of ore treated after waste rejection was nickel, 1.87 per cent, and copper, 0.925 per cent. It was found necessary to re-arrange and extend the grinding facilities and add further flotation, thickening and filtering equipment, involving also an addition to the building. To improve conditions in the sintering plant, a third machine was installed.

At Port Hope, Ontario, a new chemical plant for the recovery of radium in the form of radium-barium sulphate concentrate and silver in the form of silver sulphide was erected by Eldorado Gold Mines Ltd.. Chemical operations by the company were limited to nine months in 1937, the old plant being operated to full capacity up to October 1st. At that date it was necessary to close all chemical treatment for transfer of the equipment from the old plant to the new. The ore shipments received at the plant from the mine in 1937 amounted to 339 tons. The roasting and milling plant treated 294 tons of ore and produced 302 tons of roasted ore ready for chemical treatment. From the 302 tons of ore obtained after roasting and milling, 290 tons were used during the year, and entered into the chemical treatment for the recovery of silver, radium and uranium. Treatment for the silver was fully completed on the 290 tons entered; for uranium, 287 tons, and for radium, 305 tons, which includes some of the ore in course of finishing at the beginning of the year. Recovery for both radium and uranium was about 90 per cent and for silver about 96 per cent. At current market values, the total production of finished products of radium, uranium and silver, amounted to $850,000.00. All silver produced during the year was in the form of silver sulphide which was disposed of entirely in the United States for silver refineries. During the year a certain amount of lead contained in the ore was recovered chemically in the form of lead sulphate, to meet the demand for radio-active lead as a source of radium D.

At Deloro, in Hastings county, the smelter and refinery of the Deloro Smelting and Refining Company, Limited, was in continuous operation throughout the year. This company treats silver-cobalt ores from Northern Ontario and produces silver bullion, white arsenic, cobalt metal, cobalt salts and oxides, nickel oxide, and a silver-lead-bismuth bullion.

MANITOBA and SASKATCHEWAN - The copper smelter of the Hudson Bay Mining and Smelting Company, Limited, is located on or adjacent to the inter-provincial boundary between Manitoba and Saskatchewan. There was treated in the concentrator of this company during 1937 an average of 4,503 tons of ore per day, or a total of 1,643,452 tons. Both the daily tonnage treated and the yearly tonnage were slightly higher than they were for the preceding year. The assay per ton of ore milled averaged gold, 0.107 oz.; silver, 1.52 oz.; copper, 2.17 per cent, and zinc, 4.7 per cent. From this was produced a total of 315,124 tons of copper concentrates assaying gold, 0.387 oz.; silver, 5.23 oz.; copper, 9.92 per cent, and 106,025 tons of zinc concentrates assaying gold, 0.077 oz.; silver, 1.74 oz.; copper, 0.75 per cent, and zinc, 45.2 per cent.

The copper smelter was operated continuously throughout the year, treating considerably more pay charge than in the preceding year and producing a record tonnage of blister copper. Not only was there a greater tonnage of pay charge delivered to the smelter from Flin Flon mine materials but customs concentrates were being treated continuously throughout the latter part of the year. In order to smelt this greatly increased tonnage a number of alterations and additions to equipment were made.

There was smelted during the year a total of 320,918 tons of Flin Flon ore and concentrates averaging gold, 0.432 oz.; silver, 5.53 oz.; copper, 9.84 per cent, and 21,462 tons of customs ore and concentrates assaying gold, 0.150 oz.; silver, 3.84 oz., and copper, 23.09 per cent. There were shipped 34,240 tons of blister copper with an average assay of gold, 3.974 oz.; silver, 50.44 oz., and copper, 98.80 per cent.

The zinc plant operated continuously during the year and produced the largest amount of slab zinc for any year to date. There was treated in the zinc plant a total of 94,936 tons of zinc concentrates which averaged gold, 0.079 oz.; silver, 1.76 oz.; copper, 0.75 per cent, and zinc, 45.2 per cent; from these concentrates was produced for sale a total of 68,972,224 pounds of slab zinc. There was also produced the usual zinc plant residue which was sent to stockpiles. The tank house was extended by about one-third its former size and an addition was built on the zinc leaching plant. The cadmium plant was operated continuously throughout the year.

BRITISH COLUMBIA - The Consolidated Mining and Smelting Company of Canada, Limited, treated 2,267,170 short tons of ore at its Kimberley and Trail plants in 1937. Once again the lead smelting plant made an all-time high record; costs in this plant were higher during the first eight months of the year but lower during the last four months of 1937. Recoveries, while not quite as low as the record year, were about one-half of one per cent better than the last three years. The lead, silver and gold refineries also made a new all-time high record, the production of refined lead being 200,284 tons in 1937, 182,541 tons in 1936, and 164,329 tons in 1935. Refining costs were held at the same figure through the year, the last three months each being a new low record; silver production was 9,846,545 ounces.

A plant to recover metallic antimony from the by-products of the silver refinery was under construction in 1937. This plant should have a capacity of between four and five tons of metallic antimony per day and is expected to be in operation in 1938.

Production in the zinc plant was also a new record at 124,094 tons. In addition to this, 41,860 tons of zinc concentrates were exported to Europe. The waste heat boilers which have been installed on the concentrate burning furnaces have been a great success and are providing a large amount of the steam required for the chemical operations. All of the zinc plant roaster gases have been treated for the recovery of sulphur dioxide for the greater part of the year.

