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

ANNUAL REPORT

ON THE

MINERAL PRODUCTION OF CANADA

DURING THE CALENDAR YEAR

1943

Published by Authority of the Hon. James A. MacKinnon, M.P.,
Minister of Trade and Commerce

OTTAWA
EDMOND CLOUTIER
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1945

Price, $1.00

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

ANNUAL REPORT

ON THE

MINERAL PRODUCTION OF CANADA

DURING THE CALENDAR YEAR

1943

Published by Authority of the Hon. James A. MacKinnon, M.P.,
Minister of Trade and Commerce

OTTAWA
EDMOND CLOUTIER
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1945

PREFACE

Annual reports on the Mineral Production of Canada have been published since 1886. The first reports were published by the Geological Survey of Canada, later by the Mines Branch of the Department of Mines, and since 1921 by the Dominion Bureau of Statistics.

The present report contains final data on the production of Canada's mines, together with details of capital employed in the industry, salaries and wages paid, the number of employees, the amounts expended on fuel and power, the power producing equipment installed, and the process supplies purchased. Bulletins on each industry are issued throughout the year and each chapter of the report is comprised of the essential features of each bulletin.

The total value of the Mineral Production of Canada, as shown in this report, includes all metals and minerals with the exception of those obtained from pitchblende ores which are still on the confidential list.

It has been the practice during pre-war years to include in this report world tables of all important minerals by countries. No figures on world production have been available since 1939 but their publication will be resumed when world censorship is lifted.

The publication of tables showing imports and exports of minerals and mineral products has been resumed in this report.

As in previous years, the Bureau co-operated with the Mines Departments of the provinces of Nova Scotia, Quebec, Ontario, Saskatchewan and British Columbia in the collection of these statistics. Forms are filled out in duplicate by the reporting companies, thereby saving the operator extra work, and resulting in uniform totals for Dominion and Provincial statistical bureaux.

The thanks of the Bureau are tendered to the Dominion Department of Mines and Resources and to the mine and smelter operators for assistance given and information made available. Close co-operation has been maintained with the office of the Metals Controller. Railway and other transportation companies as well as smelter operators outside of Canada have also furnished data, the receipt of which is gratefully acknowledged.

The report has been prepared under the direction of Mr. W. H. Losee, B.Sc., Chief of the Mining, Metallurgical and Chemical Branch, by Mr. R. J. McDowall, B.Sc., Mining Statistician.

S. A. CUDMORE,
Dominion Statistician.

DOMINION BUREAU OF STATISTICS,
OTTAWA, May 24, 1945.

TABLE OF CONTENTS

DOMINION BUREAU OF STATISTICS

S. A. CUDMORE, M.A. (Oxon.), LL.D. (Tor.), F.S.S., F.R.S.C., Dominion Statistician

W. H. LOSEE, B.Sc., Chief of the Mining, Metallurgical and Chemical Branch

R. J. McDOWALL, B.Sc., Statistician, Mining, Metallurgical and Chemical Branch

ANNUAL REPORT

ON THE

MINERAL PRODUCTION OF CANADA

DURING THE CALENDAR YEAR 1943

CHAPTER ONE

Canadian primary production of minerals or mineral products during 1943 totalled $530,053,966 as compared with $566,768,672 in 1942. This decrease of 6·5 per cent largely reflects the curtailment in the output of gold at auriferous quartz mines.

Compared with 1942, the total value of mineral output in 1943 was less in all provinces with the exception of New Brunswick, Saskatchewan and Alberta. There was, however, no slackening by the mining industry as a whole in providing Canada and the allied nations with essential materials considered vital to a total war effort. There was distinct evidence of a revival in prospecting and exploration for new ore deposits.

The value of metals and metal-bearing minerals in 1943 amounted to $356,812,760 as against $392,192,452 in 1942 and the output of clay products and other structural materials at $42,010,254 represents a decrease of $3,719,553 from the corresponding production of the preceding year. These losses were offset to some extent by increases recorded in the output of petroleum, asbestos and certain other non-metallic minerals. Of the total value of Canadian mineral production in 1943, the province of Ontario contributed 43·95 per cent, Quebec 19·17 per cent and British Columbia 12·91 per cent.

Capital employed by the Canadian mining industry in 1943 totalled $1,183,442,427. The industry as a whole provided employment for 112,140 persons and distributed $207,575,955 in salaries and wages. Expenditures during the year under review, for ores, process supplies, fuel, electricity, outgoing freight and smelter treatment amounted to $498,885,557. The labour stringency particularly affected metallic ore mining, chiefly gold.

Table 1.—Quantities and Values of Mineral Products from Canadian Sources, 1942 and 1943

—		1942*		1943*	
		Quantity	Value	Quantity	Value
			$		$
METALLICS					
Antimony	lb.	3,041,108	516,988	1,114,166	189,408
Arsenic (As_2O_3)	lb.	14,967,874	652,041	3,153,538	254,009
Bismuth	lb.	347,556	479,627	407,597	562,484
Cadmium	lb.	1,148,963	1,355,776	786,611	904,602
Chromite	ton	11,456	343,568	29,595	919,878
Cobalt	lb.	(d) 83,871	88,444	(d) 175,961	191,407
Copper	lb.	603,661,826	60,417,372	575,190,132	67,170,601
Gold valued at standard rate	fine oz.	4,841,308	100,078,674	3,651,301	75,479,087
Estimated exchange equalization on gold produced		....	86,311,607	....	65,096,001
Indium	fine oz.	471	4,710	....	....
Iron ore	ton	545,306	1,517,077	641,294	2,032,240
Lead	lb.	512,142,562	17,218,233	444,060,769	16,670,041

	1942*		1943*	
	Quantity	Value	Quantity	Value
		$		$
METALLICS—Conc.				
Magnesium ... lb.	808,718	355,836	7,153,974	2,074,652
Manganese ore ... ton	435	8,932	48	985
Mercury ... lb.	1,035,914	2,943,807	1,690,240	4,559,200
Molybdenite concentrates ... lb.	227,586	134,963	784,715	549,515
Nickel ... lb.	285,211,803	69,998,427	288,018,615	71,675,322
Palladium, rhodium, iridium, etc ... fine oz.	222,573	8,279,221	126,004	5,233,068
Platinum ... fine oz.	285,228	10,898,561	219,713	8,458,951
Pitchblende products ...	(a)	(a)	(a)	(a)
Selenium ... lb.	495,369	951,108	374,013	654,523
Silver ... fine oz.	20,695,101	8,726,296	17,344,569	7,849,111
Tellurium ... lb.	11,084	17,735	8,600	15,050
Tin ... lb.	1,237,863	643,689	776,937	450,623
Titanium ore ... ton	10,031	50,906	69,437	308,290
Tungsten concentrates ... lb.	520,981	406,275	1,508,621	1,083,538
Zinc ... lb.	580,257,373	19,702,579	610,754,354	24,430,174
Total ...	...	**392,192,452**	...	**356,812,760**
NON-METALLICS—FUELS				
Coal ... ton	18,865,030	62,897,581	17,859,057	62,877,549
Natural gas ... M cu. ft.	45,697,359	13,301,655	44,276,216	13,159,418
Peat ... ton	172	1,204	782	7,000
Petroleum, crude ... brl.	10,364,796	15,968,851	10,052,302	16,470,417
Total ...	...	**92,169,291**	...	**92,514,384**
OTHER NON-METALLICS				
Asbestos ... ton	439,459	22,663,283	467,196	23,169,505
Barite ... ton	19,667	188,144	24,474	279,253
Diatomite ... ton	365	9,088	98	3,331
Feldspar ... ton	22,270	213,941	23,858	237,771
Fluorspar ... ton	6,199	146,039	11,210	318,424
Garnet rock ... ton	17	176	...	...
Graphite ...	...	117,904	1,903	197,431
Grindstones ... ton	216	10,000	164	6,225
Gypsum ... ton	566,166	1,254,182	446,848	1,381,468
Iron oxides (ochre) ... ton	9,304	151,653	8,401	135,893
Magnesitic dolomite and brucite ...	...	1,059,374	...	1,260,056
Magnesium sulphate ... ton	1,140	38,760	...	...
Mica ... ton	3,010	383,567	4,025	553,856
Mineral waters ... Imp. gal.	157,085	74,505	139,611	67,541
Nepheline syenite ...	...	246,893	...	292,010
Peat moss ... ton	53,506	1,069,372	64,360	1,461,422
Phosphate ... ton	1,264	17,431	1,451	18,385
Quartz ... ton	1,738,174	1,538,162	1,776,749	1,608,448
Salt (b) ... ton	653,672	3,844,187	687,686	4,379,378
Silica brick ... M	4,273	263,006	4,165	295,505
Soapstone (c) ... ton	14,369	136,529	14,204	135,469
Sodium carbonate ... ton	256	2,048	468	5,148
Sodium sulphate ... ton	131,258	1,079,692	107,121	1,025,151
Sulphur** ... ton	303,714	1,994,891	257,515	1,753,425
Talc ... ton	15,499	174,295	11,959	131,216
Volcanic dust ... ton	...	...	50	257
Total ...	...	**36,677,122**	...	**38,716,568**
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS				
Clay Products—**Total** ...	...	**7,081,723**	...	**6,608,193**
OTHER STRUCTURAL MATERIALS				
Cement ... brl.	9,126,041	14,365,237	7,302,289	11,599,033
Lime (b) ... ton	884,830	6,530,839	907,768	6,832,992
Sand and gravel ... ton	26,349,907	9,005,414	25,744,469	9,005,857
Stone (b) ... ton	7,978,066	8,746,594	7,222,950	7,964,179
Total ...	...	**38,648,084**	...	**35,402,061**
Grand Total in Canadian Funds ...	...	**566,768,672**	...	**530,053,966**

*Unless otherwise noted, all total values of mineral production from 1931 to 1943, inclusive, contain estimated exchange equalization on gold produced.

**Sulphur content of pyrites shipped and estimated sulphur contained in sulphuric acid and other products made from waste smelter gases.

(a) Data not available for publication.
(b) Includes relatively large quantities used as a chemical material.
(c) Includes some talc.
(d) Exclusive of ore placed on government stock pile at Deloro, Ontario.
1 Ton = 2,000 lb.

Table 2.—Finally Revised Statistics on the Mineral Production of Canada, by Provinces, 1943

—	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Northwest Territories	Yukon	Canada
METALLICS											
Antimony ... lb.								1,114,166			1,114,166
$								189,408			189,408
Arsenic (As_2O_3) (x) ... lb.			2,744,921	408,617				(c)			3,153,538
$			221,085	32,924				(c)			254,009
Bismuth ... lb.								407,597			407,597
$								562,484			562,484
Cadmium ... lb.					20,983	166,955		598,673			786,611
$					24,130	191,998		688,474			904,602
Chromite ... ton			29,595								29,595
$			919,878								919,878
Cobalt ... lb.				(a) 175,961							175,961
$				191,407							191,407
Copper ... lb.			131,163,776	277,840,560	38,014,872	85,948,719		42,222,205			575,190,132
$			15,411,744	32,232,027	4,466,747	10,098,974		4,961,109			67,170,601
Gold ... fine oz.	4,129		922,533	2,117,215	91,775	174,090	21	241,346	59,032	41,160	3,651,301
$	158,967		35,517,521	81,512,777	3,533,337	6,702,465	808	9,291,821	2,272,732	1,584,660	140,575,088
Iron ore ... ton		143,062		498,232							641,294
$		579,990		1,452,250							2,032,240
Lead ... lb.			2,435,523	2,273,896				439,155,635		195,715	444,060,769
$			91,430	85,362				16,485,902		7,347	16,670,041
Magnesium ... lb.				7,153,974							7,153,974
$				2,074,652							2,074,652
Manganese ore ... ton		48									48
$		985									985
Mercury ... lb.								1,690,240			1,690,240
$								4,559,200			4,559,200
Molybdenite (concentrates) ... lb.			784,715								784,715
$			549,515								549,515
Nickel ... lb.				288,018,615							288,018,615
$				71,675,322							71,675,322
Palladium, rhodium, iridium, etc ... fine oz.				126,004							126,004
$				5,233,068							5,233,068
Platinum ... fine oz.				219,706				7			219,713
$				8,458,681				270			8,458,951
Pitchblende products ... $									(b)		(b)
Selenium ... lb.			216,498	82,000	5,239	70,276					374,013
$			378,872	143,500	9,168	122,983					654,523
Silver ... fine troy oz.	144		2,212,115	2,671,320	587,279	2,812,624	1	8,995,488	13,250	52,348	17,344,569
$	65		1,001,071	1,208,879	265,767	1,272,825		4,070,818	5,996	23,690	7,849,111
Tellurium ... lb.				8,600							8,600
$				15,050							15,050
Tin ... lb.								776,937			776,937
$								450,623			450,623

(x) Refined arsenic produced in Canada plus As_2O_3 content of crude arsenic exported. (a) Exclusive of metal in ore placed on Government stock pile at Deloro, Ont. (b) Not available for publication. (c) Considerable unpaid-for arsenic is contained in auriferous quartz ores exported, however, data relative to its possible recovery are unobtainable.

Table 2.—Finally Revised Statistics on the Mineral Production of Canada, by Provinces, 1943—Concluded

—		Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskat-chewan	Alberta	British Columbia	Northwest Territories	Yukon	Canada
METALLICS—Concluded												
Titanium ore	ton	...	...	69,437	...	...	...	...	...	...	...	69,437
	$	...	...	308,290	...	...	...	...	...	...	...	308,290
Tungsten (concentrates)	lb.	19,374	...	5,401	494,405	16	...	...	976,622	720	12,083	1,508,621
	$	18,564	...	5,369	356,478	16	...	...	692,260	729	10,122	1,083,538
Zinc	lb.	...	...	128,169,810	3,299,812	46,783,873	96,350,404	...	336,150,455	...	...	610,754,354
	$	...	...	5,126,792	131,993	1,871,355	3,854,016	...	13,446,018	...	...	24,430,174
Total	**$**	**177,596**	**580,975**	**59,531,567**	**294,804,370**	**10,170,520**	**22,243,261**	**808**	**55,398,387**	**2,279,457**	**1,625,819**	**356,812,760**
NON-METALS												
FUELS												
Coal	ton	6,103,085	372,873	...	...	999	1,665,972	7,676,726	2,039,402	...	...	17,859,057
	$	27,121,861	1,641,069	...	...	2,964	2,432,249	24,030,686	7,648,720	...	...	62,877,549
Natural gas	M cu. ft.	...	675,029	...	7,914,408	...	116,201	35,569,078	...	1,500	...	44,276,216
	$	...	327,787	...	6,543,913	...	45,568	6,241,815	...	335	...	13,159,418
Peat	ton	...	...	522	260	...	...	...	...	...	...	782
	$	...	...	4,440	2,560	...	...	...	...	...	...	7,000
Petroleum, crude	bbl.	...	24,530	...	132,492	...	...	9,601,530	...	293,750	...	10,052,302
	$	...	34,342	...	311,356	...	...	15,724,518	...	400,201	...	16,470,417
Total Fuels	**$**	**27,121,861**	**2,003,198**	**4,440**	**6,857,829**	**2,964**	**2,477,817**	**45,997,019**	**7,648,720**	**400,536**	...	**92,514,384**
OTHER NON-METALLIC AND INDUSTRIAL MINERALS												
Asbestos	ton	...	...	467,196	...	...	...	...	...	...	...	467,196
	$	...	...	23,169,505	...	...	...	...	...	...	...	23,169,505
Barite	ton	22,550	...	...	...	...	...	...	1,924	...	...	24,474
	$	263,419	...	...	...	...	...	...	15,834	...	...	279,253
Diatomite	ton	82	...	...	...	...	...	...	16	...	...	98
	$	2,465	...	...	...	...	...	...	866	...	...	3,331
Feldspar	ton	...	...	17,199	6,659	...	...	...	...	...	...	23,858
	$	...	...	176,222	61,549	...	...	...	...	...	...	237,771
Fluorspar	ton	825	...	...	10,385	...	...	...	...	...	...	11,210
	$	17,000	...	...	301,424	...	...	...	...	...	...	318,424
Graphite	ton	...	...	...	1,903	...	...	...	...	...	...	1,903
	$	...	...	...	197,431	...	...	...	...	...	...	197,431
Grindstones (including pulpstones, etc.)	ton	...	164	...	...	...	...	...	...	...	...	164
	$	...	6,225	...	...	...	...	...	...	...	...	6,225
Gypsum	ton	255,736	36,263	...	92,448	37,989	...	...	24,412	...	...	446,848
	$	368,639	148,315	...	335,637	380,529	...	...	148,348	...	...	1,381,468
Iron oxides (ochre)	ton	...	...	7,998	...	...	...	...	403	...	...	8,401
	$	...	...	131,057	...	...	...	...	4,836	...	...	135,893

Magnesitic dolomite and brucite	$			1,260,056								1,260,056
Magnesium sulphate	ton											
	$											
Mica (all grades)	lb.			3,086,673	4,254,019				710,000			8,050,692
	$			245,846	296,189				11,821			553,856
Mineral waters	Imp. gal.			125,605	14,006							139,611
	$			61,793	5,748							67,541
Nepheline syenite	$				292,010							292,010
Peat Moss	ton		990	14,398	11,120	2,042		55	35,755			64,360
	$		27,000	298,307	136,595	72,687		1,425	925,408			1,461,422
Phosphate	ton			1,050	401							1,451
	$			14,272	4,113							18,385
Quartz	ton	9,486		214,959	1,350,640		163,102		38,562			1,776,749
	$	16,126		605,916	852,196		57,086		77,124			1,608,448
Salt	ton	47,775			594,889	27,523		17,499				687,686
	$	245,157			3,356,870	497,227		280,124				4,379,378
Silica brick	M	3,113			1,052							4,165
	$	169,783			125,722							295,505
Soapstone (including talc)	ton			14,204								14,204
	$			135,469								135,469
Sodium carbonate	ton								468			468
	$								5,148			5,148
Sodium sulphate	ton						107,121					107,121
	$						1,025,151					1,025,151
Sulphur	ton			136,007	16,907				104,601			257,515
	$			545,229	169,070				1,039,126			1,753,425
Talc	ton				11,959							11,959
	$				131,216							131,216
Volcanic dust	ton						50					50
	$						257					257
Total Other Non-Metals	$	**1,082,589**	**181,540**	**26,643,672**	**6,265,770**	**950,443**	**1,082,494**	**281,549**	**2,228,511**			**38,716,568**
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS												
CLAY PRODUCTS												
Clay—Bentonite	$					110,428		5,262	1,357			117,047
Fireclay	ton	2,542			508		1,497		1,106			5,653
	$	9,944			2,247		15,173		14,758			42,122
Kaolin	ton			93								93
	$			1,531								1,531
Other clay	ton				702		19,876		60			20,638
	$				2,475		98,363		198			101,036
Fireclay blocks and shapes	$	1,220	2,308				218,151		34,976			256,655
Firebrick	M								3,644			3,644
	$								192,618			192,618
Brick, soft mud process—Face	M				8,818				442			9,260
	$				195,366				11,460			206,826
Common	M		1,602	1,250	4,558	1,546		3,508	1,731			14,195
	$		25,460	16,050	81,605	21,954		28,370	36,069			209,508
Stiff mud process—Face	M		1,209	12,612	20,331		6	395	70			34,623
(wire cut)	$		37,273	299,598	518,038		179	9,626	2,916			867,630
Common	M	6,411	4,045	33,229	6,818		10	187	300			51,000
	$	108,963	58,626	542,388	111,232		255	3,366	4,535			829,365

Table 2.—Finally Revised Statistics on the Mineral Production of Canada, by Provinces, 1943—Concluded

—		Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskat-chewan	Alberta	British Columbia	Northwest Territories	Yukon	Canada
Clay Products and Other Structural Materials—Concluded												
Brick—*Concluded*												
Dry press—Face	M	...	...	1,188	7,296	...	119	1,718	183	...	...	**10,504**
	$	...	...	34,440	186,469	...	3,124	24,879	7,450	...	...	**256,362**
Common	M	...	...	4,149	5,153	...	160	6,218	...	...	...	**15,680**
	$	...	...	83,894	93,459	...	1,800	64,293	...	...	...	**243,446**
Fancy or ornamental brick (including special shapes, embossed and enamelled brick)	M	...	...	...	3,190	...	...	...	...	...	...	**3,190**
	$	...	...	...	191,424	...	...	...	...	...	...	**191,424**
Sewer brick	M	...	...	...	225	...	...	...	...	...	...	**225**
	$	...	...	...	4,203	...	...	...	...	...	...	**4,203**
Paving brick	M	...	...	...	151	...	...	...	...	...	...	**151**
	$	...	...	...	8,967	...	...	...	...	...	...	**8,967**
Structural tile—Hollow blocks (including fire-proofing and load-bearing tile)	ton	11,875	1,610	25,378	35,980	...	725	6,353	2,548	...	...	**84,469**
	$	124,687	15,536	261,874	333,256	...	6,055	49,667	28,460	...	...	**819,535**
Roofing tile	$	...	...	...	744	...	...	...	83	...	...	**827**
Floor tile (quarries)	$	...	...	...	26,864	...	...	...	85	...	...	**26,949**
Drain tile	M	169	114	1,006	10,192	...	125	190	1,205	...	...	**13,001**
	$	6,084	4,248	40,419	279,806	...	5,625	6,735	47,460	...	...	**390,377**
Sewer pipe (including copings, flue linings, etc.)	$	227,673	3,098	169,413	348,641	...	...	274,273	93,748	...	...	**1,116,846**
Pottery, glazed or unglazed (including coarse earthenware, stoneware, flower pots and all other pottery)	$	...	68,058	54,391	63,600	...	...	512,178	2,917	...	...	**701,144**
Other products	$	...	1,839	430	5,433	...	...	...	16,073	...	...	**23,775**
Total Clay Products	$	**478,571**	**216,446**	**1,504,428**	**2,453,829**	**132,382**	**348,725**	**978,649**	**495,163**	...	...	**6,608,193**
Other Structural Materials												
Cement	brl.	...	...	3,394,895	1,972,009	793,913	...	606,703	534,769	...	...	**7,302,289**
	$	...	...	4,899,578	2,872,732	1,503,416	...	1,176,442	1,146,865	...	...	**11,599,033**
Lime (x)—Quicklime	ton	9,611	13,634	285,794	382,950	24,962	...	17,482	31,714	...	...	**766,147**
	$	111,758	132,901	2,331,293	2,794,071	216,414	...	142,125	261,526	...	...	**5,990,088**
Hydrated lime	ton	122	3,748	96,638	28,971	5,076	...	733	6,333	...	...	**141,621**
	$	1,586	41,467	336,098	321,123	91,405	...	7,330	43,895	...	...	**842,904**
Total lime	ton	9,733	17,382	382,432	411,921	30,038	...	18,215	38,047	...	...	**907,768**
	$	113,344	174,368	2,667,391	3,115,194	307,819	...	149,455	305,421	...	...	**6,832,992**
Sand and gravel	ton	917,376	719,531	10,601,376	8,285,309	1,048,673	1,288,263	626,157	2,257,784	...	...	**25,744,469**
	$	585,007	372,936	2,362,635	3,620,852	293,938	583,687	309,389	877,413	...	...	**9,005,857**

Stone—Granite	ton	703	1,522	634,920	79,582	....	....	....	63,695	....	....	780,422
	$	28,407	15,856	1,164,463	212,130	....	....	....	101,210	....	....	1,522,072
Limestone (x)	ton	174,933	51,406	2,709,320	3,114,460	37,974	....	13,961	163,127	....	....	6,265,181
	$	264,197	128,915	2,696,205	2,704,205	50,784	....	47,899	213,544	....	....	6,105,749
Marble	ton	....	....	7,596	4,167	....	....	....	85	....	....	11,848
	$	....	....	41,720	24,852	....	....	....	1,450	....	....	68,022
Sandstone	ton	72,232	655	75,298	7,818	....	....	....	8,160	....	....	164,163
	$	128,265	2,600	94,388	17,190	....	....	....	8,160	....	....	250,603
Slate	ton	....	....	191	....	....	....	....	1,145	....	....	1,336
	$	....	....	191	....	....	....	....	17,542	....	....	17,733
Total stone	ton	247,868	53,583	3,427,325	3,206,027	37,974	....	13,961	236,212	....	....	7,222,950
	$	420,869	147,371	3,996,967	2,958,383	50,784	....	47,899	341,906	....	....	7,964,179
Total Other Structural Materials	$	**1,119,220**	**694,675**	**13,926,571**	**12,567,161**	**2,155,957**	**583,687**	**1,683,185**	**2,671,605**	....	....	**35,402,061**
Total Clay Products and other Structural Materials	$	**1,597,791**	**911,121**	**15,430,999**	**15,020,990**	**2,288,339**	**932,412**	**2,661,834**	**3,166,768**	....	....	**42,010,254**
Grand Total	$	**29,979,837**	**3,676,834**	**101,610,678**	**232,948,959**	**13,412,266**	**26,735,984**	**48,941,210**	**68,442,386**	**2,679,993**	**1,625,819**	**530,053,966**
Metallics	$	177,596	580,975	59,531,567	204,804,370	10,170,520	22,243,261	808	55,398,387	2,279,457	1,625,819	356,812,760
Fuels	$	27,121,861	2,003,198	4,440	6,857,829	2,964	2,477,817	45,997,019	7,648,720	400,536	....	92,514,384
Other non-metallics	$	1,082,589	181,540	26,643,672	6,265,770	950,443	1,082,494	281,549	2,228,511	....	....	38,716,568
Clay products	$	478,571	216,446	1,504,428	2,453,829	132,382	348,725	978,649	495,163	....	....	6,608,193
Other structural materials	$	1,119,220	694,675	13,926,571	12,567,161	2,155,957	583,687	1,683,185	2,671,605	....	....	35,402,061
Grand Total—1943	$	**29,979,837**	**3,676,834**	**101,610,678**	**232,948,959**	**13,412,266**	**26,735,984**	**48,941,210**	**68,442,386**	**2,679,993**	**1,625,819**	**530,053,966**
Per cent of total		5·66	0·69	19·17	43·95	2·53	5·04	9·23	12·91	0·51	0·31	**100·00**
Grand Total—1942	$	**32,783,165**	**3,609,158**	**104,300,010**	**259,114,946**	**14,345,046**	**20,578,749**	**47,359,831**	**77,247,932**	**3,976,267**	**3,453,568**	**566,768,672**
Grand Total—1941	$	**32,569,867**	**3,690,375**	**99,651,044**	**267,435,727**	**16,689,867**	**15,020,555**	**41,364,385**	**76,841,180**	**3,860,298**	**3,117,992**	**560,241,290**
Grand Total—1940	$	**33,318,587**	**3,435,916**	**86,313,491**	**261,483,349**	**17,828,522**	**11,505,858**	**35,092,337**	**74,134,485**	**2,594,157**	**4,118,333**	**529,825,035**

(x) Includes relatively large quantities used as a chemical.

Table 3.—Summary, by Nine Main Branches, of the Net Value of Commodity Production in Canada, 1939-1942*

—	1939	1940	1941	1942	Percentage of Total Net Value 1942
	$	$	$	$	%
Agriculture	826,390,000	885,115,000	951,025,000	1,691,540,000	27·0
Forestry	271,723,416	370,121,275	421,419,139	429,079,260	6·9
Fisheries	34,378,681	38,106,690	51,769,638	64,821,702	1·0
Trapping	7,919,412	11,207,930	15,138,040	23,801,213	0·4
Mining (Total)	393,232,044	446,080,729	497,904,632	514,109,951	8·2
Auriferous quartz	129,633,245	146,713,744	145,978,833	131,938,062	2·1
Other mining	263,598,799	299,366,985	351,925,799	382,171,889	6·1
Electric power	149,863,892	163,780,757	183,146,426	200,345,240	3·2
Construction	183,706,338	206,893,992	269,561,885	310,917,190	5·0
Custom and repair	96,652,386	110,745,900	135,287,000	139,349,000	2·2
Manufactures, n.e.s. (*)	1,277,265,130	1,591,625,600	2,194,821,573	2,884,501,057	46·1
Grand Total	**3,241,131,299**	**3,823,676,973**	**4,720,073,333**	**6,258,464,613**	**100·0**
Manufactures, Total†	**1,531,051,901**	**1,914,412,381**	**2,605,119,788**	**3,309,973,758**	**52·9**

* Business Statistics Branch, Dominion Bureau of Statistics (1942 Survey of Production Report).
† The difference between "manufactures, total" and "manufactures, n.e.s." is the amount of the duplication between primary and secondary industries. The sum of "manufactures, n.e.s." and the eight other main branches is regarded as the grand total.

Table 4.—Provincial Distribution of the Net Value of Commodity Production in Canada, 1939-1942*

Province	1939	1940	1941	1942	Percentage of Total Net Value 1942
	$	$	$	$	%
Prince Edward Island	12,554,392	13,826,491	13,200,776	21,404,746	0·3
Nova Scotia	109,739,025	132,038,545	136,856,241	175,667,076	2·8
New Brunswick	77,156,799	90,119,421	103,968,110	128,162,880	2·1
Quebec	841,474,236	1,011,051,952	1,279,353,703	1,665,325,431	26·6
Ontario	1,365,101,538	1,642,788,599	2,087,958,441	2,529,183,058	40·4
Manitoba	156,371,495	176,734,411	205,348,561	295,240,285	4·7
Saskatchewan	212,101,124	219,966,345	228,318,037	494,011,113	7·9
Alberta	209,850,313	234,388,768	276,898,177	439,812,709	7·0
British Columbia	† 256,781,477	† 302,762,441	379,925,005	500,027,020	8·0
Yukon and Northwest Territories	....	....	8,246,282	9,630,295	0·2
Canada	**3,241,131,299**	**3,823,676,973**	**4,720,073,333**	**6,258,464,613**	**100·0**

* Business Statistics Branch, Dominion Bureau of Statistics (1942 Survey of Production Report).
† Includes Yukon.

Table 5.—Proportion Contributed by Mining to Total Net Value of Production in each Province, 1939-1942

Province	1939	1940	1941		1942		
	Mining Net	Mining Net	Mining Net	Percentage of Net Value Provincial Production (all mines)	Mining Net	Percentage of Net Value Provincial Production	
						All Mines	Auriferous quartz mines only
	$	$	$	%	$	%	%
Prince Edward Island	....	....	....	....	....	....	....
Nova Scotia	23,504,419	26,189,233	24,535,707	17·9	25,174,960	14·3	0·2-
New Brunswick	3,600,454	3,024,317	3,231,658	3·1	3,176,007	2·5	....
Quebec	81,600,118	98,134,979	127,649,905	10·0	138,100,940	8·3	1·5
Ontario	188,867,969	209,277,055	219,459,986	10·5	212,351,819	8·4	3·4
Manitoba	12,401,404	14,065,270	11,898,109	5·8	9,508,569	3·2	0·9
Saskatchewan	6,391,404	8,652,006	9,336,756	4·1	14,487,408	2·9	0·07
Alberta	26,049,861	29,593,293	36,167,469	13·1	40,604,704	9·2	....
British Columbia	†50,816,415	†57,144,576	60,323,299	15·9	64,378,171	12·9	2·7
Yukon and Northwest Territories	....	....	5,301,743	64·3	6,327,373	65·7	31·1
Canada	**393,232,041**	**446,080,729**	**497,904,632**	**10·5**	**514,109,951**	**8·2**	**2·1**

† Includes Yukon and Northwest Territories.

Table 6.—Annual Values of the Mineral Production of Canada since 1886

NOTE.—In presenting a total valuation of the mineral production as is here given, it should be explained that the production of the metals, copper, gold, lead, nickel, silver, zinc, etc., is given as far as possible on the basis of the quantities of metals recovered in smelters, and the total quantities in each case are valued chiefly at the average market price of the refined metal in a recognized market. There is thus included in some cases the values that have accrued in the smelting or refining of metals outside of Canada.

Year	Value of production	Value per capita	Year	Value of production	Value per capita
	$	$		$	$
1886	10,221,255	2·23	1915	137,109,171	17·44
1887	10,321,331	2·23	1916	177,201,534	22·05
1888	12,518,894	2·67	1917	189,646,821	23·18
1889	14,013,113	2·96	1918	211,301,897	25·37
1890	16,763,353	3·50	1919	176,686,390	20·84
1891	18,976,616	3·92	1920	227,859,665	26·40
1892	16,623,415	3·39	1921	171,923,342	19·56
1893	20,035,082	4·04	1922	184,297,242	20·55
1894	19,931,158	3·98	1923	214,079,331	23·41
1895	20,505,917	4·05	1924	209,583,406	22·71
1896	22,474,256	4·38	1925	226,583,333	24·19
1897	28,485,023	5·49	1926	240,437,123	25·61
1898	38,412,431	7·32	1927	247,356,695	25·67
1899	49,234,005	9·27	1928	274,989,487	27·96
1900	64,420,877	12·04	1929	310,850,246	31·00
1901	65,797,911	12·16	1930	279,873,578	27·42
1902	63,231,836	11·36	1931	230,434,726	22·21
1903	61,740,513	10·83	1932	191,228,225	18·20
1904	60,082,771	10·27	1933	221,495,253	20·74
1905	69,078,999	11·49	1934	278,161,590	25·67
1906	79,286,697	12·81	1935	312,344,457	28·56
1907	86,865,202	13·75	1936	361,919,372	32·82
1908	85,557,101	13·16	1937	457,359,092	41·13
1909	91,831,441	13·70	1938	441,823,237	39·42
1910	106,823,623	14·93	1939	474,602,059	41·94
1911	103,220,994	14·32	1940	529,825,035	46·39
1912	135,048,296	18·33	1941	560,241,290	49·06
1913	145,634,812	19·35	1942	566,768,672	48·63
1914	128,863,075	16·75	1943	530,053,966	*44·87
			Grand Total	**10,282,036,232**	

*Based on an estimated population of 11,812,000 in 1943.

NOTE.—For complete data, by minerals, see Annual Mineral Production Report for 1942.

Table 7.—Annual Values of the Mineral Production of Canada, by Classes, since 1929

Year	Metallics	Non-metallics: Fuels and other non-metallics	Non-metallics: Structural materials and clay products	Total
	$	$	$	$
1929	154,454,056	97,861,356	58,534,834	**310,850,246**
1930	142,743,764	83,402,349	53,727,465	**279,873,578**
1931	120,930,147	65,346,284	44,158,295	**230,434,726**
1932	112,041,763	56,788,179	22,398,283	**191,228,225**
1933	147,015,593	57,782,973	16,696,687	**221,495,253**
1934	194,110,968	64,763,861	19,286,761	**278,161,590**
1935	221,800,849	67,328,208	23,215,400	**312,344,457**
1936	259,425,194	76,723,437	25,770,741	**361,919,372**
1937	334,165,243	88,324,150	34,869,699	**457,359,092**
1938	323,075,154	84,869,417	33,878,666	**441,823,237**
1939	343,506,123	95,733,177	35,362,759	**474,602,059**
1940	382,503,012	104,849,372	42,472,651	**529,825,035**
1941	395,346,581	119,521,437	45,373,272	**560,241,290**
1942	*392,192,452	128,846,413	45,729,807	**566,768,672**
1943	*356,812,760	131,230,952	42,010,254	**530,053,966**

*Exclusive of the values of pitchblende products.

NOTE.—For a history of Canadian Mining see the 1942 Annual Mineral Production Report for Canada.

Table 8.—Total (Cumulative) Recorded Production in Canada of Specified Metals and Minerals to December 31, 1943

—	—	Quantity	Value
			$
Gold	(a) fine ounces	89,374,843	2,571,855,908
Silver	(b) fine ounces	867,292,819	488,706,170
Copper	(c) pounds	9,175,310,925	1,071,923,777
Nickel	(d) pounds	3,907,424,263	1,067,587,732
Lead	(b) pounds	8,262,341,389	354,727,126
Zinc	(f)	....	256,848,376
Cobalt	(e) pounds	34,381,103	33,692,811
Platinum metals	(g) fine ounces	3,157,265	....
Coal	(h) tons	669,322,057	2,031,284,132
Asbestos	(i) tons	8,659,674	337,939,002

NOTE.—The total value of production by the entire Canadian mining industry from 1886 to the end of 1943 totalled $10,282,036,232.

(a) Since 1858; (b) since 1887; (c) since 1886; (d) since 1889; (e) since 1904; (f) since 1898; (g) since 1920. Production data prior to 1920 were not included owing to some doubt existing as to origin of certain metals recovered in United States plants (h) since 1785 (i) since 1880.

Table 9.—Values of the Mineral Production of Canada, by Provinces, since 1932

Year	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba
	$	$	$	$	$
1932	16,201,279	2,223,505	25,638,466	85,910,030	9,058,365
1933	16,966,183	2,107,682	28,141,482	110,205,021	9,026,951
1934	23,310,729	2,156,151	31,269,945	145,565,871	9,776,934
1935	23,183,128	2,821,027	39,124,696	158,934,269	12,052,417
1936	26,672,278	2,587,791	49,736,919	184,532,892	11,315,527
1937	30,314,188	2,763,643	65,160,215	230,042,517	15,751,645
1938	26,253,645	3,802,565	68,965,594	219,801,994	17,173,002
1939	30,746,200	3,949,433	77,335,998	232,519,948	17,137,930
1940	33,318,587	3,435,916	86,313,491	261,483,349	17,828,522
1941	32,569,867	3,690,375	90,651,044	267,435,727	16,689,867
1942	32,783,165	3,690,158	104,300,010	259,114,940	14,345,046
1943	29,979,837	3,676,834	101,610,678	232,948,959	13,412,266

Year	Saskatchewan	Alberta	British Columbia	Yukon	Northwest Territories (*)
	$	$	$	$	$
1932	1,681,728	21,174,061	27,326,173	1,993,195	21,423
1933	2,477,425	19,702,953	30,794,504	2,041,223	279,729
1934	2,977,061	20,228,851	41,206,965	1,628,879	199,604
1935	3,816,943	22,289,681	48,692,050	1,302,308	541,638
1936	6,970,397	23,305,726	54,407,036	2,220,372	775,834
1937	10,271,463	25,597,117	73,555,798	3,784,528	994,518
1938	7,782,847	28,966,272	64,549,130	3,959,570	1,614,076
1939	8,794,090	30,691,617	65,216,745	4,961,321	3,248,777
1940	11,505,858	35,092,337	74,134,485	4,118,333	2,594,157
1941	15,020,555	41,364,385	76,841,180	3,117,992	3,860,298
1942	20,578,749	47,359,831	77,247,932	3,453,568	3,976,267
1943	26,735,984	48,941,210	68,442,386	1,625,819	2,679,993

* Values of pitchblende products not included in 1942 or 1943.

Table 10.—Average Annual Metal Prices, in Canadian Dollars, 1929-1943

Year	Gold	Silver	Copper	Lead	Zinc
	Troy oz.	Troy oz.	Pound	Pound†	Pound†
	$	$	$	$	$
1929	20·67	0·530	0·180*	0·050	0·054
1930	20·67	0·381	0·130*	0·039	0·036
1931	21·55	0·298	0·0837*	0·027	0·025
1932	23·47	0·317	0·0638	0·021	0·024
1933	28·60	0·378	0·0745	0·024	0·032
1934	34·50	0·475	0·0742	0·024	0·030
1935	35·19	0·648	0·0780	0·031	0·031
1936	35·03	0·451	0·0948	0·039	0·033
1937	34·99	0·449	0·131	0·051	0·0490
1938	35·17	0·435	0·0997	0·034	0·031
1939	36·14	0·405	0·101†	0·032	0·031
1940	38·50	0·382	0·101	0·034	0·034
1941	38·50	0·3826	0·101	0·034	0·034
1942	38·50	0·4216	0·101	0·034	0·034
1943	38·50	0·4525	0·1175	0·375	0·040

*Based on New York; 1932-1942 based on London.

† Based on London; prices controlled by Government since 1939 and subject to revision since 1939.

