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THE NON-FERROUS SMELTING AND REFINING INDUSTRY, 1951

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NOTICE

The annual reports prepared by the Industry and Merchandising Division of the Bureau of Statistics are divided into 4 volumes, as follows: **Volume I**—The Primary Industries, including mining, forestry and fisheries; **Volume II**—Manufacturing; **Volume III**—Construction; **Volume IV**—Merchandising and Services. The volumes are made up of parts, and the parts in turn are subdivided according to the industries which they comprise.

Volume I consists of the following parts:

Part I—Mineral Statistics
Part II—Forestry Statistics—Operations in the Woods
Part III—Fisheries Statistics

Part I includes the following reports which constitute the complete series on Mineral Statistics of Canada. Individual reports are issued as the information becomes available; they are arranged in a form suitable for binding.

A—General Review of the Mining Industry, 50¢.
B—The Gold Mining Industry, 50¢.
C—The Silver-Lead-Zinc Mining Industry, 25¢.
D—The Nickel-Copper Mining, Smelting and Refining Industry, 25¢.
E—The Miscellaneous Metal Mining Industry, 25¢.
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Q—The Clay and Clay Products Industry, 25¢.
R—The Lime Industry, 25¢.
S—The Sand and Gravel Industry, 25¢.
T—The Stone Industry, 25¢.
U—Contract Diamond Drilling in the Mining Industry, 25¢.

THE NON-FERROUS SMELTING AND REFINING INDUSTRY, 1951

The non-ferrous smelting and refining industry, as defined for statistical purposes, includes only those firms engaged primarily in the smelting of non-ferrous ores or concentrates and in the refining of metals recovered therefrom. The smelting of imported ores is included.

The net value added by the industry in the processing of crude or semi-crude materials during 1951 totalled $262,972,790 compared with $222,711,781 in 1950. Refined products included gold, silver, nickel, copper, lead, zinc, aluminum, tin, magnesium, calcium, barium, titanium, zirconium, antimony, bismuth, cobalt, cadmium, selenium, and tellurium. Other end products of individual plants or companies were copper-nickel matte, cobalt salts, cobalt oxide, nickel oxide, nickel salts, bauxite concentrates, arsenious oxide, sulphuric acid, platinum metals residues, zinc oxide, zinc dust, blister and anode copper, titanium dioxide slag, and iron ingots. Statistics relating to the production of pitchblende products at the refinery at Port Hope, Ontario, are not included in this report.

It should be noted, in a study of these data, that firms which operate both mines and smelters may vary from year to year the nominal values placed on crude ores, etc., shipped from their mines to their own smelters, with the result that in some years the mining industry proper may be favoured statistically at the expense of the non-ferrous smelting and refining industry and vice versa. However, the total annual net value of commodity production for the Dominion as a whole, is not affected by these arbitrary internal evaluations.

Fuel and electricity used by the industry in 1951 cost $44,684,200 including 9,993,886,098 k.w.h. of purchased electricity at $23,296,759.

The value of process supplies consumed during the year amounted to $46,411,504.

There were 22,814 persons employed by the industry. Earnings of the employees amounted to $75,474,505. The man-hours of labour totalled 53,031,620.

The 10 firms in this industry operated 17 smelters or refineries. The names of the operators and the plant locations are given in the directory on the last page of this report.

TABLE 1. Principal Statistics of the Non-ferrous Smelting and Refining Industry, 1949-1951

–		1949	1960	1951
Number of companies		10	10	11
Number of plants		16	17	17
Number of employees – Administrative and office		2,773	3,134	3,748
Workmen		16,377	16,729	19,066
Total		**19,150**	**19,863**	**22,814**
Earnings – Administrative and office	$	9,870,736	10,940,723	13,816,942
Workmen	$	45,262,329	47,807,639	61,657,563
Total	$	**55,132,065**	**58,748,362**	**75,474,505**
Gross value of products[1]	$	599,188,135	669,882,806	861,315,930
Estimated cost of ores, concentrates, etc., treated	$	348,459,951	377,490,223	507,247,437
Cost of fuel and purchased electricity	$	37,004,311	38,473,238	44,684,200
Process supplies (other than ores, fuel, etc.)	$	31,816,026	31,207,564	46,411,504
Value added by smelting (net)[2]	$	181,907,847	222,711,781	262,972,790

1. The gross value of production should not be interpreted as the ultimate sales value of finished metals only, as it represents the combined figure for smelters and refineries, and the usual duplication occurs when the product of one plant is shipped to, and becomes the material for, another plant. For example, blister copper is given a value at the smelter since it is the final product for that works; it is then shipped to the refinery for which it is the principal material, where values are placed on the refined products.
2. See preceding text.