An increase of 18 tons capacity per day was being installed in the ammonia plant and further increases in the sulphur, sulphuric acid and absorption plants were being made or under design; these will enable the company to treat all of the smelter gases for the recovery of sulphur dioxide.

Table 1 - PRINCIPAL STATISTICS OF THE NON-FERROUS METALLURGICAL INDUSTRY IN CANADA, 1935, 1936 and 1937.

	1935	1936	1937
Number of companies	12	11	10
Number of plants	14	14	13
Capital employed	$ 145,686,299	143,858,717	162,696,595
Number of salaried employees	935	863	1,003
Salaries	$ 2,055,694	2,176,110	2,575,849
Number of wage-earners	8,009	9,152	10,567
Wages	$ 10,631,662	12,169,940	15,415,098
Value of plant products (gross) (/)	$ 186,245,658	229,737,420	318,278,251
Estimated cost of ores, concentrates, etc., treated (a)	$ 108,081,395	137,857,452	191,303,251
Cost of fuel and purchased electricity (b)	$ 11,242,698	12,613,763	14,607,421
Process supplies other than items (a) and (b)	$ 7,479,978	7,989,580	10,559,714
Value added by smelting (net)	$ 59,441,587	71,276,645	101,807,865

(/) The gross value of production should not be interpreted as the ultimate sale value of finished metal only, as it represents the combined values of all industry (smelting, refining, etc.) end products (blister copper matte, etc.), and in this sense is a duplication of values.

Table 2 - NUMBER OF WAGE-EARNERS, BY MONTHS, 1932 - 1937.

Month	1932	1933	1934	1935	1936	1937
January	5,496	5,003	6,870	7,280	8,660	9,814
February	5,400	4,831	6,832	7,407	8,544	9,842
March	5,355	4,926	7,034	7,452	8,665	9,966
April	4,750	4,890	7,264	7,636	8,694	10,153
May	4,297	4,910	7,530	7,945	8,858	10,458
June	4,475	5,534	7,717	7,982	8,912	10,814
July	4,205	6,080	7,734	8,201	9,406	11,047
August	4,160	6,322	7,767	8,495	9,606	11,172
September	4,198	6,368	7,595	8,231	9,626	11,031
October	4,326	6,478	7,816	8,365	9,623	10,895
November	4,316	6,396	7,620	8,587	9,542	10,868
December	4,274	6,410	7,606	8,529	9,669	10,749
AVERAGE	4,604	5,681	7,449	8,009	9,152	10,567

Table 3 - FUEL AND ELECTRICITY USED IN THE NON-FERROUS SMELTING AND REFINING INDUSTRY, 1936 and 1937.

Kind	Unit of measure	For light and power		For metallurgical purposes	
		Quantity	Cost	Quantity	Cost
			$		$
1936					
Bituminous coal - Canadian	short ton	12,256	61,194	459,313	2,843,370
Imported	short ton	27,320	161,631	78,589	452,750
Anthracite coal	short ton	52	717	...	...
Coke	short ton	1,142	12,616	279,452	2,727,536
Gasoline (exclusive of that used in motor cars)	Imp. gal.	82,557	16,274	2,358	680
Fuel oil and diesel oil	Imp. gal.	76,060	5,334	14,597,844	766,703
Kerosene or coal oil	Imp. gal.	2,871	645	4,371	870
Wood (cords of 128 cubic feet)	cord	9	28	8,764	67,105
Gas - Manufactured	M cu.ft.	653	1,325	28,463	2,909
Natural	M cu.ft.	370	260	...	...

Table 3 - FUEL AND ELECTRICITY USED IN THE NON-FERROUS SMELTING AND REFINING INDUSTRY, 1936 and 1937 (concluded)

Kind	Unit of measure	For light and power		For metallurgical purposes	
		Quantity	Cost	Quantity	Cost
			$		$
1936 (concluded)					
Other fuel	$	...	882	...	7,882
Electricity purchased	K. W. H.	1,240,494,288	3,595,564	942,223,934	1,887,513
TOTAL	$	...	3,856,490	...	8,757,273
Electricity generated for own use	K. W. H.	29,851,136	...	55,123,271	...
Process supplies used, chemicals, etc.	$		9,582,122		
1937					
Bituminous coal - Canadian	short ton	7,947	39,846	551,908	3,375,925
Imported	short ton	26,210	160,840	75,508	445,617
Anthracite coal - United States	short ton	19	286	...	...
Other	short ton	53	521	...	...
Coke	short ton	345	3,500	331,776	3,320,298
Gasoline	Imp. gal.	95,682	18,306	14,009	3,645
Fuel oil and diesel oil	Imp. gal.	171,222	17,334	20,308,735	1,092,436
Kerosene or coal oil	Imp. gal.	2,490	503	4,278	904
Wood (cords of 128 cubic feet)	cord	...	...	16,950	78,648
Gas - Manufactured	M cu.ft.	...	...	29,949	4,489
Natural	M cu.ft.	...	...	119	96
Other fuel	$	...	...	...	5,076
Electricity purchased	K. W. H.	1,105,813,182	3,534,091	1,259,810,494	2,505,060
TOTAL	$	...	3,775,227	...	10,832,194
Electricity generated for own use	K. W. H.	28,806,400	...	210,455,752	...
Process supplies used, chemicals, etc..	$	...	10,559,714		

Table 4 - POWER EMPLOYED IN THE NON-FERROUS SMELTING AND REFINING INDUSTRY, 1937.