YEARLY AVERAGE PRICES OF COPPER, LEAD, ZINC AND SILVER

Table 11.—(Copper, lead and zinc in U.S. cents per pound; silver, U.S. cents per ounce) (American Bureau of Metal Statistics)

Year	Copper New York (b)	Lead New York	Zinc (a)	Silver New York	Year	Copper New York (b)	Lead New York	Zinc (a)	Silver New York
	Yearly average	Yearly average	Yearly average	Yearly average		Yearly average	Yearly average	Yearly average	Yearly average
1889	13·750	3·930	5·023	93·600	1917	27·180	8·787	8·730	81·417
1890	15·750	4·480	5·550	104·600	1918	24·628	7·413	7·890	96·772
1891	12·625	4·350	5·020	98·800	1919	18·691	5·759	6·988	111·122
1892	11,550	4·090	4·630	87·600	1920	17·456	7·957	7·671	100·900
1893	10·750	3·730	4·060	78·200	1921	12·502	4·545	4·655	62·654
1894	9·560	3·290	3·520	63·000	1922	13·382	5·734	5·716	67·528
1895	10·760	3·230	3·630	65·280	1923	14·421	7·267	6·607	64·873
1896	10·880	2·980	3·940	67·060	1924	13·024	8·097	6·344	66·781
1897	11·290	3·580	4·120	59·790	1925	14·042	9·020	7·622	69·065
1898	12·030	3·780	4·570	58·260	1926	13·795	8·417	7·337	62·107
1899	16·670	4·470	5·750	59·580	1927	12·920	6·755	6·242	56·370
1900	16·190	4·370	4·390	61·330	1928	14·570	6·305	6·027	58·176
1901	16·110	4·330	4·070	58·950	1929	18·107	6·833	6·512	52·993
1902	11,626	4·069	4·840	52·160	1930	12,982	5·517	4·556	38·154
1903	13·235	4·237	5·191	53·570	1931	8·116	4·243	3·640	28·700
1904	12·823	4·309	4·931	57·221	1932	5·555	3·180	2·876	27·892
1905	15·590	4·707	5·730	60·352	1933	7·025	3·869	4·029	34·727
1906	19·278	5·657	6·048	66·791	1934	8·428	3·860	4·158	47·973
1907	20·004	5·325	5·812	65·327	1935	8·649	4·065	4·328	64·273
1908	13·208	4·200	4·578	52·864	1936	9·474	4·710	4·901	45·087
1909	12·982	4·273	5·352	51·502	1937	13·167	6·009	6·519	44·883
1910	12·738	4·446	5·370	53·486	1938	10·000	4·739	4·610	43·225
1911	12,376	4·420	5·608	53·304	1939	10·965	5·053	5·110	39·082
1912	16·341	4·471	6·799	60·835	1940	11·296	5·179	6·335	34·773
1913	15·269	4·370	5·504	59·791	1941	11·797	5·793	7·474	34·783
1914	13·602	3·862	5·061	54·811	1942	11·775	6·481	8·250	38·333
1915	17·275	4·673	13·054	49·684	1943	11·775	6·500	8·250	44·750
1916	27·202	6·858	12·634	65·661					

(a) To 1902, price of zinc at New York; for later years, price of zinc at East St. Louis.

(b) To 1898, price of Lake Copper.

RECENT TAX CHANGES OF INTEREST TO THE MINING INDUSTRY

(Department of Finance)

With a view to stimulating exploration and development of mineral resources in Canada, certain exemptions from income tax have been granted from time to time to new or re-opened mines coming into production. An amendment to the Income War Tax Act, made in May, 1936, provided that any metalliferous mine coming into production between May 1, 1936 and January 1, 1940 would be exempt from income tax for its first three fiscal periods following the commencement of production. The Minister of National Revenue, having regard to the production of ore in reasonable commercial quantities, determines which mines, whether new or old, qualify for this exemption, and a certificate is issued accordingly. In the 1939 session of Parliament an amendment to the Income Tax Act extended for a further three years the qualifying period for the above three-year exemption from January 1st, 1940 to January 1st, 1943.

In order to stimulate the production of wartime metals, Parliament in the 1942 session provided a three-year exemption from the excess profits tax for the profits of any company derived from the operation of any base metal or strategic mineral mine coming into production in the three years following after January 1st, 1943. The Minister of National Revenue was given power to determine what mines, whether new or old, and what types of minerals would qualify for this exemption. Section 89 of the Income War Tax Act was not extended and will have application only to the period now mentioned in the statute.

Provision is made for an exemption from tax in respect of dividends paid to a company incorporated in Canada by a company which has never paid a tax by reason of the three-year exemption. It might be explained that under the Income Tax Act a corporation is exempt from tax on dividends received from another corporation if the paying corporation has already paid corporation income tax on its earnings. This is to avoid double taxation of corporate earnings. It is seen, therefore, that but for this provision a receiving corporation would automatically lose the exemption (which it would otherwise enjoy) through the fact that the paying corporation had received the three-year exemption accorded to new mines and thus the purpose of the Government in allowing the three-year exemption would be defeated.

In the 1943 amendment to the Income War Tax Act a substantial concession was extended to corporations whose chief business is that of mining or exploring for metalliferous and strategic minerals. Such companies were granted a deduction from their combined income and excess profits taxes equal to 26⅔ per cent of all prospecting, exploration and development expenses incurred in searching for base metals and strategic minerals during the period from January 1st, 1943 to March 31st, 1945, such deduction to be taken in the year of the expenditure. The deduction is contingent on provision by the company of certified statements of expenditures and submission of satisfactory evidence that the funds were expended in prospecting and exploring for base metals and strategic minerals by qualified persons.

As a companion measure to the above-mentioned exemption from excess profits tax, an amendment was made to the Income War Tax Act in 1942 designed to encourage prospecting for strategic minerals. It provided that a taxpayer contributing in 1942 to prospecting syndicates, associations or mining partnerships registered or otherwise recognized under the laws of any of the provinces, will be allowed a deduction from the income tax otherwise payable, equal to forty per cent of such contributions, provided that the tax credit will apply only in respect of contributions up to $500 in the case of one syndicate, association or mining partnership, and only in respect of total contributions not exceeding $5,000 in the case of any one taxpayer. In the 1943 amendment to the Income War Tax Act this provision was extended for another year to apply to contributions made during 1943, and again in 1944 was extended to apply to contributions in that year, as announced in the Budget Speech of June 26th, 1944.

General regulations covering depletion allowance to precious metal mines are unchanged from the previous year and remain on the basis of 33⅓ per cent for mining companies, with allowance in the case of dividends received by shareholders standing at 20 per cent.

A further amendment to the Income War Tax Act provided that taxes payable by mining companies to municipalities, under certain sections of the Assessment Act in the Province of Ontario, shall be allowed as a deduction from the income of such companies in calculating their income and excess profits taxes, provided that the Minister of National Revenue is satisfied that in calculating the taxes payable to the municipalities under the above-mentioned Act no deduction is allowed in respect of income and excess profits taxes payable to the Dominion. This amendment will effect a change in the amount of taxes payable respectively to the municipalities and to the Dominion but leaves unchanged the aggregate amount of taxes payable by a mining company.

Table 12.—Mineral Production of Nova Scotia, 1941-1943

Product	1941		1942		1943	
	Quantity	Value	Quantity	Value	Quantity	Value
		$		$		$
METALLICS—						
Antimony....pound	...	...	...	...	...	...
Copper....pound	...	...	...	...	...	...
Gold....fine oz.	19,170	738,045	12,989	500,076	4,129	158,967
Lead....pound	...	...	...	...	...	...
Manganese ore....tons	...	...	61	91	...	...
Manganese metal....pound	7,500	2,250	...	...	...	...
Silver....fine oz.	673	257	446	188	144	65
Tungsten concentrates....pound	...	...	4,300	3,967	19,374	18,564
Zinc....pound	...	...	...	...	...	...
NON-METALLICS—						
Barytes....tons	6,561	72,468	17,750	172,060	22,550	263,419
Coal....tons	7,387,762	28,446,204	7,204,852	29,116,118	6,103,085	27,121,861
Diatomite....tons	239	7,310	218	6,541	82	2,465
Fluorspar....tons	300	3,900	300	6,584	825	17,000
Grindstones....tons	...	...	...	...	...	...
Gypsum....tons	1,395,172	1,517,297	394,216	512,762	255,736	368,639
Quartz....tons	11,477	24,100	10,708	23,557	9,486	16,126
Salt....tons	54,007	307,637	50,199	317,798	47,775	245,157
Silica brick....M	2,828	119,511	3,090	142,511	3,113	169,783
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Clay products....	...	529,435	...	618,441	...	478,571
Lime—						
Quicklime....tons	20,789	198,057	21,540	222,304	9,611	111,758
Hydrated lime....tons	152	1,520	310	4,030	122	1,586
Sand and gravel....tons	749,441	332,531	775,795	371,970	917,376	585,007
Stone....tons	113,602	269,345	229,517	764,167	247,868	420,869
Total....	...	**32,569,867**	...	**32,783,165**	...	**29,979,837**

Table 13.—Mineral Production of New Brunswick, 1941-1943

Product	1941		1942		1943	
	Quantity	Value	Quantity	Value	Quantity	Value
		$		$		$
METALLICS—						
Iron ore....tons	...	...	...	...	143,062	579,990
Manganese ore....tons	...	...	374	8,841	48	985
NON-METALLICS—						
Coal....tons	523,344	2,021,394	435,203	1,826,403	372,873	1,641,069
Grindstones....tons	188	11,500	216	10,000	164	6,225
Gypsum....tons	56,172	150,530	36,623	111,316	36,263	148,315
Natural gas....M cu. ft.	653,542	317,437	619,380	299,688	675,029	327,787
Petroleum....brls.	31,359	44,102	28,089	39,467	24,530	34,342
Peat Moss....tons	...	...	295	8,100	990	27,000
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Clay products....	...	193,643	...	246,041	...	216,446
Lime—						
Quicklime....tons	14,539	122,797	16,217	146,357	13,634	132,901
Hydrated lime....tons	7,213	57,336	6,210	51,124	3,748	41,467
Sand and gravel....tons	962,483	423,772	923,020	540,541	719,531	372,930
Stone....tons	138,148	347,864	87,937	321,280	53,583	147,371
Total....	...	**3,690,375**	...	**3,609,158**	...	**3,676,834**

Table 14.—Mineral Production of Quebec*, 1941-1943

Product	1941 Quantity	1941 Value	1942 Quantity	1942 Value	1943 Quantity	1943 Value
		$		$		$
METALLICS—						
Arsenic (As_2O_3)...lb.	2,056,000	89,024	6,349,074	428,562	2,744,921	221,085
Chromite...tons	2,372	42,679	11,456	343,568	29,595	919,878
Copper...lb.	143,783,978	14,502,052	140,911,876	14,212,372	131,163,776	15,411,744
Gold...fine oz.	1,089,339	41,939,552	1,092,388	42,056,938	922,533	35,517,521
Iron ore...tons	...	...	187	935	...	...
Lead...lb.	...	...	437,634	14,713	2,435,523	91,430
Molybdenite concentrates...lb.	196,600	88,470	222,276	131,906	784,715	549,515
Selenium...lb.	203,162	388,039	326,208	626,319	216,498	378,872
Silver...fine oz.	1,657,082	634,016	1,655,042	697,865	2,212,115	1,001,071
Tellerium...lb.	...	...	...	...	...	...
Titanium ore, sold for export...tons	12,651	49,110	10,031	50,906	69,437	308,290
Tungsten concentrates...lb.	989	627	2,981	2,612	5,401	5,369
Zinc...lb.	46,389,581	1,582,349	73,940,811	2,522,121	128,169,810	5,126,792
Magnesium metal (a)...lb.	...	...	141,081	62,076	...	...
NON-METALLICS—						
Asbestos...tons	477,846	21,468,840	439,459	22,663,283	467,196	23,169,505
Barite...tons	101	808	...	...	...	...
Feldspar...tons	14,218	137,160	16,802	164,588	17,199	176,222
Iron oxides (ochre)...tons	8,770	139,185	8,866	147,049	7,998	131,057
Magnesitic dolomite and brucite...	...	831,041	...	1,059,374	...	1,260,056
Mica...tons	802	284,563	1,328	285,263	1,543	245,846
Natural mineral waters...Imp. gal.	144,441	58,002	129,062	60,316	125,605	61,793
Peat fuel...tons	...	...	...	...	522	4,440
Peat moss...tons	7,265	173,639	12,982	197,560	14,398	298,307
Phosphate...tons	2,487	33,376	930	12,973	1,050	14,272
Quartz...tons	147,318	388,948	203,219	543,817	214,959	605,916
Soapstone†...tons	...	155,925	14,369	136,529	14,204	135,469
Sulphur...tons	146,826	575,422	168,832	673,965	136,007	545,229
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Cement...brls.	4,048,749	5,798,188	4,446,416	6,487,078	3,394,895	4,899,578
Clay products...	...	1,944,358	...	1,741,297	...	1,504,428
Lime—						
Quicklime...tons	245,814	1,791,604	263,321	1,981,535	2,857,94	2,331,293
Hydrated lime...tons	60,701	271,140	85,255	342,172	96,638	336,098
Sand and gravel...tons	11,681,390	2,673,300	11,026,249	2,485,853	10,601,376	2,362,635
Stone...tons	3,775,330	3,609,567	4,188,210	4,166,465	3,427,325	3,996,967
Total...	...	**99,651,944**	...	**104,300,910**	...	**101,610,678**

(a) Produced in Ontario from Quebec brucite.
* There is also in this province an important production of aluminum from imported ores.
† Includes some talc.

Table 15.—Mineral Production of Ontario, 1941-1943

Product	1941 Quantity	1941 Value	1942 Quantity	1942 Value	1943 Quantity	1943 Value
		$		$		$
METALLICS—						
Arsenic (As_2O_3)...lb.	1,482,000	64,171	1,504,040	152,331	408,617	32,294
Bismuth...lb.	7,499	10,379	2,333	3,219	...	...
Chromite...tons	...	...	...	...	...	...
Cobalt...lb.	263,257	255,904	(a) 83,871	88,444	(a) 175,961	191,407
Copper...lb.	333,829,767	33,192,644	308,282,414	30,625,404	277,840,560	32,232,027
Gold...fine oz.	3,194,308	122,980,858	2,763,819	106,407,032	2,117,215	81,512,777
Iron ore...short tons	516,037	1,426,057	545,119	1,516,142	498,232	1,452,250
Lead...lb.	1,622,823	54,559	3,183,159	107,018	2,273,896	85,362
Magnesium metal...lb.	...	...	473,910	208,520	7,153,974	2,074,652
Molybdenite (concentrates)...lb.	...	...	423	150	...	...
Nickel...lb.	282,258,235	68,656,795	285,211,803	69,998,427	288,018,615	71,675,322
Palladium, rhodium, etc...fine oz.	97,432	3,396,304	222,573	8,279,221	126,004	5,233,068
Platinum...fine oz.	124,257	4,747,860	285,188	10,897,033	219,706	8,458,681
Selenium...lb.	142,498	272,171	76,000	145,920	82,000	143,500
Silver...fine oz.	4,977,476	1,904,432	4,452,767	1,877,562	2,671,320	1,208,879
Tellurium...lb.	11,453	18,394	9,500	15,200	8,600	15,050
Tungsten concentrates...lb.	3,830	2,432	162,185	145,241	494,405	356,478
Zinc...lb.	1,100,949	37,553	4,710,394	160,671	3,299,812	131,993

Table 15.—Mineral Production of Ontario, 1941-1943—Concluded

Product	1941		1942		1943	
	Quantity	Value	Quantity	Value	Quantity	Value
		$		$		$
NON-METALLICS—						
Asbestos.....tons	.....	.....	.....	.....	.....	.....
Barite.....tons	.....	.....	.....	.....	.....	.....
Diatomite.....tons	.....	.....	.....	.....	.....	.....
Feldspar.....tons	11,822	107,124	5,468	49,353	6,659	61,549
Fluorspar.....tons	5,234	93,867	4,340	113,957	10,385	301,424
Garnet (schist).....tons	16	160	17	176	.....	.....
Graphite.....tons	.....	132,924	.....	117,904	1,903	197,431
Gypsum.....tons	90,599	276,459	82,796	304,170	92,448	335,637
Mica.....tons	794	47,047	1,400	89,243	2,127	296,189
Natural mineral waters.....Imp. gal.	36,623	14,469	28,023	14,189	14,006	5,748
Natural gas.....M cu. ft.	11,828,703	7,140,130	10,476,770	6,809,901	7,914,408	6,543,913
Nepheline syenite.....$	.....	227,583	.....	246,893	.....	292,010
Peat (fuel).....tons	355	2,155	172	1,204	260	2,560
Peat (moss).....tons	4,315	42,708	9,427	147,729	11,120	136,595
Petroleum.....brls.	160,238	337,760	143,845	306,242	132,492	311,356
Phosphate.....tons	.....	.....	334	4,458	401	4,113
Quartz (b).....tons	1,745,244	899,687	1,367,733	914,256	1,350,640	852,196
Salt.....tons	477,170	2,512,166	558,407	2,703,328	594,889	3,356,870
Silica brick.....M	1,283	118,922	1,183	120,495	1,052	125,722
Strontium minerals.....tons	27	280	.....	.....	.....	.....
Sulphur†.....tons	10,057	100,570	18,634	186,340	16,907	169,070
Talc.....tons	18,171	204,884	15,499	174,295	11,959	131,216
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Cement.....brls.	2,748,854	4,019,656	2,784,782	3,998,294	1,972,009	2,872,732
Clay Products.....	.....	3,087,616	.....	2,549,486	.....	2,453,829
Lime—						
Quicklime.....tons	373,927	2,649,304	382,667	2,761,643	382,950	2,794,071
Hydrated lime.....tons	57,198	597,344	33,031	363,931	28,071	321,123
Sand and gravel.....tons	11,569,382	4,524,463	8,420,358	3,433,986	8,285,309	3,620,852
Stone.....tons	3,526,242	3,277,936	3,106,545	2,985,938	3,206,027	2,958,383
Total.....	.....	**267,435,727**	.....	**259,114,946**	.....	**232,948,959**

† Sulphur content of pyrites shipped and estimated sulphur salvaged from smelter gases.
(a) Exclusive of metal in ore placed on Government stock pile at Deloro, Ontario.
(b) Includes low grade silica sand for fluxing purposes.

Table 16.—Mineral Production of Manitoba, 1941-1943

Product	1941		1942		1943	
	Quantity	Value	Quantity	Value	Quantity	Value
		$		$		$
METALLICS—						
Cadmium.....lb.	61,085	71,714	29,236	34,498	20,983	24,130
Copper.....lb.	67,018,563	6,759,492	47,595,586	4,800,491	38,014,872	4,466,747
Gold.....fine oz.	150,553	5,796,290	136,226	5,244,701	91,775	3,533,337
Selenium.....lb.	32,179	61,462	21,209	40,721	5,239	9,168
Silver.....fine oz.	966,105	369,641	821,824	346,539	587,279	265,767
Tellurium.....lb.	†	†	361	578	†	†
Tungsten concentrates.....lb.	.....	.....	1,399	1,300	16	16
Zinc.....lb.	34,879,239	1,189,731	29,908,179	1,020,168	46,783,873	1,871,355
NON-METALLICS—						
Coal.....tons	1,246	3,411	1,265	3,763	999	2,964
Feldspar.....tons	.....	.....	.....	.....	.....	.....
Gypsum.....tons	27,601	162,822	29,218	179,780	37,989	380,529
Lithium minerals.....$	.....	.....	.....	.....	.....	.....
Natural gas.....cu. ft.	(b)	(b)	(b)	(b)	(b)	(b)
Peat moss.....tons	1,457	32,342	2,224	55,832	2,042	72,687
Salt.....tons	13,051	115,367	22,706	397,101	27,523	497,227
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Cement.....brls.	576,648	1,274,392	654,855	1,374,498	793,913	1,503,416
Clay products.....	.....	84,817	.....	80,890	.....	132,382
Lime—						
Quicklime.....tons	21,444	174,624	21,443	181,052	24,962	216,414
Hydrated lime.....tons	5,656	98,868	4,981	84,027	5,076	91,405
Sand and gravel.....tons	1,503,901	429,996	1,443,001	427,150	1,048,673	293,938
Stone.....tons	38,347	64,898	43,488	71,966	37,974	50,784
Total.....	.....	**16,689,867**	.....	**14,345,046**	.....	**13,412,266**

† No commercial recovery reported by smelter; sometimes recovered by copper refiner but not paid for.
(b) No official reports received; estimated in previous years.

Table 17.—Mineral Production of Saskatchewan, 1941-1943

Product	1941		1942		1943	
	Quantity	Value	Quantity	Value	Quantity	Value
		$		$		$
METALLICS—						
Cadmium..........lb.	108,832	127,769	147,314	173,831	166,955	191,998
Copper..........lb.	32,324,512	3,260,250	56,781,466	5,726,979	85,948,719	10,098,974
Gold..........fine oz.	138,015	5,313,578	178,871	6,886,533	174,090	6,702,465
Selenium..........lb.	29,091	55,564	71,952	138,148	70,276	122,983
Silver..........fine oz.	2,047,164	783,266	2,664,132	1,123,358	2,812,624	1,272,825
Tellurium..........lb.	†	†	1,223	1,957	†	†
Zinc..........lb.	62,142,288	2,119,673	84,461,520	2,880,983	96,350,404	3,854,016
NON-METALLICS—						
Coal..........tons	1,322,763	1,713,478	1,301,116	1,760,065	1,665,972	2,432,249
Grinding pebbles..........tons	....	....	....	....	....	....
Quartz (a)..........tons	148,208	51,873	155,699	54,495	163,102	57,086
Salt..........tons	....	....	....	....	....	....
Sodium sulphate..........tons	115,600	931,522	131,258	1,079,692	107,121	1,025,151
Natural gas..........M cu. ft.	106,168	31,850	117,124	45,585	116,201	45,568
Petroleum crude..........brls.	....	....	....	....	....	....
Volcanic dust..........tons	....	....	....	....	50	257
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Clay products..........	....	224,897	....	271,325	....	348,725
Sand and gravel..........tons	1,220,801	406,835	679,979	435,798	1,288,263	583,687
Total..........	....	**15,020,555**	....	**20,578,749**	....	**26,735,984**

(a) Low grade silica sand for fluxing purposes.
† No commercial recovery reported. See footnote preceding table.

Table 18.—Mineral Production of Alberta, 1941-1943

Product	1941		1942		1943	
	Quantity	Value	Quantity	Value	Quantity	Value
		$		$		$
METALLICS—						
Gold..........fine oz.	215	8,277	34	1,309	21	808
Silver..........fine oz.	21	8	2	1	1	....
NON-METALLICS—						
Bituminous sands..........tons	(a)	(a)	(a)	(a)	(a)	(a)
Coal..........tons	6,969,962	19,382,471	7,754,053	22,624,410	7,676,726	24,030,686
Natural gas..........M cu. ft.	30,905,440	5,175,364	34,482,585	6,146,146	35,569,078	6,241,815
Peat moss..........tons	421	5,055	58	1,380	55	1,425
Petroleum..........brls.	9,918,577	13,985,906	10,117,073	15,514,665	9,601,530	15,724,518
Salt..........tons	16,617	260,995	22,360	335,960	17,499	280,124
Sodium sulphate..........tons	8	32	....	....	....	....
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Cement..........brls.	492,515	985,030	668,043	1,307,353	606,703	1,176,442
Clay products..........	....	952,144	....	1,013,497	....	978,649
Lime—						
Quicklime..........tons	17,276	144,556	18,117	148,720	17,482	142,125
Hydrated lime..........tons	674	6,740	704	7,040	733	7,330
Sand and gravel..........tons	956,484	433,504	481,644	218,914	626,157	309,389
Stone..........tons	7,942	24,303	12,028	40,436	13,961	47,899
Total..........	....	**41,264,385**	....	**47,359,831**	....	**48,941,210**

(a) Included with petroleum refining; no crude sands sold.

Table 19.—Mineral Production of British Columbia, 1941-1943

Product	1941		1942		1943	
	Quantity	Value	Quantity	Value	Quantity	Value
		$		$		$
METALLICS—						
Antimony ... lb.	3,185,077	445,911	3,041,030	516,975	1,114,166	189,408
Arsenic (As_2O_3) ... lb.	(a)	(a)	7,114,751 (b)	71,148	(a)	(a)
Bismuth ... lb.	12	17	345,223	476,408	407,597	562,484
Cadmium ... lb.	1,081,374	1,269,533	972,413	1,147,447	598,673	688,474
Copper ... lb.	66,327,166	6,689,758	50,015,521	5,044,565	42,222,205	4,961,109
Gold ... fine oz.	608,203	23,415,816	474,338	18,262,052	241,346	9,291,821
Indium ... fine oz.	...	...	471	4,710	...	...
Lead ... lb.	456,840,454	15,358,976	507,199,704	17,052,054	439,155,635	16,485,902
Magnesium ... lb.	†10,905	2,944	193,727	85,240	...	...
Mercury ... lb.	536,304	1,335,697	1,035,914	2,943,807	1,690,240	4,559,200
Molybdenite ... lb.	...	...	4,887	2,907	...	...
Platinum ... fine oz.	60	2,293	40	1,528	7	270
Silver ... fine oz.	11,233,788	4,298,160	10,596,204	4,467,996	8,995,488	4,070,818
Tin ... lb.	64,744	33,667	1,237,863	643,689	776,937	450,623
Tungsten concentrates ... lb.	34,495	21,453	250,930	228,590	976,622	692,260
Zinc ... lb.	367,869,579	12,548,031	387,236,469	13,208,636	336,150,455	13,446,018
NON-METALLICS—						
Barite ... tons	228	1,140	1,917	16,084	1,924	15,834
Coal ... tons	2,020,844	6,492,672	2,168,541	7,566,822	2,039,402	7,648,720
Diatomite ... tons	105	2,625	147	2,547	16	866
Fluorspar ... tons	...	...	1,559	25,498	...	...
Gypsum ... tons	23,862	141,320	23,313	146,154	24,412	148,348
Iron oxides (ochre) ... tons	275	2,884	438	4,604	403	4,836
Magnesium sulphate ... tons	265	7,343	1,140	38,760	...	...
Mica (schist) ... tons	148	3,678	281	9,061	355	11,821
Peat moss ... tons	14,345	390,509	28,320	658,771	35,755	925,408
Quartz ... tons	631	1,579	815	2,037	38,562	77,124
Sodium carbonate ... tons	186	1,488	256	2,048	468	5,148
Sulphur* ... tons	103,140	1,026,794	116,248	1,134,586	104,601	1,039,126
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Cement ... brls.	501,945	986,322	571,945	1,198,014	534,769	1,146,865
Clay Products ...	...	558,426	...	560,746	...	495,163
Lime—						
Quicklime ... tons	30,075	206,769	25,977	204,438	31,714	261,526
Hydrated lime ... tons	5,427	37,282	5,057	32,466	6,333	43,895
Sand and gravel ... tons	2,960,924	1,151,322	2,599,861	1,091,202	2,257,784	877,413
Stone ... tons	341,190	406,771	310,341	396,342	236,212	341,906
Total ...	...	**76,841,180**	...	**77,247,932**	...	**68,442,386**

* Includes sulphur content of pyrites shipped and estimated sulphur contained in sulphuric acid and other products made from waste smelter gases.

(a) Considerable arsenic is contained in auriferous quartz ores exported. However, this is not paid for and data relating to its possible recovery are unobtainable.

(b) Estimated.

Table 20.—Mineral Production of Yukon, 1941-1943

Product	1941		1942		1943	
	Quantity	Value	Quantity	Value	Quantity	Value
		$		$		$
METALLICS—						
Antimony ... lb.	...	...	78	13	...	...
Gold ... fine oz.	70,959	2,731,922	83,246	3,204,971	41,160	1,584,660
Lead ... lb.	1,703,728	57,280	1,322,065	44,448	195,715	7,347
Silver ... fine oz.	856,772	327,810	482,133	203,296	52,348	23,690
Tungsten concentrates ... lb.	1,560	980	968	840	12,083	10,122
NON-METALLIC—						
Coal ... tons	...	...	...	...	...	...
Total ...	...	**3,117,992**	...	**3,453,568**	...	**1,625,819**

Table 21.—Mineral Production of Northwest Territories, 1941-1943

Product	1941		1942		1943	
	Quantity	Value	Quantity	Value	Quantity	Value
		$		$		$
Copper..........lb.	32,727	3,301	74,963	7,561	....	....
Gold..........fine oz.	74,417	2,865,054	99,394	3,826,669	59,032	2,272,732
Pitchblende products..........	(a)	925,196	(a)	(a)	(a)	(a)
Natural gas..........M cu. ft.	1,500	335	1,500	335	1,500	335
Silver..........fine oz.	15,327	5,864	22,531	9,500	13,250	5,996
Petroleum, crude..........brls.	23,664	47,328	75,789	108,477	293,750	400,201
Tungsten concentrates..........lb.	41,972	13,220	98,218	23,725	720	729
Total..........	....	**3,860,298**	....	**3,976,267**	....	**2,679,993**

(a) Data not available for publication, recovered in refinery located at Port Hope, Ontario.

Note.—For complete data relating to Canadian Mineral Production, by Provinces, see Annual Mineral Production Report for 1942.

Table 22.—Tonnage of Ore Mined and Rock Quarried in the Canadian Mining Industry, 1941, 1942 and 1943

—	1941	1942	1943
Gold quartz ores..........	20,031,736	17,722,866	12,853,610
Copper-gold-silver ores..........	9,263,071	8,575,626	M 8,251,579
Nickel-copper ores..........	9,974,272	12,081,545	M 12,925,590
Silver-cobalt ores..........	11,507	25,550	M 39,184
Silver-lead-zinc ores..........	2,816,974	2,951,480	M 3,252,657
Miscellaneous metals..........	883,851	1,120,478	M 1,359,008
Asbestos..........	7,707,367	8,233,516	7,929,471
Feldspar and nepheline syenite..........	57,861	77,049	90,416
Quartz, exclusive of sand..........	335,085	487,664	947,195
Gypsum..........	1,532,228	794,886	430,822
Talc and soapstone..........	38,067	30,376	M 22,128
Iron oxides..........	15,917	15,629	M 12,648
Other non-metals..........	412,159	457,251	529,326†
Stone, all kinds, quarries (exclusive of stone used for cement and lime)..........	7,940,801	7,978,066	7,222,950
Stone used for the manufacture of cement..........	2,086,781	2,155,750	1,994,202
Estimate rock for the manufacture of lime..........	1,530,200	1,574,508	1,614,481
Total (other than coal)..........	**64,637,877**	**64,282,240**	**59,475,267**
Total coal..........	**18,225,921**	**18,865,030**	**17,859,057**

For years 1922 to 1940, see Annual Mineral Production Report, year 1941.

† Exclusive of Peat and Peat Moss.

Table 23.—Principal Statistics of the Mineral Industry in Canada, by Industries, 1939-1943

1 Year	2 Number of active firms	3 Number of operating mines, oil and gas wells, quarries, gravel pits, etc.	4 Capital employed (excluding ore reserves or other unmined material) $	5 Number of employees	6 Salaries and wages $	7 Cost of process supplies, purchased electricity and fuel also freight and smelter charges (d) $	8 Net value of bullion, ore, concentrates, residues and other minerals shipped from the mines, smelters, brick and cement plants and quarries $
Metal Mining Industries							
Alluvial Gold Mines							
1939	98	104	9,844,524	830	1,439,765	318,613	4,204,974
1940	125	126	9,933,894	840	1,680,779	298,680	3,820,169
1941	108	110	10,755,706	797	1,954,278	332,361	3,800,142
1942	80	80	10,071,917	471	1,283,274	206,635	4,114,995
1943	43	43	11,372,849	237	646,283	157,758	1,892,214
Auriferous Quartz Mines							
1939	455	474	248,692,569	30,622	53,206,225	30,380,927	129,633,245
1940	428	438	250,919,160	31,405	55,205,096	32,076,741	146,713,744
1941	338	357	243,138,864	32,551	62,150,810	33,124,349	145,978,833
1942	223	227	245,240,997	26,030	54,388,872	28,625,881	131,938,902
1943	151	156	212,675,979	19,038	40,665,283	21,236,137	95,597,710
Copper-Gold-Silver Mines							
1939	28	30	58,867,620	6,083	9,920,591	24,978,891	26,182,577
1940	25	26	60,446,948	6,115	10,777,827	25,370,357	**27,804,419
1941	21	22	81,521,902	5,866	10,695,023	34,608,742	30,220,331
1942	26	28	84,776,243	5,646	11,097,412	35,459,148	33,688,642
1943	20	22	94,750,186	5,748	11,806,827	29,696,643	43,840,679
Silver-Cobalt Mines							
1939	36	43	2,461,556	323	412,728	237,096	653,032
1940(e)	48	44	337,060	123	158,024	57,347	809,263
1941	24	14	439,877	182	229,984	126,372	662,443
1942	13	14	358,691	192	283,980	150,043	600,207
1943	20	21	587,039	221	290,654	142,312	578,861
Silver-Lead-Zinc-Mines*							
1939	82	83	23,664,620	1,646	2,803,057	4,699,242	13,555,609
1940	82	83	19,969,198	1,585	3,052,532	4,380,568	16,439,530
1941	63	64	17,717,334	1,666	3,452,199	3,624,765	20,653,212
1942	44	44	19,484,442	2,185	4,730,370	4,268,352	23,504,642
1943	31	32	20,603,191	3,097	6,423,724	5,140,238	21,932,644
Nickel-Copper Mines							
1939	4	7	35,307,319	5,759	10,960,710	6,117,331	32,259,124
1940	3	6	36,765,154	6,372	12,256,863	6,783,621	34,240,489
1941	3	6	41,730,329	6,490	13,680,994	7,214,448	41,525,277
1942	4	8	48,303,780	7,147	15,365,207	8,180,777	50,801,633
1943	6	10	52,250,437	7,270	15,863,646	8,896,063	54,324,097
Miscellaneous Metal Mines							
1939	31	31	3,074,999	331	455,278	175,573	349,404
1940	36	36	2,720,642	445	628,025	720,173	1,309,105
1941	46	47	2,931,695	725	1,141,244	1,355,563	2,073,323
1942	68	67	3,956,427	1,352	2,396,731	1,519,686	3,906,555
1943	54	59	15,603,307	1,964	4,295,153	2,540,873	6,521,495
Non-Ferrous Metal Smelting and Refining							
1939	9	13	192,186,465	12,449	19,372,119	(b)182,544,662	† 80,057,833
1940	9	13	234,826,742	13,466	21,766,197	(b)207,301,259	† 98,059,288
1941	9	13	309,963,342	16,014	27,482,689	(b)259,585,976	†119,736,294
1942	10	15	356,052,965	21,162	37,340,556	(b)321,736,152	†125,881,047
1943	9	16	392,217,159	26,749	48,491,732	(b)309,356,356	†111,857,020
Total Metal Mining Industries							
1939	**743**	**785**	**574,099,672**	**58,043**	**98,570,473**	**249,452,335**	**286,895,798**
1940	**756**	**772**	**615,918,818**	**60,351**	**105,525,343**	**276,988,746**	****329,196,007**
1941	**612**	**633**	**708,199,049**	**61,291**	**120,787,221**	**339,972,576**	**364,649,855**
1942	**(f)468**	**483**	**768,245,462**	**64,185**	**126,886,402**	**490,152,674**	**374,526,623**
1943	**(g)334**	**359**	**800,060,147**	**64,324**	**128,483,302**	**467,165,380**	**336,541,720**

*Contains data relating to silver-pitchblende ores in the Northwest Territories. †Value added by smelting.

(b) Includes fuel and electricity used for metallurgical purposes and cost of ores, etc., treated which were $173,070,377 in 1938, $154,879,498 in 1939, $174,274,655 in 1940, $213,542,005 in 1941, $258,903,818 in 1942 and $317,917,186 in 1943.

(d) See end of table.

(e) The large decrease in capital employed in the Silver-Cobalt industry in 1940 resulted largely from the leasing of the O'Brien mine and the cessation of mining operations by M. J. O'Brien Ltd. Delinquent returns, received after completion of these totals show 83 employees receiving $88,105 in salaries and wages in the Silver-Cobalt Industry also capital was increased by $154.109.

(f) 371 producing. **Revised data. (g) 285 producing.

Table 23.—Principal Statistics of the Mineral Industry in Canada, by Industries, 1939-1943—Continued

1 Year	2 Number of active firms	3 Number of operating mines, oil and gas wells, quarries, gravel pits, etc.	4 Capital employed (excluding ore reserves or other unmined material) $	5 Number of employees	6 Salaries and wages $	7 Cost of process supplies, purchased electricity and fuel also freight and smelter charges (d) $	8 Net value of bullion, ore, concentrates, residues and other minerals shipped from the mines, smelters, brick and cement plants and quarries $
Total Non-Metal Mining Industries, including Fuels							
*FUELS							
COAL							
1939	467	510	109,072,484	26,472	30,720,991	8,203,815	38,062,870
1940	491	527	103,634,890	26,434	34,043,162	8,996,231	43,552,679
1941	417	469	106,498,356	26,330	38,149,602	9,680,614	45,780,856
1942	380	419	108,766,697	26,205	42,091,137	10,965,528	49,473,229
1943	356	413	111,867,036	26,473	47,291,919	11,551,496	48,329,450
NATURAL GAS							
1939	222	3,352	78,409,338	1,990	2,536,220	98,397	10,634,146
1940	236	3,438	80,487,760	2,189	2,748,740	94,354	11,108,749
1941	231	3,424	81,280,541	2,161	2,841,795	108,204	11,114,899
1942	212	3,566	82,768,602	1,940	2,826,811	104,802	11,251,548
1943	191	3,558	83,963,163	1,882	2,846,514	189,740	11,362,956
PETROLEUM							
1939	348	2,389	52,102,077	1,780	2,567,983	1,432,055	9,310,922
1940	300	2,360	53,216,853	1,741	2,835,410	1,467,995	10,018,083
1941	272	2,312	58,206,984	1,844	3,254,817	803,798	14,207,526
1942	242	2,253	54,707,282	1,072	3,648,965	1,207,463	15,668,660
1943	233	2,197	59,058,622	2,399	5,212,895	912,358	15,994,422
TOTAL FUELS							
1939	*1,037*	*6,251*	*239,583,899*	*30,242*	*35,825,194*	*9,734,267*	*58,007,938*
1940	*1,027*	*6,325*	*237,339,500*	*30,364*	*39,627,312*	*10,558,580*	*64,679,511*
1941	*920*	*6,205*	*245,985,881*	*30,335*	*44,246,214*	*10,592,616*	*71,103,281*
1942	*834*	*6,238*	*246,242,581*	*30,117*	*48,566,913*	*12,277,793*	*76,393,437*
1943	*780*	*6,168*	*254,888,821*	*30,754*	*55,351,328*	*12,653,594*	*75,686,828*
OTHER NON-METAL MINING INDUSTRIES							
ASBESTOS							
1939	8	9	22,489,233	3,784	4,347,064	3,463,513	12,395,699
1940	8	9	19,799,280	3,886	4,728,702	3,720,968	11,903,688
1941	9	10	21,325,558	3,760	4,996,101	4,246,246	17,229,399
1942	8	10	18,741,364	3,749	5,299,454	4,393,973	18,277,235
1943	9	10	20,831,427	3,844	5,576,734	4,509,876	19,899,540
FELDSPAR, QUARTZ AND NEPHELINE SYENITE							
1939	43	43	1,591,015	338	330,170	178,721	1,173,950
1940	44	46	2,174,258	400	377,254	214,517	1,294,482
1941	38	38	2,314,582	506	610,489	250,983	1,587,071
1942	36	38	2,563,248	533	782,903	412,028	1,586,968
1943	35	37	2,895,131	535	768,199	456,852	1,681,377

* Production of peat since 1929 included with the other non-metallics.
(d) See footnote at end of table.