Note. Data in this report do not include those relating to Eldorado Mining and Refining Ltd., which mines and refines pitchblende products.

TABLE 2. Number of Workmen, by Months, 1949-1951 (Administrative and Office Employees not Included)

Month	1949		1950		1951	
	Male	Female	Male	Female	Male	Female
	(Number)					
January	16,177	54	15,501	68	17,603	59
February	16,481	55	15,469	66	18,098	59
March	16,839	56	15,586	67	18,386	60
April	16,737	53	15,985	64	18,558	60
May	16,849	54	16,648	64	18,851	60
June	16,569	55	16,977	63	19,736	60
July	16,593	59	17,170	67	19,889	64
August	16,479	60	17,205	68	19,820	62
September	16,085	61	17,284	69	19,139	60
October	15,768	57	17,371	67	19,232	60
November	15,744	55	17,353	67	19,390	61
December	15,543	55	17,390	69	19,577	57
Average	**16,321**	**56**	**16,662**	**67**	**19,005**	**61**

–	Total man-hours worked
Administrative and office	9,561,287
Workmen	43,470,333
Total	**53,031,620**

TABLE 3. Average Annual Metal Prices, in Canadian Dollars, 1942-1951

Year	Gold	Silver	Copper	Lead	Zinc
	Troy oz.	Troy oz.	Pound	Pound	Pound
	(Dollars)				
1942	38.50	0.4216	0.1010	0.0340	0.0340
1943	38.50	0.4525	0.1175	0.0370	0.0400
1944	38.50	0.4300	0.1200	0.0450	0.0430
1945	38.50	0.4700	0.1255	0.0500	0.0644
1946	36.75	0.8365	0.1280	0.0675	0.0781
1947	35.00	0.7200	0.2039	0.1367	0.1123
1948	35.00	0.7500	0.2235	0.1804	0.1393
1949	36.00	0.7425	0.1997	0.1580	0.1325
1950	38.05	0.8082	0.2342	0.1445	0.1565
1951	36.85	0.9455	0.2770	0.1840	0.1990

TABLE 4. Production of New Gold and Silver, 1947-1951 (From all types of ores)

Year	Gold		Silver	
	Fine ounces	$	Fine ounces	$
1947	3,070,221	107,457,735	12,304,018	9,002,893
1948	3,529,606	123,536,280	16,109,982	12,082,487
1949	4,123,518	148,446,648	17,641,493	13,098,808
1950	4,441,227	168,988,687	23,221,431	18,767,561
1951	4,392,751	161,872,873	23,125,825	21,865,467

TABLE 5. Source of Canadian Gold Production, 1947-1951

Year	In alluvial gold	In crude gold bullion produced at mines	In base bullion produced at lead smelters	In blister copper	In ores, matte, slags, etc., exported	Total gold produced
	(Per cent)					Fine ounces
1947	1.74	84.41	0.15	9.40	4.30	3,070,221
1948	2.23	83.19	0.22	10.01	4.35	3,529,608
1949	2.35	83.94	0.23	9.71	3.77	4,119,302
1950	2.43	81.51	0.38	12.26	3.42	4,441,227
1951	2.49	81.86	0.33	12.20	3.42	4,392,751

TABLE 6. Source of Canadian Silver Production, 1947-1951

Source	1947	1948	1949	1950	1951
	(Per cent)				
In silver-cobalt ores	2.41	6.08	5.41	12.68	12.80
In base bullion[1]	43.96	41.03	52.81	53.05	51.84
In gold bullion and placer	4.03	3.82	3.84	3.06	3.21
In blister and anode copper	31.43	27.47	27.00	22.04	21.93
In matte, copper ores and silver-lead ores, etc., exported (other than silver-cobalt ores)	18.17	21.60	10.94	9.17	10.22