Description	Ordinarily in use		In reserve or idle	
	Number of units	Total horse power	Number of units	Total horse power
1. Steam engines and steam turbines	24	9,151	3	1,134
2. Gasoline, gas and oil engines	10	455	...	...
3. Hydraulic turbines or water wheels	11	51,125	...	...
4. Electric motors - (a) Operated by purchased power	5,512	264,824	613	23,216
Total (1), (2), (3) and (4)	5,557	325,555	616	24,350
(b) Operated by power generated by the establishment	585	7,950	51	621
Stationary boilers	32	18,943	4	1,907

Table 5 - METAL PRICES, 1933 - 1937.

Metal	Market	Unit of measure	1933	1934	1935	1936	1937
			$	$	$	$	$
Arsenic (As_2O_3)	New York	Pound	0.04	0.04	0.035	0.035	0.03
Cobalt (nominal)	New York	Pound	2.50	2.50	2.50	2.50	2.31
Cobalt oxide	New York	Pound	1.35	1.35	1.37	1.38	1.54
Copper	New York	Pound	0.07025	0.08428	0.08649	0.09474	0.13167
Copper	London	Pound	0.074548(a)	0.074193(a)	0.07795(a)	0.09477(a)	0.13078(a)
Lead	London	Pound	0.023916(a)	0.024364(a)	0.03133(a)	0.03913(a)	0.05110(a)
Silver	New York	Ounce	0.378328(a)	0.474609(a)	0.64790(a)	0.45126(a)	0.44881(a)
Zinc	London	Pound	0.032105(a)	0.030436(a)	0.03099(a)	0.03315(a)	0.04902(a)
Gold	World	Fine oz.	28.60(a)	34.50(a)	35.19(a)	35.03(a)	34.99(a)

(a) Canadian funds.

Table 6 - AVERAGE MONTHLY PRICE OF GOLD, SILVER, COPPER, LEAD and ZINC, IN CANADIAN FUNDS, 1937, and JANUARY 1 to JUNE 30, 1938.

Month	GOLD (a) Dollars per fine ounce		SILVER (b) Cents per fine ounce		COPPER (c) Cents per pound		LEAD (c) Cents per pound		ZINC (c) Cents per pound	
	1937	1938	1937	1938	1937	1938	1937	1938	1937	1938
January	35.01	34.99	44.926	44.754	12.337	10.131	5.977	3.592	4.636	3.338
February	35.01	35.00	44.759	44.736	13.990	9.756	6.189	3.440	5.490	3.218
March	34.98	35.05	45.120	44.569	16.603	9.725	7.199	3.559	7.234	3.196
April	34.95	35.15	45.397	42.983	14.601	9.701	5.457	3.474	5.746	3.060
May	34.94	35.22	44.961	43.091	14.008	9.162	5.275	3.171	5.070	2.961
June	35.02	35.36	44.839	43.213	13.541	8.832	5.043	3.125	4.714	2.881
AVERAGE - 6 Months .	34.99	35.13	45.000	43.891	14.180	9.551	5.857	3.3935	5.482	3.109
July	35.05	35.24	44.808	42.972	13.956	9.846	5.309	3.290	5.008	3.119
August	35.00	35.12	44.754	42.893	14.146	10.034	5.020	3.131	5.361	2.933
September	35.00		44.752		15.014		4.623		4.710	
October	34.99		44.740		11.169		4.029		3.905	
November	34.98		44.714		9.787		3.703		3.498	
December	34.93		44.769		9.793		3.540		3.404	
AVERAGE - YEAR	34.99		44.881		13.078		5.110		4.902	

(a) World market.
(b) New York market.
(c) London market.

Table 7 - CAPACITIES OF CANADIAN COPPER SMELTING AND REFINING WORKS, 1937 (a)

Company	BLAST FURNACES Number	BLAST FURNACES Annual capacity - tons of ore and concentrates	REVERBERATORIES Number	REVERBERATORIES Annual capacity - tons of ore and concentrates	CONVERTERS Number	CONVERTERS Annual capacity - tons of ore and concentrates
Consolidated Mining & Smelting Co. of Canada, Ltd. (b)	...	...	1	48,000	2	16,000
Falconbridge Nickel Mines Ltd.	1	275,000	...	...	3	25,000
Hudson Bay Mining & Smelting Co. Ltd. ..	...	...	1	325,000	2	...
Noranda Mines Ltd.	...	...	2	950,000	4	200,000
International Nickel Co. of Canada, Ltd.	4	800,000	7	2,800,000	24	...

(a) American Bureau of Metal Statistics.
(b) Idle.

ELECTROLYTIC COPPER REFINERIES	ANNUAL CAPACITY - short tons
Canadian Copper Refiners Ltd.	75,000
Ontario Refining Company, Ltd.	120,000

Table 8 - PRODUCTION(f) OF NEW COPPER IN CANADA, FROM ALL SOURCES, 1927 - 1937.

Year	Pounds	$	Year	Pounds	$
1927	140,147,440	17,195,487	1933	299,982,448	21,634,853
1928	202,696,046	28,598,249	1934	364,761,062	26,671,438
1929	248,120,760	43,415,251	1935	418,997,700	32,311,960
1930	303,478,356	37,948,359	1936	421,027,732	39,514,101
1931	292,304,390	24,114,065	1937	530,028,615	68,917,219
1932	247,679,070	15,294,058			

(f) Including copper in ores and matte exported and in blister and anode copper made in Canada.