Table 23.—Principal Statistics of the Mineral Industry in Canada, by Industries, 1939-1943—Continued

1 Year	2 Number of active firms	3 Number of operating mines, oil and gas wells, quarries, gravel pits, etc.	4 Capital employed (excluding ore reserves or other unmined material) $	5 Number of employees	6 Salaries and wages $	7 Cost of process supplies, purchased electricity and fuel also freight and smelter charges (d) $	8 Net value of bullion, ore, concentrates, residues and other minerals shipped from the mines, smelters, brick and cement plants and quarries $
OTHER NON-METAL MINING INDUSTRIES—Continued							
GYPSUM							
1939	10	17	6,806,907	714	692,158	299,319	1,635,808
1940	9	16	4,648,662	694	717,666	418,339	1,647,594
1941	8	15	5,175,821	648	745,008	452,008	1,796,420
1942	7	13	4,386,531	510	657,620	244,139	1,010,043
1943	6	12	5,147,424	438	617,780	248,043	1,133,425
IRON OXIDES (OCHRE)							
1939	7	7	215,445	38	26,916	8,194	80,224
1940	7	7	195,263	46	38,842	18,033	93,841
1941	4	4	189,877	44	42,152	21,394	120,675
1942	5	5	194,541	47	44,288	26,615	125,038
1943	5	5	254,891	47	46,554	27,028	108,865
MICA							
1939	61	61	230,337	224	112,653	19,014	128,307
1940	65	65	259,168	218	134,705	27,829	209,316
1941	81	81	1,180,097	246	181,800	39,529	295,759
1942	106	106	1,460,769	361	258,605	37,31[illegible]	346,254
1943	78	78	458,402	430	357,992	54,395	499,461
PEAT (e)							
1940	(f)	(f)	(f)	(f)	(f)	(f)	(f)
1941	22	22	825,154	667	486,116	17,472	628,936
1942	35	35	3,212,921	1,316	1,380,142	277,086	1,031,211
1943	44	44	2,477,287	1,012	1,000,348	307,674	1,384,770
SALT							
1939	9	9	4,447,204	547	741,736	784,778	2,173,204
1940	9	9	4,903,914	586	836,506	860,768	2,461,482
1941	9	9	5,559,307	668	1,018,652	1,175,966	2,676,533
1942	9	9	5,687,511	675	1,114,574	† 1,419,248	3,173,755
1943	9	9	5,490,594	682	1,223,009	† 1,539,774	3,648,854
TALC AND SOAPSTONE							
1939	6	6	239,835	65	60,512	22,332	147,734
1940	8	8	319,398	94	80,879	37,130	192,509
1941	8	8	695,581	148	128,820	55,206	305,603
1942	10	10	567,665	115	113,601	59,113	251,711
1943	8	8	576,691	90	101,719	58,031	208,654
MISCELLANEOUS							
1939	46	47	3,128,035	465	539,143	394,357	964,565
1940	46	46	2,491,527	547	703,501	608,028	1,508,728
1941	61	63	2,648,830	683	878,700	797,564	1,645,184
1942	61	64	4,919,871	811	1,142,072	952,860	2,053,307
1943	52	54	3,522,842	911	1,363,526	1,208,470	2,208,237

(d) See footnote at end of this table.
(e) Includes data on peat fuel, peat moss and peat humus.
‡ Value of containers is included from 1939.

Table 23.—Principal Statistics of the Mineral Industry in Canada, by Industries, 1939-1943—Continued

1 Year	2 Number of active firms	3 Number of operating mines, oil and gas wells, quarries, gravel pits, etc.	4 Capital employed (excluding ore reserves or other unmined material) $	5 Number of employees	6 Salaries and wages $	7 Cost of process supplies, purchased electricity and fuel also freight and smelter charges (d) $	8 Net value of bullion, ore, concentrates, residues and other minerals shipped from the mines, smelters, brick and cement plants and quarries $
TOTAL OTHER NON-METAL MINING INDUSTRIES							
1939	*190*	*199*	*39,148,011*	*6,175*	*6,850,352*	*5,170,228*	*18,699,491*
1940	*196*	*206*	*34,881,470*	*6,471*	*7,618,055*	*5,905,612*	*19,311,640*
1941	*240*	*250*	*39,914,807*	*7,370*	*9,087,838*	*7,056,368*	*26,285,580*
1942	*277*	*290*	*41,734,421*	*8,117*	*10,793,259*	*7,822,375*	*27,855,522*
1943	*246*	*257*	*41,654,689*	*7,989*	*11,055,861*	*8,410,143*	*30,833,183*
Total Non-Metal Mining Industries, including Fuels							
1939	**1,227**	**6,450**	**278,731,910**	**36,417**	**42,675,546**	**14,904,495**	**76,707,429**
1940	**1,223**	**6,531**	**272,220,979**	**36,835**	**47,245,367**	**16,464,192**	**83,991,151**
1941	**1,160**	**6,455**	**285,900,688**	**37,705**	**53,334,052**	**17,648,984**	**97,388,861**
1942	**1,111**	**6,528**	**287,977,002**	**38,234**	**59,360,172**	**20,100,168**	**104,248,959**
1943	**1,026**	**6,425**	**296,543,510**	**38,743**	**66,107,189**	**21,063,737**	**106,520,011**
Clay Products and Other Structural Materials							
CLAY PRODUCTS							
Brick, Tile and Sewer Pipe							
1939	133	141	17,614,307	2,055	2,072,351	1,093,160	3,852,837
1940	132	136	16,569,424	2,343	2,488,390	1,402,681	4,581,541
1941	127	132	16,734,645	2,557	2,981,278	1,748,511	5,323,433
1942	111	115	17,181,503	2,152	2,777,171	1,420,355	5,016,090
1943	93	97	16,423,684	1,781	2,565,580	1,233,412	4,674,246
STONEWARE AND POTTERY							
1939	8	8	326,435	110	89,337	14,338	190,901
1940	7	7	577,019	214	186,861	19,547	340,778
1941	10	10	642,908	324	246,507	20,062	483,330
1942	8	8	612,428	371	295,840	30,884	614,394
1943	8	8	739,063	392	344,261	28,395	672,140
*TOTAL CLAY PRODUCTS**							
1939	*141*	*149*	*17,940,742*	*2,165*	*2,161,688*	*1,107,498*	*4,043,738*
1940	*139*	*143*	*17,146,443*	*2,557*	*2,675,251*	*1,422,228*	*4,922,319*
1941	*137*	*142*	*17,377,553*	*2,881*	*3,227,785*	*1,768,573*	*5,806,763*
1942	*119*	*123*	*17,793,931*	*2,523*	*3,073,011*	*1,451,239*	*5,630,484*
1943	*101*	*105*	*17,162,747*	*2,173*	*2,909,841*	*1,261,807*	*5,346,386*
OTHER STRUCTURAL MATERIALS†							
CEMENT							
1939	3	8	51,251,358	1,001	1,297,542	2,238,039	6,273,172
1940	3	8	50,370,276	1,052	1,515,766	4,291,221	8,715,422
1941	3	8	51,108,294	1,235	1,860,931	5,044,208	9,279,164
1942	3	8	51,121,894	1,241	2,059,337	5,414,487	10,213,916
1943	3	8	50,438,932	1,209	2,154,218	5,557,089	7,152,763

(*) Includes kaolin and other clays.

(†) A considerable proportion of the values shown for lime and stone sales represents shipments for chemical purposes —see chapter 9.

Table 23.—Principal Statistics of the Mineral Industry in Canada, by Industries, 1939-1943—Cnotinued

1	2	3	4	5	6	7	8
Year	Number of active firms	Number of operating mines, oil and gas wells, quarries, gravel pits, etc.	Capital employed (excluding ore reserves or other unmined material) $	Number of employees	Salaries and wages $	Cost of process supplies, purchased electricity and fuel also freight and smelter charges (d) $	Net value of bullion, ore, concentrates, residues and other minerals shipped from the mines, smelters, brick and cement plants and quarries $
OTHER STRUCTURAL MATERIALS—Concluded							
LIME							
1939	54	59	4,802,983	937	849,468	1,052,012	2,951,502
1940	50	55	5,107,739	962	1,003,671	1,601,546	3,593,009
1941	45	50	4,633,946	1,105	1,321,571	2,196,529	4,161,412
1942	44	48	4,742,066	1,022	1,312,320	2,598,560	3,932,279
1943	41	45	4,607,651	898	1,408,393	1,924,482	4,908,510
SAND AND GRAVEL							
1939	1,403	6,215	2,735,690	6,120	3,981,913	274,509	10,966,593
1940	1,458	5,596	3,456,502	4,243	3,744,585	291,008	11,468,237
1941	1,390	5,407	4,287,789	3,252	2,995,526	474,647	9,901,076
1942	1,419	5,217	4,477,547	2,141	2,404,755	677,149	8,328,265
1943	1,387	5,054	3,674,501	2,320	2,683,257	379,435	8,626,422
STONE							
1939	452	573	12,213,030	3,076	2,816,578	1,081,884	5,393,812
1940	482	560	12,127,271	2,886	2,779,703	1,204,375	6,194,584
1941	457	539	11,162,036	2,758	2,896,100	1,283,183	6,717,501
1942	412	490	10,988,011	2,697	3,454,263	1,517,169	7,229,425
1943	407	453	10,954,939	2,473	3,529,755	1,533,627	6,430,552
TOTAL OTHER STRUCTURAL MATERIALS							
1939	*1,912*	*6,855*	*71,003,061*	*11,134*	*8,945,501*	*4,648,444*	*25,585,079*
1940	*1,993*	*6,219*	*71,061,788*	*9,143*	*9,043,725*	*7,388,150*	*29,971,252*
1941	*1,904*	*6,004*	*71,192,065*	*8,350*	*9,074,128*	*8,998,567*	*30,059,153*
1942	*1,878*	*5,763*	*71,329,518*	*7,101*	*9,230,675*	*10,207,365*	*29,703,885*
1943	*1,838*	*5,560*	*69,676,023*	*6,900*	*9,775,623*	*9,394,633*	*27,118,247*
Total Clay Products and Other Structural Materials							
1939	**2,053**	**7,004**	**88,943,803**	**13,299**	**11,107,189**	**5,753,912**	**29,628,817**
1940	**2,132**	**6,362**	**88,208,231**	**11,700**	**11,718,976**	**8,810,378**	**31,893,571**
1941	**2,041**	**6,146**	**88,569,618**	**11,231**	**12,301,913**	**10,767,140**	**35,865,916**
1942	**1,997**	**5,886**	**89,123,419**	**9,624**	**12,303,686**	**11,658,604**	**35,331,369**
1943	**1,939**	**5,665**	**86,838,770**	**9,073**	**12,685,461**	**10,656,440**	**32,461,633**
GRAND TOTAL OF ALL INDUSTRIES							
1939	**4,023**	**14,239**	**911,775,385**	**107,759**	**152,353,208**	**270,110,772**	**393,232,044**
1940	**4,111**	**13,665**	**976,318,028**	**108,886**	**164,189,686**	**302,263,316**	***418,080,720**
1941	**3,813**	**13,234**	**1,082,669,355**	**113,227**	**186,423,186**	**368,388,700**	**497,904,632**
1942	**3,576**	**12,897**	**1,145,345,913**	**112,043**	**198,550,260**	**431,911,416**	**514,109,951**
1943	**3,299**	**12,449**	**1,183,442,127**	**112,140**	**207,575,955**	**498,885,557**	**475,529,364**

NOTE.—The net value as given in column 8 represents the **gross value** as given by the operator less the cost of items indicated in column 7.

* Revised data.

Table 24.—Principal Statistics of the Mineral Industry in Canada, by Provinces, 1939-1943

1 Year	2 Number of operating mines, oil and gas wells, quarries gravel pits, etc.	3 Capital employed (excluding ore reserves or other unmined material) $	4 Number of employees	5 Salaries and wages $	6 Cost of process supplies, purchased electricity and fuel also freight and smelter charges (b) (d) $	7 Net value of bullion, ore, concentrates, residues and other minerals shipped from the mines, smelters, brick and cement plants and quarries (*) $
Nova Scotia						
1939	914	52,580,559	15,202	17,371,518	5,450,671	23,504,419
1940	666	48,086,422	14,934	19,285,662	6,041,154	26,189,233
1941	622	48,356,346	15,246	21,388,809	6,684,110	24,535,707
1942	694	49,486,029	14,394	22,169,053	6,594,557	25,174,060
1943	712	51,261,925	13,852	25,348,097	6,737,166	21,979,202
New Brunswick						
1939	426	4,466,757	3,263	2,311,835	329,538	3,600,454
1940	423	4,522,307	2,240	1,939,160	376,192	3,024,317
1941	428	4,429,485	2,262	2,097,842	421,785	3,231,658
1942	433	4,401,029	1,718	1,855,798	404,750	3,176,007
1943	433	4,320,846	1,570	1,828,019	396,622	3,249,933
Quebec						
1939	4,137	179,371,057	20,872	25,689,382	81,840,188	81,600,118
1940	3,857	213,363,729	21,726	29,025,418	93,034,012	⊕ 100,134,979
1941	3,780	298,678,687	23,149	34,008,021	127,618,884	127,649,905
1942	3,442	329,023,834	27,235	42,901,445	169,770,830	138,100,940
1943	3,332	368,560,300	31,491	52,859,348	234,019,383	134,500,359
Ontario						
1939	6,380	397,025,573	37,233	63,220,042	119,307,190	188,867,969
1940	6,406	405,063,185	38,774	66,395,845	135,879,424	209,277,055
1941	6,196	408,374,770	40,496	74,902,555	154,713,109	219,459,986
1942	6,324	438,130,467	36,866	72,868,161	168,749,548	212,351,819
1943	6,128	426,410,248	33,516	67,732,244	177,688,655	183,488,086
Manitoba						
1939	260	36,516,216	3,027	4,541,992	16,217,955	12,401,404
1940	136	39,640,423	3,145	5,107,054	16,016,832	14,065,270
1941	185	41,780,442	3,101	5,312,075	18,966,154	11,898,109
1942	173	33,172,231	2,512	4,600,171	12,470,881	9,508,569
1943	150	29,033,717	1,777	3,497,951	9,429,404	8,973,959
Saskatchewan						
1939	258	18,838,439	2,026	2,347,264	6,749,197	6,391,404
1940	252	17,008,171	1,961	2,573,878	7,033,060	8,652,006
1941	249	22,851,100	1,977	3,105,529	12,689,122	9,336,756
1942	219	34,755,279	2,450	4,401,181	22,710,389	14,487,408
1943	206	47,167,799	3,067	5,737,896	24,468,836	23,507,079

Plants in the provinces do not add to Canada total, owing to the fact that a plant located on the Manitoba-Saskatchewan boundary is counted but once.

* See footnote, preceding table.

(b) Includes fuel and electricity used for metallurgical purposes.

(d) See footnote, preceding table.

⊕ Revised data.

Table 24.—Principal Statistics of the Mineral Industry in Canada, by Provinces, 1939-1943—Concluded

1	2	3	4	5	6	7
Year	Number of operating mines, oil and gas wells, quarries gravel pits, etc.	Capital employed (excluding ore reserves or other unmined material) $	Number of employees	Salaries and wages $	Cost of process supplies, purchased electricity and fuel also freight and smelter charges (b) (d) $	Net value of bullion, ore, concentrates, residues and other minerals shipped from the mines, smelters, brick and cement plants and quarries (*) $
Alberta						
1939	709	121,311,648	10,548	13,097,818	3,508,845	26,049,861
1940	729	120,234,760	10,628	14,535,789	3,832,268	29,593,293
1941	742	129,681,543	11,141	17,065,351	3,612,114	36,167,469
1942	723	126,642,796	11,446	19,628,105	4,736,312	40,604,704
1943	795	128,657,659	12,316	21,825,643	4,082,748	41,767,222
British Columbia						
1939	1,130	119,437,585	14,587	21,698,600	34,754,310	45,419,651
1940	1,169	115,249,764	14,420	23,227,719	38,730,717	52,513,427
1941	1,008	114,213,762	14,801	25,797,418	42,582,946	60,323,299
1942	845	110,267,057	14,323	27,106,996	45,101,414	64,378,171
1943	654	107,674,852	13,399	25,703,433	40,092,618	54,105,996
Northwest Territories						
1939	15	2,110,344	273	468,996	354,228	(e) 1,592,779
1940	16	3,037,930	441	880,414	623,965	1,539,206
1941	12	4,267,299	553	1,174,903	565,197	2,355,624
1942	29	8,888,280	701	1,737,398	951,183	3,017,569
1943	31	8,391,343	800	1,999,601	364,802	2,305,032
Yukon						
1939	10	10,117,207	728	1,605,671	1,598,650	3,803,985
1940	11	10,141,337	617	1,518,747	695,692	3,091,943
1941	12	10,035,921	501	1,570,683	535,279	2,946,119
1942	15	10,578,920	398	1,221,952	415,582	3,309,804
1943	8	11,963,738	352	1,043,663	705,323	1,652,496
Canada						
1939	**11,239**	**841,775,385**	**107,759**	**152,353,208**	**270,110,772**	**393,232,044**
1940	**13,665**	**976,348,028**	**108,886**	**164,489,686**	**302,263,316**	⊕ **448,080,729**
1941	**13,234**	**1,082,669,355**	**113,227**	**186,423,186**	**368,388,700**	**497,961,632**
1942	**12,897**	**1,145,345,913**	**112,043**	**198,550,260**	**431,911,446**	**514,109,951**
1943	**12,449**	**1,183,442,427**	**112,140**	**207,575,955**	**498,885,557**	**475,529,364**

Plants in the provinces do not add to Canada total, owing to the fact that a plant located on the Manitoba-Saskatchewan boundary is counted but once.

* See footnote, preceding table.

(b) Includes fuel and electricity used for metallurgical purposes.

(d) See footnote, preceding table.

(e) The value of Pitchblende refinery products is credited to the non-ferrous smelting and refining industry on Ontario and data relating to Pitchblende mining operations are included with Yukon. The value of Pitchblende refinery products are not included in 1943.

⊕ Revised data

TREND IN EMPLOYMENT, 1943

(Employment and Payroll Statistics Branch—Dominion Bureau of Statistics)

General Summary

The mining industry continued to suffer from the prevailing shortage of labour; employment in each month of the year under review was in smaller volume than in 1942, when activity was generally less than in 1941. The index declined from 162·4 at January 1, to 158·1 at the beginning of December, averaging 158·5 in the twelve months. The 1942 mean had been 171·3.

The 74,070 persons employed, on the average, by the 457 co-operating mining operators were reported to have been paid a weekly average payroll of $2,672,498 in 1943. This was a per capita of $36.09. In the year before, the 80,056 persons in recorded employment received an average of $2,785,432 per week in salaries and wages, while the average per employee was $34.81. The annual index of payrolls was 102·7 in the year under review, as compared with 108·1 in 1942; the decline in employment in the same comparison was 7·5 per cent.

Coal Mining.—There was a slight falling off in coal mining, on the whole, during 1943, when the index averaged 93·2, as compared with 94·7 in the preceding year; it should also be noted however, that the index at its 1943 maximum of 100·4 at December 1, was 8½ per cent higher than at the same date in 1942, whereas the January 1 figure had been 7·4 per cent lower than it was 12 months earlier. The more favourable situation towards the end of the year resulted from important measures taken by the Government to increase production. A working force of 25,614 persons was employed, on the average, by the 115 co-operating firms, as compared with 26,020 employees in 105 mines in 1942. The reported payrolls in the year under review amounted to $850,359 per week, a per capita average of $33.18. In 1942, the indicated disbursements averaged $808,893, representing an average of $31.09 per person. At their 1943 maximum at December 1, payrolls in the coal mining division had risen by 53 per cent from June 1, 1941, while employment in the same period had advanced by 9·7 per cent. The substantially greater gain in the disbursements was partly due to important wage adjustments authorized by the War Labour Board.

Metallic Ores—The prevailing labour situation had an especially marked effect upon metallic ore mining, particularly upon gold mining; throughout 1943, activity was less than in 1942, or, indeed, than in any earlier year since 1937. The index averaged 303·3, as compared with 346·1 in 1942, and 366·2 in 1941, when the figure was the highest in the record. Data were tabulated from 221 employers whose working forces aggregated 37,867, varying from 39,854 at January 1, to 35,794 at the beginning of December. The reported weekly payrolls of the persons employed by the co-operating metallic ore mines averaged $1,502,469, a per capita of $39·70; in 1942 the weekly salaries and wages were given as $1,668,080, and the average, $38.60.

Non-metallic Minerals, Other than Coal.—A slight decline from 1942 was generally indicated in employment in the production of non-metallic minerals, other than coal. Information was furnished by 121 firms in 1943, with an average staff of 10,589, whose salaries and wages averaged $319,670 per week; in the preceding year, the 10,821 persons in recorded employment had received an average of $308,459. The average per employee rose from $28.51 in 1942, to $30.84 in 1943. The latest annual index of employment, at 156·3, was slightly below that of 159·4 in 1942, while the index of payrolls, averaging 116·2, was 2·6 per cent higher. Asbestos mining and certain other divisions of the group continued active, but quarrying and some other branches were quieter.

Table 25.—Strikes and Lock-outs in Canada, by Industries, 1942 and 1943 (Department of Labour)

—	1942					1943				
	Number of strikes and lockouts	Workers involved		Time lost		Number of strikes and lockouts	Workers involved		Time lost	
		No.	Per cent of total	Man working days	Per cent of total		No.	Per cent of total	Man working days	Per cent of total
Agriculture	2	426	0·3	278	0·1	....	....	....	....	....
Logging	5	604	0·5	974	0·2	6	632	0·3	7,287	0·7
Fishing and trapping	1	3,260	2·9	10,000	2·2	....	....	....	....	....
Mining, etc. (a)	61	22,408	19·7	129,529	28·8	120	59,552	27·3	208,314	20·0
Coal mining	(53)	(19,670)	(17·3)	(66,318)	(14·7)	(111)	(59,017)	(27·0)	(204,980)	(19·7)
Manufacturing	219	80,037	70·3	296,135	65·8	222	139,056	63·9	777,661	74·7
Construction	31	3,889	3·4	4,266	1·0	12	785	0·4	1,920	0·2
Transportation and Public Utilities	15	2,233	2·0	5,439	1·2	24	8,712	3·9	18,958	1·8
Trade	4	61	0·0	74	0·0	7	202	0·1	718	0·1
Finance	1	224	0·2	1,100	0·2	....	....	....	....	....
Service	15	774	0·7	2,407	0·5	16	8,865	4·1	26,340	2·5
Total	**354**	**113,916**	**100·0**	**450,202**	**100·0**	**402(b)**	**218,404**	**100·0**	**1,041,198**	**100·0**

(a) Non-ferrous smelting is included with mining.

(b) This total is not the sum of the figures given above because two protest strikes in Nova Scotia involved workers in more than one industry.

Of the 402 strikes and lockouts recorded for 1943, 120 were in mining, involving 27·3 per cent of the workers in all strikes and causing a time loss in man-working days of 20 per cent of the total. In the coal mining industry there were 111 strikes, involving 27 per cent of the workers in all strikes and causing 19·7 per cent of the total time loss. In April a general strike of 2,000 coal miners in the Drumheller Valley, Alberta, caused a time loss of 20,000 man-days; in September a strike of 1,500 miners at Springhill caused a time loss of 14,500 days; and in November a general strike of 9,850 miners in Alberta and British Columbia caused a time loss of 94,000 days. These three strikes accounted for more than 20 per cent of the workers involved in coal mining strikes and more than 60 per cent of the time loss. In manufacturing, a strike in August of 21,131 aircraft factory workers at Montreal was responsible for a time loss of 200,000 man-working days or more than 19 per cent of the total for the year. During the year 12 strikes caused about 60 per cent of the total time loss. There were no strikes in gold mining during 1943 but two were on record for 1942, one involving a small number of workers at Pickle Crow, Ontario, and the other a strike of 2,800 miners at Kirkland Lake, Ontario, which commenced in 1941 and terminated in 1942, causing a time loss of 58,000 days in 1942 and 78,000 in 1941.

Table 26.—Employees, Salaries and Wages in the Mineral Industry in Canada, by Provinces, 1943

Province	*Average number of employees					Salaries and wages		
	Salaried employees		Wage-earners		Total†	Salaries	Wages	Total
	Male	Female	Male	Female				
						$	$	$
Nova Scotia	523	154	13,162	13	**13,852**	1,358,679	23,989,418	**25,348,097**
New Brunswick	63	29	1,455	23	**1,570**	181,335	1,646,684	**1,828,019**
Quebec	2,699	808	27,809	175	**31,491**	6,977,670	45,881,678	**52,859,348**
Ontario	3,050	664	28,809	993	**33,516**	9,814,745	57,917,495	**67,732,241**
Manitoba	170	36	1,501	70	**1,777**	532,387	2,965,564	**3,497,951**
Saskatchewan	311	68	2,583	105	**3,067**	956,140	4,781,756	**5,737,896**
Alberta	1,174	245	10,705	192	**12,316**	3,197,858	18,627,785	**21,825,643**
British Columbia	1,438	349	11,246	366	**13,399**	4,259,122	21,444,311	**25,703,433**
Yukon	52	6	289	5	**352**	208,197	835,466	**1,043,663**
Northwest Territories (a)	209	55	527	9	**800**	690,847	1,308,814	**1,999,661**
Canada	**9,689**	**2,414**	**98,086**	**1,951**	**112,140**	**28,176,980**	**179,398,975**	**207,575,955**

*The average number of wage-earners was obtained by adding the monthly figures for individual companies and dividing by 12 irrespective of the number of months worked, the average number of wage-earners in the industry, as in the previous years, is the sum of these individual averages.

†The data are not inclusive of all individuals or syndicates engaged exclusively in prospecting or general exploration.

(a) Pitchblende mining data included with Yukon.

Table 27.—Employees, Salaries and Wages in the Mineral Industry in Canada, by Industries, 1943

Industry	*Average number of employees					Salaries and wages		
	Salaried employees		Wage-earners		Total	Salaries	Wages	Total
	Male	Female	Male	Female				
						$	$	$
METAL MINING								
Alluvial Gold Mines	31	5	198	3	**237**	131,995	514,288	**646,283**
Auriferous Quartz Mines	1,750	227	16,921	140	**19,038**	6,088,392	34,576,891	**40,665,283**
Copper-Gold-Silver Mines	535	120	4,938	155	**5,748**	1,795,297	10,011,530	**11,806,827**
Silver-Cobalt Mines	34	6	180	1	**221**	56,570	234,084	**290,654**
Silver-Lead-Zinc Mines†	359	48	2,646	44	**3,097**	940,099	5,483,625	**6,423,724**
Nickel-Copper Mines	401	44	6,677	148	**7,270**	1,273,291	14,590,355	**15,863,646**
Miscellaneous Metal Mines	232	45	1,652	35	**1,964**	600,684	3,694,469	**4,295,153**
Non-ferrous Smelting and Refining	2,456	919	22,577	797	**26,749**	7,160,290	41,331,442	**48,491,732**
NON-METAL MINING, INCLUDING FUELS								
Coal	1,359	248	24,843	23	**26,473**	3,502,776	43,789,143	**47,291,919**
Natural gas	769	214	883	16	**1,882**	1,728,318	1,118,196	**2,846,514**
Petroleum	496	155	1,736	12	**2,399**	1,547,605	3,665,290	**5,212,895**
OTHER NON-METALLIC MINING								
Asbestos	254	91	3,486	13	**3,844**	772,455	4,804,279	**5,576,734**
Feldspar and Quartz (a)	58	10	465	2	**535**	118,703	649,496	**768,199**
Gypsum	41	10	369	18	**438**	116,717	501,063	**617,780**
Iron Oxides	4	3	40	......	**47**	10,293	36,261	**46,554**
Mica	31	8	229	162	**430**	57,307	300,685	**357,992**
Peat (b)	43	21	866	82	**1,012**	119,156	881,192	**1,000,348**
Salt	82	53	495	52	**682**	366,555	856,454	**1,223,009**
Talc and Soapstone	8	2	80	......	**90**	23,794	77,925	**101,719**
Miscellaneous	74	10	825	2	**911**	155,593	1,207,933	**1,363,526**
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS								
Cement	75	16	1,091	27	**1,209**	215,137	1,939,081	**2,154,218**
Clay Products	190	58	1,718	207	**2,173**	570,300	2,339,541	**2,909,841**
Lime	78	21	797	2	898	158,629	1,249,764	**1,408,393**
Sand and Gravel	77	12	2,227	4	**2,320**	182,034	2,501,223	**2,683,257**
Stone	252	68	2,147	6	**2,473**	484,990	3,044,765	**3,529,755**
Total	**9,689**	**2,414**	**98,086**	**1,951**	**112,140**	**28,176,980**	**179,398,975**	**207,575,955**

*See footnote, preceding table.
†Includes pitchblende-silver mines.
(a) Includes nepheline-syenite mines.
(b) Includes fuel, moss and humus.

Table 28.—The Number of Wage-Earners in the Canadian Mining Industry, 1943, who Worked the Number of Hours Specified, during One Week in Month of Highest Employment

—	30 hours or less	31-43 hours	44 hours	45-47 hours	48 hours	49-50 hours	51-54 hours	55 hours	56-64 hours	65 hours and over	Grand total	Total wages paid in that week*
												$
By provinces—												
Nova Scotia	123	1,532	507	186	13,118	27	222	38	820	108	16,681	549,687
New Brunswick	34	183	35	33	2,385	86	411	1	75	26	3,269	61,787
Quebec	1,207	1,825	433	710	20,527	899	2,025	371	3,984	1,239	33,220	993,009
Ontario	879	1,585	233	1,497	20,272	505	1,803	388	4,909	1,338	33,409	1,238,371
Manitoba	50	74	61	53	1,565	139	123	19	460	78	2,622	87,138
Saskatchewan	214	303	25	315	1,318	171	313	35	327	173	3,194	104,543
Alberta	509	1,083	337	254	8,208	251	704	21	512	368	12,247	482,501
British Columbia	289	1,534	266	239	9,770	56	266	24	1,056	54	13,554	496,066
Yukon†	7	4	5	1	......	30	11	2	179	140	379	18,983
Northwest Territories	23	14	1	......	420	4	22	......	177	31	692	35,142
Canada Total, Male	**3,188**	**7,916**	**1,809**	**3,111**	**75,998**	**2,089**	**5,767**	**862**	**12,422**	**3,518**	**116,680**	**4,011,362**
Canada Total, Female	**147**	**221**	**94**	**177**	**1,585**	**79**	**133**	**37**	**77**	**37**	**2,587**	**55,865**
Canada Total	**3,335**	**8,137**	**1,903**	**3,288**	**77,583**	**2,168**	**5,900**	**899**	**12,499**	**3,555**	**119,267**	**4,067,227**

Table 28.—The number of Wage-Earners in the Canadian Mining Industry, 1943, who Worked the Number of Hours Specified, during One Week in Month of Highest Employment—Concluded

—	30 hours or less	31-43 hours	44 hours	45-47 hours	48 hours	4.-50 hours	51-54 hours	55 hours	56-64 hours	65 hours and over	Grand total	Total wages paid in that week*
												$
By Industries—												
METAL MINING												
Alluvial Gold Mines	5	4	.....	2	37	.....	6	2	169	44	269	13,668
Auriferous Quartz Mines	521	1,318	134	208	11,089	314	1,146	80	4,148	653	19,611	762,307
Copper-Gold-Silver Mines	200	385	32	280	3,272	217	529	25	555	87	5,582	211,916
Silver-Cobalt Mines	13	43	1	6	139	6	14	.....	54	9	285	8,177
†Silver-Lead-Zinc Mines	80	137	11	27	1,910	58	92	4	580	168	3,067	119,362
Nickel-Copper Mines	78	160	22	141	6,962	16	70	5	73	30	7,557	307,579
Miscellaneous Metal Mines	59	70	16	96	758	38	132	24	734	203	2,130	88,679
Non-Ferrous Smelting and Refining	657	826	210	1,400	19,322	262	1,161	64	1,339	169	25,410	806,064
Total, Male	**1,574**	**2,894**	**405**	**2,107**	**42,295**	**908**	**3,107**	**196**	**7,630**	**1,331**	**62,447**	**2,278,656**
Total, Female	**39**	**49**	**21**	**53**	**1,194**	**3**	**43**	**8**	**22**	**32**	**1,464**	**39,096**
Total	**1,613**	**2,943**	**426**	**2,160**	**43,489**	**911**	**3,150**	**204**	**7,652**	**1,363**	**63,911**	**2,317,752**
NON-METAL MINING, INCLUDING FUELS												
Coal	596	3,758	701	411	21,361	323	445	38	1,140	397	29,170	1,062,031
Natural gas	148	106	102	57	229	19	129	4	175	69	1,038	25,575
Petroleum	76	102	20	9	1,546	11	171	5	222	12	2,174	89,974
Total, Male	**812**	**3,957**	**818**	**477**	**23,109**	**349**	**729**	**17**	**1,526**	**477**	**32,301**	**1,175,773**
Total, Female	**8**	**9**	**5**	.....	**27**	**4**	**16**	.....	**11**	**1**	**81**	**1,807**
Total	**820**	**3,966**	**823**	**477**	**23,136**	**353**	**745**	**47**	**1,537**	**478**	**32,382**	**1,177,580**
OTHER NON-METAL MINING												
Asbestos	9	90	6	20	3,067	60	87	6	187	92	3,624	102,228
Feldspar and Quartz	30	39	10	25	143	27	76	17	143	59	569	16,924
Gypsum	55	42	27	12	106	31	50	39	92	70	524	16,169
Iron Oxides	.....	.....	.....	.....	34	.....	15	.....	.....	.....	49	1,077
Mica	71	100	17	72	137	57	69	54	43	19	639	10,466
Peat (a)	312	388	164	160	379	114	393	30	128	51	2,119	39,142
Salt	35	67	31	33	96	44	67	43	110	76	602	18,709
Talc and Soapstone	5	7	3	5	5	2	21	3	63	13	127	2,720
Miscellaneous	64	116	11	35	189	23	84	14	210	294	1,040	32,911
Total, Male	**487**	**688**	**203**	**249**	**4,016**	**308**	**823**	**177**	**942**	**670**	**8,563**	**230,207**
Total, Female	**94**	**161**	**66**	**113**	**140**	**50**	**39**	**29**	**34**	**4**	**730**	**10,139**
Total	**581**	**849**	**269**	**362**	**4,156**	**358**	**862**	**206**	**976**	**674**	**9,293**	**240,346**
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS												
Cement	17	61	40	31	567	59	85	11	298	81	1,250	40,548
Clay Products	43	64	142	66	437	238	542	156	448	148	2,284	55,725
Lime	27	39	23	35	120	21	155	20	332	106	884	28,582
Sand and Gravel	16	34	32	24	5,391	6	45	11	266	158	5,983	115,938
Stone	218	181	148	133	287	222	316	238	900	547	3,280	90,758
Total, Male	**315**	**377**	**383**	**278**	**6,578**	**524**	**1,108**	**442**	**2,324**	**1,040**	**13,369**	**326,726**
Total, Female	**6**	**2**	**2**	**11**	**224**	**22**	**35**	.....	**10**	.....	**312**	**4,823**
Total	**321**	**379**	**385**	**289**	**6,802**	**546**	**1,143**	**442**	**2,334**	**1,040**	**13,681**	**331,549**

†Contains data on mining of silver-pitchblende ores in the Northwest Territories.

*Includes the actual money wages paid, the value of room and board, where provided, deductions from employees for income tax and social services, such as sickness, accident, insurance, pensions, etc., as well as any other allowance forming part of the employees' wages, includes overtime.

(a) In all forms.

Table 29.—Employees and Salaries and Wages Paid in Canadian Mining Industry, 1930-1943

Year	Nova Scotia		New Brunswick		Quebec		Ontario		Manitoba		Saskatchewan	
	No.	$	No.	$	No.	$	No.	$	No.	$	No.	$
1930......	15,484	19,284,197	1,391	1,132,306	15,397	15,190,714	24,706	34,433,915	3,021	4,372,044	1,371	1,040,790
1931......	14,871	15,302,444	1,197	1,048,860	11,141	12,666,586	20,277	30,470,475	2,059	3,096,332	1,002	896,131
1932......	13,706	11,302,801	1,480	1,123,080	7,694	8,198,379	16,376	24,412,126	1,730	2,106,017	924	748,782
1933......	13,915	9,852,765	1,629	1,402,114	8,629	8,621,984	17,306	25,600,168	1,379	1,847,251	1,265	1,111,001
1934......	13,500	13,594,114	1,722	1,276,770	10,362	10,492,169	22,033	32,619,846	1,948	2,796,454	1,461	1,257,282
1935......	14,550	14,301,510	2,390	1,865,407	11,811	12,794,600	25,264	38,152,140	2,346	3,403,649	1,457	1,343,041
1936......	15,368	15,980,687	1,744	1,248,431	14,225	15,774,362	31,105	46,899,805	2,932	3,752,367	1,828	1,937,825
1937......	15,629	18,373,958	3,012	1,509,063	19,121	22,708,131	36,238	58,891,339	3,159	4,301,366	2,307	2,372,443
1938......	15,591	15,959,095	3,042	2,074,273	20,829	24,485,254	35,791	58,926,900	2,840	4,393,270	2,287	2,470,530
1939......	15,202	17,371,518	3,263	2,311,835	20,872	25,689,382	37,233	63,220,042	3,027	4,541,992	2,026	2,347,264
1940......	14,934	19,285,662	2,240	1,939,160	21,726	29,025,418	38,774	66,395,845	3,145	5,107,054	1,961	2,573,878
1941......	15,246	21,388,809	2,262	2,097,842	23,149	34,008,021	40,496	74,902,555	3,101	5,312,075	1,977	3,105,529
1942......	14,394	22,169,053	1,718	1,855,798	27,235	42,901,445	36,866	72,868,161	2,512	4,401,171	2,450	4,401,181
1943......	13,852	25,348,097	1,570	1,828,019	31,491	52,859,348	33,516	67,732,244	1,777	3,497,951	3,067	5,737,896

Year	Alberta		British Columbia		Yukon		Northwest Territories (a)		**Canada**	
	No.	$	No.	$	No.	$	No.	$	**No.**	**$**
1930...............	12,675	16,272,916	14,836	21,412,925	319	835,525	....	....	**89,200**	**113,975,332**
1931...............	10,579	11,357,722	11,297	16,345,887	296	784,862	....	....	**72,809**	**91,969,299**
1932...............	9,692	10,476,449	9,565	12,612,151	286	761,585	17	30,679	**61,470**	**71,772,049**
1933...............	9,057	9,463,382	9,845	11,455,946	233	545,692	76	131,502	**63,334**	**70,031,805**
1934...............	9,843	9,792,297	12,270	15,482,102	286	660,814	80	154,338	**73,505**	**88,126,186**
1935...............	9,706	10,882,198	12,352	16,479,606	333	809,067	47	69,341	**80,256**	**100,080,559**
1936...............	10,376	11,850,463	12,827	17,908,553	566	1,372,917	28	40,812	**90,999**	**110,766,222**
1937...............	10,843	12,924,934	14,282	21,487,277	691	1,502,692	132	221,181	**105,414**	**144,292,384**
1938...............	10,612	12,811,975	15,179	21,975,143	794	1,962,941	310	584,619	**107,275**	**145,644,000**
1939...............	10,548	13,097,818	14,587	21,698,690	728	1,605,671	273	468,996	**107,759**	**152,353,208**
1940...............	10,628	14,535,789	14,420	23,227,719	617	1,518,747	441	880,414	**108,886**	**164,489,686**
1941...............	11,141	17,065,351	14,801	25,797,418	501	1,570,683	553	1,174,003	**113,227**	**186,423,186**
1942...............	11,435	19,628,105	14,323	27,166,996	398	1,221,952	701	1,737,398	**112,032**	**198,550,260**
1943...............	12,316	21,825,643	13,399	25,703,433	352	1,043,663	800	1,999,661	**112,140**	**207,575,955**

(a) Data relating to mining of Pitchblende ores included with Yukon.