1. Includes silver bullion from silver-lead ores.

TABLE 7. Production of New Copper, 1947-1951 (From all types of ores)

Year	Copper in all forms[1]		Refined copper
	Tons	$	Tons
1947	225,862	91,541,888	202,427
1948	240,732	107,159,756	221,275
1949	263,457	104,719,151	226,083
1950	264,209	123,211,407	238,204
1951	269,971	149,026,216	245,466

1. Blister copper plus recoverable copper in concentrates and matte exported.

TABLE 8. Production of New Copper, by Sources, 1950 and 1951

Source	1950		1951	
	Tons	Value	Tons	Value
		$		$
In blister and anode copper produced[1]	231,241	108,313,437	236,036	130,763,621
In ores, concentrates and any copper matte exported	24,573	11,456,085	25,634	14,161,852
In nickel-copper matte exported	8,395	3,441,885	8,301	4,100,743
Total	**264,209**	**123,211,407**	**269,921**	**149,026,216**

1. Includes a small quantity of copper contained in gold and silver ores shipped to Canadian smelters.

TABLE 9. Production[1] of Nickel, 1947-1951

Year	Tons	$
1947	118,621	70,650,764
1948	131,740	86,904,235
1949	128,689	99,173,289
1950	123,654	112,104,685
1951	137,903	151,669,994

1. Includes nickel in matte exported, refined nickel produced in Canada, and nickel in oxides and salts sold or produced.

TABLE 10. Production of Lead, 1947-1951

Year	Lead in all forms[1]		Refined lead[2]
	Tons	$	Tons
1947	161,668	44,200,124	162,000
1948	167,251	60,344,146	160,025
1949	159,775	50,488,879	146,149
1950	165,697	47,886,452	170,023
1951	158,231	58,229,148	162,000

1. Lead content of base bullion produced from Canadian ores plus recoverable lead in ores exported.
2. Includes some lead refined from foreign ores.

TABLE 11. Production of Zinc, 1947-1951

Year	Zinc in all forms[1]		Refined zinc[2]
	Tons	$	Tons
1947	207,863	46,486,010	177,878
1948	234,164	65,237,956	196,575
1949	288,262	76,372,147	206,045
1950	313,227	98,040,145	204,367
1951	341,112	135,762,643	218,578

1. Refined zinc produced in Canada plus recoverable zinc in ores exported.
2. Includes some refined zinc from foreign ores.

TABLE 12. Production of Bismuth and Cadmium, 1947-1951

Year	Bismuth		Cadmium	
	Pounds	$	Pounds	$
1947	284,372	560,213	718,534	1,235,879
1948	240,242	480,484	766,090	1,398,114
1949	102,913	210,992	846,541	1,735,409
1950	191,621	431,147	848,406	1,968,302
1951	230,298	543,504	1,326,920	3,556,145

TABLE 13. Production of Selenium and Tellurium, 1947-1951

Year	Selenium		Tellurium	
	Pounds	$	Pounds	$
1947	501,090	937,038	9,194	15,814
1948	390,894	781,788	11,425	19,994
1949	318,225	652,361	11,692	21,046
1950	261,973	633,975	10,075	19,143
1951	382,603	1,239,633	8,913	16,400

TABLE 14. Production of New Aluminum and Magnesium, 1947-1951

Year	Aluminum[1] tons	Magnesium	
		Pounds	$
1947	299,061		
1948	367,079	Not available for publication	
1949	369,466		
1950	396,882		
1951	447,095		

1. All from imported ores.

TABLE 15. Production of New Antimony and Tin, 1947-1951

Year	Antimony (Content of antimonial lead)		Tin	
	Pounds	$	Pounds	$
1947	1,150,463	384,255	714,198	517,794
1948	310,062	113,173	691,332	688,567
1949	158,288	61,020	619,117	633,047
1950	643,540	215,586	796,403	828,259
1951	6,702,164[1]	1,436,713	346,716	494,073

1. Includes antimony in flue dust produced in earlier years but not previously recorded.

TABLE 16. Production (shipments) of Molybdenite Concentrates and Tungsten Concentrates, 1947-1951