Table 9 - PRODUCTION IN CANADA, IMPORTS AND EXPORTS OF COPPER, 1936 and 1937.

	1936 Pounds	1936 Value $	1937 Pounds	1937 Value $
PRODUCTION -				
By Provinces -				
Nova Scotia	779,307	75,855	180,609	25,620
Quebec	66,340,175	6,287,058	94,653,132	12,378,737
Ontario	287,914,078	26,898,920	322,039,208	41,716,364
Manitoba	29,853,220	2,829,190	44,920,835	5,874,747
Saskatchewan	14,971,609	1,418,859	22,436,843	2,934,290
British Columbia (x)	21,169,343	2,006,219	45,797,988	5,989,461
TOTAL	421,027,732	39,514,101	530,028,615	68,917,219
By Sources -				
In blister and anode copper produced	382,310,369	36,231,553	463,025,584	60,554,486
In ores, concentrates and copper matte exported	13,894,160	930,053	(a)54,010,039	7,063,434
In nickel-copper matte exported	24,823,203	2,352,495	12,992,992	1,299,299
TOTAL	421,027,732	39,514,101	530,028,615	68,917,219
IMPORTS -				
Copper in bars or rods, when imported by manufacturers of trolley, telegraph and telephone wires and electric cables for use only in the manufacture of such articles in their own factories	742,400	93,489	1,048,800	158,528
Copper bars for use only in the manufacture of rods to be used exclusively in the manufacture of electrical conductors, and copper rods for such manufacture, individual units of conductors not to exceed area of No. 7-0 gauge conductor	18,700	1,858	7,400	825
Copper in bars or rods, in lengths of not less than 6 feet, unmanufactured	165,500	30,723	333,500	61,180
Copper in blocks, pigs or ingots	189,300	19,858	15,500	1,941
Copper, scrap, cathode plates, etc.	7,000	316	4,600	455
Copper in strips, sheets or plates not polished or coated	378,700	71,262	707,300	155,465
Copper tubings in lengths of not less than 6 feet, and not polished, bent or otherwise manufactured	431,244	106,253	675,896	193,637
Copper wire, n.o.p.	21,055	5,017	37,576	6,851
Copper wire cloth, or woven wire of copper	...	6,263	...	7,523
Copper, manufactures of, n.o.p.	...	388,399	...	536,135
Copper, precipitate of, crude	...	...	246	33
Anodes of nickel, zinc, copper, silver or gold	...	6,384	...	7,098
Copper, sub-acetate of, or verdigris, dry	7,015	1,212	...	...
Copper, sulphate of (blue vitriol)	4,542,122	149,889	5,665,495	238,636
Copper rollers adapted for use in calico printing	...	78,621	...	124,315
Copper, sulphate of, dehydrated, for agricultural or spraying purposes	7,000	585	...	...
TOTAL	...	960,127	...	1,492,600
EXPORTS -				
Copper, fine, contained in ore, matte, regulus, etc.	45,519,600	2,971,042	73,867,600	7,409,381
Copper, blister	...	...	10,884,300	1,333,073
Copper, old and scrap	8,108,700	535,753	5,551,000	549,638
Copper in ingots, bars, cakes, slabs and billets	310,860,400	27,460,714	296,141,300	38,705,380
Copper in rods, strips, sheets, plates, and tubing.	48,152,900	4,769,923	51,224,800	7,310,329
Copper wire and cable, insulated	...	469,789	...	436,854
Copper manufactures, n.o.p.	...	294,433	...	410,647
TOTAL	...	36,501,654	...	56,155,282
Copper coin, foreign	...	3,048	...	2,382
Copper coin, Canadian	...	570	...	113
Brass and its products	...	1,018,932	...	1,614,953

(x) Includes a small production from the Northwest Territories in 1936.
(a) Includes a relatively small quantity of copper contained in gold and silver ores shipped to Canadian smelters.

Table 10 - PRODUCTION OF REFINED COPPER IN CANADA, 1931 - 1937.

Year	Short tons	Year	Short tons
1931	92,183	1935	173,290
1932	90,077	1936	191,818
1933	112,245	1937	215,080
1934	149,261		

Table 11 - PRODUCTION OF COPPER IN CANADA, JANUARY 1 to JUNE 30, 1937 and 1938.

	1937		1938	
	Pounds	Value $	Pounds	Value $
PRODUCTION -				
By Provinces -				
Nova Scotia	180,949	25,659	...	...
Quebec	39,055,191	5,538,026	54,121,838	5,169,177
Ontario	158,394,912	22,250,510	163,897,090	15,492,188
Manitoba	17,975,386	2,548,910	33,791,190	3,227,396
Saskatchewan	10,243,335	1,452,505	7,365,050	703,436
British Columbia	18,069,633	2,562,274	33,221,703	3,173,005
TOTAL	243,919,406	34,377,884	292,396,871	27,765,202
By Sources -				
In blister copper produced	215,996,243	30,628,267	245,141,550	23,413,470
(x) In ores shipped and concentrates exported	21,322,914	3,023,590	40,919,622	3,908,233
In copper-nickel matte exported	6,600,249	726,027	6,335,699	443,499
TOTAL	243,919,406	34,377,884	292,396,871	27,765,202

(x) Includes copper in matte exported from British Columbia.