Table 30.—Wage-earners on Surface, Underground and in Mill, 1943

Province	Metal Mines			Fuels			Other†		
	Surface (a)	Underground	Mill	Surface	Underground	Mill	Surface	Underground	Mill
Nova Scotia	18	41	6	2,083	9,814	....	879	37	297
New Brunswick	....	....	....	392	636	....	288	16	146
Quebec	2,138	4,357	13,581	....	....	....	3,962	612	3,334
Ontario	4,762	12,568	8,619	679	....	....	1,779	102	1,293
Manitoba	319	519	149	1	2	....	336	16	229
Saskatchewan	629	488	600	331	392	....	103	....	145
Alberta	....	....	....	4,028	6,151	....	163	....	555
British Columbia	1,572	2,357	3,815	790	1,958	....	822	....	298
Yukon (b)	78	62	154	....	....	....	....	....	....
Northwest Territories	125	105	50	256	....	....	....	....	....
Total, 1943	**9,641**	**20,497**	**26,974**	**8,560**	**18,953**	....	**8,332**	**783**	**6,297**
Total, 1942	**28,724**	**24,780**	**3,969**	**7,932**	**19,227**	....	**11,743**	**938**	**3,427**
Total, 1941	**25,940**	**28,388**	**4,198**	**7,902**	**19,608**	....	**12,915**	**923**	**3,208**
Total, 1940	**23,525**	**27,575**	**3,833**	**8,040**	**19,859**	....	**12,979**	**775**	**2,958**
Total, 1939	**23,018**	**26,530**	**3,750**	**8,037**	**19,861**	....	**11,406**	**857**	**5,766**
Total, 1938	**23,326**	**24,754**	**3,713**	**8,277**	**20,260**	....	**15,808**	**678**	**1,894**

†Includes asbestos, salt, gypsum, stone quarries, brick plants, etc., etc.
(a) Including non-ferrous smelters and refineries.
(b) Includes data on mining of Pitchblende ores in Northwest Territories.

Table 31.—Fuel and Electricity Used for All Purposes in the

Industry		Bituminous		Anthracite coal		Lignite coal	Coke	Gasolene	Kerosene	Charcoal
		Canadian	Imported	From United States	From other countries					
		Tons	Tons	Tons	Tons	Tons	Tons	Imp. gal.	Imp. gal.	lb.
METAL MINING										
Alluvial Gold	Quantity	8	....	1	....	....	2	24,743	478	....
	$	720	....	18	....	....	194	15,101	391	....
Auriferous Quartz	Quantity	10,435	41,286	3,652	125	275	38	245,150	19,213	1,022
	$	116,485	473,642	48,758	2,353	1,512	831	91,295	7,594	47
Copper-Gold-Silver	Quantity	13,664	2,658	111	73	76,830	148	93,615	5,923	30,068
	$	103,469	29,898	1,971	1,468	229,770	2,632	32,571	1,448	682
Silver-Cobalt	Quantity	4	1,170	114	34	....	....	27,648	95	....
	$	56	19,180	1,880	571	....	....	8,482	24	....
Silver-Lead-Zinc (E)	Quantity	46,516	3,002	387	....	338	....	55,422	1,728	....
	$	215,144	32,659	4,082	....	2,409	....	19,582	815	....
Nickel-Copper	Quantity	1,643	13,906	155	....	....	13	71,117	3,030	....
	$	13,400	112,001	2,352	....	....	176	17,816	639	....
Miscellaneous Metals	Quantity	303	4,517	86	....	154	21,425	152,754	3,365	....
	$	2,739	53,069	1,672	....	1,956	102,711	49,301	1,005	....
Non-Ferrous Smelting and Refining.	Quantity	463,372	767,278	245	....	....	373,512	340,161	38,401	1,471,455
	$	3,780,821	6,137,251	3,393	....	....	4,326,749	105,224	7,478	24,366
Total	*Quantity*	*535,945*	*833,817*	*4,751*	*232*	*77,597*	*395,138*	*1,010,616*	*72,233*	*1,502,545*
	$	*4,232,834*	*6,857,700*	*64,126*	*4,392*	*235,647*	*4,433,293*	*339,372*	*19,394*	*25,095*
NON-METAL MINING										
Fuels										
Coal	Quantity	537,877	....	....	....	56,063	....	217,612	5,302	....
	$	1,750,001	....	....	....	60,619	....	63,901	1,369	....
Natural Gas	Quantity	12	100	5	....	....	....	53,743	....	....
	$	139	1,376	70	....	....	....	15,186	....	....
Petroleum	Quantity	905	2	2	....	17	....	128,521	2,210	....
	$	4,178	19	35	....	36	....	37,682	332	....
Total	*Quantity*	*538,794*	*102*	*7*	....	*56,080*	....	*399,876*	*7,512*	....
	$	*1,754,408*	*1,395*	*105*	....	*60,655*	....	*116,769*	*1,701*	....
Other Non-Metal Mining										
Asbestos	Quantity	309	31,384	21,293	594	....	....	150,302	7,989	....
	$	3,976	307,722	195,329	4,853	....	....	47,231	1,460	....
Feldspar, nepheline syenite and quartz.	Quantity	1,086	5,060	6	....	....	32	82,187	2,571	....
	$	9,700	42,454	98	....	....	227	23,485	439	....
Gypsum	Quantity	8,887	3,188	....	....	1,441	341	127,193	194	....
	$	65,177	25,753	....	....	5,826	4,195	37,328	41	....
Iron Oxides	Quantity	210	563	12	....	....	3	1,327	100	....
	$	2,100	6,656	150	....	....	42	413	19	....
Mica	Quantity	50	262	35	....	....	10	31,605	138	....
	$	528	2,880	591	....	....	250	9,577	46	....
Peat	Quantity	....	16	....	....	....	....	75,889	4,759	....
	$	....	134	....	....	....	....	19,138	941	....
Salt	Quantity	10,229	60,007	....	....	23,890	....	10,907	82	....
	$	63,281	421,213	....	....	88,420	....	3,090	23	....
Talc and Soapstone	Quantity	....	....	....	....	41	....	8,044	60	....
	$	....	....	....	....	190	....	2,475	12	....
Miscellaneous	Quantity	21,248	31,637	11	3	18,839	....	167,998	1,745	....
	$	104,183	281,454	195	35	59,488	....	48,116	355	....
Total	*Quantity*	*42,079*	*138,117*	*21,357*	*597*	*44,211*	*386*	*655,452*	*17,638*	....
	$	*248,945*	*1,088,266*	*196,569*	*4,888*	*153,924*	*4,714*	*190,553*	*3,336*	....
STRUCTURAL MATERIALS AND CLAY PRODUCTS										
Cement	Quantity	98,135	225,741	....	....	....	....	142,655	6,667	....
	$	595,385	1,664,546	....	....	....	....	38,583	1,242	....
Clay Products	Quantity	28,281	71,115	84	....	1,183	180	110,766	4,282	....
	$	204,239	645,112	1,281	....	5,062	2,002	32,642	926	....
Lime	Quantity	38,719	84,137	21,245	....	....	20,641	94,735	40	....
	$	341,588	575,641	193,207	....	....	209,008	27,491	8	....
Sand and Gravel	Quantity	5,063	9,348	....	....	....	....	332,133	1,045	....
	$	42,785	67,849	....	....	....	....	98,011	231	....
Stone	Quantity	2,311	10,354	363	105	....	459	792,412	6,937	....
	$	24,257	88,[illegible]	4,207	1,065	....	5,126	225,926	1,216	....
Total	**Quantity**	**172,509**	**400,695**	**21,692**	**105**	**1,183**	**21,280**	**1,472,701**	**18,971**	....
	$	**1,268,254**	**3,041,236**	**198,695**	**1,065**	**5,062**	**216,226**	**422,653**	**3,623**	....
Grand Total	**Quantity**	**1,289,327**	**1,372,731**	**47,807**	**934**	**179,071**	**416,804**	**3,538,645**	**116,354**	**1,502,545**
	$	**7,114,441**	**10,988,597**	**459,295**	**10,345**	**455,288**	**4,654,233**	**1,069,647**	**28,054**	**25,095**

(a) On outgoing shipments only.
(b) Paid by mine operator only.
(c) Value of 67,464,700 cu. ft. compressed air.
(d) Exclusive cost of ores treated. (E) includes Pitchblende ores.

Mineral Industry in Canada, by Kinds and Industries, 1943

Fuel oil and diesel oil	Wood	Gas: Manufactured	Gas: Natural	Other fuel	Electricity purchased	Total	Electricity generated for own use	Electricity generated for sale	Process supplies	Freight (a)	Treatment charges (b)
Imp. gal.	Cords	M cu.ft.	M cu. ft.	$	K.W.H.	$	K.W.H.	K.W.H.	$	$	$
36,860	1,244						10,955,900	4,301,788			
18,645	17,030					52,099		34,000	55,393	31,571	18,695
2,478,307	47,512				738,795,434		59,325,596	4,320,089			
380,034	318,051			207	4,947,060	6,387,869		65,868	12,773,650	453,720	1,620,898
712,593	697				269,523,279		85,880,844	2,175,430			
102,514	3,980				916,307	1,426,710		31,815	5,506,715	1,353,139	21,409,079
8,287	252			(c)	2,294,327						
1,212	1,727			17,023	24,536	74,691			48,068	4,192	15,361
1,104,269	1,608				81,712,950		33,763,446				
201,789	29,571				480,468	986,519			2,044,367	1,655,637	453,715
996,267	518				161,326,077		20,280				
105,543	3,322				541,426	796,675			7,969,067	18,108	112,213
2,014,882	30,613				25,218,193		5,139,498				
343,017	318,298				185,784	1,059,552			1,215,049	263,513	2,759
49,841,845	6,350	4,434	333		11,009,840,128		270,383,150	25,030,900			
3,472,400	29,145	5,300	362		25,212,612	43,105,101		95,517	38,334,069 (d)		
57,193,310	*88,794*	*4,434*	*333*		*12,288,710,388*		*465,468,714*	*35,828,207*			
4,625,154	*721,124*	*5,300*	*362*	*17,230*	*32,308,193*	*53,889,216*		*227,200*	*67,946,378*	*3,779,880*	*23,632,720*
87,522					175,576,548		47,335,794	7,057,736			
16,117				98	1,951,354	3,843,549		106,113	7,707,947		
510	2		906,442		61,736						
63	31		160,828		4,148	181,841			7,899		
151,239	245		6,601,392		2,003,695						
10,452	792		616,404	10,696	29,253	709,879			202,479		
239,271	*247*		*7,507,834*		*177,641,979*		*47,335,794*	*7,057,736*			
26,632	*823*		*777,232*	*10,794*	*1,984,755*	*4,735,269*		*106,113*	*7,918,325*		
49,070					137,385,310						
9,423					1,055,456	1,625,450			1,651,260		
214,466	776				3,604,590		1,740,806				
24,486	4,506				28,852	134,247			322,605		
36,195	103		6,300		5,371,792		1,467,586				
3,620	663		2,546		56,831	201,980			46,063		
865	972				233,890						
173	6,804				3,075	19,438			7,590		
85	1,031				206,250						
12	5,506				5,367	21,757			29,638		
8,733	586				578,605		100				
1,611	2,060				11,234	35,118			48,534		
343			91		3,701,270		7,675,462				
30			51		20,144	596,252			134,272		
14,668	102				1,578,590		156,250				
2,336	750				18,341	21,104			33,927		
2,590,358	2,379	114,213			8,782,586		2,690,998				
220,049	9,570	11,707			88,195	823,347			382,648		
2,915,683	*5,949*	*114,213*	*6,391*		*161,442,793*		*13,740,202*				
261,740	*29,859*	*11,707*	*2,597*		*1,287,495*	*3,484,693*			*2,656,537*		
44,132	58				150,920,220		328,452				
5,499	319				783,806	3,089,380			1,356,890		
176,013	15,026	23,295	758,138		10,748,573		258,910				
15,037	79,967	5,158	15,971	1,061	148,923	1,157,471			104,337		
1,033,350	43,232				12,874,498		1,865,183				
59,520	249,317			995	90,237	1,747,012			177,470		
97,224	10				10,859,629						
13,326	35				99,965	322,202			57,233		
352,812	1,259		1,200		20,956,390		361,500				
52,443	7,211		872		267,998	678,409			855,218		
1,703,531	**59,585**	**23,295**	**759,338**		**206,368,310**		**2,814,045**				
145,825	**336,849**	**5,158**	**16,813**	**2,056**	**1,390,929**	**6,991,474**			**2,551,147**		
62,051,795	**154,575**	**141,942**	**8,273,896**		**12,834,163,479**		**529,358,755**	**42,885,943**			
5,059,351	**1,088,655**	**22,165**	**797,034**	**30,080**	**36,971,372**	**69,103,652**		**333,313**	**84,072,387**	**3,779,880**	**23,632,720**

Table 32.—Fuel and Electricity Used for All Purposes

Industry		Bituminous		Anthracite coal		Lignite coal	Coke	Gaso-lene	Kero-sene	Char-coal
		Canadian	Imported	From United States	From other countries					
		Tons	Tons	Tons	Tons	Tons	Tons	Imp. gal.	Imp. gal.	lb.
Metal Mining										
Nova Scotia	Quantity	372,556	...	...	...	...	2,942	92,376	265	...
	$	1,460,273	...	...	...	...	19,614	24,119	60	...
New Brunswick	Quantity	16,711	...	...	...	...	...	32,291	1,800	...
	$	112,219	...	...	...	...	...	8,641	450	...
Quebec	Quantity	307,991	389,949	44,087	772	...	2,915	1,257,953	59,731	80,000
	$	2,859,404	3,510,029	412,104	6,917	...	38,982	382,254	14,461	1,645
Ontario	Quantity	19,673	977,473	3,715	60	28	335,008	1,176,994	28,888	1,392,152
	$	172,910	7,424,649	47,047	1,061	259	3,885,733	346,023	6,494	22,754
Manitoba	Quantity	43,279	5,234	...	...	25,420	491	68,852	1,319	3,307
	$	360,441	51,641	...	...	94,458	6,380	25,108	392	75
Saskatchewan	Quantity	76,175	65	...	...	48,559	73	173,124	5,840	26,761
	$	502,444	1,413	...	...	91,419	1,028	54,436	1,489	607
Alberta	Quantity	188,911	...	...	...	27,426	...	218,616	4,729	...
	$	507,498	...	...	...	33,315	...	59,843	968	...
British Columbia	Quantity	264,024	10	5	102	77,638	75,373	479,886	12,704	325
	$	1,408,548	865	144	2,367	235,837	702,302	147,304	2,848	14
Yukon (c)	Quantity	7	...	...	...	...	2	27,745	976	...
	$	704	...	...	...	...	194	16,325	841	...
Northwest Territories	Quantity	...	...	...	...	...	...	10,808	102	...
	$	...	...	...	...	...	...	5,594	51	...
Canada	**Quantity**	**1,289,327**	**1,372,731**	**47,807**	**934**	**179,071**	**416,804**	**3,538,645**	**116,354**	**1,502,545**
	$	**7,444,441**	**10,988,597**	**459,295**	**10,345**	**455,288**	**4,651,233**	**1,069,647**	**28,054**	**25,095**

(a) On outgoing shipments only.
(b) Paid by mine operator only.
(c) Includes data relating to mining of Pitchblende ores in Northwest Territories.

Table 33.—Fuel and Electricity Used Only for Metallurgical

Province		Bituminous coal		Anthracite coal		Lignite coal	Coke	Charcoal
		Candian	Imported	From United States	From Other Countries			
		Tons	Tons	Tons	Tons	Tons	Tons	lb.
Quebec	Quantity	259,017	138,110	...	...	...	2,478	80,000
	$	2,413,933	1,314,853	...	...	...	33,639	1,645
Ontario	Quantity	809	585,534	245	...	...	295,187	1,391,455
	$	6,600	4,478,237	3,393	...	...	3,585,575	22,721
Manitoba	Quantity	6,682	...	...	...	...	...	...
	$	55,335	...	...	...	...	...	...
Saskatchewan	Quantity	54,072	...	...	...	...	...	...
	$	447,713	...	...	...	...	...	...
British Columbia	Quantity	100,036	...	...	...	...	74,440	...
	$	606,595	...	...	...	...	692,884	...
Canada	**Quantity**	**420,616**	**723,644**	**245**	...	...	**372,105**	**1,471,455**
	$	**3,530,176**	**5,793,090**	**3,393**	...	...	**4,312,298**	**24,366**

*All Used in the non-ferrous smelting and refining industry and included in table 26.

in the Mineral Industry in Canada, by Provinces, 1943

Fuel oil and diesel oil	Wood	Gas: Manu-factured	Gas: Natural	Other fuel	Electricity purchased	Total	Electricity generated for own use	Electricity generated for sale	Process supplies	Freight (a)	Treatment charges (b)
Imp. gal.	Cords	Mcu. ft.	Mcu. ft.	$	K.W.H.	$	K.W.H.	K.W.H.	$	$	$
50,128	616	114,213	....	....	108,842,609	....	20,539,610	3,354,145	....	....	....
5,069	2,237	11,707	....	....	1,174,702	**2,697,781**	....	35,934	3,994,535	740	1,500
6,274	10,526	....	40,865	....	2,209,937	....	....	....	....	....	....
740	57,576	....	16,592	599	44,203	**241,020**	1,217,586	....	152,320	282	....
33,206,189	45,455	4,434	....	....	9,802,032,386	....	283,586,810	23,920,300	....	....	....
2,518,864	257,948	5,300	....	396	23,349,422	**33,357,726**	....	89,494	34,860,594	1,186,821	14,942,424
20,026,830	34,203	23,295	202,167	....	1,567,755,618	....	24,005,954	1,110,600	....	....	....
1,523,714	203,288	5,158	118,906	17,087	7,425,526	**21,290,609**	....	6,023	29,156,549	454,339	1,008,016
103,530	10,806	....	....	....	102,173,520	....	7,955,177	....	....	....	....
19,420	80,433	....	....	....	383,125	**1,021,473**	....	....	1,412,556	102,976	1,338,895
2,143,201	325	....	....	....	359,343,697	....	5,003,650	11,069	....	....	....
196,817	2,274	....	....	....	381,768	**1,293,695**	....	1,106	2,520,593	....	4,386,608
173,259	3,080	....	8,030,864	....	60,185,393	....	12,082,410	277,717	....	....	....
13,636	14,935	....	661,536	10,794	623,694	**1,926,219**	....	19,498	2,906,239	....	....
5,000,275	42,282	....	....	....	827,530,200	....	147,274,875	5,727,755	....	....	....
636,088	366,785	....	....	1,204	3,526,550	**7,036,856**	....	84,212	5,536,748	1,880,299	1,906,101
374,304	2,249	....	....	....	....	....	13,741,081	4,301,788	....	....	....
125,849	41,308	....	....	....	....	**185,221**	....	34,000	347,474	148,665	23,963
67,745	5,033	....	....	....	4,090,110	....	13,951,602	4,182,569	....	....	....
19,154	61,871	....	....	....	62,382	**149,052**	....	63,046	184,779	5,758	25,213
62,051,795	**154,575**	**141,942**	**8,273,896**	....	**12,834,163,470**	....	**529,358,755**	**42,885,943**	....	....	....
5,059,351	**1,088,655**	**22,165**	**797,034**	**30,080**	**36,971,372**	**69,103,652**	....	**333,313**	**81,072,387**	**3,779,880**	**23,632,720**

Purposes in the Mineral Industry of Canada, by Provinces, 1943(*)

Gasolene	Kerosene	Fuel oil and diesel oil	Wood	Gas: Manu-factured	Gas: Natural	Other	Electricity	Total	Electricity generated own use
Imp. gal.	Imp. gal.	Imp. gal.	Cords	M cu. ft.	M cu. ft.	$	K.W.H.	$	K.W.H.
10,320	1,203	30,726,460	4,630	4,434	....	....	8,925,699,281	....	261,748,496
3,415	273	2,192,226	14,816	5,300	....	....	18,840,245	**24,820,545**	....
49,360	355	17,842,172	184	....	333	....	327,516,993	....	....
12,761	61	1,124,279	1,560	....	362	....	1,056,855	**10,292,104**	....
....	....	2,490	40	....	....	....	27,960,791	....	....
....	....	381	281	....	....	....	21,660	**77,657**	....
....	....	20,145	325	....	....	....	226,228,224	....	....
....	....	3,082	2,274	....	....	....	175,253	**628,322**	....
85,934	....	1,123,624	793	....	....	....	655,709,950	....	....
28,466	....	126,857	7,131	....	....	....	2,488,864	**3,950,797**	....
145,614	**1,558**	**49,714,891**	**5,972**	**4,434**	**333**	....	**10,163,115,239**	....	**261,748,496**
44,642	**334**	**3,446,825**	**26,062**	**5,300**	**362**	....	**22,582,877**	**39,769,725**	....

Table 34.—Electricity Purchased by Canadian Mining Industry, 1934-1943

Year	Auriferous Quartz Mining (gold mines)		Total All Metal Mines (including non-ferrous smelters and refineries)		Total entire mining industry	
	K.W.H.	$*	K.W.H.	$*	K.W.H.	$*
1934	415,570,323	3,091,147	2,099,586,731	8,433,428	2,359,525,280	11,510,481
1935	464,146,582	3,722,163	2,320,385,917	9,415,062	2,591,470,745	12,546,298
1936	449,026,003	4,345,066	2,841,045,187	10,783,296	3,151,192,519	14,055,915
1937	629,083,378	5,031,691	3,368,047,901	12,442,423	3,744,919,549	16,135,702
1938	741,866,953	5,333,427	4,125,037,129	13,917,518	4,441,098,287	17,485,652
1939	777,832,223	5,803,160	4,449,477,330	13,060,673	4,817,050,497	18,749,417
1940	868,846,323	5,893,562	5,105,497,931	17,005,546	5,569,961,386	21,066,734
1941	947,563,696	6,277,626	7,105,275,873	22,373,156	7,630,138,911	26,710,350
1942	846,900,417	5,856,971	9,626,254,575	29,004,724	10,186,657,256	33,614,088
1943	738,705,434	4,947,060	12,288,710,388	32,308,193	12,834,163,470	36,971,372

*Includes service charges, for previous years see annual mineral production report for 1942.

Table 35.—Power Equipment in Use, and Power Equipment in Reserve

Province		Ordinarily in use									
		Steam engines	Steam turbines	Diesel engines	Gasoline, gas and oil engines other than Diesel engines	Hydraulic turbines or water wheels	*Total primary power*	Electric motors run by purchased power	**Total power employed**	Electric motors run by primary power in same plant	Boilers
Nova Scotia	No.	47	6	47	24	....	*124*	977	**1,101**	163	81
	H.P.	37,274	11,254	5,181	1,191	....	*54,900*	67,336	**122,236**	9,787	27,796
New Brunswick	No.	15	....	26	17	....	*58*	259	**317**	16	21
	H.P.	1,715	....	283	938	....	*2,936*	1,969	**4,905**	255	1,365
Quebec	No.	38	6	113	310	16	*483*	11,063	**11,546**	501	158
	H.P.	1,468	8,740	21,865	10,795	54,040	*96,908*	310,474	**407,382**	7,612	32,939
Ontario	No.	100	16	63	452	6	*637*	13,349	**13,986**	657	207
	H.P.	6,063	5,670	5,464	10,385	2,395	*35,977*	417,589	**453,566**	12,140	27,853
Manitoba	No.	8	1	5	31	1	*46*	976	**1,022**	172	17
	H.P.	253	500	734	529	1,900	*3,916*	29,822	**33,738**	2,869	2,327
Saskatchewan	No.	15	2	23	54	....	*94*	1,869	**1,963**	129	19
	H.P.	1,030	1,375	2,653	1,364	....	*6,422*	74,909	**81,331**	1,918	3,858
Alberta	No.	174	8	12	201	....	*395*	1,714	**2,109**	351	236
	H.P.	36,330	1,970	880	8,042	....	*47,222*	51,314	**98,536**	7,827	28,822
British Columbia	No.	82	17	72	124	64	*359*	4,420	**4,779**	1,490	72
	H.P.	14,639	20,091	12,510	4,366	28,467	*80,673*	165,329	**246,002**	39,724	12,537
Yukon (a)	No.	....	....	7	4	....	*11*	....	**11**	214	2
	H.P.	....	....	1,343	380	....	*1,723*	....	**1,723**	6,532	120
N.W.T.	No.	....	....	1	2	1	*4*	78	**82**	34	6
	H.P.	....	....	156	8	4,700	*4,864*	1,210	**6,074**	626	411
Canada	**No.**	**479**	**56**	**369**	**1,219**	**88**	*2,211*	**34,705**	**36,916**	**3,727**	**819**
	H.P.	**98,772**	**50,200**	**51,069**	**43,998**	**91,502**	*335,541*	**1,119,952**	**1,455,493**	**89,290**	**138,029**

(a) Includes data relating to mining of Pitchblende in the Northwest Territories.

Table 36.—Power Equipment in Use and Power Equipment in

ORDINARILY IN USE

Industry		Steam engines	Steam turbines	Diesel engines	Gasoline, gas and oil engines other than Diesel engines	Hydraulic turbines or water wheels	*Total primary power*	Electric motors run by purchased power	**Total power employed**	Electric motors run by primary power in same plant	Boilers
METAL MINING—											
Alluvial Gold Mines	No.	1	....	8	15	2	*26*	....	**26**	122	....
	H.P.	15	....	805	236	90	*1,146*	....	**1,146**	5,398	....
Auriferous Quartz Mines	No.	6	3	33	43	15	*100*	8,973	**9,073**	1,044	168
	H.P.	255	900	8,980	3,393	15,685	*29,213*	234,810	**264,023**	17,783	14,616
Copper-Gold-Silver Mines	No.	....	1	18	9	6	*34*	2,794	**2,828**	471	42
	H.P.	....	13,400	3,986	615	8,900	*26,901*	106,067	**132,968**	16,549	10,280
Silver-Cobalt Mines	No.	2	....	3	....	....	*5*	73	**78**	....	5
	H.P.	195	....	125	....	....	*320*	1,693	**2,013**	....	175
Silver-Lead-Zinc Mines (a)	No.	....	3	24	13	12	*52*	933	**985**	568	17
	H.P.	....	6,000	3,951	585	1,580	*12,116*	22,330	**34,446**	12,051	2,910
Nickel-Copper Mines	No.	1	....	3	1	....	*5*	986	**991**	....	5
	H.P.	15	....	255	4	....	*274*	41,652	**41,926**	....	470
Miscellaneous Metal Mines	No.	....	....	21	25	....	*46*	454	**500**	80	16
	H.P.	....	....	3,107	939	....	*4,046*	17,118	**21,164**	1,840	1,248
Non-ferrous Smelting and Refining	No.	25	7	15	22	11	*80*	11,922	**12,002**	328	54
	H.P.	2,556	13,220	8,361	2,008	51,125	*77,270*	374,475	**451,745**	4,153	30,100
Total	**No.**	**35**	**14**	**125**	**128**	**46**	*348*	**26,135**	**26,483**	**2,613**	**307**
	H.P.	**3,036**	**33,520**	**29,570**	**7,780**	**77,380**	*151,286*	**798,145**	**949,431**	**57,774**	**59,799**

or Idle, in the Mineral Industry in Canada, by Provinces, 1943

In reserve or idle										
Steam engines	Steam turbines	Diesel engines	Gasoline, gas and oil engines other than Diesel engines	Hydraulic turbines or water wheels	*Total primary power*	Electric motors run by purchased power	**Total power employed**	Electric motors run by primary power in same plant	Boilers	Motor generator sets in use and in reserve Total
9	1	10	30	....	*50*	45	**95**	6	11	26
1,303	502	1,301	1,822	....	*4,928*	1,608	**6,536**	282	3,171	2,198
....	....	....	5	....	*5*	23	**28**	....	1	1
....	....	....	49	....	*49*	290	**339**	....	50	10
9	....	17	56	2	*84*	1,066	**1,150**	47	41	249
425	....	2,400	3,658	50	*6,593*	27,400	**33,993**	1,420	6,987	25,572
17	2	20	88	....	*127*	1,154	**1,281**	81	39	477
2,011	195	3,371	5,670	....	*11,247*	39,760	**51,007**	2,620	3,733	90,754
....	....	3	12	....	*15*	52	**67**	19	3	26
....	....	501	820	....	*1,321*	1,821	**3,142**	245	250	2,623
3	3	6	9	....	*21*	127	**148**	27	6	45
0	2,515	1,340	435	....	*4,790*	4,104	**8,894**	670	1,255	38,721
501	7	2	32	....	*72*	90	**162**	24	31	50
6,238	718	385	1,401	....	*8,792*	3,989	**12,781**	532	2,771	4,053
88	5	26	41	6	*86*	672	**758**	139	19	120
1,368	10,300	3,043	985	840	*16,536*	16,602	**33,138**	2,891	1,243	58,098
....	....	2	....	....	*2*	....	**2**	249	....	3
....	....	165	....	....	*165*	....	**165**	14,606	....	11
....	....	8	1	....	*9*	6	**15**	127	3	14
....	....	1,285	10	....	*1,295*	365	**1,660**	2,147	171	185
† **77**	**18**	**94**	**274**	8	*471*	**3,235**	**3,706**	**719**	**154**	**1,017**
11,895	**14,230**	**13,851**	**14,850**	**890**	*55,716*	**95,939**	**151,655**	**25,413**	**19,631**	**228,225**

Reserve or Idle, in the Mineral Industry in Canada, by Industries, 1943

IN RESERVE OR IDLE

Steam engines	Steam turbines	Diesel engines	Gasoline, gas and oil engines other than Diesel engines	Hydraulic turbines or water wheels	*Total primary power*	Electric motors run by purchased power	**Total power employed**	Electric motors run by primary power in same plant	Boilers	Motor generator sets in use and in reserve Total
....	....	5	6	5	*16*	....	**16**	235	6	....
....	....	120	66	60	*255*	....	**255**	14,599	81	....
6	4	44	102	1	*157*	829	**986**	242	53	409
857	445	7,436	7,240	780	*16,758*	24,363	**41,121**	5,055	3,723	16,271
....	3	3	3	....	*9*	151	**160**	51	6	98
....	10,050	710	270	....	*11,030*	4,192	**15,222**	2,525	140	28,562
2	....	1	3	....	*6*	15	**21**	....	1	....
40	....	120	24	....	*184*	516	**700**	....	10	....
....	....	7	6	....	*18*	128	**141**	55	1	35
....	....	664	439	....	*1,103*	4,462	**5,565**	895	20	3,358
....	....	....	....	....	....	67	**67**	....	2	78
....	....	....	....	....	....	1,955	**1,955**	....	145	32,231
2	....	10	6	....	*18*	30	**48**	7	3	12
311	....	1,500	535	....	*2,346*	506	**2,852**	343	259	1,043
1	3	2	1	....	*7*	1,286	**1,293**	29	11	225
1,074	2.515	175	60	....	*3,824*	29,003	**32,827**	344	6,750	134.065
11	**10**	**72**	**127**	**6**	*226*	**2,506**	**2,732**	**619**	**83**	**857**
2,282	**13,010**	**10,734**	**8,634**	**840**	*35,500*	**64,997**	**100,497**	**23,761**	**11,128**	**215,530**

Table 36.—Power Equipment in Use and Power Equipment in Reserve

ORDINARILY IN USE

Industry		Steam engines	Steam turbines	Diesel engines	Gasoline, gas and oil engines other than Diesel engines	Hydraulic turbines or water wheels	*Total primary power*	Electric motors run by purchased power	**Total power employed**	Electric motors run by primary power in same plant	Boilers
NON-METAL MINING, INCLUDING FUELS—											
Coal	No.	215	14	13	201	2	*445*	3,061	**3,506**	460	215
	H.P.	61,213	12,021	865	3,720	12,000	*89,819*	121,871	**211,690**	21,592	47,073
Natural Gas	No.	7	....	26	237	....	*270*	107	**377**	23	14
	H.P.	235	....	283	8,110	....	*8,628*	1,107	**9,735**	1,273	2,460
Petroleum	No.	67	6	8	107	....	*188*	162	**350**	33	120
	H.P.	25,153	415	555	6,167	....	*32,290*	1,058	**33,348**	525	11,651
Total	**No.**	**289**	**20**	**47**	**545**	**2**	*903*	**3,330**	**4,233**	**516**	**349**
	H.P.	**86,601**	**12,436**	**1,703**	**17,997**	**12,000**	*130,737*	**124,036**	**254,773**	**23,390**	**61,184**
OTHER NON-METAL MINING											
Asbestos	No.	6	1	1	33	....	*41*	1,098	**1,139**	....	3
	H.P.	210	120	105	1,161	....	*1,596*	54,069	**55,665**	....	80
Feldspar, nepheline syenite and quartz	No.	8	....	18	32	....	*58*	99	**157**	122	9
	H.P.	508	....	2,052	1,186	....	*3,746*	2,043	**5,789**	1,192	785
Gypsum	No.	4	....	12	13	....	*29*	191	**220**	25	5
	H.P.	1,130	....	1,355	781	....	*3,266*	6,059	**9,325**	551	750
Iron Oxides	No.	....	....	1	....	....	*1*	15	**16**	....	....
	H.P.	....	....	30	....	....	*30*	100	**130**	....	....
Mica	No.	2	....	....	23	....	*25*	11	**36**	....	3
	H.P.	60	....	....	627	....	*687*	215	**902**	....	00
Peat	No.	2	....	4	81	....	*87*	54	**141**	....	1
	H.P.	50	....	240	2,452	....	*2,742*	667	**3,409**	....	15
Salt	No.	18	14	....	3	....	*35*	146	**181**	229	8
	H.P.	900	3,444	....	32	....	*4,376*	988	**5,364**	2,265	4,720
Talc and Soapstone	No.	....	....	4	10	....	*14*	37	**51**	13	....
	H.P.	....	....	343	230	....	*573*	685	**1,258**	132	....
Miscellaneous	No.	4	....	19	20	2	*45*	262	**307**	77	15
	H.P.	63	....	2,161	948	300	*3,472*	6,290	**9,762**	1,109	902
Total	**No.**	**44**	**15**	**59**	**215**	**2**	*336*	**1,913**	**2,248**	**466**	**44**
	H.P.	**2,921**	**3,564**	**6,286**	**7,417**	**300**	*20,488*	**71,116**	**91,604**	**5,249**	**7,342**
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—											
Cement	No.	....	....	5	41	....	*46*	1,472	**1,518**	26	9
	H.P.	....	....	1,176	1,254	....	*2,430*	76,989	**79,419**	968	515
Clay Products	No.	33	2	7	49	17	*108*	405	**513**	26	53
	H.P.	3,128	250	560	1,418	712	*6,068*	12,185	**18,253**	267	5,114
Lime	No.	7	....	5	20	6	*38*	497	**535**	57	11
	H.P.	225	....	569	553	105	*1,452*	7,957	**9,409**	835	1,558
Sand and Gravel	No.	9	....	6	54	7	*76*	192	**268**	....	7
	H.P.	459	....	520	1,965	240	*3,184*	6,687	**9,871**	....	497
Stone	No.	62	5	115	167	8	*357*	761	**1,118**	23	39
	H.P.	2,402	430	10,685	5,614	765	*19,896*	22,837	**42,733**	807	2,019
Total	**No.**	**111**	**7**	**138**	**331**	**38**	*625*	**3,327**	**3,952**	**132**	**119**
	H.P.	**6,214**	**680**	**13,510**	**10,804**	**1,822**	*33,030*	**126,655**	**159,685**	**2,877**	**9,703**
Grand Total 1943	**No.**	**479**	**56**	**369**	**1,219**	**88**	*2,211*	**34,705**	**36,916**	**3,727**	**819**
	H.P.	**98,772**	**50,200**	**51,069**	**43,998**	**91,502**	*335,541*	**1,119,952**	**1,455,493**	**89,290**	**138,028**
Grand Total 1942	**No.**	**546**	†	**311**	**1,604**	**85**	*2,546*	**32,609**	**35,155**	**4,601**	**804**
	H.P.	**153,068**	†	**42,240**	**50,710**	**116,765**	*362,788*	**1,093,541**	**1,456,324**	**114,951**	**125,430**

† Included with steam engines (a) Includes Pitchblende ores.

or Idle, in the Mineral Industry in Canada, by Industries, 1943—Concluded

IN RESERVE OR IDLE

Steam engines	Steam turbines	Diesel engines	Gasoline, gas and oil engines other than Diesel engines	Hydraulic turbines or water wheels	*Total primary power*	Electric motors run by purchased power	**Total power employed**	Electric motors run by primary power in same plant	Boilers	Motor generator sets in use and in reserve Total
31	1	....	19	....	*51*	146	**197**	18	26	79
7,579	500	....	356	....	*8,435*	3,622	**12,057**	357	4,935	7,316
....	....	....	2	....	*2*	....	**2**	....	....	2
....	....	....	60	....	*60*	....	**60**	....	....	102
6	2	2	32	....	*42*	10	**52**	6	14	2
310	198	385	1,308	....	*2,201*	140	**2,341**	175	671	8
37	**3**	**2**	**53**	....	*95*	**156**	**251**	**24**	**40**	**83**
7,889	**698**	**385**	**1,724**	....	*10,696*	**3,762**	**14,458**	**532**	**5,606**	**7,426**
....	....	....	....	....	....	39	**39**	....	....	3
....	....	....	....	....	....	3,254	**3,254**	....	....	19
....	....	....	5	....	*5*	5	**10**	20	....	14
....	....	....	86	....	*86*	71	**157**	120	....	317
5	....	7	30	....	*42*	17	**59**	5	3	14
170	....	1,134	1,545	....	*2,849*	630	**3,479**	245	90	923
....	....	....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....	....	....
2	....	2	3	....	*7*	....	**7**	....	1	....
85	....	150	153	....	*388*	....	**388**	....	40	....
....	....	1	14	2	*17*	....	**17**	....	....	2
....	....	115	504	50	*669*	....	**669**	....	....	4
....	1	....	....	....	*1*	9	**10**	19	8	2
....	502	....	....	....	*502*	5	**507**	225	1,635	35
....	....	....	....	....	....	5	**5**	....	....	....
....	....	....	....	....	....	320	**320**	....	....	....
....	....	4	8	....	*12*	17	**29**	26	2	1
....	....	980	421	....	*1,401*	562	**1,963**	320	65	7
7	**1**	**14**	**60**	**2**	*84*	**92**	**176**	**70**	**14**	**36**
255	**502**	**2,379**	**2,709**	**50**	*6,896*	**4,842**	**10,737**	**910**	**1,830**	**1,305**
1	....	....	8	....	*9*	350	**359**	6	1	12
50	....	....	490	....	*540*	17,021	**17,561**	210	40	1,424
6	4	....	11	....	*21*	39	**60**	....	9	2
647	20	....	600	....	*1,267*	1,928	**3,195**	....	690	13
2	....	....	2	....	*4*	11	**15**	....	4	....
60	....	....	120	....	*180*	231	**411**	....	152	....
2	....	....	4	....	*8*	16	**22**	....	2	4
170	....	....	205	....	*375*	482	**857**	....	150	1,610
11	....	6	9	....	*26*	65	**91**	....	1	23
542	....	353	368	....	*1,263*	2,676	**3,939**	....	35	917
22	**4**	**6**	**34**	....	*66*	**481**	**547**	**6**	**17**	**41**
1,469	**20**	**353**	**1,783**	....	*3,625*	**22,338**	**25,963**	**210**	**1,067**	**3,964**
77	**18**	**94**	**274**	8	*471*	**3,235**	**3,706**	**719**	**154**	**1,017**
11,895	**14,230**	**13,851**	**14,850**	**890**	*55,716*	**95,939**	**151,655**	**25,413**	**19,631**	**228,225**
85	†	**85**	**251**	**9**	*430*	**3,080**	**3,510**	**351**	**179**	**813**
26,532	†	**11,428**	**14,018**	**9,240**	*61,218*	**88,563**	**149,781**	**13,411**	**22,316**	**160,073**

WARTIME MINE SHOP ASSOCIATION

OLIVER HALL—*Chairman*

The Porcupine camp was on war work in 1941, 1942, 1943 and 1944 and had some orders to finish in 1945. All told, this mining camp took 190 orders and the work completed to date totals $1,880,411. All the mines participated in this work. The work in this camp was organized by Charles Kemsley, Mechanical Superintendent of Dome Mines. The mechanical superintendents all co-operated. Most of the work was for merchant shipping.