Year	Molybdenite concentrates			Tungsten concentrates		
	Gross weight	MoS_2 content	$	Gross weight	WO_3 content	$
	Tons	Tons		Tons	Tons	
1947	396	380	309,048	334	314	680,792
1948	174	152	137,143	705	523	1,046,160
1949	—	—	—	117	126	252,380
1950	109	52	60,059	943	142	160,343
1951	241	191	228,958	2	1.4	7,098

TABLE 17. Production of Cobalt and Arsenic, 1947-1951

Year	Cobalt[1]		Arsenious Oxide[2]	
	Pounds	$	Tons	$
1947	572,673	875,644	394	49,348
1948	1,544,852	2,029,178	581	82,909
1949	619,065	952,469	263	26,332
1950	583,806	964,003	397	52,029
1951	951,607	1,999,612	1,177[3]	129,435

1. Content in metal and oxides produced in Canada and in ores exported.
2. Refined white arsenic produced in Canada plus arsenic content of crude arsenic exported. Excludes arsenic in ores exported from British Columbia as it is not paid for.
3. Includes some arsenic recovered from foreign ores.

TABLE 18. Platinum Metals[1] Produced, 1947-1951

Year	Platinum		Palladium and other platinum metals	
	Ounces	$	Ounces	$
1947	94,570	5,582,467	110,332	4,387,740
1948	121,404	10,622,850	148,343	6,295,132
1949	153,784	11,596,002	182,233	8,289,915
1950	124,571	10,255,929	148,741	7,578,144
1951	153,483	14,542,515	164,905	7,950,107

1. Figures represent the metal content of concentrates produced from nickel-copper ores, included are metals recovered from alluvial deposits.

TABLE 19. Capacities of Canadian Copper Smelting and Refining Works, 1951

Company	Blast furnaces		Reverberatories		Converters
	Number	Annual capacity: tons of ore and concentrates	Number	Annual capacity: tons of ore and concentrates	Number
Falconbridge Nickel Mines, Ltd.	2	600,000	—	—	3
Hudson Bay Mining & Smelting Co., Ltd.	—	—	1	575,000	3
Noranda Mines Ltd.	—	—	2	1,300,000	5
International Nickel Co. of Canada, Ltd.:					
Copper cliff	2	430,000	9	3,500,000	20
Coniston	4	950,000	—	—	5
	Annual Capacity (Short tons)				
Electrolytic Copper Refineries:					
Canadian Copper Refiners, Ltd.	132,000				
International Nickel Co. of Canada, Ltd.	168,000				

TABLE 20. Lead Smelting Capacity of Canada, 1951

Company	Number of blast furnaces	Annual capacity
		Tons of charge
Consolidated Mining & Smelting Company of Canada, Limited, Trail, British Columbia	5	711,000

TABLE 21. Capacity of Electrolytic Zinc Plants in Canada, 1951

Company	Estimated annual capacity for cathode zinc
	Short tons
Consolidated Mining & Smelting Company of Canada, Ltd	172,875
Hudson Bay Mining & Smelting Co., Ltd	78,135

Directory, of Firms in the Non-ferrous Smelting and Refining Industry, 1951

Name of Firm	Head or Executive Office Address	Location of Plant
Quebec:		
Aluminum Company of Canada Ltd	1700 Sun Life Bldg., Montreal	Arvida, La Tuque, Shawinigan Falls, Isle Maligne, Beauharnois
Canadian Copper Refiners Ltd	1600 Royal Bank Bldg., Toronto, Ontario	Montreal East
Noranda Mines Limited	1600 Royal Bank Bldg., Toronto, Ontario	Noranda
Quebec Iron and Titanium Corp.	1255 Phillips Square, Montreal	Sorel
Ontario:		
Deloro Smelting & Refining Co. Ltd	Deloro	Deloro
Dominion Magnesium Ltd	67 Yonge St., Toronto	Haley
Falconbridge Nickel Mines Ltd	304 Bay St., Toronto	Falconbridge
International Nickel Co. of Canada, Limited	Copper Cliff	Copper Cliff, Coniston, Port Colborne
Manitoba:		
Hudson Bay Mining and Smelting Co. Limited	500 Royal Bank Bldg., Winnipeg	Flin Flon
British Columbia:		
Consolidated Mining & Smelting Co. of Canada Limited	Trail	Trail

Note. Information relating to operations of the Eldorado Mining and Refining Co. at Port Hope, Ontario, is secret and, therefore, not included in this report.

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