Table 12 - COPPER PRODUCTION OF THE WORLD ON SMELTERY BASIS(a). (In tons of 2,000 pounds)
(This statement taken from the Year Book of the American Bureau of Metal Statistics)

	1929	1932	1936	1937
United States	1,179,269	309,160	724,296	996,999
Whereof from scrap	47,628	18,183	65,262	89,292
Whereof from foreign ore	105,293	35,468	44,063	68,363
Mexico	63,795	37,440	35,395	49,115
Canada	79,186	106,050	189,241	227,332
Chile	333,296	107,242	269,652	437,000
Peru	59,527	22,910	35,741	37,547
Austria	4,293	1,703	1,984	1,984
Finland	...	...	7,205	11,464
Germany	59,083	56,107	65,697	71,650
Great Britain	14,440	8,267	6,720	3,307
Norway	2,633	5,937	9,173	9,402
Russia	28,443	33,816	91,491	101,963
Spain	22,215	9,998	9,500	10,200
Sweden	5,271	7,016	10,518	9,966
Yugoslavia	22,790	33,244	43,126	43,137
Other Europe	10,498	5,658	3,600	7,600
Japan	83,189	79,230	85,950	96,561
India	1,976	4,976	8,062	7,650
Other Asia	2,000	1,000	2,800	4,500
Australasia	13,907	16,472	17,832	18,308
Africa	159,250	145,931	269,532	411,414
Whereof, Belgian Congo	...	59,522	105,454	165,896
Whereof, Rhodesia	...	75,403	154,337	234,405
Totals	2,145,061	992,247	1,887,515	2,557,099
Deduct, U. S. scrap	47,628	18,183	65,262	89,292
TOTAL NEW COPPER	2,097,433	974,064	1,822,253	2,467,807

(a) The above table gives only the copper that is smelted, including direct production by electrolysis, and does not break down to origin back of the place of beneficiation; every effort has been made to eliminate secondary copper so far as possible.

Table 13 - AVAILABLE STATISTICS ON THE CONSUMPTION OF COPPER IN SPECIFIED CANADIAN INDUSTRIES, 1935 and 1936.

Industry	Item (Used)		1935	1936
Brass and Copper Products (a)	(Ingots, wire bars, cakes, slabs, etc.	lb.	75,018,643	99,560,824
	(Scrap	lb.	3,256,426	5,574,612
	(Other bars and rods	lb.	15,127	42,556
	(Pipe and tubing	lb.	45,177	39,888
	(Plates and sheets	lb.	497,964	640,597
	(Wire	lb.	379,889	196,768
	(Castings	lb.	1,663	4,679
	(Other	lb.	75,060	71,062
White Metal Alloys	(Scrap	lb.	1,571,355	1,851,095
	(Copper bars, sheets, etc.	lb.	130,404	57,378
Electrical Apparatus and Supplies	(Castings	lb.	62,212	99,137
	(Bars and rods	lb.	22,374,396	25,702,675
	(Scrap	lb.	62,743	51,964
	(Tubing and pipe	lb.	434,131	655,102
	(Sheets and plates	lb.	235,944	304,733
	(Wire, bare	lb.	3,544,916	3,956,581
	(Wire, enamelled	$	285,760	369,796
	(Wire, other insulated	$	422,431	637,391
Iron and Steel and Their Products	(Copper sheets, bars, etc.	lb.	5,920,923	7,609,363

(a) A relatively large part of the copper included under this industry is rolled into wire rods, which are sold to manufacturers of electrical cable and duplication to this extent results from the inclusion of these rods in the electrical apparatus industry.
Complete data for 1937 not yet available.

Table 14 - LEAD SMELTING CAPACITY OF CANADA.

Company	Situation of plant	Number of blast furnaces	Annual Capacity (tons of charge)
Consolidated Mining & Smelting Co. of Canada, Ltd.	Trail, B.C.	5	700,000

LEAD REFINING CAPACITY OF THE WORLD, 1937.
(American Bureau of Metal Statistics)

The lead refining capacity of the world, as at the end of 1937, aggregated about 1,084,000 short tons in the United States and about 2,143,000 elsewhere, a grand total of about 3,227,000 tons. There was an increase of about 124,000 tons in the reported capacity during 1937, about 54,000 tons in the United States and 70,000 in foreign countries.

Probably not more than 950,000 tons of the listed capacity in the United States and 1,550,000 tons elsewhere, a total of 2,500,000 tons, is to be rated as useful and effective, the remainder being obsolete, incapable of economical ore supply, or otherwise useless. These accountings are exclusive of capacity in Russia, and also of a few thousand tons in Greece.

Table 15 - PRODUCTION(/) IN CANADA, IMPORTS AND EXPORTS OF LEAD, 1936 and 1937.

	1936		1937	
	Pounds	Value	Pounds	Value
		$		$
PRODUCTION -				
Nova Scotia	1,901,712	74,414	413,086	21,364
Quebec	2,047,689	80,126	1,521,182	77,732
Ontario	17,442	683	29,849	1,525
British Columbia	376,645,367	14,738,133	403,589,913	20,623,445
Yukon Territory	2,568,699	100,513	6,440,454	329,107
TOTAL	383,180,909	14,993,869	411,999,484	21,053,173

Table 15 - PRODUCTION(✓) IN CANADA, IMPORTS AND EXPORTS OF LEAD, 1936 and 1937. (concluded)