The work in the Kirkland Lake camp totalled a similar amount. Their total for the same period and up to the end of February, 1945 was $1,764,420.67. Twelve mines carried on work on steam generators, steering engines, pumps, etc., for merchant shipping. Lake Shore mines organized the reception and distribution of orders, and Mr. W. Purdy of Lake Shore mine and all the mechanical superintendents co-operated.

Consolidated Smelters built large engines for naval service and the International Nickel Company built the standards for naval guns.

All told, the war work in the mine shops has totalled about $4,250,000 (March, 1945).

CHAPTER TWO

THE GOLD MINING INDUSTRY IN CANADA

Including—(a) The Alluvial Gold Mining Industry; (b) The Auriferous Quartz Mining Industry; (c) The Copper-Gold-Silver Mining Industry; (d) Miscellaneous Data on Monetary Gold and World Gold Production, Prices, etc.

Definition of the Industry—Gold mining in Canada is classified into three principal industries—(a) the recovery of gold from the gravels and sands of stream channels or beaches or what is defined as "The Alluvial Gold Mining Industry"; (b) the recovery of lode gold, which is designated "The Auriferous Quartz Mining Industry" and in which industry gold is usually the most important economic constituent of the ores mined and quartz the predominant gangue mineral; (c) gold is often found in various other mineral deposits, more particularly in those of copper, and for this reason the review of Canada's "Copper-Gold-Silver Mining Industry" is included here to complete a more comprehensive survey of Canadian gold production.

Canadian production of fine gold in 1943 totalled 3,651,301 troy ounces valued at $140,575,088 compared with 4,841,306 troy ounces worth $186,390,281 in 1942. The quantity of gold recovered from Canadian ores, of all kinds, during the year under review, was the smallest since 1936 and reflected the strain borne by a nation that had experienced over four years of total war. Many employees of both auriferous quartz and base metal mines have entered the various branches of the armed forces, and the manufacture of certain equipment or materials necessary for the development of new gold mines or expansion in older one shas been considerably restricted or the products of such manufacture diverted for more urgent use in our all out war effort.

Ontario, Quebec and British Columbia retained their positions as the most important gold producing provinces; of the total gold produced in the Dominion in 1943, Ontario contributed 58 per cent, Quebec 25·3 per cent and British Columbia 6·6 per cent. The balance of the year's output came from deposits located in Saskatchewan, Manitoba, Northwest Territories, Yukon, Nova Scotia and Alberta.

Canadian gold production in 1943, according to the nature of the ores from which the metal was recovered, was as follows: placer deposits, 1·45 per cent, auriferous quartz ores, 82·66 per cent; copper-gold-silver ores, 13·85 per cent; nickel-copper ores, 1·53 per cent, and silver-lead and other ores, 0·51 per cent.

Table 37.—Production of New Gold in Canada, by Provinces and Sources, 1942 and 1943 (Gold at $20·671834 per fine ounce)

—	1942		1943	
	Fine troy ounces	$	Fine troy ounces	$
NOVA SCOTIA—				
In gold bullion	* 12,980	268,506	4,129	85,354
Estimated exchange equalization on gold produced	....	231,570	....	73,613
Total Value—Canadian Funds	....	500,076	....	158,967
QUEBEC—				
In anode copper, in ores shipped and in gold bullion	1,092,388	22,581,663	922,533	19,070,449
Estimated exchange equalization on gold produced	....	19,475,275	....	16,447,072
Total Value—Canadian Funds	....	42,056,938	....	35,517,521
ONTARIO—				
*Porcupine Area—In gold bullion	1,308,590	27,050,955	1,020,977	21,105,467
*Kirkland Lake—In gold bullion (a)	756,388	15,635,927	635,393	13,134,739
*Other gold mines—In gold bullion	627,646	12,974,594	405,007	8,372,237
Copper-nickel and other ores	71,195	1,471,731	55,838	1,154,274
Total	2,763,819	57,133,207	2,117,215	43,766,717
Estimated exchange equalization on gold produced	....	49,273,825	....	37,746,060
Total Value—Canadian Funds	....	106,407,032	....	81,512,777

NOTE: The estimated average price of a troy ounce of fine gold in Canadian funds was $38.50 in both 1942 and 1943.
*Includes relatively small amounts of gold contained in slags, and ore shipped.
(a) Includes production in Larder Lake area.

Table 37.—Production of New Gold in Canada, by Provinces and Sources, 1942 and 1943
Gold at $20·671834 per fine ounce—Concluded

—	1942		1943	
	Fine troy ounces	$	Fine troy ounces	$
MANITOBA—				
In gold bullion, ores shipped and in blister copper	136,226	2,816,041	91,775	1,897,158
Estimated exchange equalization on gold produced	....	2,428,660	....	1,636,179
Total Value—Canadian Funds	....	5,244,701	....	3,533,337
SASKATCHEWAN—				
In ores shipped to Canadian smelters, crude placer gold and gold bullion	178,871	3,697,592	174,090	3,598,760
Estimated exchange equalization on gold produced	....	3,188,941	....	3,103,705
Total Value—Canadian Funds	....	6,886,533	....	6,702,465
ALBERTA—				
In alluvial gold	34	703	21	434
Estimated exchange equalization on gold produced	....	606	....	374
Total Value—Canadian Funds	....	1,309	....	808
BRITISH COLUMBIA—				
In alluvial gold	26,323	544,145	11,680	241,447
In gold bullion	275,178	5,688,434	136,340	2,818,397
In base bullion and in slag and ores exported	172,838	3,572,878	93,326	1,929,220
Total	474,339	9,805,457	241,346	4,989,064
Estimated exchange equalization on gold produced	....	8,456,595	....	4,302,757
Total Value—Canadian Funds	....	18,262,052	....	9,291,821
YUKON—				
In alluvial gold	83,198	1,719,855	41,157	850,790
In ores shipped	48	992	3	62
Total	83,246	1,720,847	41,160	850,852
Estimated exchange equalization on gold produced	....	1,484,124	....	733,808
Total Value—Canadian Funds	....	3,204,971	....	1,584,660
NORTHWEST TERRITORIES—				
In ores shipped	723	14,946	5	103
In gold bullion produced	98,671	2,039,710	59,027	1,220,196
Total	99,394	2,054,656	59,032	1,220,299
Estimated exchange equalization on gold produced	....	1,772,013	....	1,052,433
Total Value—Canadian Funds	....	3,826,669	....	2,272,732
Total for Canada	4,841,306	100,078,674	3,651,301	75,470,087
Total estimated exchange equalization on gold produced	....	86,311,607	....	65,096,001
Grand Total Value, including exchange	....	**186,390,281**	....	**140,575,088**

Table 38.—Estimated Average Monthly Value of an Ounce of Fine Gold, Expressed in Canadian Funds, 1931-1943

Month	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940 1943
	$	$	$	$	$	$	$	$	$	$
January	20·71	24·24	23·64	33·05	34·95	35·06	35·01	34·99	35·30	38·50
February	20·67	23·67	24·74	35·29	35·05	35·18	35·01	35·00	35·19	38·50
March	20·67	23·11	24·78	35·08	35·40	35·11	34·98	35·05	35·13	38·50
April	20·68	22·98	25·33	34·93	35·18	35·13	34·95	35·15	35·15	38·50
May	20·68	23·38	27·75	34·94	34·95	35·00	34·94	35·22	35·13	38·50
June	20·73	23·83	28·24	34·73	35·05	35·09	35·02	35·36	35·07	38·50
July	20·74	23·73	30·58	34·59	35·08	34·91	35·05	35·24	35·06	38·50
August	20·73	23·61	30·09	34·19	35·09	35·00	35·00	35·12	35·01	38·50
September	21·55	22·88	31·79	34·18	35·28	34·99	35·00	35·12	37·21	38·50
October	23·22	22·65	31·48	34·27	35·49	34·99	34·99	35·32	38·43	38·50
November	23·22	23·73	32·68	34·16	35·37	34·95	34·98	35·25	38·50	38·50
December	25·01	23·85	32·14	34·57	35·33	34·98	34·93	35·28	38·50	38·50
Yearly average	21·55	23·47	28·60	34·50	35·19	35·03	34·99	35·17	36·14	38·50

NOTE: Procedure regarding the marketing of gold by the Department of Finance, Ottawa, is noted elsewhere in this report. At December 31, 1943, the price paid by the United States Treasury for gold purchased by the Mint continued at $35 per troy ounce of fine gold, less ¼ of 1 per cent. Actual payment by the United States Treasury for gold in imported and domestic ore or concentrate was at 99·75 per cent of the price quoted by the Treasury, which, at the close of 1943, was equal to $34·9125 per ounce.

Table 39.—Production of Gold in Canada, by Principal Mines, 1943

Property and Province	Ore raised	Material sorted (discarded)	Ore treated	Gold production	Mill capacity 24 hours	See footnotes
	tons	tons	tons	fine oz.	tons	
NOVA SCOTIA—						
Avon Gold Mines Ltd.	350	....	350	335	100	(a) (b)
Consolidated Mining & Smelting Co. of Canada (Holman)	8,979	....	9,004	3,533	40	(a) (c)
Queens Mines Ltd.	5,405	(d)	(d)	843	120	(a)
Total Nova Scotia	....	....	....	*4,129	....	....

FOOTNOTES—
(a) Amalgamation.
(b) Operations ceased January 31.
(c) In addition, 42 ounces of gold were contained in concentrates produced but not treated.
(d) Not reported.
(*) Receipts at Royal Canadian Mint, Ottawa.

Property and Province	Ore raised	Material sorted (discarded)	Ore treated	Gold production	Mill capacity 24 hours	See footnotes
QUEBEC—						
Beattie Gold Mines (Quebec) Ltd.	299,500	28,921	270,579	26,680	1,800	(c) (d) (e)
Belleterre Quebec Mines Ltd.	131,363	20,723	110,640	42,794	300	(c)
Canadian Malartic Gold Mines Ltd.	323,697	....	323,697	32,284	1,000	(c)
Central Cadillac Mines Ltd.	(i)	(i)	(i)	3,263	(i)	(j)
East Malartic Mines Ltd.	315,088	....	315,088	49,014	1,500	(c)
Francoeur Gold Mines Ltd.	63,852	....	63,852	10,526	250	(c)
Lamaque Mining Co. Ltd.	269,535	....	269,535	75,969	1,200	(c) (g)
Lapa Cadillac Gold Mines Ltd.	24,185	....	23,481	5,536	250	(a) (c)
Malartic Gold Fields Ltd.	226,855	....	226,855	43,679	750	(c)
McWatters Gold Mines Ltd.	39,287	684	38,603	5,274	150	(c)
Mic Mac Mines Ltd.	139,172	....	139,009	20,375	650	(a) (b)
O'Brien Gold Mines Ltd.	66,572	....	66,409	25,666	200	(a) (c) (d)
Paulos, Thos. (Eureka Mining Reg.)	1,200	....	1,200	2,850	10	(a)
Perron Gold Mines Ltd.	142,372	25,312	117,060	29,246	360	(c)
Powell Rouyn Gold Mines Ltd.	272,648	....	266,069	34,549	450	(h)
Senator-Rouyn Ltd.	98,022	....	96,073	14,435	300	(c)
Siscoe Gold Mines Ltd.	365,621	45,507	320,114	40,618	1,000	(a) (c)
Sladen Malartic Mines Ltd.	223,619	....	223,743	21,345	700	(c)
Sigma Mines (Quebec) Ltd.	336,098	....	336,098	64,119	1,100	(c) (g)
Stadacona Rouyn Mines Ltd.	137,662	....	137,662	22,444	500	(c)
Sullivan Cons. Mines Ltd.	191,679	40,746	150,933	38,516	500	(a) (c)
West Malartic Mines Ltd.	93,345	....	93,340	11,305	300	(c)
Copper-gold-silver and other ores	....	....	....	302,046	....	....
Total Quebec	....	....	....	922,533	....	....

FOOTNOTES—
(a) Amalgamation.
(b) Auriferous copper concentrates shipped to smelter; in addition, 100 ounces gold contained in concentrates not yet shipped.
(c) Cyanided.
(d) In addition, shipped crude arsenic.
(e) Milling suspended from June 20.
(f) Gold recovered as precipitate and also in lead and zinc concentrates exported.
(g) Also shipped scheelite.
(h) Crude ore shipped to smelter.
(i) Data not available.
(j) Closed April 30.

Property and Province	Ore raised	Material sorted (discarded)	Ore treated	Gold production	Mill capacity 24 hours	See footnotes
ONTARIO—						
Porcupine District						
Aunor Gold Mines Ltd.	159,436	....	159,436	49,720	300	(c)
Bonetal Gold Mines Ltd.	31,351	3,553	27,798	4,299	....	(c)
Broulan Porcupine Mines Ltd.	131,747	13,740	118,007	28,609	350	(c)
Buffalo Ankerite Gold Mines Ltd.	261,484	1,100	260,271	49,151	1,300	(c)
Coniaurum Mines Ltd.	111,455	....	111,455	30,842	600	(c)
Delnite Mines Ltd.	126,446	....	125,887	21,271	520	(c) (b)
Dome Mines Ltd.	525,900	....	525,900	149,641	1,700	(a) (c)
Hallnor Mines Ltd.	105,544	....	105,544	37,918	400	(c)
Hollinger Cons. Gold Mines Ltd. (Ross)	85,125	....	85,221	14,877	300	(c)
Hollinger Cons. Gold Mines Ltd. (Timmins)	1,076,459	....	1,078,946	282,356	3,900	(c) (b)
Hoyle Gold Mines Ltd.	108,944	3,286	105,606	9,731	600	(a) (c) (d)
McIntyre Porcupine Mines Ltd.	662,706	....	668,700	192,869	2,500	(c)
Moneta Porcupine Mines Ltd.	14,101	13	14,088	5,928	175	(c) (e)
Pamour Porcupine Mines Ltd.	525,557	....	525,557	54,073	1,600	(c)
Paymaster Cons. Mines Ltd.	143,581	....	138,531	29,504	600	(c)
Preston East Dome Mines Ltd.	248,766	....	247,026	59,215	1,000	(a) (c) (b)
Kirkland Lake District						
Bidgood Kirkland Gold Mines Ltd.	49,965	....	49,835	14,378	125	(c)
Kirkland Lake Gold Mining Co. Ltd.	83,987	....	83,987	30,863	400	(c)
Lake Shore Mines Ltd.	293,398	....	293,398	133,906	2,300	(c)
Macassa Mines Ltd.	103,230	....	103,259	42,854	400	(c)
Sylvanite Gold Mine Ltd.	148,749	....	148,190	52,515	600	(c)
The Teck-Hughes Gold Mines Ltd.	100,705	....	100,705	32,456	600	(c)
Toburn Gold Mines Ltd.	43,174	2,269	40,905	15,798	174	(c)
Upper Canada Mines Ltd.	68,829	....	68,829	29,848	250	(c)
Wright Hargreaves Mines Ltd.	225,710	....	225,710	113,343	1,200	(c)

Table 39.—Production of Gold in Canada, by Principal Mines, 1943—Continued

Property and Province	Ore raised	Material sorted (discarded)	Ore treated	Gold production	Mill capacity 24 hours	See footnotes
	tons	tons	tons	fine oz.	tons	
Larder Lake District						
Chesterville Larder Lake Gold Mining Co. Ltd.	196,687	....	196,687	23,264	700	(c)
Kerr-Addison Gold Mines Ltd.	674,487	....	674,487	130,192	2,000	(c) (b)
Omega Gold Mines Ltd.	109,846	....	109,846	15,446	500	(c)
Matachewan District						
Hollinger Cons. Gold Mines Ltd. (Young-Davidson)	192,701	....	192,727	20,008	1,050	(c)
Matachewan Consolidated Mines Ltd.	250,179	....	249,779	18,713	1,000	(c)
Sudbury District						
Jerome Gold Mines Ltd.	107,608	....	107,608	18,641	500	(c) (f)
Thunder Bay District						
Hard Rock Gold Mines Ltd.	122,503	24,734	97,373	24,064	500	(c) (g)
Leitch Gold Mines Ltd.	35,127	7,678	27,438	21,884	90	(a) (b) (c)
Little Long Lac Gold Mines Ltd.	104,707	3,868	88,890	26,180	300	(a) (b) (c)
Magnet Cons. Mines Ltd.	43,834	774	43,060	14,878	175	(a) (c) (h)
MacLeod-Cockshutt Gold Mines Ltd.	273,617	91,856	181,761	54,632	650	(c) (i)
Kenora and Rainy River District						
Kenwest Gold Mines Ltd.	3,119	....	3,119	437	125	(c) (j)
Wendigo Gold Mines Ltd.	309	8	301	1,064	80	(a) (k) (n)
Patricia District						
Berens River Mines Ltd.	53,255	....	53,255	16,135	225	(l) (n)
Central Patricia Gold Mines Ltd.	104,451	....	104,451	37,001	400	(c)
Cochenour Willans Gold Mines Ltd.	55,663	....	55,663	28,694	200	(a) (c) (m) (n)
Hasaga Gold Mines Ltd.	146,111	25,923	120,318	18,353	350	(c)
Madsen Red Lake Gold Mines Ltd.	144,796	....	144,792	34,259	400	(a) (c)
McKenzie Red Lake Gold Mines Ltd.	103,449	17,476	85,073	24,672	250	(c) (b)
McMarmac Red Lake Gold Mines Ltd.	32,073	....	32,073	7,213	75	(o) (c) (n)
Pickle Crow Gold Mines Ltd.	81,535	10,740	70,575	34,404	400	(a) (c) (b)
Uchi Gold Mines Ltd.	14,614	....	14,614	3,172	750	(a) (c) (o)
Nickel-copper mines	....	....	....	55,776	....	....
Other mines	....	....	....	2,108	....	....
Total Ontario	....	....	....	2,117,215	....	....

Footnotes—
(a) Amalgamation.
(b) Also shipped scheelite.
(c) Cyanided.
(d) Milling suspended July 11.
(e) Operations ceased June 30.
(f) Suspended milling August 31.
(g) Includes 1,541 ounces recovered from 3,906 tons tailings.
(h) Operations suspended October 29.
(i) Includes 278 ounces recovered from 1,980 tons tailings.
(j) Suspended mining May 31.
(k) Operations ceased January 5.
(l) Gold content of precipitate and lead concentrates shipped, in addition, there is a relatively high recovery of silver and lead.
(m) In addition, there were approximately 545 ounces gold in concentrates produced but not shipped.
(n) Concentrates smelted.
(o) Operations ceased March 8.

Property and Province	Ore raised	Material sorted (discarded)	Ore treated	Gold production	Mill capacity 24 hours	See footnotes
Manitoba—						
God's Lake Gold Mines Ltd.	49,294	....	49,294	13,677	200	(a) (b) (c)
San Antonio Gold Mines Ltd.	164,390	....	164,307	48,508	550	(a) (c)
Copper-gold-silver and other mines	....	....	....	29,590	....	....
Total Manitoba	....	....	....	91,775	....	....

Footnotes—
(a) Amalgamation.
(b) Operations ceased August 27.
(c) Cyanided.

Property and Province	Ore raised	Material sorted (discarded)	Ore treated	Gold production	Mill capacity 24 hours	See footnotes
Saskatchewan—						
Copper-gold-silver and other ores	....	....	....	174,090	....	....
Alberta—						
Placer gold	....	....	....	21	....	....

Table 39.—Production of Gold in Canada, by Principal Mines, 1943—Concluded

Property and Province	Ore raised	Material sorted (discarded)	Ore treated	Gold production	Mill capacity 24 hours	See footnotes
	tons	tons	tons	fine oz.	tons	
BRITISH COLUMBIA—						
Bralorne Mines Ltd.	125,357	6,895	118,462	73,817	150	(a) (b) (j)
Cariboo Gold Quartz Mining Co. Ltd.	35,822	...	38,249	16,269	350	(a) (c)
Gold Belt Mining Co., Ltd.	14,839	...	14,839	5,785	150	(c) (e)
Hedley Mascot Gold Mines Ltd.	47,669	...	47,849	13,122	200	(c) (d) (f)
Island Mountain Mines Co. Ltd.	22,635	...	22,635	10,202	150	(c)
Kelowna Exploration Co. Ltd.	67,640	...	67,640	23,344	275	(d) (g)
Kootenay Belle Gold Mines Ltd.	2,744	...	2,744	1,983	150	(a) (c) (j)
Pioneer Gold Mines of B.C. Ltd.	30,245	3,810	26,435	11,261	300	(c)
Privateer Mine Ltd. } Prident Gold Mines Ltd. }	19,452	5,655	14,106	13,485	90	(a) (c) (h)
Sheep Creek Gold Mines Ltd.	30,285	...	30,285	13,079	150	(c)
Silbak Premier Mines Ltd.	93,003	...	(i)	(i)	500	(d)
Placer gold	...	...	(k) 754,202	11,680	...	...
Copper-gold ores	...	...	...	18,137	...	...
Silver-lead and other ores	...	...	...	29,182	...	...
Total British Columbia	...	...	...	241,346	...	...

FOOTNOTES—
(a) Amalgamation.
(b) Also shipped scheelite.
(c) Cyanided.
(d) Concentrates shipped to smelter.
(e) Milling suspended August 31.
(f) Ore also contains copper and arsenic; milling ceased September 30.
(g) Ore also contained copper and arsenic; in addition, 16,966 tons tailings treated.
(h) Operations suspended November 15.
(i) Data not available.
(j) Operations ceased June 15.
(k) Cubic yards material handled (estimate).

YUKON—						
Placers	...	...	(a)7,273,915	41,157	...	...
Silver-lead ores	...	...	...	(b) 3	...	...
Total Yukon	...	...	...	41,160	...	...

FOOTNOTES—
(a) Cubic yards—estimated.
(b) In ores exported.

NORTHWEST TERRITORIES—						
Cons. Mining & Smelting Company of Canada Ltd. (Con)	33,713	...	33,713	20,357	350	(a) (b) (c) (d)
Negus Mines Ltd.	27,358	5,019	22,333	19,080	60	(a) (c)
Rycon Mines Ltd.	4,608	...	4,608	2,620	...	(e)
Thompson-Lundmark Gold Mines Ltd.	23,545	...	23,545	16,814	100	(a) (c) (f)
Other gold mines	...	...	...	161	...	...
Total Northwest Territories	...	...	...	59,032	...	...

FOOTNOTES—
(a) Amalgamation.
(b) Milling suspended September 11.
(c) Cyanided.
(d) In addition, there were 2524·6 tons of concentrates assaying 1·52 ounces gold per ton produced but not treated.
(e) Mining suspended September 11; ore milled at Con mine.
(f) Operations suspended September 20.

CANADA—						
Total Canada	...	...	...	**3,651,301**	...	...

Table 40.—Gold Recovered in Canada According to Nature of Ore, by Provinces, 1938-1945

Year and Province	Placer gold	Auriferous quartz ores (†)	Copper-gold-silver ores	Nickel-copper ores	Silver-lead and other ores	Total
	oz.	oz.	oz.	oz.	oz.	oz.
1938						
Nova Scotia		26,560				26,560
Quebec		576,034	305,229			881,263
Ontario		2,816,250		80,222	5	2,896,477
Manitoba		103,291	82,415			185,706
Saskatchewan	81		49,940			50,021
Alberta	305					305
British Columbia	46,207	523,153	22,267		13,990	605,617
Northwest Territories		6,794			6	6,800
Yukon	71,303				1,065	72,368
Total Canada	117,896	4,052,082	459,851	80,222	15,066	4,725,117
1939						
Nova Scotia		28,071			1,872	29,943
Quebec		680,410	272,967			953,377
Ontario		3,008,976		77,094	6	3,086,076
Manitoba		107,024	73,851			180,875
Saskatchewan	63	8,555	68,502			77,120
Alberta	359					359
British Columbia	39,797	534,938	36,883		15,352	626,970
Northwest Territories		51,911			3	51,914
Yukon	85,572	1,146			1,027	87,745
Total Canada	125,791	4,421,031	452,203	77,094	18,260	5,094,379
1940						
Nova Scotia		22,219				22,219
Quebec		751,942	267,233			1,019,175
Ontario		3,170,823		90,863	2	3,261,688
Manitoba		76,897	75,398			152,295
Saskatchewan	69	20,863	81,993			102,925
Alberta	215					215
British Columbia	32,128	509,260	54,731		20,892	617,011
Northwest Territories	3	55,156				55,159
Yukon	79,905	292			261	80,458
Total Canada	112,320	4,607,452	479,355	90,863	21,155	5,311,145
1941						
Nova Scotia		19,170				19,170
Quebec	9	813,158	276,172			1,089,339
Ontario		3,116,303		77,960	45	3,194,308
Manitoba		80,330	70,223			150,553
Saskatchewan	57	24,631	113,327			138,015
Alberta	215					215
British Columbia	35,020	516,941	35,010		21,232	608,203
Northwest Territories	39	74,378				74,417
Yukon	70,847				112	70,959
Total Canada	106,187	4,644,911	494,732	77,960	21,389	5,345,179
1942						
Nova Scotia		12,989				12,989
Quebec		811,714	280,580		94	1,092,388
Ontario		2,692,828		70,861	130	2,763,819
Manitoba		85,193	51,033			136,226
Saskatchewan	9	15,141	163,721			178,871
Alberta	34					34
British Columbia	26,323	418,048	19,892		10,076	474,[illegible]
Northwest Territories		99,394				99,[illegible]
Yukon	83,198				48	83,[illegible]
Total Canada	109,564	4,135,307	515,226	70,861	10,348	4,841,[illegible]
1943						
Nova Scotia		4,129				4,129
Quebec		625,429	284,112		* 12,992	922,533
Ontario		2,061,376	1	55,776	62	2,117,215
Manitoba		62,254	29,521			91,775
Saskatchewan		4	174,086			174,090
Alberta	21					21
British Columbia	11,680	205,850	18,137		5,679	241,346
Northwest Territories		59,032				59,032
Yukon	41,157				* 3	41,160
Total Canada	52,858	3,018,074	505,857	55,776	18,736	3,651,301
Total Six Years	**624,616**	**24,878,857**	**2,907,224**	**452,776**	**104,954**	**28,968,427**

† Contains a relatively small quantity of gold recovered from certain complex ores (lead, copper, etc.) which are difficult to classify. This applies especially to British Columbia ores.

* Includes production of Golden Manitou mine which was classified in previous years as auriferous quartz.

Table 41.—Gold Production of the World(a)—(In fine ounces)—1938 and 1943

Country	1938	1943
(Taken from American Bureau of Metal Statistics)		
NORTH AMERICA—		
United States	5,008,178	1,365,223
Canada	4,725,117	3,652,263
Mexico	923,819	* 800,000
Newfoundland	24,104	20,000
Total North America	10,681,218	5,837,486
CENTRAL AMERICA AND WEST INDIES	164,000	300,000
SOUTH AMERICA—		
Brazil	174,041	250,000
Chile	294,092	174,000
Colombia	520,715	570,092
Ecuador	74,042	100,000
Peru	260,319	230,000
Guiana—British	38,482	(d)
Dutch	12,000	(d)
French	40,605	(d)
Venezuela	114,978	110,000
Other South America	40,000	(d)
Total South America	1,569,274	1,439,092
EUROPE—		
Czechoslovakia	10,000	....
France	87,354	....
Yugoslavia	78,301	....
Romania	172,453	....
Russia and Siberia	* 5,800,000	....
Sweden	234,116	....
Other Europe	45,000	....
Total Europe	6,427,224	* 4,500,000
OCEANIA—		
New South Wales	88,708	55,000
Queensland	151,432	* 100,000
Victoria	141,243	55,000
Western Australia	1,167,792	546,470
Tasmania	22,200	* 20,000
New Guinea	236,397	....
New Zealand	152,050	150,000
Fiji	92,400	90,000
Other Oceania (c)	52,600	* 40,000
Total Oceania	2,107,822	1,056,470
ASIA—		
British India	322,397	252,000
China, including Manchuria	188,000	(d)
Korea	948,447	(d)
Netherland India	76,300	(d)
Formosa	* 60,000	(d)
Japan	* 760,000	(d)
Other Asia	104,000	(d)
Total Asia	2,459,144	* 1,600,000
AFRICA—		
Belgian Congo	473,246	(d)
French West Africa	127,153	(d)
Kenya	69,436	(d)
Madagascar	13,760	(d)
Rhodesia	815,191	665,000
British West Africa (b)	729,754	600,000
Tanganyika	82,168	110,000
Transvaal, Cape Colony and Natal	12,161,392	12,800,021
Other Africa	150,000	(d)
Total Africa	14,622,100	15,080,021
Totals for World	**38,030,782**	**29,813,069**

(a) In compiling this table free use has been made of the reports of the United States Director of the Mint. Production of the Philippine Islands is included with the United States in this table.

(b) Comprising Gold Coast, Sierra Leone and Nigeria.

(c) Includes Papua.

(d) Not reported; estimate has been included in total.

* Conjectural.

Table 42.—Comparative Figures of Gold Production for the World Since the Discovery of America, also Production for Russia, Transvaal, United States and Canada

Year	Russia (a)	Transvaal since the commencement of Fields (i)	United States (f) (a)	Canada since the recording of production in 1858	(a) World since the discovery of America
	fine ounces	fine ounces	fine ounces	fine ounces	fine ounces
1493-1600	....	....	....	....	24,206,820
1601-1700	....	....	....	....	29,330,445
1701-1800	....	....	....	....	61,088,215
1801-1840	....	....	....	....	20,488,552
1841-1850	....	....	(c) 1,187,170	....	17,605,018
1851-1860	....	....	....	220,039	64,482,933
1861-1870	....	....	(d) 58,279,778	1,477,999	61,098,343
1871-1880	....	....	(e) 15,281,264	904,093	55,670,618
1881-1890	....	1,070,651	15,808,339	584,102	51,280,184
1891-1895	....	6,870,158	9,106,834	291,564	39,412,823
1896-1900	....	12,578,869	15,728,572	3,469,791	62,234,698
1901-1905	....	13,632,908	19,393,722	4,592,261	78,033,650
1906	....	5,792,823		556,415	19,471,080
1907	....	6,450,740		405,517	19,977,260
1908	....	7,056,266	22,993,218	476,112	21,422,244
1909	....	7,295,108		453,865	21,965,111
1910	....	7,527,108		493,707	22,022,180
1911	....	8,249,461	4,687,053	473,159	22,397,136
1912	(g)	9,107,512	4,520,719	611,885	22,605,008
1913	1,583,677	8,798,336	4,299,784	802,973	22,556,347
1914	1,733,914	8,394,322	4,572,976	773,178	21,652,883
1915	1,382,450	9,093,902	4,887,604	918,056	22,846,608
1916	1,089,885	9,296,618	4,479,057	930,492	22,032,542
1917	871,265	9,018,084	4,051,440	738,831	20,346,043
1918	554,588	8,418,292	3,320,784	699,681	18,588,127
1919	173,610	8,331,294	2,918,628	766,764	17,339,679
1920	73,945	8,158,226	2,476,166	765,007	16,146,830
1921	65,907	8,128,681	2,422,006	926,329	15,997,692
1922	191,614	7,009,767	2,363,075	1,263,364	15,496,859
1923	305,425	9,148,771	2,502,632	1,233,341	17,845,349
1924	546,550	9,574,918	2,528,900	1,525,382	18,610,481
1925	632,390	9,597,573	2,411,987	1,735,735	18,673,178
1926	760,605	9,954,762	2,335,042	1,754,228	19,117,568
1927	688,492	10,122,459	2,197,125	1,852,785	19,058,736
1928	385,800	10,354,157	2,233,251	1,890,592	18,885,849
1929	707,300	10,412,326	2,208,386	1,928,308	19,207,452
1930	1,501,083	10,716,349	2,285,903	2,102,068	20,903,736
1931	1,655,725	10,877,708	2,395,878	2,093,892	22,284,290
1932	1,938,000	11,557,858	2,449,032	3,044,387	24,098,676
1933	2,700,000	11,012,340	2,556,246	2,949,309	25,400,205
1934	3,858,000	10,479,194	3,091,183	2,972,074	27,372,374
1935	4,781,030	10,773,041	3,609,283	3,284,890	29,999,245
1936	(h) 6,500,000	11,335,092	4,357,394	3,748,028	32,930,554
1937	(h) 5,900,000	11,734,553	4,804,540	4,096,213	35,118,298
1938	(h) 5,800,000	12,161,375	5,089,811	4,725,117	37,703,334
1939	(h) 5,000,000	12,821,061	5,611,171	5,094,379	39,534,430
1940	(h) 4,000,000	14,037,741	(j) 6,003,105	5,311,145	41,067,101
1941	(b)	14,386,361	(l) 5,976,419	5,345,179	(k) 40,332,204
1942	(b)	14,120,617	(n) 3,741,800	4,841,306	(m) (k) 36,000,000
1943	(b)	12,800,021	(p) 1,360,350	3,651,301	(o)
Total	....	**408,257,403**	**272,527,333**	**89,374,843**	....

(a) Supplied by United States Mint.

(b) Not available.

(c) 1792-1847.

(d) 1848-1872.

(e) 1873-1880.

(f) Including Philippine Islands production received in United States. Data represent receipts at United States Mint's refineries assay offices.

(g) Data not available for preceding years. A revision by the United States Mint of estimated Russian gold production for the years 1913 to 1934 was made from United States consular reports, based principally on Soviet publications. While available data are quite indefinite and, in many instances, contradictory, it is believed that this revision more nearly represents actual production than data heretofore used. Figures for Russian production since 1937 supplied by American Bureau of Metal Statistics.

(h) Subject to revision. American Bureau of Metal Statistics.

(i) Annual Report—Department of Mines, Union of South Africa. 1941 and 1942 figures, Transvaal Chamber of Mines.

(j) Includes 1,140,126 fine ounces received from Philippines.

(k. Includes conjectural data for Russia.

(l) Includes 1,144,332 fine ounces from Philippine Islands.

(m) The Mining Journal, London—subject to revision.

(n) Includes 158,726 ounces received from Philippine Islands.

(o) Omitted due to incomplete data.

(p) United States Bureau of Mines—preliminary.

Table 43.—Precious Metals Consumed by the Jewellery and Silverware Industry in Canada, 1941 and 1942

Material	Cost at works	
	1941	1942
	$	$
Precious metals—		
Fine gold	2,343,880	2,789,986
Gold alloys	392,067	607,604
Fine silver	1,144,409	1,476,788
Silver alloys	646,528	754,421
Platinum	208,318	361,006
Old gold, jewellers' findings, waste and scrap for refining	1,318,882	1,324,155
Gold-filled wire and stock	510,646	557,245
Precious and semi-precious stones	732,748	697,703

GOLD EXPORTS

(Order-in-Council P.C. 207—January 13, 1944)

WHEREAS by Order in Council, P.C. 1150, dated May 17, 1932, regulations respecting the export of gold, whether in the form of coin or bullion, from the Dominion of Canada, were made under the authority of The Gold Export Act;

AND WHEREAS the said regulations were by Order in Council, P.C. 11498, dated December 22, 1942, continued in force until December 31, 1942;

AND WHEREAS in the opinion of the Minister of Finance it is expedient that the said regulations be continued in force beyond December 31, 1943;

NOW, THEREFORE, His Excellency the Governor General in Council, on the recommendation of the Minister of Finance and under the provisions of the said "The Gold Export Act", is pleased to order that the provisions of the said Regulations be and they are hereby continued in force and effect until December 31, 1944, unless sooner rescinded by Order in Council.

NOTE.—Order in Council P.C. 1150, reads, in part, as follows—"The export of gold, whether in the form of coin or bullion (including ore, etc.), from the Dominion of Canada, is hereby prohibited, except in such cases as may be deemed advisable by the Minister of Finance, and under license to be issued by him..........".

GOLD IN CANADIAN TRADE STATISTICS

The publication of statistics showing the gross imports and exports of gold has been temporarily suspended as from September, 1939. Statistics for periods prior to that time have been accordingly revised to exclude all gold formerly included in the total of merchandise exports.

Statistics showing the net exports of non-monetary gold, including changes in stocks held under earmark, are published as a supplement to the trade figures, and are given below.

Exports of gold in Canadian trade statistics were distinguished in previous reports as between monetary and non-monetary. Monetary gold exports were described as those which entailed a reduction in the Dominion's monetary gold stocks. All other gold exported (classed as non-monetary) were shown as merchandise, and included with the total merchandise exports.

The fact that gold is a money metal gives it peculiar attributes which distinguish it from other commodities in trade. In particular, the movement of gold in international trade is determined almost exclusively by monetary factors. The amount of exports may fluctuate widely from month to month owing to other than ordinary trade or commercial considerations. In addition, gold is generally acceptable. It does not have to surmount tariff barriers and is normally assured a market at a relatively fixed price. For these reasons, provision was made in previous trade reports for a supplementary table showing exports from Canada excluding all gold.

It is further to be noted that gold does not move in international trade in any direct or normal relation to sales and purchases. It may be bought or sold abroad without moving in or out across the frontier, the sales or purchases in such cases being recognized by simply setting aside or "earmarking" the gold in the vaults of the central bank. Trade statistics deal only with physical movements, sales or purchases of gold which do not involve an actual movement being more properly regarded as an "invisible item" and taken care of in the "International Balance of Payments" statements. Changes in the Bank of Canada's stock of gold under earmark do not enter, therefore, into the trade statistics.

Table 44.—Trade of Canada, by Months, January, 1940 to December, 1945 (External Trade Branch, D.B.S.)

Balance of Trade (Excluding Gold)

Month	1940		1941		1942		1943	
		$		$		$		$
January	+	19,749,692	−	9,429,803	+	10,180,853	+	51,236,770
February	+	1,272,518	+	10,892,522	+	48,641,010	+	55,052,562
March	+	6,731,244	−	5,023,835	+	32,063,651	+	60,460,065
April	−	1,286,841	+	12,124,675	+	27,884,655	+	78,378,660
May	+	10,226,810	+	34,566,669	+	88,179,951	+	98,913,387
June	+	20,916,821	+	31,898,663	+	58,170,621	+	104,375,178
July	+	11,966,940	+	43,193,512	+	59,824,137	+	155,643,568
August	+	14,523,715	+	12,582,786	+	45,905,877	+	145,971,168
September	+	16,491,368	+	5,905,452	+	81,170,827	+	110,097,386
October	−	1,854,042	−	1,141,275	+	72,774,449	+	99,953,595
November	+	16,120,464	+	29,888,112	+	82,758,195	+	133,101,370
December	−	3,591,816	+	26,205,413	+	133,669,887	+	173,091,680
Total	+	**111,266,873**	+	**191,662,891**	+	**741,224,113**	+	**1,266,275,389**

Net Exports of Non-Monetary Gold (Additional to Balance of Trade)

(Millions of Dollars)

January	21·6	19·2	15·1	13·9
February	12·4	14·7	16·6	12·8
March	16·2	19·7	16·1	12·8
April	18·0	14·3	14·1	13·5
May	16·9	16·1	15·5	12·5
June	15·1	18·4	16·8	12·2
July	15·9	17·3	16·3	10·0
August	17·6	12·6	13·1	10·2
September	16·5	21·2	15·0	11·8
October	18·9	17·4	19·3	11·3
November	16·6	15·4	12·6	8·8
December	17·3	17·4	13·9	12·2
Total	**203·0**	**203·7**	**184·4**	**142·0**

CANADIAN STOCKS OF GOLD METAL

Data relating to Canadian stocks of metallic gold since 1939 were not published. For information pertaining to these stocks prior to 1940, see previous annual gold mining reports as issued by the Bureau of Statistics.