	1936		1937	
	Pounds	Value	Pounds	Value
		$		$
IMPORTS -				
Old and scrap, pig and block	60,879	4,234	79,327	6,148
Bars and sheets	36,192	2,117	45,694	3,391
Litharge	1,968,600	124,001	2,560,500	194,421
Acetate of lead	128,569	8,637	177,352	13,552
Nitrate of lead	165,285	9,292	312,776	23,739
Other manufactures	...	79,823	...	88,183
Pipe lead	24,084	1,818	9,061	1,488
Shots and bullets	8,066	828	3,327	350
Tea lead	...	...	1,000	85
Lead arsenate	225,300	20,096	237,992	19,565
Lead tetraethyl, compounds of	5,019,356	1,414,720	4,518,567	2,032,333
Lead capsules for bottles	...	63,964	...	90,644
Lead pigments -				
Dry white lead	21,302	1,458	42,818	3,360
White lead, ground in oil	15,137	1,348	15,116	1,499
Dry red lead and orange mineral	847,859	55,353	679,276	53,805
Total	...	1,787,689	...	2,532,563
EXPORTS -				
Lead, contained in ore	9,395,500	287,569	16,529,600	862,850
Pig lead	321,350,900	10,113,282	553,139,600	16,978,147
White lead	634,200	43,555	217,000	17,842
Total	...	10,444,406	...	17,858,839

(✓) Includes lead in ores exported.

Table 16 - PRODUCTION OF REFINED LEAD IN CANADA, 1931 - 1937.

Year	Pounds	Year	Pounds
1931	278,448,457	1935	327,515,277(✓)
1932	253,136,522	1936	363,449,490(✓)
1933	254,565,861	1937	399,394,939(✓)
1934	314,457,735(✓)		

(✓) Primary lead only.

Table 17 - PRODUCTION(✓) IN CANADA OF LEAD, JANUARY 1 to JUNE 30, 1937 and 1938.

	1938		1937	
	Pounds	$	Pounds	$
Nova Scotia	418,086	24,487	...	...
Quebec	...	...	...	...
Ontario	7,163	420	7,329	249
British Columbia	197,288,120	11,555,165	203,078,408	6,892,481
Yukon	1,490,993	87,327	1,875,384	63,650
TOTAL	199,204,362	11,667,399	204,961,121	6,956,380

(✓) Includes lead in ores exported.

Table 18 - WORLD PRODUCTION OF LEAD(a). (Short tons)

Origin	1922	1929	1934	1935	1936	1937
North America	649,022	1,121,394	687,515	744,843	828,551	932,466
South America	6,547	34,038	10,892	9,658	24,300	44,200
Total Europe	514,647	458,279	446,521	449,503	452,716	517,767
Total Asia	53,441	100,743	92,022	90,815	96,469	107,088
Australia	118,064	195,403	226,336	243,046	221,121	254,408
Africa	37,419	22,663	30,105	27,987	23,200	30,405
GRAND TOTAL	1,179,140	1,932,520	1,493,391	1,565,852	1,646,357	1,886,334

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

Of the output recorded for North America in 1937, Canada contributed 205,479 short tons, excluding lead exported to European countries. As a world producer of lead, Canada ranked fourth in 1937.

Table 19 - CAPACITY and PRODUCTION OF ELECTROLYTIC ZINC PLANTS IN CANADA, 1935 - 1937.

Company	Maximum H.P. used (a)	Estimated annual capacity for cathode zinc (short tons) (b)	Actual production as ingot zinc (short tons) 1935	1936	1937
Consolidated Mining & Smelting Co. of Canada Ltd.	72,000	145,000	119,051	119,478	124,157
Hudson Bay Mining & Smelting Co. Ltd.	19,300	42,000	30,052	32,219	34,486

NOTE - This statement supplied by the American Bureau of Metal Statistics.
(a) Expressed as power in terms of direct current after transforming the alternating current in sub-station at the works.
(b) Capacity for ingot zinc may be reckoned at 95% capacity for cathode deposition.

The American Bureau of Metal Statistics estimates the capacity of American zinc metallurgical works at the end of 1937 as being nominally for the production of about 600,000 short tons of spelter per annum by distilling, including the capacity in continuously operating vertical retorts, and about 210,000 tons by electrolysis, a total of about 810,000 tons, but the first-class effective capacity is probably something less than that. The effective capacity outside the United States at the end of 1937 is estimated at 1,150,000 metric tons whereof about 250,000 tons was in Australia, Canada and Mexico, and about 900,000 tons elsewhere. The estimate of 1,150,000 tons for foreign plants is exclusive of plants in Russia.

Table 20 - PRODUCTION IN CANADA, IMPORTS and EXPORTS OF ZINC, 1936 and 1937.

	1936 Pounds	1936 Value $	1937 Pounds	1937 Value $
PRODUCTION(/) -				
Nova Scotia	6,180,219	204,874	5,485,550	268,902
Quebec	6,896,123	228,606	8,566,927	419,951
Ontario	...	...	120,011	5,883
Manitoba	36,744,951	1,218,095	36,221,314	1,775,569
Saskatchewan	27,692,869	918,019	32,750,910	1,605,449
British Columbia	255,668,574	8,475,413	287,192,877	14,078,195
TOTAL	333,182,736	11,045,007	370,337,589	18,153,949
IMPORTS -				
Zinc dust	1,619,800	68,914	1,499,500	78,508
Zinc in blocks, pigs, bars and rods, and zinc plates, n.o.p.	11,400	1,238	19,400	2,805
Zinc in sheets and strips, and zinc plates for marine boilers	5,739,200	394,327	7,040,600	574,545
Zinc spelter	...	...	2,000	199
Zinc white (zinc oxide)	13,240,889	519,425	14,481,533(x)	742,500
Zinc sulphate	832,886	12,830	976,592	19,064
Zinc, chloride of	1,933,034	60,724	1,284,296	44,703
Zinc, manufactures of, n.o.p.	...	121,863	...	244,349
Lithopone	18,859,517	666,667	22,162,600(a)	777,752
TOTAL	...	1,845,988	...	2,484,425
EXPORTS -				
Zinc, contained in ore	39,132,000	727,253	65,695,800(b)	2,618,641
Zinc, scrap, dross and ashes	5,007,100	63,875	6,393,800	133,303
Zinc, spelter	280,422,900	8,523,906	268,378,000	12,739,242
TOTAL - EXPORTS	324,562,000	9,315,034	340,467,600	15,491,186

(/) From all sources including metal in ores, etc., exported.
(x) 10,073,137 pounds from the United Kingdom and 3,298,398 pounds from the United States.
(a) 10,132,452 pounds from the United Kingdom.
(b) 65,290,500 pounds to Belgium.

Table 21 - REFINED NEW ZINC PRODUCED IN CANADA, 1931 - 1937.

Year	Short tons	Year	Short tons
1931	118,622	1935	149,523
1932	86,141	1936	151,103
1933	91,946	1937	139,342
1934	134,917		

Table 22 - WORLD'S PRODUCTION OF ZINC(a). (in short tons - 2,000 pounds)

Country	1930	1936	1937
United States	504,463	523,166	595,319
Mexico	41,066	35,506	40,364
Canada	121,467	151,697	158,643
Belgium	194,258	215,301	248,656
Czechoslovakia	13,904	8,667	7,956
France	100,030	59,084	66,611
Germany	107,254	150,354	179,895
Great Britain	54,427	68,086	69,597
Italy	21,235	29,742	41,631
Netherlands	25,634	17,006	27,166
Norway	38,152	49,631	45,492
Poland	192,598	102,062	118,219
Russia	4,772	71,650	71,650
Spain	11,790	8,601	5,819
Sweden	4,548	...	...
Yugoslavia	8,361	3,967	4,695
Australia	61,397	77,778	78,120
Japan	27,193	39,683	50,155
French Indo-China	4,253	4,528	4,633
Rhodesia	20,055	23,218	15,714
TOTALS, ex. U.S.A.	1,052,394	1,116,561	1,235,016
GRAND TOTALS	1,556,857	1,639,727	1,830,335

(a) The data as recorded in the table by the American Bureau of Metal Statistics 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 production of zinc dust is excluded. The production figure for the United States in 1937 includes spelter derived from Peruvian ore.

Table 23 - PRODUCTION OF ZINC IN CANADA, JANUARY 1 to JUNE 30, 1937 and 1938.

	1937		1938	
	Pounds	$	Pounds	$
Nova Scotia	3,078,372	168,756	...	...
Quebec	...	...	...	...
Manitoba	17,584,559	963,986	25,030,307	778,192
Saskatchewan	14,220,981	779,594	12,957,584	402,851
British Columbia	135,651,801	7,436,432	159,963,332	4,973,260
TOTAL	170,535,713	9,348,768	197,951,223	6,154,303

Table 24 - WORLD PRODUCTION OF NICKEL ORE, 1933 - 1937.(a) (In terms of metal)

Country	1933	1934	1935	1936	1937
			(Short tons)		
Canada (b)	41,632	64,344	69,258	84,870	112,395
New Caledonia (c)	4,900	5,500	5,800	5,400	6,300
Greece (e)	1,344	1,200	1,200	1,380	(f)
India (d)	1,090	1,354	1,640	1,447	1,345
Norway	1,096	1,532	1,677	1,400	(f)
Russia	...	951	2,016	(f)	(f)

NOTE - Footnotes to this table will be found on next page.
This statement taken from the American Bureau of Metal Statistics Year Book.

FOOTNOTES TO Table 24 -

(a) Production outside of these countries is very small.
(b) Production in all forms from Canadian ores.
(c) Estimated content of ore and matte exported.
(d) Nickel content of speiss obtained as a by-product.
(e) Nickel and cobalt content beginning 1934.
(f) Not yet reported.

Production of nickel in Canada during the first six months of 1938 totalled 109,286,472 pounds compared with 111,610,392 pounds in the first half of 1937.

Table 25 - WORLD PRODUCTION OF ALUMINIUM (Supplied by the American Bureau of Metal Statistics).
(in metric tons)

Country	1922	1929	1932	1936	1937
United States	33,600	102,100	47,600	102,028	132,759
Canada	10,000	42,000	18,000	26,900	42,550
Europe (a)	48,200	137,198	87,769	231,181	304,300
Japan	...	...	...	6,664	10,000
TOTAL FOR WORLD	91,800	281,298	153,369	366,773	489,609

NOTE - Omitted from this table is a small production in Belgium.
(a) German output in 1936 and 1937 was, respectively, 97,400 and 127,500 metric tons.

Canadian gold production in 1937 totalled 4,096,213 fine ounces valued in Canadian currency at $143,326,495. Canada in 1937, as a gold producing country, was surpassed only by the Union of South Africa and Russia. The origin of Canadian production is shown in the following table.

Table 26 - SOURCE OF CANADIAN FINE GOLD PRODUCTION, BY PERCENTAGES, 1932, 1933, 1935 - 1937.