Table 45.—World's Monetary Stocks of Gold at the Close of 1940, 1941 and 1942 (Subject to Revision)

(Compiled by the United States Mint from available data)

(Stated in United States money)

Country	Total Gold Stock Value, 1940 (e)	Per capita	Total Gold Stock Value, 1941 (e)	Per capita	Total Gold Stock Value, 1942 (e)	Per capita
	$	$	$	$	$	$
United States (d)	21,991,102,000	165·98	22,736,557,000	167·62	22,726,255,000	168·85
Canada	7,251,000	0·63	5,000,000	0·44	5,629,000	0·49
Argentina	438,078,000	34·33	389,798,000	29·26	353,728,000	25·80
Belgium	736,000,000	88·03	734,000,000	87·42	735,000,000	89·02
Denmark	52,003,900	13·82	44,000,000	11·39	44,000,000	11·39
France	2,000,068,000	47·73	2,000,000,000	47·64	2,000,000,000	47·64
Germany	40,280,000	0·60	29,000,000	0·42	29,000,000	0·42
Great Britain	1,991,000	0·04	1,648,000	0·03	1,000,000	0·02
Italy	137,090,000	3·13	(a)	(a)	(a)	(a)
Netherlands	617,299,000	71·49	575,000,000	64·44	506,000,000	56·71
Norway	84,388,000	29·03	(a)	(a)	(a)	(a)
Poland	...	...	...	...	...	...
Portugal	92,284,000	12·69	59,000,000	7·66	59,000,000	7·60
Roumania	157,400,000	8·01	182,000,000	13·49	241,000,000	12·09
Russia (Soviet Union)	(a)	(a)	(a)	(a)	(a)	(a)
Spain	(a)	(a)	(a)	(a)	42,000,000	1·60
Sweden	304,955,000	48·52	223,371,000	35·06	335,000,000	52·58
Switzerland	502,115,000	120·29	665,000,000	156·21	824,000,000	193·56
British India (ex. Burma)	274,480,000	0·81	274,392,000	0·71	274,392,000	0·71
Japan (including Chosen, Taiwan, Kwantung)	163,570,000	1·61	(a)	(a)	(a)	(a)
Netherlands East Indies	139,659,000	2·17	235,000,000	3·31	(a)	(a)
Egypt	52,000,000	3·10	52,000,000	3·10	112,208,000	4·85
Australia	16,683,000	2·43	(a)	(a)	(a)	(a)
New Zealand	23,087,000	14·41	23,000,000	14·08	23,087,000	14·13
Union of South Africa	352,713,000	36·00	366,000,000	35·39	634,457,000	60·30
Other countries	902,251,000	...	(a)	(a)	(a)	(a)
Total	**29,086,657,000**	(b) **14·28**	(c)	(c)	(c)	(c)

(a) Complete data omitted because of indefiniteness or unavailability.

(b) Population figures are principally supplied by United States Department of Commerce, 1938–40.

(c) Totals omitted due to the great number of instances in which data are not available.

(d) Includes Alaska, Hawaii and Puerto Rico.

(e) 1 ounce fine gold = $35.

NOTE.—It is understood that material amounts of gold are not reported by several countries, such as amounts held in secret funds for stabilizing currencies and those hoarded or held outside of regularly reported stocks; also, Belgium, Canada, France, Germany and the United Kingdom do not include gold held in exchange equalization and similar accounts.

Table 46.—Average Commercial Ratio of Silver to Gold for each Specified Year Since 1700

(Supplied by United States Mint)

Year		Year		Year	
1700	14·81	1905	33·87	1935	54·19
1750	14·55	1910	38·22	1936	77·09
1800	15·68	1915	40·48	1937	77·44
1850	15·70	1920	20·28	1938	80·39
1875	16·64	1925	29·78	1939	88·84
1880	18·05	1930	53·74	1940	99·76
1885	19·41	1932	73·29	1941	99·73
1890	19·75	1933	59·06	1942	90·57
1895	31·60	1934	72·49	1943	85·07*
1900	33·33				

* Estimate based on Canadian prices.

ORDER-IN-COUNCIL P.C. 1004—FEBRUARY 18, 1944

WHEREAS subsection one of section twenty-five of the Bank of Canada Act, Chapter forty-three of the Statutes of Canada, 1934, provides that the Bank shall sell gold to any person who makes demand therefor at the head office of the Bank and tenders the purchase price in legal tender, but only in the form of bars containing approximately four hundred ounces of fine gold;

AND WHEREAS by Order in Council P.C. 1238 dated February 15, 1943, passed under the provisions of sub-section two of said section twenty-five of the said Act, the operation of said subsection one of section twenty-five was suspended for a period of one year from and after March 10, 1943.

NOW, THEREFORE, His Excellency the Governor General in Council, on the recommendation of the Minister of Finance and under the provisions of said subsection two of section twenty-five of the Bank of Canada Act is pleased to order that the operation of said subsection one of section twenty-five be and it is hereby suspended for a further period of one year from and after the tenth day of March, 1944, unless sooner rescinded by Order in Council.

ROYAL CANADIAN MINT

The Ottawa Mint, established as a branch of the Royal Mint under the (Imperial) Coinage Act, 1870, and opened up on January 2, 1908, was by 21–22 Geo. V, C. 48, constituted a branch of the Department of Finance and since December 1, 1931, has operated as the Royal Canadian Mint. The great development of the gold mining industry in Canada has resulted in gold refining becoming one of the principal activities of the Mint. Gold coins have never been a popular medium of exchange in Canada and have not been struck since 1919, most of the fine gold produced from the rough shipments from the mines being delivered to the Bank of Canada in the form of bars, the rest being sold in convenient form to manufacturers.

The domestic gold currency of Canada, as at present authorized by the Currency Act, consists of \$20, \$10, \$5 and \$2½ gold pieces, 900 millesimal fineness (only \$10 and \$5 have been issued). Gold was used only to an insignificant extent as a circulating medium in Canada, its monetary use being practically confined to reserves; \$5 and \$10 gold pieces weighing respectively 129 and 258 grains, 9/10th pure gold by weight, have been coined, the Canadian gold dollar thus containing 23·22 grains of pure gold. The \$5, \$10 and \$20 gold coins of the United States, which contain exactly the same weight of gold as Canadian gold coins of these denominations, are legal tender for their face value only, as are the British sovereigns, which are legal tender for \$4.86 2/3, their equivalent in Canadian gold dollars.

The regulations in part for the receipt of gold bullion at the Royal Canadian Mint, Ottawa, are as follows: Each parcel of bullion for which a separate assay is required shall be regarded as a separate deposit, and no ingot exceeding 1,500 ounces troy, gross weight, will be accepted. All deposits shall be dealt with in the order in which they are received. Deposits containing, by assay, less than 200 parts of gold in 1,000, or appearing, either before or after melting and assaying, to be unsuitable for treatment by the refining process in use, may be rejected. A deposit so rejected shall be returned to the depositor on payment by him of any costs incurred for melting and assaying.

The Mint charges, to be calculated on the gross weight of the deposit after melting, shall be as follows:

(a) For melting and assaying—one dollar for the first four hundred ounces or part thereof and twenty-five cents for each additional one hundred ounces or part thereof.

(b) For refining—When the deposit contains not more than 5 per cent base metal, 3 cents the ounce.
Over 5 per cent but not over 10 per cent base metal, 3½ cents the ounce.
Over 10 per cent but not over 15 per cent base metal, 4½ cents the ounce.
Over 15 per cent but not over 20 per cent base metal, 5 cents the ounce.
On deposits which contain over 20 per cent base metal, or which require other treatment, a charge not exceeding 10 cents the ounce, to be determined by the cost of the treatment.

The minimum charge for refining shall be two dollars for each deposit and the charge for refining shall apply to all deposits containing by assay less than 995 parts fine gold in 1,000.

An additional handling charge at the rate of 35 cents the ounce fine, to cover costs of realization in a market outside Canada, shall be made on all newly mined Canadian gold deposited with the Mint, and this charge shall be increased to $1.00 the ounce fine on all other gold accepted as a deposit.

The gross value of gold deposited for sale with the Royal Canadian Mint or the Dominion of Canada Assay Office, Vancouver, shall be the market price of gold in the country to which the Government is at the time of the receipt of the deposit exporting gold, converted into Canadian funds at the average of the buying rates of exchange of that country to the Department of Finance by the Bank of Canada at 11 a.m. daily during the week in which the gold is deposited with the Mint or Assay Office.

In addition to newly-mined Canadian gold there may be accepted at the Mint, gold (over 1 ounce troy fine) in the following forms: old jewellery and dental scrap, provided it has not been melted or otherwise treated in any way to prevent its origin being readily recognized; scrap from manufacturers and refiners the result of processes carried out by them in the ordinary course of their business; gold coin which, when of full weight and fineness, is not legal tender in Canada. Satisfactory evidence as to the origin of the gold shall be furnished by the depositor if required.

Delivery of deposits shall be accepted at the Mint counter only, free of all charges, and when bullion is forwarded by mail or express the original packages will not ordinarily be opened until an invoice of the description and weight of their several contents has been received. When there is a serious discrepancy between the actual and invoice weights of any deposit, further action in regard to it will be deferred pending communication with depositor.

The gross value of a deposit shall be calculated at a rate of one dollar for each 23·22 grains fine gold contained therein (equivalent to $20·6718+ the ounce fine) and at a rate for all silver in excess of one per centum of the weight of the deposit after melting to be determined by the Minister of Finance. The rate to be paid, under Clause 4 of the Regulations, for silver in excess of one per centum of the weight of deposits received in any week, shall be the domestic price for silver for the basic period of September 15 to October 11, 1941, under the maximum price regulations of the Wartime Prices and Trade Board, namely 38·6 cents per ounce fine.

GOLD BULLION

Four thousand eight hundred and twenty-five deposits of gold bullion weighing 4,371,213 ounces were received at the Ottawa Mint from Canadian Mining Companies and sundry persons, and 165 deposits weighing 85,225 ounces received from the Dominion of Canada Assay Office, Vancouver, B.C. The total gross weight of gold deposited, including mutilated gold coin, was 4,456,438 ounces, containing by assay 3,616,959 ounces fine gold and 474,386 ounces fine silver. This shows a decrease as compared with the year 1942 of 1,655 deposits, gross weight 1,304,606 ounces, fine gold 995,023 ounces fine and fine silver 178,441 ounces fine.

The net amount paid by the Royal Canadian Mint to depositors by cheque was $135,169,933.85. In addition, fine gold amounting to 5,835,849 ounces with a statutory value of $120,638.10 was also issued in payment of gold deposits.

Postage collected for the Postmaster General on deposits shipped to the Mint postage collect amounted to $21,965.02.

There were 722 rough gold deposits received at Vancouver and 4,825 deposits at Ottawa. Details relating to the origin of these deposits are shown in the following statement:

Source	Gross Weight	Fine Gold	Fine Silver
	Ounces	Ounces	Ounces
From Canadian mines—			
Ontario	2,613,308·050	2,110,420·496	275,272·27
Quebec	1,304,195·150	1,087,610·755	127,697·94
British Columbia	210,490·910	162,102·034	33,984·39
Manitoba	156,422·550	129,975·593	10,243·70
Yukon	52,709·610	41,156·860	8,810·11
Nova Scotia	4,448·625	4,130·962	144·70
Northwest Territories	86,065·025	64,586·135	14,363·50
Alberta and Saskatchewan	37·210	26·229	2·77
Total from mines	4,427,677·130	3,600,009·070	470,519·38
From jewellery and scrap	22,561·795	10,534·869	3,161·89
Foreign	1,526·300	1,470·261	28·96
Mutilated gold coin	0·264	0·237	....
Grand Total	**4,451,765,489**	**3,612,014,437**	**473,710·23**

A detail of the fine gold issued in the form of trade bars to the Bank of Canada and granulated, sweep, proof plate and medals to sundry persons is shown hereunder:

	Ounces Fine
8,925 Trade Bars to Bank of Canada	3,559,549·683
Depositors	5,835·849
Sales to Manufacturers	62,684·078
Proof Plate	0·500
Medals	7·838
Sweep	17,662·016
	3,645,739·964

This total shows a decrease of 966,152·263 ounces fine as compared with the year 1942.

DOMINION OF CANADA ASSAY OFFICE, VANCOUVER, B.C.

Disbursements through this office in 1943 for the purchase of gold bullion amounted to $2,414,688.10, as against $5,628,080.26 for the calendar year 1942, a decrease of $3,213,392.16.

Particulars as to source, weights, etc., are as under:

Source	Number of Deposits	Gross Weight	Fine Gold	Fine Silver
		Ounces	Ounces	Ounces
Yukon Territory	286	52,709·61	41,156·866	8,810·11
British Columbia	288	24,116·11	20,540·529	2,220·36
Alberta and Saskatchewan	3	28·76	22·115	1·76
Northwest Territories	1	3·40	2·997	0·23
Jewellery and dental scrap	144	3,694·62	1,589·807	597·78
	722	80,552·50	63,312·314	11,630·24

The above figures show a net decrease of 738 in the number of deposits, and of 84,205.603 ounces fine gold, as compared with the year 1942.

THE ALLUVIAL GOLD MINING INDUSTRY, 1943

In 1943, and for many years past, the greater part of the Canadian production of alluvial gold came from Yukon and British Columbia; relatively small quantities are also obtained in Alberta, Saskatchewan, and sometimes Quebec.

During the year under review, there were 52,837 troy ounces of fine gold recovered from crude gold obtained in Canadian alluvial mining operations. This represents a decrease of 48 per cent from the corresponding production in 1942 and reflects the increasing scarcity of men available for mining operations and prospecting.

Quebec and Ontario.—No placer gold mining operations were reported in 1943 from either Quebec or Ontario.

Saskatchewan and Alberta.—Placer gold has been mined along the North Saskatchewan River at various points between Rocky Mountain House, Alberta, and Prince Albert, Saskatchewan, from about 1860. Most activity has, however, been confined to the Alberta region. particularly in the vicinity of Edmonton. In 1943 no placer gold was recovered in Saskatchewan and only 21 troy ounces in Alberta.

British Columbia.—It has been found impractical to obtain complete reports for each individual placer gold mining operation in British Columbia, inasmuch as a considerable quantity of the crude placer gold is recovered annually by prospectors of no fixed abode who, in many instances, market their recoveries through local merchants and banks. Recoveries in 1943 were made chiefly from deposits located in the Atlin, Cariboo and Omineca districts; other districts to report production included Kamloops, Fort Steele, Revelstoke and Clinton. It was estimated that 11,680 troy ounces of fine gold were recovered from crude alluvial gold produced in British Columbia during 1943.

The number of alluvial gold operators reporting in 1943 totalled 39 as against 72 in 1942. The quantity of sands and gravels, including overburden and barren material moved during the year was estimated at 754,202 cubic yards compared with 1,884,887 cubic yards in the preceding year.

Yukon.—The following is from the annual report of G. A. Jeckell, Controller of Yukon Territory, for the fiscal year ending March 31, 1944:

"The total revenue collected in the Dawson Office on account of Mining Lands was \$53,435.50. Of this amount \$52,392.75 was from Placer, and \$1,042.75 was from Quartz. The decrease from last year's revenue is under the item of Royalty Export Tax on gold, and this decrease was due to the closing down of one-half of the gold dredges because of scarcity of labour. The revenue from mining fees alone shows a considerable increase over previous year. Comparative statements showing the revenue collected during the past years are attached.

"In the Mayo Mining Recorder's Office the total collections on account of mining were \$2,784.59. Of this amount \$1,218.98 was from placer, and \$1,565.61 was from Quartz. There was no revenue from royalty on silver.

"In the Whitehorse Mining Recorder's Office the total collections on account of mining were \$1,069.75, of which \$260.00 was from Placer, \$289.00 from Quartz, \$131.00 from Coal Leases, and \$389.75 from the sale of maps.

"The amount of placer gold mined during the year in the Territory on which Royalty Export Tax was paid was 52,853.58 ounces, produced as follows: 52,141.22 ounces, Dawson District; 530.50 ounces, Mayo District; and 181.86 ounces, Whitehorse District. The Royalty collected was \$19,820.17, as follows: Dawson District, \$19,552.92; Mayo District \$198.98; and Whitehorse District, \$68.27. The total gold production was 52,577.31 ounces less than for the previous year.

"In the Dawson District sixty-five new placer location grants, twenty-four relocation grants, and two thousand four hundred and nine renewal grants were issued, representing two thousand four hundred and ninety-eight placer claims in good standing. Three Dredging Leases were renewed covering twenty-three miles, and fees for the renewal of four hydraulic leases were paid.

"In the Mayo District one new placer location grant and one hundred renewal placer grants were issued, making one hundred and one claims in good standing.

"In the Whitehorse District three placer relocation grants, and twenty-two renewal placer grants were issued, making a total of twenty-five placer claims in good standing.

"The total number of placer claims in good standing in the Territory was two thousand six hundred and twenty-four.

"Fifty-seven Prospecting Leases were issued during the year representing a total of one hundred and forty-eight miles leased, being an increase of forty miles over previous year. There were twenty-nine new Leases issued, and twenty-eight Leases renewed. Divided as to Districts, ninety-five miles were in the Dawson District, thirty-nine miles in the Whitehorse District, and fourteen miles in the Mayo District."

The following is, in part, a review of the operations of the Yukon Consolidated Gold Corporation Limited:

"The winter of 1942–43 was one of the coldest on record. The low temperatures were not extreme but continued for long periods. Following a cold spell in December, when it reached a minimum of −55°, the New Year came in comparatively warm, with temperatures between zero and 8° above. However, after the first week in January, the weather changed and remained cold, −20° to −55° until after the middle of February, when there was a two-week period of moderately cold weather from 10° above to 20° below zero. Thereafter the weather was very characteristic of the time of the year, with day temperatures of zero to −15° and cold nights of more than 40° below, gradually moderating into Spring. The snowfall was average with the greater amount falling early in the season. In the Spring it disappeared slowly without bringing the streams to high stages. There was little wind other than that which usually occurs during the Spring months of March and April. The official date of the ice break-up in the Yukon River at Dawson was 7.48 p.m. on May 2. However, the ice moved only a short distance at this time and did not actually clear out until three days later, on the afternoon of May 5. The rainfall was greater than normal and was well distributed throughout the summer, making it an ideal season for mining operations. The summer heat, on the other hand, was slightly below normal, due in part to the overcast skies and rainfall. There was a two-week period of unusually warm weather in late June and early July, when many severe electrical and rain storms occurred. The Fall was very mild. There were slight frosts of plant killing intensity on the nights of

August 20 and 21, after which none occurred until September 20. The first severe frosts which affected mining operations happened on October 2, when the temperature dropped to 20°. Ideal dredging conditions existed well into December.

"The Company's hydro-electric power plant, which is located on the North Fork of the Klondike River, operated without interruption during the year. 18,395,400 k.w. were generated, of which 10,695,900 or 58.14 per cent were used by the Company in its mining operations; 4,301,788 k.w. were sold to The Dawson Electric Light and Power Company, Limited, for power and light in the City of Dawson; 1,306,900 k.w. were used in power plant operation; 2,090,812 k.w were consumed in line loss. The power output was far below the capacity of the plant, due to lack of power demand. The water supply in both the North and South Forks of the Klondike River was above normal and equivalent at all times to plant capacity requirements. The Power Ditches, totalling 22 miles in length, were maintained in good condition. The Company's power distribution system was kept in operating order. Good service was maintained over both the Power Plant high tension and The Yukon Telephone Syndicate, Limited, creek telephone service lines.

"The only cold water thawing operation carried on during the 1943 season was on the Lower Klondike, No. 3 area, where the thawing of ground which had been given water the preceding season was completed. Work there was started late, May 17, as there was little preliminary work to be done, and the Fall dismantling of equipment was completed on October 16.

"Five dredges were operated during the 1943 season. Dredge No. 7, on Quartz Creek, was shut down before the end of the normal operating season in order to use the men on other dredges where the crews became too small for proper operation. One inactive dredge, No. 5, was totally destroyed by fire on the morning of July 12. Spring dredge repairs were started on March 27 and actual operations commenced on April 26, when Dredge No. 7 at Quartz Creek began digging. The other dredges started shortly thereafter and all were in operation by May 15. The dredging period extended to December 19, when the last dredge, No. 3, was closed down.

"The total production for the year from dredging operations was 34,304.353 fine ounces of gold valued at $1,320,950.03 with gold at $38.50 per ounce, Canadian and 7,676.69 fine ounces of silver valued at $2,963.23. The combined value was $1,323,923.26 and was taken from 6,867,514 cubic yards, which represented an average value of 19.28c per cubic yard dredged.

"The Clear Creek Placers, Limited, operated their 3-cubic foot pontoon type steel constructed dredge on the Left Fork of Clear Creek from June 1 to October 14, 1943. The total number of cubic yards of gravel dredged was 244,860. The total gold recovery was $157,242.95. The average number of men employed was 16. The Company maintained and improved thirty-seven miles of road extending from McQuesten Airport on the Stewart River to the Dredge, at a cost of $5,344.17. Of this amount, $2,000.00 was furnished by the Yukon Territorial Government. The Company has also a complete drag line outfit on their property which they propose to operate when they can secure the necessary operating crew. This year they will confine operations to muck stripping so as to prepare an area in advance for dredging.

"The Holbrook Dredging Company opened up a Camp at the first of the season, but being unable to get an adequate operating crew, they did not start up the dredge, but did some repair work.

"The more important individual operations in the Dawson area were the hydraulic operations of Colbourne and Osborn on Homestake Gulch, a tributary of Bonanza Creek; and those of Hilson and Townshend and Franich and Brenner on Last Chance Creek. There were the usual summer mining operations on the older placer Creeks in the Klondike and Sixty-mile Districts by individual claim owners.

"In the Mayo District mining for placer gold and scheelite was continued on Dublin Gulch. The three operators there were assisted to some extent by the Government. Lunde and Swanson recovered sufficient scheelite and gold to make their operations successful, but Hugo Seaholm working farther up the Gulch was unsuccessful in developing a paying operation. 4,540 pounds of scheelite concentrate was recovered from these operations. It is reported that 565 ounces of gold was also recovered. Some placer mining was done on Higbet Creek by E. Middlecoff.

"No placer mining of any consequence was carried on in Southern Yukon.

"Representatives of several United States and Canadian Mining Companies visited the Territory during 1943. The parts of the Territory made accessible by the Alaska Highway received attention, but there were examinations made by several mining Companies in other parts of the Territory. The total number of prospectors was not large and records in the Mining Recorders' Offices reveal that only a comparatively few locations were made."

Table 47.—Summary Statistics of Alluvial Gold Mining in Canada, 1942 and 1943

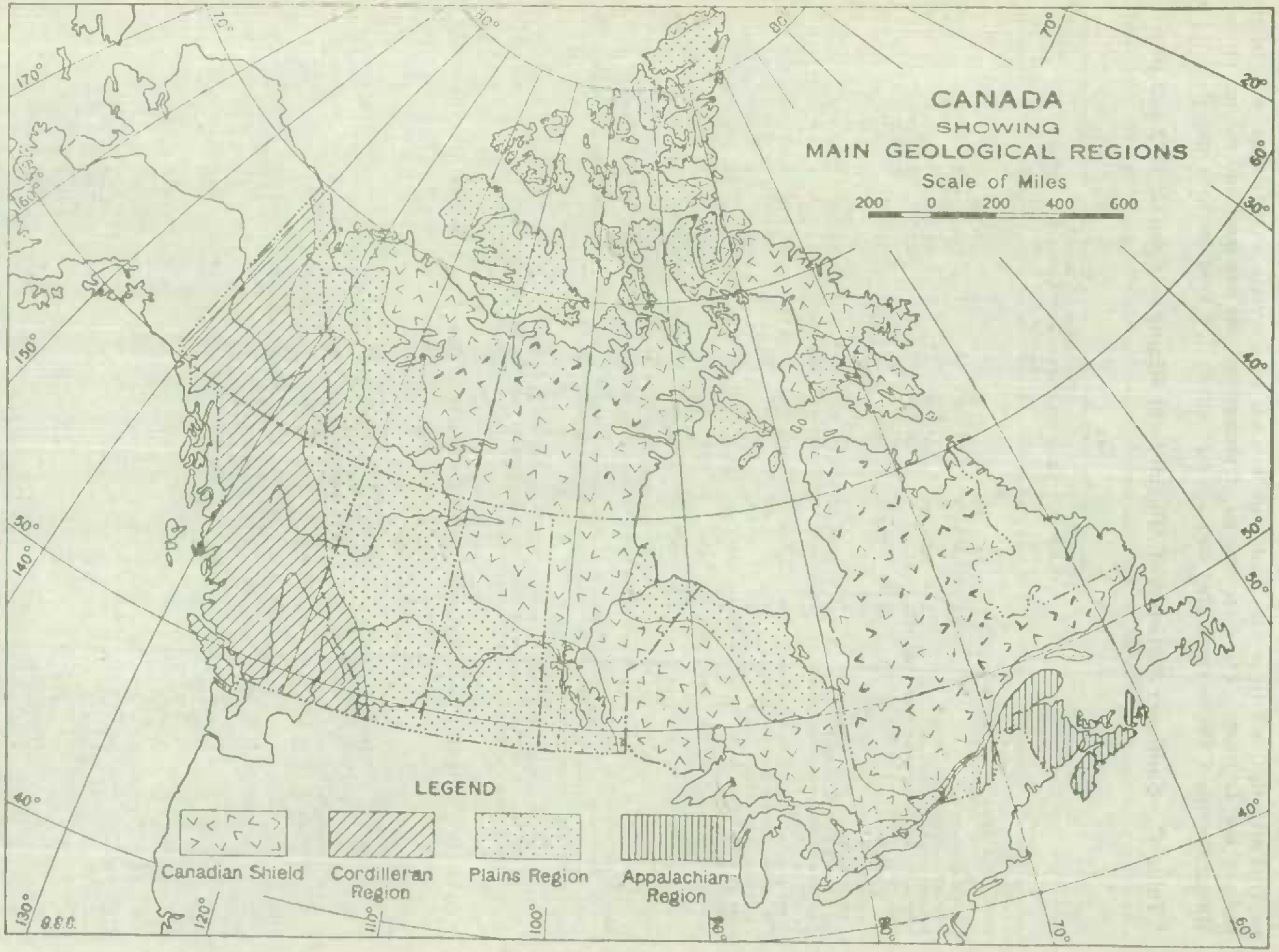
—	1942			1943		
	British Columbia (d)	Yukon (e)	(a) Saskatchewan and Alberta	British Columbia (d)	Yukon (e)	Alberta (a)
Number of firms and individual operators (†)	72	8	...	39	4	...
Capital employed $	1,028,679	9,043,238	...	631,157	10,741,692	...
Number of employees	155	316	...	62	175	...
Salaries and wages paid $	275,485	1,007,789	...	101,119	545,164	...
Electricity generated for own use K.W.H.	...	24,624,400	...	260,000	10,695,900	...
Electricity generated for sale	...	4,169,616	...	...	4,301,788	...
Crude gold recovered — crude ozs.	32,904	104,346	46	14,600	52,710	22
Platinum recovered ozs.	40	...	...	7	...	...
Value of platinum recovered $	1,528	...	...	269	...	...
Quantity of material handled (f) cu. yds.	1,884,887	11,875,833	...	754,202	7,273,915	...
Tungsten recovered (pounds concts.) lb.	Included with Auriferous Quartz			...	12,083	...
Length of ditches miles (b)	56	52	...	53	50	...
Total gross value of alluvial products $	1,005,758	3,314,217	1,655	451,000	1,598,164	808
Fuel and electricity used (purchased) $	26,226	77,098	...	8,288	43,811	...
Process supplies used $	20,140	17,203	...	4,441	50,952	...
Cost of freight and express on dust, nuggets, bullion, etc., shipped (c) $	2,626	28,741	...	829	30,742	...
Cost of smelter, refinery and mint treatment on material shipped (c) $	4,991	29,610	...	2,240	16,455	...
Total net value of alluvial products $	951,775	3,161,565	1,655	435,202	1,456,204	808

(†) In addition to the number shown in the table, there were numerous small operators from whom returns were not obtainable; subject to revision.
(a) Recoveries for Alberta and Saskatchewan represent receipts of crude gold from Alberta and Saskatchewan at the Dominion Assay Office, Vancouver, B.C. No other statistics available.
(b) Includes flume; in use.
(c) Information not completely available.
(d) Value of crude gold in Canadian funds in 1942 was estimated to be $30.52 per crude ounce. In 1943 it was $30.87.
(e) Value of crude gold in Canadian funds in 1942 was estimated to be $31.76 per crude ounce. In 1943 it was $30.10.
(f) Includes some overburden or barren material.

Table 48.—Alluvial Gold Recovered and Quantity of Material Handled (†), 1925-1943

Year	British Columbia				Yukon				Average value gold per fine oz.
	Material handled (*)	Gold recovered	Ounces per cu. yd.	Value per cu. yd.	Material handled (*)	Gold recovered	Ounces per cu. yd.	Value per cu. yd.	
	cu. yd.	fine oz.	fine oz.	$	cu. yd.	fine oz.	fine oz.	$	$
1925	(a)	13,181	(a)	...	3,103,892	47,817	0·0154	0·318	20·67
1926	1,237,090	16,730	0·0135	0·279	2,501,200	25,344	0·0101	0·208	20·67
1927	2,470,552	7,353	0·0029	0·0599	2,421,489	30,778	0·0127	0·262	20·67
1928	1,188,667	6,739	0·0057	0·1178	5,097,182	34,116	0·0067	0·1385	20·67
1929	1,336,390	5,158	0·0039	0·0806	4,500,000	35,678	0·0079	0·1633	20·67
1930	224,339	7,164	0·0319	0·6593	3,559,642	35,160	0·0099	0·2046	20·67
1931	1,587,271	13,741	0·0086	0·1853	4,914,638	44,061	0·0090	0·1939	21·55
1932	1,053,677	16,320	0·0155	0·3637	6,051,256	40,373	0·0067	0·1572	23·47
1933	1,326,721	19,142	0·0144	0·4118	5,605,522	39,174	0·0070	0·2002	28·60
1934	2,034,522	20,145	0·0099	0·3415	6,315,070	38,703	0·0061	0·2104	34·50
1935	1,855,937	24,744	0·0133	0·4680	5,442,861	35,705	0·0066	0·2322	35·19
1936	2,083,934	34,711	0·0166	0·5815	8,067,159	50,192	0·0062	0·2172	35·03
1937	3,472,025	43,322	0·0125	0·4373	8,298,514	46,679	0·0056	0·1959	34·99
1938	4,138,746	46,207	0·0112	0·3939	8,870,628	71,303	0·0080	0·2813	35·17
1939	4,779,407	39,797	0·0083	0·2999	11,152,198	85,572	0·0077	0·2782	36·14
1940	6,680,457	32,128	0·0048	0·1848	11,551,170	79,965	0·0069	0·2656	38·50
1941	4,587,103	35,020	0·0076	0·2926	8,792,220	70,847	0·0081	0·3119	38·50
1942	1,884,887	26,323	0·0139	0·5352	11,875,833	83,198	(b) 0·0070	0·2695	38·50
1943	754,202	11,680	0·0156	0·6006	8,028,117	41,157	(b) 0·0051	0·1964	38·50

(†) In addition, relatively small amounts of alluvial gold have been recovered in Quebec, Saskatchewan and Alberta, but complete data are not available; also, data relating to material handled, particularly those pertaining to small operations, are not complete and necessitate estimates in order to obtain totals.
(*) Data partly conjectural and includes some overburden and barren material.
(a) Not available.
(b) Fine gold received at Royal Canadian Mint (Vancouver Assay Office); previous year's figures represent estimated fine gold in crude gold recovered.


CANADA
SHOWING
MAIN GEOLOGICAL REGIONS
Scale of Miles
200 0 200 400 600
LEGEND
Canadian Shield
Cordilleran Region
Plains Region
Appalachian Region

THE AURIFEROUS QUARTZ MINING INDUSTRY IN CANADA

The great part of the gold of Canada comes from the Canadian Shield, an immense area of precambrian rocks extending from the Labrador Coast westward almost to the mouth of the MacKenzie River. The area of the shield is roughly 1,825,000 square miles, almost half of Canada. The deposits of the shield are of two main types, namely, quartz veins, from which most of the gold, up to the present time, has been won, and sulphide deposits which produce a smaller but very considerable proportion. The second great source of gold in Canada has been the Western or Cordilleran section, comprising British Columbia and Yukon Territory—the gold production from this section includes relatively large quantities obtained from alluvial deposits. The third principal area in which gold deposits occur is the Acadian region of Eastern Canada, the metal occurring principally in Nova Scotia where it has been mined since 1862.

In 1943 mining operations were conducted at 156 auriferous quartz mines compared with 227 in 1942. The number of producing properties totalled 135 during the year under review as against 184 in the preceding year and 33 in 1923. From official returns received, it was estimated that 22 regular producing gold mines ceased or suspended production in 1943; of these, 1 was located in Nova Scotia, 3 in Quebec, 10 in Ontario, 1 in Manitoba, 5 in British Columbia and 3 in Northwest Territories.

The gross value of output of the entire auriferous quartz mining industry, including the value of all recoverable metals, gold, silver, etc., totalled $116,833,847 in 1943 compared with $160,564,783 in 1942. Of the 1943 total, $79,799,131 represented recoveries from Ontario ores, $24,088,645 from Quebec ores and $8,094,301 from the gold mines of British Columbia.

Employees in the lode gold mining industry totalled 19,038 compared with 26,030 in 1942 and 5,524 in 1923. Salaries and wages paid amounted to $40,665,283 as against $54,388,872 in the preceding year. Fuel and purchased electricity consumed by the industry in 1943 totalled $6,387,869 and the cost of explosives, drill steel and other process supplies used amounted to $12,773,650. A total of $14,733,787 was paid in 1943 by operating Canadian gold mining companies in government taxes and $723,788 was expended for prospecting.

LODE GOLD DEPOSITS IN CANADA

(By George Hanson, Ph.D., Chief Geologist, Geological Survey, Ottawa)

Lode gold deposits like most metalliferous ore deposits are very closely linked in origin and place with geological formations of certain ages and types. In broad outline these relationships are known and easily understood but because geological information is very incomplete for Canada—less than a fifth of Canada has been studied in any adequate manner—it is not yet possible to indicate the location of more than a part of the ground that is favourable for the occurrence of metallic ore deposits.

Geological explorations extending far beyond ground that has been geologically mapped provide general information and permits the delineation of broad features relating to ore deposition. In mapped areas much more detailed information of like type is available. Knowledge of the relationship between geology and ore deposition is of the greatest importance because it guides the search for new deposits.

Canada is divisible broadly into four large regions, each having its own characteristic stratigraphy and structure. These are from west to east: (1) the Cordilleran region embracing most of British Columbia and Yukon, (2) the Plains region forming a broad belt east of the Cordillera, (3) the Canadian Shield extending east ot the St. Lawrence and (4) the Appalachian region embracing southeastern Quebec and the Maritime Provinces.

The Cordilleran Region.—The Cordilleran region comprises all of Canada west of the Plains region. The potential metalliferous part includes practically all of Yukon except the southeastern corner, and all of British Columbia west of the Rocky Mountain trench or west of a line joining Fernie in southeastern British Columbia to Watson Lake in southeastern Yukon.

The rocks of the metalliferous part of the region range in age from Precambrian to Tertiary. All of the strata older than the Tertiary have been folded, faulted, and built into mountains. The structural trends run northwest parallel to the Pacific coast and in Yukon they swing westward into Alaska. The sedimentary and volcanic rocks have been intruded by several very large batholiths and by a great many stocks and small batholiths of granitoid rocks. The Coast Range intrusives occupy much of the western and southern part of British Columbia and the western part of Yukon. The Cassiar and the Omineca batholiths cross the northern interior of British Columbia.

In various places in the region where the geology has been done in some detail it is possible to outline small areas that are favourable for the occurrence of gold deposits and also to point out other small areas that are not favourable. In general, however, present knowledge indicates that practically all of the region that may hold metallic mineral deposits must also be considered as favourable ground for the occurrence of gold, and any rocks older than Upper Cretaceous may hold gold deposits.

In Yukon gold bearing quartz veins have been mined near Whitehorse and on Freegold Mountain in the Carmacks district. Copper deposits near Whitehorse mined some years ago contained some gold. They are of the contact metamorphic type and lie near bodies of intrusive rock.

In British Columbia the principal gold camps are Atlin, Taku, River, Stewart, Surf Inlet, Zeballos, Cariboo, Bridge River, Hedley, and Ymir-Sheep Creek. The chief copper-gold camps are Anyox, Britannia, Copper Mountain, and Rossland. With few exceptions the deposits are all in rocks of Mesozoic age. Most are in rocks that are invaded by the Coast Range intrusives and some are in the intrusives themselves.

At Atlin the gold deposits are of the quartz vein type. Most of the veins are narrow but interbanded with country rock they form vein zones as much as 50 feet wide.

The Principal vein at the Polaris Taku mine on Taku River ranges from 2 to 25 feet wide and is at the contact between greenstone and schists of sedimentary origin.

At Stewart the Premier and adjacent ore bodies lie mainly in quartz-feldspar porphyry and to a minor extent in tuff. The ore bodies were in the main of the gold-sulphide type but some were gold-quartz veins with little sulphide. One of the deposits had a mining width of 70 feet and was of excellent grade. At the Big Missouri broad silicified zones sparsely mineralized with sulphides are cut by narrow veinlets of gold-bearing quartz. In places the veinlets are so numerous that large blocks of ground can be mined.

The Porcher Island-Surf Inlet deposits are gold-quartz veins ranging in width up to 40 feet and occupying fracture zones mainly in granitic rocks of the Coast Range instrusives.

In the Zeballos district, Vancouver Island, numerous gold-quartz veins occur in a body of granite and in adjacent volcanic rocks. The veins are quite persistent in length but many are no more than 1 foot wide.

In the Cariboo district the ores are gold-quartz veins and gold-pyrite replacements in limestone. The veins cut across moderately dipping beds of the Cariboo series of Precambrian age. The ores found so far are restricted to a belt about 1,000 feet wide that has been traced for 20 miles. The gold belt follows certain strata that were fractured during folding and thus provided channelways for ore deposits. Many of the numerous veins carry somewhat more than half an ounce of gold to the ton and the replacements run approximately two ounces.

In the Bridge River district the deposits are gold-quartz veins lying in or near intrusive bodies of diorite. Present information indicates that the best ground is diorite containing a considerable proportion of soda-rich granite. The veins range in width up to 20 feet and are very persistent in length and depth.

In the Hedley district the ores are of the contact metamorphic type containing considerable arsenopyrite. They replace calcareous sedimentary rocks and are roughly tabular in shape. One of the largest ore bodies was 500 feet long and 65 feet thick. The location of the ore has been controlled by the structure of the enclosing rocks and detailed geological study has resulted in the discovery of a great deal of ore.

In the southern Okanagan valley gold-quartz veins in schists of late Palaeozoic age have been mined at Fairview and Camp McKinney and replacement deposits in limestone members of the same series of rocks have been mined at Osoyoos.

In the Ymir-Sheep Creek district gold is produced from gold-quartz veins in late Precambrian sedimentary rocks, in Triassic volcanic rocks, and in younger grandiorite instrusives.

Copper ores containing gold have been mined in five districts. At Anyox, large lenses of copper and iron sulphides occurred at the contact between sedimentary rocks and greenstone and in the greenstone. At Britannia large lenses of ore of similar type are mined from a shear zone in sheared porphyry. At copper Mountain extensive deposits occur within a gabbro stock and in adjacent volcanic rocks. In the Greenwood-Grand Forks district deposits of the contact metamorphic type have produced considerable gold and copper. At Rossland the large deposits of copper-gold ore were replacement veins attaining a local width of 130 feet. The best ore was found in the basic intrusive rocks.

The Plains Region.—The Plains region is bounded on the west by the mountains of western Alberta, eastern British Columbia and western Northwest Territories. The eastern boundary is the Canadian Shield and follows closely a line from Darnley Bay on the Arctic coast through Great Bear Lake, Great Slave Lake, Lake Athabaska, Lac la Ronge, Lake Winnipeg and Lake of the Woods. The eastern boundary swings through the northern United States and enters Canada again at Sault Ste. Marie and crosses southern Ontario eastward from Georgian Bay. Much of the western Archipelago and the lowland southwest of Hudson Bay are also of the Plains type. Of similar type also is the lowland along the St. Lawrence between Quebec and Brockville. This part of the Plains region is separated from the Appalachian region on the southeast by a great fault.

The rocks of the Plains region range in age from early Palaeozoic to Tertiary. They are of sedimentary type and are everywhere essentially flat-lying. They have not been cut by intrusive rocks. No deposits of gold quartz nor of gold sulphide types have been found in the region and it is not expected that any will be found. This belief is based not only on the fact that none have been found but also on the sound theory that such ore deposits are related in origin to intrusive rocks and the region does not include rocks of this type. The St. Lawrence lowlands near Montreal are intruded by small stocks of alkaline intrusive rocks. No ore deposits have been found associated with these rocks.

The Canadian Shield.—The Canadian Shield includes some of the Arctic Islands and practically all of the mainland part of Canada east of the Plains region and north of the St. Lawrence River. It consists mainly of intrusive rocks of granite type, including a great many areas of various sizes underlain by greenstones, schists and gneisses derived from volcanic and sedimentary rocks which are older than the granites. The granites and older rocks are mainly of Archaen or Early Precambrian age. The intrusives and included complexes of older rocks are overlain here and there by Proterozoic or Late Precambrian volcanic and sedimentary rocks and are also intruded by Late Precambrian granites.

Present information indicates that the complexes of ancient rocks are the best hosts for ores of the gold-quartz type. Over a hundred mines of this type have been opened and all lie within the complexes. The ores were derived from igneous sources and as igneous rocks exist almost everywhere in the Shield mineral deposits may be much more widespread than is suggested by present mines, and search for new deposits should not be confined to the complexes. However, the location of present mines shows clearly that the complexes are exceptionally favourable for ore deposits.

The gold mines so far discovered in the Shield all lie in the south, southwest and west. The present Quebec and eastern Ontario gold mines lie south of latitude 49°. In western Ontario the mines are within 400 miles of the Plains boundary and farther west the mines are within 200 miles of the Plains boundary. This fringe of mines in the southern and western part of the Shield is probably a result of accessibility rather than any lack of ore farther north.

At Yellowknife, Northwest Territories, gold-quartz veins occur both in the greenstones and in the sedimentary rocks of a large complex. In the sedimentary rocks the veins are numerous along the crests of folds and parallel with the bedding planes. In the greenstone they follow shear zones and are near a great fault extending north along the shore of Yellowknife Bay.

At Goldfields on Lake Athabaska a small complex extends north from the lake. At this place a stockwork of small veinlets was mined for a short time.

North of The Pas, Manitoba, a succession of closely spaced greenstone-sedimentary complexes extend westward into Saskatchewan and for 100 miles east of Flin Flon. In these rocks various gold-quartz veins have been mined as well as the Sherritt Gordon, Flin Flon and Mandy gold-sulphide ores.

Between northwestern Manitoba and Lake Superior several dozen complexes are known and mines have been found in all the more accessible ones. In this area the God's Lake ore is a bed of tuff that has been fractured and mineralized with numerous veinlets of gold-quartz. At the San Antonio, Beresford Lake and Gunnar Gold mines gold-quartz veins lie in diabasic and gabbroic rocks. In the Red Lake district several of the ore deposits occur in quartz porphyry and at the Howey mine the ore body consists of a quartz porphyry dyke that has been fractured and cemented with gold bearing quartz which at the Uchi mine lies at the contact between two basic lava flows. At Pickle Lake the Central Patricia and Pickle Crow ore bodies lie in 'belts' of iron formation. Between Lake of the Woods and Lake Nipigon, many gold-quartz veins have been mined in greenstone near granite contacts. East of Lake Nipigon most of the veins are in greenstone but at Little Long Lac these ores are in silicified shear zones in sedimentary rocks; at the Hardrock and McLeod-Cockshutt mines the ores are in porphyry or at the contact between porphyry and the same series of sedimentary rocks, and at the Bankfield Consolidated and the Tombill the ores are in feldspar porphyry dykes cutting the same series of sedimentary rocks. At Schreiber and at Michipicoten the ore bodies are mainly gold quartz veins in greenstone.

The very large Porcupine complex extending east and northeast far into Quebec and southwest to Lake Huron holds numerous gold-quartz and gold-sulphide deposits and provides roughly 70 per cent of Canada's gold. This complex includes all the mines of the Porcupine, Kirkland Lake, Larder Lake, and Matachewan districts of Ontario and all the mines of northern Quebec. In this complex as elsewhere there is considerable variety in the mode of occurrence of the ores. It has been known for many years that many of the ore bodies from Kirkland Lake eastward were associated with faults and in recent years it has been pointed out that many of the faults are connected to form fault zones. One of these fault zones passes eastward through Kirkland Lake, past Noranda as far at least as Louvicourt Township Quebec.

Many of the gold mines of Ontario and Quebec are located on or near this zone. Another probably traverses the Porcupine district eastward through the Beattie mine in Quebec. A branch fault apparently swings southeast to join the southern fault zone a short distance southeast of the Beattie and another branch appears to run east past Figuery Township.

The Appalachian Region.—The Appalachian region includes all of Canada south of the St. Lawrence and east of a line joining the city of Quebec to Lake Champlain. This region is the northeastern part of the Appalachian Mountain system that extends northeastward from northern Alabama.

In the Appalachian region the geological formations lie in long bands striking northeastward parallel to the mountain chains. They have been severely folded and faulted and have been invaded by bodies of basic rock as in the Eastern Townships and by granites in various places in the Eastern Townships, Gaspé and the Maritime Provinces. The rocks are mainly of Palæozoic age but include younger and older strata. The basic intrusives are mainly of Ordovician age and the granites Devonian.

The source of the gold and gold-copper deposits in the region is generally believed to be the same as that which supplied the bodies of granite. The copper deposits of the Eastern Townships may, however, be related to the basic intrusives and not to the granites. Throughout the region in Canada as well as in the United States the Devonian granites do not appear to have been important as ore carriers and deposits associated with them have not led to large production.

Copper deposits in the Eastern Townships, mined many years ago contained very little gold, but a new find, the Aldermac-Moulton Hill mine contains gold and various sulphides. Recent geological study has shown that many of the copper deposits occurred near a large fault extending northeastward from Lake Memphremagog and this fact has led to a revival of interest which may lead to further discoveries.

Gold production in the region at present comes entirely from southern Nova Scotia from quartz veins in the Gold Bearing or Maguma series of Precambrian age. The deposits are believed to be related to granites of Devonian age that invade the Maguma series. The strata consist of alternating bands of slate and quartzite. These rocks have been folded and quartz veins commonly occur parallel to the bedding in slate at the contacts with bands of quartzite. As the veins are parallel to the bedding they arch with the anticlines and have therefore been referred to as saddle reefs. They are generally narrower than the normal width required for stopes and drifts but at the crests of folds they commonly widen and become many feet thick.

Placer gold in the Chaudière River district in southeastern Quebec was derived presumably from quartz veins in the district. Many of the veins have been tested but none has proved rich enough to mine.

Table 49.—Principal Statistics of the Auriferous Quartz Mining Industry in Canada, for Years Specified

—	Number of active operators	(c) Number of operating plants or mines	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	(b) Cost of process supplies used	Amount of freight, etc., paid on shipments of ore, slag, etc.	Smelter and refinery treatment costs	Gross value of bullion, ore, concentrates or residues shipped from mines (d)	Net value of bullion, ore, concentrates or residues shipped from mines (d)
			$		$	$	$	$	$	$	$
1923	65	65	77,574,976	5,524	8,961,434	1,497,197	Data not available			(a)25,021,837	Data not available
1929	80	85	135,166,105	8,660	14,258,733	2,579,481	Data not available			(a)37,275,986	Data not available
1942—											
Nova Scotia (f)	6	6	318,438	104	158,602	34,857	37,921	1,782	4,166	370,225	291,499
Quebec	50	50	38,379,170	5,736	11,381,876	1,763,649	4,174,550	111,979	540,223	31,413,162	24,822,761
Ontario	73	75	175,289,245	16,576	35,079,849	4,833,382	11,143,741	192,431	1,159,252	104,472,446	87,143,640
Manitoba	8	8	6,011,285	483	1,060,211	173,162	323,867	6,306	31,933	3,284,248	2,748,980
Saskatchewan	3	3	17,100	113	231,088	12,303	170,050	1,785	5,720	533,768	343,910
British Columbia	77	78	17,901,010	2,439	5,058,944	549,696	1,524,526	402,705	564,992	16,629,819	13,587,900
Northwest Territories	6	7	7,324,149	579	1,418,302	248,717	547,867	24,341	39,978	3,860,275	2,999,372
Yukon	...	...	...	...	...	...	...	...	...	840	840
Canada	**223**	**227**	**245,240,907**	**26,030**	**54,388,872**(e)	**7,615,766**	**17,922,522**	**741,329**	**2,346,264**	**160,564,783**	**131,938,902**
1943—											
Nova Scotia	3	3	102,454	77	100,311	29,965	32,644	740	1,500	181,696	116,847
Quebec	41	46	36,743,065	4,730	9,742,932	1,591,293	3,718,472	96,817	493,168	24,088,645	18,188,895
Ontario	55	55	153,377,816	12,330	26,726,377	4,108,768	8,005,040	205,794	843,453	79,799,131	66,636,066
Manitoba	7	7	4,950,511	283	634,166	127,408	197,163	5,277	26,223	2,400,287	2,044,216
Saskatchewan	1	1	9,700	...	...	...	80	...	...	154	74
British Columbia	40	40	14,511,081	1,272	2,736,093	381,383	680,405	139,334	231,331	8,094,301	6,661,848
Northwest Territories	4	4	2,981,352	346	725,404	149,052	139,846	5,758	25,213	2,269,633	1,949,764
Yukon	...	...	...	...	...	...	...	...	...	...	...
Canada	**151**	**156**	**212,675,979**	**19,038**	**40,665,283**(e)	**6,387,869**	**12,773,650**	**453,720**	**1,620,898**	**116,833,847**	**95,597,710**

(a) Less freight and treatment charges.

(b) Explosives, chemicals, etc.

(c) Number of mines producing—1923—33; 1929—38; 1937—189; 1938—226; 1939—232; 1940—278; 1941—255; 1942—184; 1943—135.

(d) Value of bullion *produced* plus value of ore, concentrates, etc. *shipped*.

(e) Includes $6,088,392 in salaries in 1943 and $6,979,330 in 1942.

(f) Does not include data for Queens Mines Ltd.

NOTE.—Net value represents the gross value less the cost of fuel and electricity, process supplies and freight.

Table 50.—Principal Statistics Relating to Producers Only in the Auriferous Quartz Mining Industry in Canada, 1943

Province	Number of producing plants or mines	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	(a) Cost of process supplies used	Value of freight paid on shipments of ore, slag, etc.	(b) Smelter and refinery treatment costs	Gross value of bullion, ore, concentrates or residues shipped from mines (d)	Net value of bullion, ore, concentrates or residues shipped from mines (d)
		$		$	$	$	$	$	$	$
Nova Scotia	3	102,454	77	100,311	29,965	32,644	740	1,500	181,696	116,847
Quebec	31	35,480,950	4,655	9,593,129	1,589,941	3,709,787	96,817	403,168	24,088,645	18,198,932
Ontario	51	153,252,006	12,319	26,717,892	4,108,572	8,005,040	205,794	843,463	79,799,131	66,636,262
Manitoba	7	4,950,511	283	634,166	127,408	197,163	5,277	26,223	2,400,287	2,044,216
Saskatchewan	1	9,700	...	...	...	80	...	...	154	74
British Columbia	38	14,339,781	1,253	2,714,106	380,209	677,556	139,334	231,331	8,094,301	6,665,871
Northwest Territories	4	2,981,352	(c) 346	725,404	149,052	139,846	5,758	25,213	2,269,633	1,949,764
Yukon	...	...	...	...	...	...	...	...	...	...
Total Canada 1943	**135**	**211,116,754**	**18,933**	**40,485,008(e)**	**6,385,147**	**12,762,116**	**453,720**	**1,620,898**	**116,833,847**	**95,611,966**
Total Canada 1942	**184**	**241,770,145**	**25,814**	**54,033,613(e)**	**7,570,656**	**17,880,267**	**741,329**	**2,346,264**	**160,564,783**	**132,026,267**
Total Canada 1941	**255**	**231,635,873**	**31,850**	**61,063,035**	**8,336,180**	**20,721,498**	**916,323**	**2,678,508**	**179,103,182**	**146,450,673**
Total Canada 1940	**278**	**230,719,341**	**30,353**	**53,560,938**	**7,935,193**	**20,390,784**	**691,649**	**2,486,587**	**178,794,678**	**147,289,865**
Total Canada 1939	**232**	**214,326,089**	**29,001**	**50,891,920**	**7,701,782**	**19,001,782**	**694,165**	**2,249,312**	**160,014,172**	**130,367,887**

(a) Explosives, etc.
(b) Includes handling charges.
(c) Not recorded separately by one company which includes data in the non-ferrous smelting industry in British Columbia.
(d) Value of bullion *produced* plus value of ore, concentrates, etc., *shipped*.
(e) Includes $6,951,901 in salaries in 1943 and $6,878,890 in 1942.

Table 51.—Ores Mined and Milled, Crude Bullion Recovered and Crude Bullion and Concentrates Shipped in the Auriferous Quartz Mining Industry, 1943

—	Nova Scotia	Quebec	Ontario	Manitoba	Saskatchewan	British Columbia	Northwest Territories	Yukon	Canada
Number of producing mines	3	31	51	7	1	38	4	....	**135**
Ore mined ... ton	9,870	3,761,642	8,288,802	213,684	25	490,363	89,224	....	**12,853,610**
Material discarded (sorted) ... ton	....	133,120	207,018	....	5	16,360	5,019	....	**361,522**
Ore milled ... ton	9,894	3,353,194	8,069,363	213,601	20	476,247	84,199	....	**12,206,518**
Tailings retreated ... ton	....	....	12,750	....	....	16,966	....	....	**29,716**
Gold content of ores, slags, residues and concentrates shipped—									
To Foreign smelters ... fine oz.	....	....	26,371	....	....	68,280	....	....	**94,651**
Canadian smelters ... fine oz.	....	46,917	1,247	....	....	2,669	....	....	**50,833**
Bullion bars shipped—									
Gold content ... fine oz.	4,711	579,782	2,032,298	62,192	4	130,549	58,871	....	**2,868,407**
Silver content ... fine oz.	157	126,084	329,971	9,887	....	27,885	13,213	....	**507,197**
Bullion produced by amalgamation ... crude oz.	5,052	58,244	237,177	14,800	9	74,364	32,346	....	**421,992**
Bullion produced by cyanidation ... crude oz.	....	710,235	2,315,612	73,186	....	84,697	36,774	....	**3,229,504**
Total Bullion Produced ... crude oz.	5,052	777,479	2,552,780	87,986	9	159,061	69,120	....	**3,651,496**
Content of bullion bars produced—									
Gold ... fine oz.	4,711	574,363	2,033,319	62,246	4	136,121	58,871	....	**2,869,635**
Silver ... fine oz.	157	125,270	339,611	9,893	....	30,384	13,213	....	(*) **518,528**
Gold value (standard) ... $	97,483	11,873,137	42,032,341	1,286,739	85	2,814,284	1,214,976	....	**59,319,045**
Silver value ... $	89	56,690	135,774	3,816	....	11,803	5,099	....	**213,271**
Exchange premium on bullion bars produced ... $	84,124	10,239,839	36,255,405	1,109,732	69	2,389,104	1,049,558	....	**51,127,831**
Value of ores, concentrates, slags and residues sold (shipped) ... $	....	1,918,079	1,375,611	....	....	2,879,110	....	....	**6,173,700**
Total Gross Value of Production ... $	**181,696**	**24,088,645**	**79,799,131**	**2,400,287**	**154**	**8,094,301**	**2,269,633**	....	**116,833,847**
Value of fuel, electricity and process supplies used, also freight on shipments, marketing, smelter and refining charges ... $	64,849	5,899,750	13,163,065	356,071	80	1,432,453	319,869	....	**21,236,137**
Net Value of Production ... $	**116,847**	**18,188,895**	**66,636,066**	**2,044,216**	**74**	**6,661,848**	**1,949,764**	....	**95,597,710**

(*) In addition, there were 881,250 ounces of silver contained in concentrates, etc., shipped to smelters. See following table for other details.

Table 52.—Ores, Concentrates, Slags, Etc., Shipped to Smelters from Canadian Gold Mines, 1929-1943

Year	To Canadian plants						To Foreign plants					
	Ores		Concentrates		Slags, residues, precipitates		Ores		Concentrates		Slags, residues, precipitates	
	Tons	Gold content fine oz.	Tons	Gold content fine oz.	Tons	Gold content fine oz.	Tons	Gold content fine oz.	Tons	Gold content fine oz.	Tons	Gold content fine oz.
1929	27,278	14,327	268	305	1	24	90,871	82,996	2,370	3,638	6	304
1930	52,540	22,910	1,187	9,665	2	117	70,497	22,432	18,276	46,102	53	1,009
1931	51,579	21,756	3,120	16,805	12	1,505	24,224	11,870	20,271	48,743	47	1,306
1932	36,397	17,943	191	952	26	1,416	36,736	15,810	16,925	52,508	30	869
1933	30,096	14,882	490	1,349	55	6,279	3,292	2,203	29,111	76,601	34	1,392
1934	48,106	20,688	2,490	10,440	203	1,487	1,419	1,936	43,053	114,476	27	599
1935	18,239	7,008	7,045	35,958	58	6,231	1,242	2,840	46,050	90,167	25	11,310
1936	4,705	6,567	7,865	34,654	64	3,609	1,864	3,421	65,660	137,273	25	16,903
1937	37,126	9,649	6,981	21,865	130	2,060	2,516	8,108	62,987	163,781	74	912
1938	172,377	36,008	8,404	25,552	37	420	4,445	8,443	40,828	142,513	1,281	23,101
1939	271,666	47,114	7,747	24,184	797	4,507	3,853	8,930	39,530	112,126	235	26,631
1940	201,941	34,315	4,485	13,532	158	3,761	7,453	8,107	44,570	125,704	103	47,160
1941	202,943	38,380	1,628	7,492	369	4,444	7,453	11,222	43,855	122,619	115	56,183
1942	280,978	38,492	2,555	7,307	137	2,831	1,356	1,020	40,428	126,931	68	55,999
1943	268,334	36,429	4,490	12,335	311	2,069	....	....	20,615	59,949	40	34,704
Grand Total	**1,704,305**	**375,468**	**58,946**	**222,395**	**2,360**	**40,760**	**257,221**	**189,338**	**534,529**	**1,423,131**	**2,163**	**278,382**

NOTE.—In addition, other material contained in ores shipped by gold mines to Canadian plants in 1943 included: Silver, 11,882 fine ounces; copper, 848,742 pounds; lead, 48,123 pounds and crude As_2O_3, 2,581,830 pounds. Tungsten concentrates produced from straight auriferous quartz ores in 1943 contained approximately 287,114 pounds of WO_3.

NOTE.—In addition, other material contained in ore exported by gold mines in 1943 included: Silver, 869,368 fine ounces; copper, 175,603 pounds; lead, 3,035,318 pounds and 16,211 pounds crude As_2O_3. Arsenic in auriferous ores exported from British Columbia is not paid for and data relating to its possible recovery are unavailable.

Table 53.—Ores, Concentrates and Slag Shipped from the Auriferous Quartz Mines in Canada, 1943

—	Ontario mines shipping		Quebec mines shipping		British Columbia mines shipping	
	To Canadian smelters	To Foreign smelters	To Canadian smelters	To Foreign smelters	To Canadian smelters	To Foreign smelters
Number of mines	12	3	10	1	29	7
Tons of ore, etc., shipped	1,049	2,503	282,054	100	2,784	18,152
Metal content—						
Gold oz.	1,247	26,371	46,917		2,669	68,280
Silver oz.	5,138	514,885	1,658	....	5,086	354,483
Copper lb.	23,411	....	825,331	....	....	175,603
Lead (a) lb.	....	1,135,861	....	....	48,123	1,899,457
Antimony (b) lb.	....	....	....	....	....	....
Arsenic lb.	....	....	2,581,830	16,211	....	(c)2,772,023
Zinc lb.	....	....	....	....	....	....
Tungsten concentrates* lb.	269,038	....	5,994	....	14,519	....
Cadmium lb.	....	....	....	....	....	....
Value—Gross $	**363,969**	**1,323,376**	**1,923,121**	**3,003**	**113,960**	**2,784,387**

(a) Some B.C. gold ores exported contain relatively large quantities of lead which are not reported by the producer; this lead is reported by the U.S. Smelters and 50 per cent is credited to Canadian lead production.

(b) Any antimony recovered from Canadian ores in Canadian smelters is not usually reported by mine operators.

(*) WO_3 content; value included also in miscellaneous metal mining industries.

(c) Estimate and arsenic not paid for.

Table 54.—Specified Costs per Ton of Ore Milled at Certain of the Principal Auriferous Quartz Mines in Canada, 1943

Name of Mine	Development and exploration (a)	Mining	Milling	General (b)	Total cost per ton (c)
	$	$	$	$	$
Quebec					
Beattie Gold Mines Ltd.	0·243	0·725	1·085	0·462	2·515
Belleterre Quebec Mines Ltd.	1·363	4·158	1·255	2·030	8·806
Canadian Malartic Gold Mines Ltd.	0·57	1·27	0·61	0·38	2·83
Central Cadillac Mines Ltd.	0·78	3·46	1·39	1·01	6·64
Francoeur Gold Mines Ltd.	0·155	2·012	1·514	1·089	4·770
Lamaque Mining Co. Ltd.	0·71	2·39	0·86	2·61	6·57
Lapa Cadillac Gold Mines Ltd.	0·79	2·96	1·68	1·23	6·66
McWaters Gold Mines Ltd.	1·196	2·024	1·405	1·039	5·664
O'Brien Gold Mines Ltd.	0·72	4·77	1·69	2·10	9·28
Powell Rouyn Gold Mines Ltd.	0·396	1·946	(d)	0·529	2·871
Senator-Rouyn Ltd.	0·78	1·77	1·04	1·37	4·96
Sigma Mines (Quebec) Ltd.	0·705	2·241	0·631	0·349	3·926
Siscoe Gold Mines Ltd.	0·293	1·575	0·699	0·577	3·144
Sladen Malartic Mines Ltd.	0·429	1·631	0·756	0·406	3·222
West Malartic Mines Ltd.	0·614	2·411	0·925	0·512	4·462
Manitoba					
God's Lake Gold Mines Ltd.	0·18	1·89	1·52	1·69	5·28
British Columbia					
Bralorne Mines Ltd. (e)	0·91	3·46	0·83	2·10	7·30
Cariboo Gold Quartz Mining Co. Ltd.	0·44	10·28	3·34	1·38	16·44
Gold Belt Mining Co. Ltd. (e)	0·131	1·603	1·746	0·606	4·086
Hedley Mascot Gold Mines Ltd. (e)	1·16	2·70	2·15	3·25	9·26
Island Mountain Mines Co. Ltd.	0·65	7·02	3·74	0·40	11·81
Kootenay Belle Gold Mines Ltd.	....	2·94	2·34	2·00	7·28
Livingstone Mining Co. Ltd. (d)	....	6·00	....	1·50	7·50
Privateer Mine Ltd.	1·05	6·35	4·96	2·89	15·25
Pioneer Gold Mines of B.C. Ltd.	0·83	6·79	2·72	3·48	13·82
Sheep Creek Gold Mines Ltd.	0·133	3·733	1·908	1·398	7·172

(a) Exclusive of outside exploration.

(b) Marketing, head office, taxes, etc.

(c) Depreciation not included.

(d) Ore shipped to smelter.

(e) Produced bullion and shipped concentrates to smelter.

Table 55.—Specified Costs per Ton of Ore Milled at Certain of the Principal Auriferous Quartz Mines in Ontario, 1943

Name of Mine	Development and exploration (a)	Mining	Milling	General (b)	Total before taxes	Total including taxes
	$	$	$	$	$	$
ONTARIO						
Porcupine District						
Aunor Gold Mines Ltd.	0·72	3·14	0·98	1·09	5·88	8·41 (d)
Bonetal Gold Mines Ltd.	0·61	2·80	1·34	0·77	5·52	5·52
Broulan Porcupine Mines Ltd.	0·35	2·27	0·84	0·94	4·40	5·34
Buffalo Ankerite Gold Mines Ltd.	0·80	3·22	0·76	1·06	5·84	7·20 (e)
Coniaurum Mines Ltd.	1·81	3·90	1·04	0·45	7·20	8·27
Dome Mines Ltd.	0·642	1·696	0·973	0·777	4·088	6·370
Hollinger Cons. Gold Mines Ltd. (Hollinger)	1·0669	3·2463	0·7405	1·0099	6·0636	7·2636
Hollinger Cons. Gold Mines Ltd. (Ross)	0·4884	1·5687	1·8931	0·5431	4·4933	4·8678
Hoyle Gold Mines Ltd.	0·32	1·59	0·95	0·93	3·79	(f)
McIntyre Porcupine Mines Ltd.	0·706	3·911	0·952	0·290	5·859	7·740
Moneta Porcupine Mines Ltd.	0·794	4·110	2·012	0·881	7·797	9·756
Pamour Porcupine Mines Ltd.	0·23	0·82	0·58	0·29	1·92	2·37
Paymaster Cons. Mines Ltd.	0·66	3·66	1·56	0·56	6·44	(f)
Preston East Dome Mines Ltd.	1·19	3·41	0·81	0·33	5·74	6·34
Kirkland Lake District						
Bidgood Kirkland Gold Mines Ltd.	1·57	4·16	1·50	1·10	8·33	8·86
Kirkland Lake Gold Mining Co. Ltd.	....	6·933	1·462	1·275	9·67	10·71
Macassa Mines Ltd.	0·93	3·84	1·33	1·19	7·29	9·70
Teck-Hughes Gold Mines Ltd.	(g)	3·69	1·28	1·32	6·29	8·16
Upper Canada Mines Ltd.	1·83	4·30	1·24	1·40	8·77	12·77
Wright Hargreaves Mines Ltd.	(g)	4·948	1·341	1·577	7·866	11·395
Larder Lake District						
Chesterville Larder Lake Gold Mining Co. Ltd.	0·67	1·72	0·99	0·51	3·89	3·89
Kerr Addison Gold Mines Ltd.	....	1·424	0·647	0·358	2·429	3·668
Omega Gold Mines Ltd.	0·888	2·808	1·446	0·087	5·229	(f)
Matachewan and Sudbury Districts						
Hollinger Cons. Gold Mines Ltd. (Young-Davidson)	0·0319	1·3325	0·7985	0·4244	2·5873	3·0309
Jerome Gold Mines Ltd.	0·051	1·993	0·843	0·649	3·536	3·550
Matachewan Cons. Mines Ltd.	0·280	0·999	0·714	0·384	2·377	(f)
Thunder Bay and Kenora Districts						
Leitch Gold Mines Ltd.	1·35	8·58	2·77	2·26	14·96	18·75
Little Long Lac Gold Mines Ltd.	1·52	3·62	2·17	1·70	9·01	9·45
MacLeod-Cockshutt Gold Mines Ltd.	0·7539	2·0990	1·2968	1·1415	5·2912	7·7010
Patricia District						
Central Patricia Gold Mines Ltd.	1·22	2·79	1·25	1·43	6·69	9·48
Cochenour Willans Gold Mines Ltd.	1·722	3·190	1·859	2·871	9·645	11·349
Hasaga Gold Mines Ltd.	0·1890	1·5780	1·1499	0·3761	3·2930	(f)
Madsen Red Lake Gold Mines Ltd.	0·492	1·844	0·991	0·931	4·258	5·576
McKenzie Red Lake Gold Mines Ltd.	0·5808	3·3774	1·1754	1·2695	6·4032	7·7362
Pickle Crow Gold Mines Ltd.	1·45	4·38	1·34	1·58	8·75	(f)
Uchi Gold Mines Ltd.	0·433	2·190	1·169	3·846	7·638	7·638

(a) Exclusive of outside exploration.
(b) Marketing, head office, etc. (exclusive of taxes).
(c) Depreciation not included.
(d) Includes depreciation and deferred development write off.
(e) Includes depreciation.
(f) Not recorded.
(g) Included with mining.

Table 56.—Dividends Paid and Ore Reserves of Specified Canadian Gold Mining Companies

Name of Firm	Dividends Paid		Estimated Ore Reserve (*)	
	During 1943	Total to Dec. 31, 1943	Total	Average ounces or dwts. fine gold or $ per ton
	$	$	tons	
QUEBEC				
Arntfield Gold Mines Ltd.	....	....	(a)	(a)
Beattie Gold Mines Ltd.	200,000	4,194,890	(b) 3,740,450	0·131 oz.
Belleterre Quebec Mines Ltd.	....	....	(a)	(a)
Canadian Malartic Gold Mines Ltd.	146,054	1,860,966	(d) 1,700,000	0·124 oz.
Central Cadillac Mines Ltd.	(a)	(a)	(a)	(a)
East Malartic Mines Ltd.	....	2,200,000	(b) (c) 2,682,000	(k) $7·56
Francoeur Gold Mines Ltd.	....	208,884	(b) (c) 329,000	0·25 oz.
Golden Manitou Mines Ltd. (m)	....	....	(j) (e) 516,500	0·085 oz.
Lamaque Mining Co. Ltd.	1,304,965	8,201,872	(d) (c) 2,083,533	4·36 dwts.
Malartic Gold Fields Ltd.	....	400,000	(b) (c) 708,885	(l) $7·70
McWatters Gold Mines Ltd.	....	653,577	(a)	(a)
Mic-Mac Mines Ltd.	....	....	(a)	(a)
O'Brien Gold Mines Ltd.	97,500	1,332,500	(f) 229,752	0·389 oz.
Perron Gold Mines Ltd.	200,000	1,940,000	(b) 306,404	0·202 oz.
Powell Rouyn Gold Mines Ltd.	50,000	262,500	583,853	0·126 oz.
Senator Rouyn Limited	102,250	102,250	(d) (c) 213,588	0·186 oz.
Sigma Mines (Quebec) Limited	600,000	1,980,000	(b) 1,311,900	(h) 0·203 oz.
Siscoe Gold Mines Ltd.	278,404	8,024,001	(d) 580,372	$4·24
Sladen Malartic Mines Ltd.	....	....	(b) (c) 475,000	(k) $3·70
Stadacona Rouyn Mines Ltd.	....	....	(a)	(a)
Sullivan Consolidated Mines Ltd.	320,000	2,040,000	(i) (c) 622,000	(l) $10·36

(a) Data not available at present.
(b) January 1, 1943.
(c) Partial only.
(d) January 1, 1944.
(e) Positive ore.
(f) October 1, 1943.
(g) March 31, 1943.
(h) Average 1941.
(i) February 15, 1943.
(j) May 1943 also contains 9·5 per cent zinc and 4·50 ounces silver per ton.
(k) $35·00 gold.
(l) $38·50 gold.
(m) Classified as a silver-lead-zinc mine.

ONTARIO				
Porcupine District				
Aunor Gold Mines Ltd.	360,000	1,000,000	(a)	(a)
Bonetal Gold Mines Ltd.	....	....	(a)	(a)
Broulan Porcupine Mines Ltd.	242,460	808,202	(b) 605,700	0·207 oz.
Buffalo Ankerite Gold Mines Ltd.	70,168	2,622,673	(c) (d) 325,341	(l) $7·709
Coniaurum Mines Ltd.	276,674	2,785,072	(b) (e) 88,673	0·2925 oz.
Delnite Mines Ltd.	89,363	625,541	(b) (e) 93,357	0·197 oz.
Dome Mines Ltd.	3,114,669	55,621,871	(d) 2,426,000	(a)
Hallnor Mines Ltd.	700,000	5,100,000	(b) 630,886	0·37 oz.
Hollinger Cons. Gold Mines Ltd. (Timmins)	3,198,000	116,286,400	(d) 7,735,904	0·331 oz.
Hollinger Cons. Gold Mines Ltd. (Ross)	....	....	(d) 679,059	0·230 oz.
Hoyle Gold Mines Ltd.	....	....	(f) 1,277,600	0·106 oz.
McIntyre Porcupine Mines Ltd.	2,657,340	32,475,068	(g) 4,435,161	0·3174 oz.
Moneta Porcupine Mines Ltd.	152,631	1,297,368	....	....
Pamour Porcupine Mines Ltd.	250,000	3,050,000	(d) 1,608,000	0·110 oz.
Paymaster Cons. Mines Ltd.	86,290	517,745	(h) 576,705	0·235 oz.
Preston East Dome Mines Ltd.	600,000	2,700,000	(d) 820,820	0·227 oz.
Kirkland Lake District (†)				
Bidgood Kirkland Gold Mines Ltd.	....	....	(b) 70,137	(a) $12·13
Kirkland Lake Gold Mining Co. Ltd.	213,067	3,933,875	(d) 356,538	(m) $13·62
Lake Shore Mines Ltd.	1,600,000	90,820,000	(a)	(a)
Macassa Mines Ltd.	642,736	6,326,131	(d) 492,600	(n) $17·36
Sylvanite Gold Mines Ltd.	395,940	8,664,410	(d) (e) 71,015	(a)
Teck-Hughes Gold Mines Ltd.	1,442,143	38,527,366	(d) 304,010	6·72 dwts.
Toburn Gold Mines Ltd.	74,000	2,183,000	(b) 93,400	0·53 oz.
Upper Canada Mines Ltd.	296,302	1,200,019	(a)	(a)
Wright-Hargreaves Mines Ltd.	1,925,000	41,027,500	(j) 1,185,445	0·50 oz.
Larder Lake District				
The Chesterville Larder Lake Gold Mining Co. Ltd.	52,067	442,568	(b) 583,400	0·140 oz.
Kerr-Addison Gold Mines Ltd.	1,655,605	5,676,361	(d) (c) 8,244,236	0·2002 oz.
Omega Gold Mines Ltd.	....	....	(g) 400,000	0·153 oz.
Yama Gold Mines Ltd.	....	....	(a)	(a)
Matachewan District				
Hollinger Cons. Gold Mines Ltd. (Young-Davidson)	63,364	253,457	(d) (e) 1,165,759	(a)
Matachewan Consolidated Mines Ltd.	....	68,600	(b) 1,237,858	0·108 oz.
Sudbury District				
Jerome Gold Mines Ltd.	....	....	(m) 213,442	0·166 oz.

Table 56.—Dividends Paid and Ore Reserves of Specified Canadian Gold Mining Companies—Continued

Name of Firm	Dividends Paid		Estimated Ore Reserve (*)	
	During 1943	Total to Dec. 31, 1943	Total	Average ounces or dwts. fine gold or $ per ton
	$	$	tons	
Thunder Bay District				
Hard Rock Gold Mines Ltd.	89,702	926,923	(b) (c) 410,000	(a) $ 7·46
Leitch Gold Mines Ltd.	256,500	1,225,502	(d) 210,160	(o) $29·43
Little Long Lac Gold Mines Ltd.	73,640	3,700,815	(d) 430,566	0·354
McLeod-Cockshutt Gold Mines Ltd.	143,124	1,281,020	(k) 776,030	0·229 oz.
Magnet Cons. Mines Ltd.	90,000	855,000	(b) 69,000	(a)
Patricia District				
Berens River Mines Ltd.	120,000	420,000	(b) 124,700	0·35 oz.
Cochenour Willans Gold Mines Ltd.	266,549	798,147	(a)	(a)
Central Patricia Gold Mines Ltd.	300,000	3,375,000	(d) 445,269	0·36 oz.
Hasaga Gold Mines Ltd.	....	....	(b) (c) 466,816	0·1411 oz.
Jason Mines Ltd.	....	119,960	(b) 45,888	(n) $16·13
Madsen Red Lake Gold Mines Ltd.	209,972	733,701	(l) (c) 807,270	0·201 oz.
McMarmac Red Lake Gold Mines Ltd.	82,000	82,900	(a)	(a)
McKenzie Red Lake Gold Mines Ltd.	322,850	2,599,400	(a)	(a)
Pickle Crow Gold Mines Ltd.	300,000	7,650,000	(d) 642,665	$13·46

(a) Complete data not yet available.
(b) January 1, 1943.
(c) Partial only.
(d) January 1, 1944.
(e) Broken ore.
(f) July 31, 1942.
(g) March 31, 1944.
(h) June 30, 1943.
(i) Several years reported.
(j) August 31, 1942.
(k) September 30, 1943.
(l) February, 1943.
(m) August 31, after making allowance for 10 per cent dilution.
(n) $38.50 gold.
(o) $35.00 gold.

Manitoba				
God's Lake Gold Mines Ltd.	....	262,500	....	....
San Antonio Gold Mines Ltd.	478,602	3,795,904	(b) 920,908	(a)

(a) Not available.
(b) January 1, 1943.

British Columbia				
Bayonne Cons. Mines Ltd.	....	25,000	(a)	(a)
Bralorne Mines Ltd.	1,496,400	11,462,150	(c) 1,085,000	0·508 oz.
Cariboo Gold Quartz Mining Co. Ltd.	53,332	1,679,976	(b) 423,311	0·398 oz.
Gold Belt Mining Co. Ltd.	....	255,000	(d) 11,680	0·335 oz.
Hedley Mascot Gold Mines Ltd.	135,848	1,290,553	(b) 190,000	(a)
Island Mountain Mines Co. Ltd.	78,804	982,409	(a)	(a)
Kootenay Belle Gold Mines Ltd.	....	357,856	....	....
Kelowna Exploration Co. Ltd.	90,000	1,200,000	(a)	(a)
Musketeer Mines Ltd.	....	....	(d) 23,000	0·40 oz.
Mount Zeballos Gold Mines Ltd.	....	165,000	(a)	(a)
Privateer Mine Ltd.—Privateer	171,786	1,865,101	(b) 4,994	0·768 oz.
Prident	....	....	(b) 26,161	0·428 oz.
Pioneer Gold Mines Ltd.	....	9,299,392	(d) 213,842	0·433 oz.
Polaris Taku Mining Co. Ltd.	....	....	(e) 181,758	(a)
Sheep Creek Gold Mines Ltd.	262,500	2,137,500	(e) 132,558	0·388 oz.
Surf Inlet Cons. Gold Mines Ltd.	....	120,278	(a)	(a)
Silbak Premier Mines Ltd.	325,000	2,125,000	(b) 149,269	0·24 oz.
Spud Valley Mines Ltd.	....	168,000	(f) 125,000	0·136 oz.
Vancouver Island Drilling & Exploration Co. Ltd	....	....	(a)	(a)
White Star Mine Ltd.	....	3,080	(a)	(a)

(a) Complete data not yet available or reported.
(b) January 1, 1943.
(c) January 1, 1944.
(d) March, 1943.
(e) May, 1942.
(f) July, 1942.

Northwest Territories				
Negus Mines Ltd.	99,850	349,475	(*) 27,500	0·82 oz.
Thompson Lundmark Gold Mines Ltd.	....	....	(*) 57,894	0·44 oz.

(*) January 1, 1943.
(x) Subject to revision and based on information secured from companies' annual printed reports.

It should be noted that annual estimates of ore reserves are more or less based on current development and exploration to date, and that eventual or actual ore reserves of most mines are very much in excess of those recorded in this report.

Table 57.—Certain Data Relating to the Production of Gold by the Entire Auriferous Quartz Mining Industry in Canada, 1928-1943 (Averages)

Year	Ounces of gold produced per wage-earner year	Cost of fuel and electricity per ounce of gold produced	Cost of wages per ounce of gold produced	Cost of explosives and other process supplies used per ounce of gold produced	Cost of freight and smelter refinery treatment of ores and bullion shipped per ounce of gold produced	Taxes per ounce of gold produced	**Total of specified costs**
	ounces	$	$	$	$	$	$
1928	206	1·47	7·45	Information not available 1928 to 1934	Information not available 1928 to 1936	Information not available 1928 to 1943	....
1929	218	1·46	7·18				....
1930	237	1·25	6·63				....
1931 (a)	250	1·19	6·50				....
1932	255	1·21	6·31				....
1933 (b)	207	1·36	7·45				....
1934 (c)	154	1·71	9·64	....	....	....	....
1935	146	1·89	10·48	4·38	....	....	**16·75**
1936	137	1·98	11·32	4·46	....	....	**17·76**
1937	132	2·10	12·18	4·65	0·33	(d)	**19·26**
1938	150	1·85	10·95	4·53	0·56	....	**17·89**
1939	157	1·81	10·69	4·45	0·67	....	**17·62**
1940	161	1·76	10·48	4·49	0·69	....	**17·42**
1941	155	1·82	11·56	4·53	0·77	....	**18·68**
1942	176	1·84	11·47	4·34	0·75	....	**18·40**
1943	176·7	2·12	11·47	4·24	0·69	4·89	**23·41**

(a) Equalization exchange premiums paid by the Dominion Government to gold miners (Great Britain goes off gold standard).