	1932	1933	1935	1936	1937
	%	%	%	%	%
In alluvial gold	1.8	2.0	1.84	2.27	2.20
In crude gold bullion (x)	79.3	79.8	78.83	77.37	80.20
In base bullion (from silver-lead ores, etc.)	1.0	0.7	2.17	1.60	0.90
In blister and anode copper	15.1	14.2	13.21	13.80	11.70
In ores, matte, slags, etc., exported	2.8	3.3	3.95	4.96	5.00
	100.0	100.0	100.0	100.0	100.0

(x) Includes a relatively small quantity of gold contained in interprovincial shipments of gold ores to smelters.

Canadian silver production in 1937 totalled 22,977,751 fine ounces valued at $10,312,644. The Dominion in 1937 ranked third as a world silver producing country. The origin of Canadian production is shown in the following table.

Table 27 - SOURCE OF CANADIAN SILVER PRODUCTION, BY PERCENTAGES, 1932, 1933, 1935 - 1937.

	1932	1933	1935	1936	1937
	%	%	%	%	%
In silver-cobalt ores	28.5	20.4	15.0	12.24	7.9
In base bullion (x)	29.2	34.6	47.9	46.28	41.7
In gold ores (Lode and placer)	2.5	3.0	7.4	9.67	7.8
In blister copper	15.5	19.5	26.1	23.76	20.5
In matte, copper ores and silver-lead ores exported	24.3	22.5	3.6	8.05	22.1
	100.0	100.0	100.0	100.0	100.0

(x) Chiefly from silver-lead ores; also includes silver recovered in Canada from silver-pitchblende ores.

Table 28 - OTHER NON-FERROUS PRODUCTS PRODUCED IN CANADIAN SMELTERS and REFINERIES, 1936 and 1937.

	Unit	1936 Quantity	1936 $	1937 Quantity	1937 $
Arsenic (As_2O_3)	lb.	1,365,606	42,491	1,389,426	41,032
Bismuth	lb.	364,165	360,523	5,711	5,654
Cadmium	lb.	785,916	699,465	745,207	1,222,140
Cobalt (a)	lb.	887,591	804,676	507,064	848,145
Palladium, rhodium, iridium, etc.	oz.	103,671	2,483,075	119,829	3,179,782
Platinum (b)	oz.	131,551	5,319,922	139,355	6,751,750
Radium, uranium			(Data not published)		
Selenium	lb.	350,857	621,017	397,227	687,203
Tellurium	lb.	35,591	62,997	41,490	71,777
Sulphur (c)	ton	58,964	589,640	130,913	1,154,998

(a) Includes metal in ores exported and salts manufactured.
(b) Final refining conducted in Europe.
(c) Sulphur recovered from smelter gases (as elemental sulphur and in sulphuric acid made, and ammonium sulphate.

DIRECTORY (1937)

Name of Company	Head Office Address	Canadian Plant Location
CANADIAN COPPER SMELTING COMPANIES		
Noranda Mines Ltd.	2 King St. E., Toronto, Ont.	Noranda, P.Q.
(a) International Nickel Company of Canada, Ltd.	67 Wall Street, New York City, U.S.A.	Copper Cliff, Port Colborne and Coniston, Ont.
(a) Falconbridge Nickel Mines Ltd.	25 King St. W., Toronto, Ont.	Falconbridge, Ont.
Hudson Bay Mining & Smelting Co. Ltd.	14 Finkle St., Woodstock, Ont.	Flin Flon, Man.
(a) Smelt nickel-copper ores.		
CANADIAN ELECTROLYTIC COPPER REFINING COMPANIES		
Canadian Copper Refiners Ltd. (c)	2 King St. E., Toronto, Ont.	Montreal East, P.Q.
Ontario Refining Co. Ltd. (c)	Copper Cliff, Ont.	Copper Cliff, Ont.
(c) Produce refined copper, silver, gold, tellurium and selenium.		
CANADIAN LEAD SMELTING AND REFINING COMPANIES		
Consolidated Mining & Smelting Co. of Canada, Limited (/)	215 St. James St. W., Montreal, P.Q.	Trail, B.C.
(/) Produce bismuth or bismuth-bearing bullion as by-products, also gold and silver.		
CANADIAN ELECTROLYTIC ZINC REFINING COMPANIES(x)		
Consolidated Mining & Smelting Co. of Canada, Limited	215 St. James St. W., Montreal P.Q.	Trail, B.C.
Hudson Bay Mining & Smelting Co. Ltd.	Woodstock, Ont.	Flin Flon, Man.
(x) Also produce cadmium.		
CANADIAN SMELTERS AND REFINERS OF COBALT-SILVER-ARSENIC ORES		
Deloro Smelting & Refining Co. Ltd. (/)	Deloro, Ont.	Deloro, Ont.
(/) Produce silver, cobalt, arsenic, bismuth, nickel oxide and cobalt oxide and salts.		
CANADIAN REFINERS OF URANIUM-RADIUM ORES		
Eldorado Gold Mines Ltd.	Star Building, Toronto, Ont.	Port Hope, Ont.
CANADIAN PRODUCERS OF PRIMARY ALUMINIUM		
Aluminum Company of Canada, Ltd.	Canada Life Bldg., Toronto 2, Ont.	Arvida and Shawinigan Falls, P.Q.

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NOTE - In addition to the companies listed above, the Chromium Mining & Smelting Corp. Ltd., treated chromite ores at Sault Ste. Marie, Ontario.