(b) United States goes off gold standard.

(c) United States gold dollar reduced in weight from 25·8 to 15 5/21 grains, 0·9 fine.

(d) Not including Mint charges and marketing prior to 1938.

NOTE.—The data contained in the foregoing table have been compiled from reports received from both producing and non-producing (exploring and developing) operators in the auriferous quartz mining industry. This fact should be noted if the information is to be construed or employed as possible criteria for technological or other statistical study. The trends revealed are not to be interpreted as entirely reflecting "Cause and effect" in the operation of producing mines only but rather as indices of change in the industry as a whole. For data relating to producers only, see Table 40.

Table 58.—Certain Data (Averages) Relating to the Total Production of Gold by Producers Only in the Auriferous Quartz Mining Industry in Canada, 1931, 1939-1945

Year	Ounces of gold produced per wage-earner year	Cost of fuel and electricity per ounce of gold produced	Cost of wages per ounce of gold produced	Cost of explosives and other process supplies used per ounce of gold produced	Cost of freight and smelter refinery treatment of ores and bullion shipped per ounce of gold produced	Taxes per ounce of gold produced	**Total of specified costs**
	ounces	$	$	$	$	$	$
1931	256	1·19	6·38	(x)	(x)	(x)	....
1939	164	1·76	10·25	4·33	0·67	(x)	**17·01**
1940	165	1·72	10·20	4·41	0·69	(x)	**17·02**
1941	158	1·79	11·37	4·46	0·77	(x)	**18·39**
1942	177	1·83	11·41	4·33	0·75	(x)	**18·32**
1943	177·6	2·12	11·42	4·23	0·69	4·89	**23·35**

(x) Data not available.

Table 59.—Principal Statistics Relative to All Ontario Gold Mines by Areas (x), 1941-1943

Camp or district	Number of producers	Ore (†) treated	Total gold recovered	Average ounces per ton recovered	Employees	Salaries and wages paid	Cost of fuel, electricity and process supplies
1941	No.	Tons	Fine oz.		No.	$	$
Porcupine	21	5,974,447	1,439,148	·24	9,746	10,230,445	8,110,392
Kirkland Lake	12	(b) 1,900,481	743,123	·39	4,359	8,253,004	3,836,956
Larder Lake	4	1,124,221	205,766	·18	1,135	2,347,675	1,218,731
Matachewan	2	543,677	58,683	·11	521	999,239	662,812
Sudbury	4	148,119	23,420	·15	468	913,103	324,611
Algoma	3	89,432	11,565	·13	186	291,953	143,423
Thunder Bay	16	(a) 823,954	243,321	·29	1,883	3,611,904	1,930,980
Rainy River and Kenora	7	53,459	18,162	·34	231	381,904	157,196
Patricia	13	1,569,616	372,727	·24	2,490	4,799,957	2,797,612
Eastern Ontario	1	300	60	·20	8	5,052	3,400
Total	**83**	**12,227,706**	**3,115,975**	**·25**	**21,007**	**40,834,236**	**19,186,113**
1942							
Porcupine	20	5,624,554	1,308,291	·23	8,499	18,209,637	7,501,441
Kirkland Lake	10	(b) 1,309,361	543,284	·41	2,946	6,028,485	2,812,489
Larder Lake	4	1,168,209	214,751	·18	1,057	2,119,060	1,033,205
Matachewan	2	611,982	59,085	·10	302	810,796	621,333
Sudbury	2	200,011	33,414	·17	339	687,691	269,285
Algoma	3	52,125	8,804	·16	98	197,350	94,898
Thunder Bay	10	662,816	218,430	·24	1,366	3,061,671	1,790,286
Rainy River and Kenora	5	36,449	12,039	·25	125	243,690	93,348
Patricia	11	987,697	294,103	·23	1,754	3,721,469	1,760,838
Eastern Ontario	......	......	......	......	......	......	......
Total	**67**	**10,651,204**	**2,692,201**	**·24**	**16,576**	**35,079,849**	**15,977,123**
1943							
Porcupine	17	4,297,973	1,020,973	·24	6,519	14,115,867	5,581,209
Kirkland Lake	9	(b) 1,114,818	466,052	·42	2,514	5,429,511	2,435,094
Larder Lake	4	981,020	160,281	·17	730	1,561,707	995,761
Matachewan	2	442,506	38,722	·09	279	569,835	465,620
Sudbury	1	107,608	18,041	·17	119	289,018	126,721
Algoma	1	1,782	254	·14	10	14,985	5,566
Thunder Bay	5	(a) 438,522	141,504	·32	919	2,011,819	1,145,151
Rainy River and Kenora	3	3,420	1,546	·45	13	26,111	10,255
Patricia	9	681,714	203,964	·30	1,227	2,707,544	1,348,422
Eastern Ontario	......	......	......	......	......	......	......
Total	**51**	**8,069,363**	**2,060,937**	**·25**	**12,330**	**26,726,377**	**12,113,808**

(a) In addition, 588 tons tailings were treated in 1941 and 5,887 tons in 1943.

(b) In addition, 407,823 tons tailings were retreated in 1941; 5,176 tons in 1942, and 6,863 tons in 1943.

(x) Includes data for all active properties.

(†) Does not include low-grade discarded by sorting, but includes ore milled or smelted.

Table 60.—Milling Capacity of Producing Canadian Gold Mines, 1935-1943 (Tons of 2,000 pounds per 24 hours)

Year	Nova Scotia	Quebec	Ontario	Manitoba	Saskatchewan	British Columbia	Northwest Territories
1935	292	3,368	20,921	1,465	......	2,990	......
1936	713	4,514	22,639	1,000	......	4,120	......
1937	565	6,090	25,249	975	30	3,915	......
1938	542	8,217	30,097	875	1,000	4,590	......
1939	562	9,580	33,324	865	1,000	4,417	......
1940	450	11,215	35,030	690	1,200	4,255	275
1941	319	12,654	37,416	990	1,355	4,510	510
1942	247	14,330	36,135	903	1,202	4,303	710
1943	280	13,304	32,555	753	2	2,845	510

Table 61.—Ores Mined and Treated by Auriferous Quartz Mining Industry, for Years Specified

Year	Ore hoisted	Ore milled (c)	Crude ore shipped to smelters (d)	Low grade sorted out	Tailings retreated	Gold recovered as bullion (b)	Gold in crude ore shipped	Gold in concentrates, slag, etc., shipped
	tons	tons	tons	tons	tons	fine oz.	fine oz.	fine oz.
1925	3,646,460	3,527,021	118,436 †	(a)	48,475	1,482,294	97,011	34,131
1930	4,472,803	4,306,869	123,037	(a)	37,095	1,782,556	45,342	56,893
1935	8,832,901	8,888,129	19,481	(a)	57,798	2,492,145	9,848	143,666
1936	10,694,208	10,504,181	6,569	(a)	33,814	2,903,063	9,988	192,439
1937	12,388,489	11,880,323	39,642	457,622	97,710	3,283,795	17,757	188,618
1938	14,749,649	14,158,555	176,822	528,696	64,926	3,810,642	44,451	191,586
1939	17,105,744	16,150,173	275,519	660,578	18,426	4,160,352	56,044	167,448
1940	18,986,306	18,083,439	209,394	757,538	180,311	4,386,673	42,422	190,157
1941	20,031,736	19,026,273	210,396	936,003	480,289	4,405,986	49,602	(e)190,738
1942	17,722,866	16,820,442	282,334	658,439	5,176	3,898,999	39,512	(e)193,068
1943	12,853,610	12,206,518	268,334	361,522	29,716	2,869,635	36,429	109,055

(a) Not available.
(b) Content of bullion shipped 1925–1935; 1936–1943 content of bullion produced.
(c) + (d) = total crude ore treated (not including sorted material).
(e) Gold in material shipped by gold mines to other gold mines for treatment is included under bullion.
(†) In addition, a relatively small tonnage of unclassified ores was shipped.

Table 62.—Gold Content of Bullion Produced and of ores, concentrates, etc., Shipped, Average Grade of Ore and Ore Milled at Auriferous Quartz Mines in Canada, With Average Price of Gold in Canadian Funds, 1929-1943

Year	Tonnage treated (*)	Gold content fine oz. (b)	Oz. of fine gold per ton	Average price of gold
1929	4,371,143	1,771,526	·41	20·67
1930	4,429,906	1,884,791	·43	20·67
1931	5,526,379	2,271,278	·41	21·55
1932	5,997,492	2,502,327	·42	23·47
1933	6,480,164	2,455,365	·38	28·60
1934	7,524,803	2,490,513	·33	34·50
1935	8,907,610	2,645,659	·30	35·19
1936	10,510,750	3,095,427	·29	35·03
1937	11,919,965(a)	3,490,170	·29	34·99
1938	14,335,377(a)	4,046,679	·28	35·17
1939	16,425,692(a)	4,383,844	·27	36·14
1940	18,292,833(a)	4,619,252	·25	38·50
1941	19,236,869(a)	4,646,326	·24	38·50
1942	17,102,776(a)	4,131,579	·24	38·50
1943	12,474,852(a)	3,015,119	·24	38·50

(*) Does not include tailings retreated, but includes ore milled plus crude ore shipped to smelters.
(a) Material discarded by sorting not included.
(b) Relatively small quantity of gold contained in concentrates, slags, etc. shipped and in cyanide solution in circuit may have originated in ores treated during the previous year; from 1937 represents metal content of total bullion produced plus metal in ores or concentrates shipped to smelters.

Table 63.—Specified Taxes Paid by Active Canadian Auriferous Quartz Mines in 1943, by Provinces (x)

Nature of Tax	Nova Scotia	Quebec	Ontario	Manitoba	Saskatchewan	British Columbia	North-west Territories	Canada
	$	$	$	$	$	$	$	$
Dominion Income Tax, including tax on non-operating revenue	....	642,554	3,801,912	103,599	....	465,639	8,910	**5,022,614**
Dominion Excess Profits Tax	....	1,073,768	5,871,066	(a)187,724	....	622,626	41,979	**7,797,163**
Provincial taxes	374	372,287	940,066	801	....	156,937	13,977	**1,484,442**
Municipal taxes	616	123,423	283,473	....	....	9,127	(b) 12,929	**429,568**
Total all specified taxes	**990**	**2,212,032**	**10,896,517**	**292,124**	....	**1,254,329**	**77,795**	**14,733,787**

(x) Does not include complete data relating to taxes that may have been paid by dormant firms.
(a) Includes $30,832 U.S.A. income taxes.
(b) Includes $4,489 other taxes.

Table 64.—Certain Specified Expenditures Made by Auriferous Quartz Mining Companies, 1942 and 1943

Province and year		Workmen's compensation	Silicosis assessment	Unemployment insurance	Aggregate cost of all supplies purchased	Aggregate cost of plant and equipment purchased
		$	$	$	$	$
Nova Scotia—	1942	4,413	...	958	13,624	5,400
	1943	5,032	...	1,000	28,508	6,000
Quebec	1942	356,093	3,733	70,804	6,156,189	1,294,283
	1943	276,270	3,864	65,393	4,985,946	392,997
Ontario—	1942	852,379	746,827	227,966	16,490,839	1,907,407
	1943	679,519	562,053	194,002	12,687,037	532,737
Manitoba—	1942	29,554	7,003	4,988	459,890	34,674
	1943	20,561	4,920	3,264	263,082	18,646
Saskatchewan	1942	(x)	(x)	(x)	(x)	(x)
	1943	...	...	...	...	...
British Columbia—	1942	138,086	139,043	22,748	1,863,036	83,257
	1943	104,921	104,816	18,092	1,112,819	28,307
Northwest Territories—	1942	17,485	...	3,788	1,034,559	118,045
	1943	17,206	...	2,575	451,798	573,969
Total Canada —	**1942**	**1,398,910**	**896,606**	**331,252**	**26,018,137**	**3,443,066**
	1943	**1,103,509**	**675,653**	**284,326**	**19,529,190**	**1,552,656**

(x) Data not available.

Table 65.—Cost of Prospecting Conducted During 1943 by Canadian Auriferous Quartz Mining Companies

Province prospecting was conducted in—	By Quebec companies (x)	By Ontario companies (x)	By Manitoba companies (x)	By British Columbia companies	By Northwest Territories companies	Total
	$	$	$	$	$	$
Nova Scotia	1,987	...	...	...	...	**1,987**
New Brunswick	877	...	...	...	...	**877**
Quebec	67,905	15,601	...	...	...	**83,506**
Ontario	22,898	188,001	5,901	12,401	...	**229,201**
Manitoba	1,829	26,402	106,605	10,515	...	**145,351**
Saskatchewan	4,633	...	...	...	...	**4,633**
British Columbia	17	57,489	...	180,488	...	**237,994**
Northwest Territories	70	...	...	...	5,130	**5,200**
Yukon	...	4,032	...	11,007	...	**15,039**
Total Canada	**100,216**	**291,525**	**112,506**	**214,411**	**5,130**	**723,788**

(x) Province in which the companies' principal operations are conducted.

Near the end of 1943 the Mines and Geology Branch, Department of Mines and Resources, Ottawa, completed arrangements whereby prospectors would receive special consideration under the wartime employment and food rationing regulations as required to enable them to organize and maintain prospecting parties in the field in 1943. Under these arrangements, employment and selective service offices and local ration boards will accord this special consideration to bona fide prospectors, certified as such by the possession of prospectors' identification cards issued through the Branch, mainly by the provincial mining recorders.

Table 66.—Drilling Completed on Auriferous Quartz Deposits in 1945 (x)

	Footage drilled
Diamond drilling for exploration (testing)—	
By companies with their own equipment and personnel	543,062
By contractors	1,321,727
Other drilling—	
Diamond drilling for breaking rock or ore:	
By companies with their own equipment and personnel	97,298
By contractors	591,598
Drilling by percussion and other machines	†20,014,708

(x) This is not complete as no records are kept by some companies.
(†) Subject to revision.

Table 67.—Capital Employed in the Entire Auriferous Quartz Mining Industry in Canada, 1943

Province	Mines: Operating	Mines: Producing	Capital Employed as Represented by: Present cash value of land, (excluding minerals	Present value of buildings, machinery, tools, equipment, etc.	Inventory value of materials on hand, ore in process, fuels, etc.	Inventory value of finished products on hand	Operating capital (cash, bills and accounts receivable, prepaid expenses, etc.)	Total
	No.	No.	$	$	$	$	$	$
Nova Scotia	3	3	13,170	80,699	4,368	....	4,217	**102,454**
Quebec	46	31	7,746,518	14,485,290	3,333,735	733,777	10,443,745	**36,743,065**
Ontario	55	51	27,114,272	69,532,512	9,705,487	2,740,646	44,284,899	**153,377,816**
Manitoba	7	7	1,871,314	781,590	309,252	78,150	1,910,205	**4,950,511**
Saskatchewan(*)	1	1	....	8,000	1,500	....	200	**9,700**
British Columbia	40	38	1,842,808	4,425,602	1,140,923	319,572	6,782,176	**14,511,081**
Yukon	....	....	....	....	....	....	....	....
Northwest Territories	4	4	1,055,219	1,049,903	436,549	43,892	395,789	**2,981,352**
Total	**156**	**135**	**39,643,301**	**90,363,596**	**14,931,814**	**3,916,037**	**63,821,231**	**212,675,979**

(*) One large producer records its capital under the non-ferrous smelting and refining industry.

Gold mining companies in Canada with a gross production of $50,000 and over, reported that the total book depreciation charged during 1943 amounted to $7,161,122. The total book depletion charged on ore reserves as reported by the same firms totalled $676 027 in 1943.

Table 68.—Employees, Salaries and Wages in the Auriferous Quartz Mining Industry in Canada, by Provinces, 1943

Province	Number of employees: On salary	Wage-earners: Surface	Wage-earners: Underground	Wage-earners: Mill	**Total employees**	Salaries and wages
						$
Nova Scotia	12	18	41	6	**77**	100,311
Quebec	535	1,079	(a) 2,691	425	**4,730**	9,742,932
Ontario	1,081	2,999	(b) 7,207	1,043	**12,330**	26,726,377
Manitoba	48	103	(c) 107	25	**283**	634,166
Saskatchewan	....	....	....	....	....	....
British Columbia	235	319	(d) 568	150	**1,272**	2,736,093
Northwest Territories	66	125	(e) 105	50	**346**	725,404
Yukon	....	....	....	....	....	....
Canada	**1,977**	**4,643**	**10,719**	**1,699**	**19,038**	**40,665,283**

(a) Includes 17 females.
(b) Includes 80 females.
(c) Includes 6 females.
(d) Includes 28 females.
(e) Includes 9 females.

Table 69.—Wage-Earners, by Months, in the Entire Auriferous Quartz Mining Industry, 1931, 1939, 1941, 1942 and 1943

Month	1931 Total	1939 Total	1941 Total	**1942 Total**	1943 Surface Male	1943 Surface Female	1943 Underground Male	1943 Mill Male	**1943 Total**
January	8,273	27,402	29,772	**26,730**	4,795	147	12,536	1,854	**19,332**
February	8,482	27,278	29,765	**26,812**	4,731	148	12,463	1,818	**19,160**
March	8,681	26,941	29,783	**26,151**	4,713	147	12,149	1,813	**18,822**
April	8,746	26,767	29,633	**26,155**	4,540	143	11,676	1,764	**18,123**
May	9,030	27,669	29,869	**25,325**	4,511	160	10,994	1,756	**17,421**
June	9,319	28,238	29,807	**21,938**	4,605	153	10,619	1,761	**17,138**
July	9,345	28,537	30,310	**23,687**	4,669	142	10,238	1,694	**16,743**
August	9,285	28,743	30,158	**21,883**	4,533	135	9,912	1,593	**16,173**
September	9,391	28,577	30,605	**21,246**	4,435	126	9,589	1,537	**15,687**
October	9,524	28,621	30,870	**20,024**	4,209	122	9,417	1,493	**15,241**
November	9,496	28,402	29,567	**19,692**	4,163	118	9,691	1,507	**15,479**
December	9,323	27,516	27,566	**19,192**	3,997	116	9,382	1,481	**14,976**

THE COPPER-GOLD-SILVER MINING INDUSTRY, 1943

The mining of "copper-gold-silver" ores in Canada during 1943 was confined to the province of Quebec, Ontario, Manitoba, Saskatchewan and British Columbia. It is to be noted that in addition to the copper recovered from ores of this type there is a very large quantity of the metal obtained in the smelting and refining of the copper-nickel ores mined in the Sudbury area of Ontario; important quantities of gold and silver are also being extracted from these copper-nickel ores. General statistics relating to labour, etc., in the nickel-copper industry are not included in this report.

Mining operations conducted on Canadian copper-gold-silver deposits (sulphide) during 1943 were reported by 20 firms compared with 26 in 1942 and 21 in 1941. The gross value of crude ore, concentrates, etc., shipped in 1943 from the mines and mills to smelters was estimated at $73,536,322; the cost of fuel, purchased electricity, process supplies, freight and smelter. treatment totalled $29,695,643 and the net value of shipments was computed at $43,840,679. Employees in 1943 totalled 5,748 compared with 5,646 in the preceding year.

The gross value of ores shipped by firms which both mine and smelt their own ores is sometimes not reported. This necessitates considerable estimating in determining gross and net values for mine shipments. However, possible abnormal evaluations resulting from this are largely compensated for in determining the value added at the smelters and refineries. This added value is credited to the non-ferrous smelting and refining industry and is also included in the total net value of production of the entire Canadian mining industry. This fact should be noted in making any statistical study of the annual production values shown for shipments from copper-gold-silver mines.

The statistics as herein shown under the copper-gold-silver mining industry refer only to mines and mills and are not inclusive of data pertaining to the operation of smelters and refineries. Statistics relating to the reduction of non-ferrous ores are recorded under the non-ferrous smelting and refining industry.

Quebec.—Noranda Mines Ltd.: A total of 9,874 feet of drifting, 908 feet of raising and 61,588 feet of exploratory diamond drilling was done in 1943. Due to a shortage of labour which prevailed throughout the year, underground exploration was greatly reduced and slow progress was made in exploring the deeper levels of the mine. From information obtained in diamond drilling and other openings in the various ore-bodies, there is now indicated above the 2,975 foot level, as of January 1, 1944, the following tonnages of ore: Sulphide ore over 4 per cent copper, 5,174,000 tons containing 7·03 per cent copper and 0·157 ounces gold per ton; sulphide ore under 4 per cent copper, 17,460,000 tons containing 0·90 per cent copper and 0·186 ounces gold per ton and 768,500 tons of silicious fluxing ore containing 0·11 per cent copper and 0·083 ounces gold per ton. During 1943 the smelter treated 1,380,738 tons of ore, concentrate and slag, including 428,073 tons of custom ores and concentrates, and produced 137,466,885 pounds of anodes. After deducting the copper, gold and silver which was recovered from the slags received from various shippers, the estimated production of new metals was 132,762,100 pounds of fine copper, 333,261 ounces of gold and 1,516,506 ounces of silver. The estimated recovery from Horne mine ore and concentrate was 66,164,400 pounds of copper, 269,732 ounces of gold and 660,780 ounces of silver; 186,633 tons of pyrite were recovered from the cyanide mill tailing and sold to chemical plants. The company sent prospecting parties into eight districts.

Normetal Mining Corporation Ltd.: There was a serious shortage of underground labour throughout the year with the result that production was reduced to an average of 563 tons of ore per day, or about 20 per cent less than the rate in 1942, against a capacity of 780 tons per day. It was found necessary to change to square-set stoping and by the end of the year about 85 per cent of the total ore hoisted was mined from square-set stopes. Ore reserves reached a peak in the history of the mine. Operating costs showed a substantial rise to an average of $6.24 per ton milled largely due to lower tonnage milled on account of labour shortage, and also partly due to increased power costs and increased cost necessitated by square-set stoping. Total ore broken in 1943 amounted to 206,437 tons. Ore milled totalled 206,437 tons. Ore milled totalled 205,020 tons. Copper production amounted to 12,448,168 pounds and zinc 15,221,966 pounds, representing concentrate recoveries of 93·55 per cent and 69·75 per cent, respectively. The gold content of copper concentrates averaged 0·1227 ounces per ton and the silver content 10·01 ounces per ton.

Waite Amulet Mines Ltd.: Tonnage treated in the mill totalled 641,340, of which 123,115 tons came from the Waite mine, 85,332 tons from "C" shaft and 432,893 tons from Amulet Dufault. The average mill fee assay was: Copper 4·15 per cent; zinc 7·58 per cent; gold 0·036 ounces, ano silver 1·71 ounces. The 300-ton addition to the mill was put in operation on February 1. An extensive program of exploratory diamond drilling was started in 1943 and will be continued until favourable areas of the property have been carefully tested. A contract was entered into with an American company for the sale of iron pyrite concentrate, which was previously discarded in the tailings.

Aldermac Copper Corporation Ltd.: Mining operations at the company's old property in the Rouyn area ceased October 28, 1943. It was reported that the company's new mine located near Sherbrooke, Quebec, was being brought into production in September, 1944. The ore is composed of copper, lead, and zinc sulphides, and contains appreciable amounts of gold and silver. The mill will produce copper, lead, and zinc concentrates for shipment to the United States. The proportion of metals in the sulphide is approximately 3 zinc, 1 lead, and 1 copper. A pyrites concentrates may also be produced.

Ontario.—Algoma Copper Mines Ltd.: The company shipped approximately 420 tons of copper ore to the International Nickel Company's smelter. This ore was mined at a property located in Township 1 A, Algoma district. The mine was active from August to December and was operated under contract. No gold values were reported.

Kam-Kotia Porcupine Mines Ltd.: Property located at Kamiscotia in the Porcupine district, was operated as a Government project from August 15. Milling commenced on September 1 and copper concentrates were shipped to the Noranda smelter. These shipments contained only a small amount of gold. The capacity of the mill is 500 tons per 24 hours.

Manitoba and Saskatchewan.—Hudson Bay Mining & Smelting Co. Ltd.: The tonnage of ore mined and hoisted from underground in 1943 totalled 2,258,638 tons averaging 0·113 ounces gold per ton, 1·88 ounces of silver per ton; 2·44 per cent copper and 5·5 per cent zinc. A total of 146,635 cubic yards of waste filling, consisting of smelter slag, sand, and waste rock was placed in stopes during the year. Diamond drilling or "blast hole" drilling has to a large extent replaced air machine drilling for stope mining. From 2,241,142 tons of ore milled there were produced 415,810 tons of copper concentrates assaying 0·407 ounces gold per ton, 7·28 ounces of silver, 11·53 per cent copper and 180,970 tons of zinc concentrates assaying 0·068 ounces of gold per ton, 1·71 ounces silver, 0·46 per cent copper and 46·1 per cent zinc. Flotation tailings treated in the cyanide plant totalled 1,589,713 tons, from which was recovered zinc dust precipitate containing 22,119 ounces gold, 225,388 ounces silver and 79.999 pounds copper; this material was sent to the copper converter.

The year's production of slab zinc at 108,498,410 pounds was the highest on record. The total production of gold and silver for the year from Hudson Bay materials alone was the second highest on record, while the production of copper from Hudson Bay materials alone, and from combined Hudson Bay and custom materials smelted, were both the highest they have ever been. Temporary farm labour, which was available only during the winter months for the past two years, made the labour shortage less acute. Labour shortages in the mill were accentuated by the necessity of transferring part of the crew to carry on the operation of the concentrator of Emergency Metals Ltd. Additional women were hired to offset in part the shortage created.

Emergency Metals Ltd.: Emergency Metals Ltd., organized in 1942 to mine, as a war measure, the lower grade remainder of an ore body (Mandy) which had been worked during the first World War by a predecessor company, completed its construction program and went into production in April, 1943. Ore milled amounted to 50,486 tons assaying 0·089 ounces gold per ton, 1·48 ounces silver per ton, 5·76 per cent copper and 15·5 per cent zinc. Concentrates were sold under contract to Metals Reserve Company, U.S.A. It was expected early in 1944 that the ore reserves would be exhausted during the latter part of the year.

Sherritt-Gordon Mines Ltd.: The company milled 770,099 tons of ore in 1943 compared with 750,687 in 1942. Production in 1943 comprised 26,959,203 pounds of copper, 8,061 ounces of gold, 245,405 ounces of silver and 28,706 tons of zinc concentrate. The total operating cost per ton of ore milled in 1943 amounted to $2.329 as against $2.421 in the preceding year. Tonnage milled in 1943 achieved a new record in spite of an unsatisfactory labour situation during a considerable part of the year. Owing to the fact that at present zinc concentrates can be marketed at a reasonable profit, mining of the zinc ore reserve in the East mine proceeded as rapidly as possible and over 28,000 tons of zinc concentrates were shipped during the year under contract with Metals Reserve Company of Washington, D.C. No new ore was found during the year, but at the end of 1943 the average grade of ore reserves was slightly better, due to the greater part of the ore extracted during 1943 having been taken from the lower grade portions of the reserve.

British Columbia.—The property of the Britannia Mining & Smelting Co. Limited, located at Britannia Beach, was operated continuously throughout 1943. The tonnage of ore mined and milled totalled 849,147. Copper conentrates exported to the United States totalled 37,240 tons containing 10,922 ounces of gold, 77,521 ounces of silver and 16,068,123 pounds of copper. In addition, there were 746,635 pounds of copper shipped as copper precipitate. The tonnage of iron pyrite shipped amounted to 6,886 tons. The Britannia ore also contains a relatively large quantity of lead. The contract which was arranged with the Wartime Metals Corporation to cover production of concentrates remained in effect throughout 1943 and has been extended indefinitely, being, however, subject to cancellation with ninety days' notice by the Canadian Government Agency. The reduced scale of operations continued throughout the year as there was no improvement in the acute labour shortage. Production was about 50 per cent normal and exploratory work was markedly curtailed. The situation at the property (February, 1944) is such, however, that full production could be resumed quickly, whenever the operating force is increased.

Granby Consolidated Mining, Smelting & Power Co. Ltd.: Mining and milling operations were carried on throughout 1943 at Copper Mountain. Ore mined totalled 1,365,000 tons. The tonnage milled amounted to 1,363,346 and 44,320 tons of copper concentrates were exported to the United States; these contained 6,681 ounces gold, 164,744 ounces of silver and 23,335,928 pounds of copper. Owing to the shortage of labour, a considerable number of women were employed on surface work. The company operated under contracts with Canadian Wartime Metals Corporation and Metals Reserve Company, Washington, D.C.

Twin "J" Mines Limited.—Mining operations were continuous throughout 1943 at the company's property located in the Victoria Mining Division. The 125-ton mill was operated from July 19 and the tonnage of ore milled totalled 17,552. The tonnage of copper concentrates exported amounted to 540, containing 470 ounces of gold, 11,730 ounces of silver and 216,045 pounds of copper. Exports of zinc concentrates totalled 565 tons containing 85 ounces of gold, 3,797 ounces of silver and 562,176 pounds of zinc. Concentrates produced comprised 570 tons copper concentrates and 1,612 tons of zinc concentrates. The company operated under contracts with Wartime Metals Corporation and Metals Reserve Company, Washington, D.C.

Industrial Metals Mining Company Ltd.: This company conducted underground mining operations at the Little Billie mine, Texada Island, from February until the end of the year. Work was of a development nature and no commercial production was reported.

Table 70.—Capital Employed in the Copper-Gold-Silver Mining Industry in Canada, 1943 (a)

Province	Mines		Present cash value of the land (excluding minerals)	Present value of buildings, machinery, tools, equipment, etc.	Inventory value of materials on hand, ore in process, fuels, etc.	Inventory value of finished products on hand	Operating capital (cash bills and accounts receivable, prepaid expenses, etc.)	Total
	Operating	Producing						
			$	$	$	$	$	$
Quebec	12	6	15,501,687	9,543,998	1,113,531	1,838,916	12,633,659	**40,631,791**
Ontario	2	2	....	615,174	39,497	....	15,815	**670,486**
Manitoba	3	3	4,135,673	4,308,207	581,701	951,079	3,660,822	**13,637,482**
Saskatchewan	(b) 1	1	6,258,210	6,888,371	1,509,979	128,413	16,364,095	**31,149,068**
British Columbia*	4	3	339,027	2,831,298	797,638	342,550	4,350,846	**8,661,359**
Total	**22**	**15**	**26,234,597**	**24,187,048**	**4,042,346**	**3,260,958**	**37,025,237**	**94,750,186**

* Reports from small leasers shipping from deposits of the Consolidated Mining and Smelting Company of Canada, Ltd., in the Rossland district, are compiled as one producer; statistics relating to employment, etc., at these properties are not available.

(a) Not including smelters and refineries.

(b) 1 firm is also included in Manitoba number of mines.

Table 71.—Employees, Salaries and Wages in the Copper-Gold-Silver Mining Industry in Canada, by Provinces, 1943*

Province	Number of employees							Salaries and wages
	On salary	Wage-earners					Total employees	
		Surface		Underground	Mill			
		Male	Female		Male	Female		
								$
Quebec	122	473	2	1,117	228	24	**1,966**	3,860,733
Ontario	5	24	....	10	4	....	**43**	94,658
Manitoba	73	193	23	412	68	3	**772**	1,805,532
Saskatchewan	247	608	21	488	139	24	**1,527**	3,261,742
British Columbia	208	382	38	577	215	20	**1,440**	2,784,162
Canada	**655**	**1,680**	**84**	**2,604**	**654**	**71**	**5,748**	**11,806,827**

* Not including smelters and refineries.

Table 72.—Wage-earners, by Months, in the Copper-Gold-Silver Mining Industry in Canada, 1943*

Month	Surface		Underground meal	Mill		Total
	Male	Female		Male	Female	
January	1,695	71	2,878	668	38	**5,350**
February	1,718	77	2,848	669	49	**5,361**
March	1,733	82	2,790	652	54	**5,311**
April	1,684	87	2,607	649	60	**5,087**
May	1,678	86	2,508	677	65	**5,014**
June	1,769	88	2,502	665	69	**5,093**
July	1,764	85	2,470	662	75	**5,056**
August	1,651	87	2,359	641	85	**4,823**
September	1,581	89	2,427	634	86	**4,817**
October	1,609	86	2,527	648	90	**4,960**
November	1,651	89	2,703	655	88	**5,186**
December	1,608	87	2,641	647	87	**5,070**
Average	**1,680**	**84**	**2,604**	**654**	**71**	**5,093**

* Smelter employees not included.

Table 73.—Dividends Paid by Specified Copper-Gold-Silver Mining Companies

Name of firm	Dividends paid in 1943	Total dividends paid to December 31, 1943
	$	$
Noranda Mines Ltd.	8,959,088	89,254,924
Waite Amulet Mines Ltd.	2,310,000	5,280,000
Amulet Dufault Mines Ltd.	3,168,000	5,632,000
Sherritt Gordon Mines Ltd.	352,466	2,114,796
Hudson Bay Mining & Smelting Co. Ltd.	5,515,946	41,369,595
Britannia Mining & Smelting Co. Ltd.	....	11,327,516
Granby Cons. Mining, Smelting & Power Co. Ltd.	202,605	11,667,609

Table 74.—Specified Data Relating to the Copper-Gold-Silver Mining Industry 1929-1943*

Year	Wage-earners	Wages paid	Average per capita wages paid	Salaried employees	Salaries paid	Total salaries and wages
	No.	$	$ (†)	No.	$	$
PRODUCING MINES—						
1929	3,036	5,465,871	1,800	174	462,268	5,928,139
1930	4,634	7,394,741	1,596	195	536,482	7,931,223
1931	2,901	4,140,890	1,427	160	465,603	4,606,493
1932	2,900	3,392,322	1,170	131	328,079	3,720,401
1933	2,590	3,550,417	1,371	123	275,650	3,826,067
1934	2,878	4,357,517	1,514	168	413,127	4,770,644
1935	2,946	4,144,095	1,407	207	473,988	4,618,083
1936	3,328	4,608,774	1,385	308	708,200	5,316,974
1937	4,618	7,019,595	1,520	436	1,058,082	8,077,677
1938	5,051	7,694,141	1,523	418	1,075,014	8,769,155
1939	5,401	8,498,360	1,573	470	1,126,561	9,624,921
1940	5,605	9,434,060	1,683	479	1,313,509	10,747,569
1941	5,324	9,249,863	1,737	524	1,428,993	10,678,856
1942	4,945	9,442,054	1,909	608	1,524,584	10,966,638
1943	5,042	9,931,712	1,970	629	1,764,200	11,695,912
Total	....	**98,324,412**	....	....	**12,954,340**	**111,278,752**
(†) Including any bonus paid.						
NON-PRODUCING MINES—						
1929	1,777	2,132,279	....	256	438,337	2,570,616
1930	775	1,037,743	....	90	187,793	1,225,536
1931	224	256,204	....	66	95,620	351,824
1932	33	27,439	....	12	22,787	50,226
1933	92	81,998	....	36	30,713	112,711
1934	87	65,485	....	36	33,672	99,157
1935	248	367,685	....	29	54,428	422,113
1936	84	119,084	....	18	37,267	156,351
1937	84	126,155	....	26	36,782	162,937
1938	93	129,246	....	15	23,064	152,310
1939	186	256,999	....	26	38,671	295,670
1940	18	18,746	....	13	11,512	30,258
1941	12	10,449	....	6	5,718	16,167
1942	71	107,532	....	22	23,242	130,774
1943	51	79,818	....	26	31,097	110,915
Total	....	**4,816,862**	....	....	**1,070,703**	**5,887,565**

(*) Not including smelters or refineries.

Table 75.—Taxes Paid by the Copper-Gold-Silver Mining Industry in Calendar year 1943

Dominion Income Tax, including tax on non-operating revenue	$	4,512,299
Dominion Excess Profits Tax	$	6,147,405
Provincial Tax	$	1,397,691
Municipal Tax	$	163,781
Grand Total Taxes Paid	**$**	**12,221,176**

Table 76.—Specified Expenditures by the Copper-Gold-Silver Mining Industry, 1942 and 1943

	1942	1943
	$	$
Workmen's compensation	375,289	423,422
Silicosis assessment	102,965	119,982
Unemployment insurance	79,117	84,818
Aggregate cost of all supplies purchased	9,168,768	9,466,714
Aggregate cost of plant and equipment purchased	1,022,614	1,514,959

Table 77.—Cost of Prospecting Conducted by the Copper-Gold-Silver Mining Industry, by Provinces, 1943

Conducted in—	$	Conducted in—	$
Nova Scotia	....	Saskatchewan	....
New Brunswick	....	British Columbia	24,898
Quebec	53,490	Yukon	542
Ontario	56,985	Northwest Territories	500
Manitoba	18,669	**Total**	**155,084**

Table 78.—Specified Data Relating to the Copper-Gold-Silver Mining Industry, 1929-1943 (†)

Year	Producing mines						Non-producing mines			
	Electricity purchased	Total cost of purchased fuel and power used	Hydraulic turbines used	Process supplies used	Freight on ore, etc., shipped	Smelter treatment charges (x)	Electricity purchased	Total cost of purchased fuel and power used	Hydraulic turbines used	Process supplies used
	k.w.h.	$	h.p.	$	$	$	k.w.h.	$	h.p.	$
1929	91,622,530	785,395	9,300	(+)	(+)	(+)	3,155,653	249,738	1,275	(+)
1930	124,395,046	1,173,447	9,300	(+)	(+)	(+)	731,964	98,815	690	(+)
1931	225,088,928	709,614	9,300	(+)	(+)	(+)	311,800	16,888	1,159	(+)
1932	127,331,868	446,736	9,300	(+)	(+)	(+)	1,584,700	16,727	609	(+)
1933	68,188,303	387,312	9,300	(+)	(+)	(+)	453,000	17,313	609	(+)
1934	90,097,659	526,941	9,300	(+)	(+)	(+)	1,108,500	15,729	....	(+)
1935	91,828,181	520,724	9,300	2,892,443	(+)	(+)	1,108,500	13,428	....	6,689
1936	71,134,263	441,132	9,300	3,127,527	(+)	(+)	2,253,803	54,711	....	28,698
1937	199,045,597	871,002	9,300	4,808,504	344,818	9,735,199	....	30,086	....	43,341
1938	214,930,438	1,049,325	9,300	4,746,830	960,791	13,639,953	5,501,100	50,959	609	96,833
1939	247,180,650	1,203,878	8,900	5,539,545	1,582,350	16,587,402	2,119,520	19,645	1,250	46,071
1940	270,601,445	1,297,454	8,900	5,812,178	882,633	17,378,092	....	....	....	....
1941	251,488,789	1,264,533	10,520	5,504,530	1,873,728	25,964,492	....	34	....	1,425
1942	259,238,497	1,333,969	8,900	5,682,271	1,932,958	26,483,998	108,000	4,768	....	21,184
1943	269,523,279	1,413,989	8,900	5,493,875	1,353,139	21,409,079	....	12,721	....	12,840
Total	**2,601,695,473**	**13,425,451**	....	**43,607,703**	**8,930,417**	**131,198,215**	**18,436,540**	**601,562**	....	**257,081**

(+) Not available.
(x) Partly conjectural.
(†) Not including smelters or refineries.

Table 79.—Shipments from Copper-Gold-Silver Mines of Canada, 1942 and 1943

—	Quantity	Value	Total Metal Content as Determined by Settlement Assay (c)				
			Gold	Silver	Copper	Sulphur	Zinc
	tons	$	fine oz.	fine oz.	pounds	tons	pounds
1942							
12 mines shipped to Canadian plants (a)—							
Ores	760,973	8,771,329	146,412	318,805	28,927,383	....	....
Copper concentrates	816,793	38,161,711	342,095	4,700,629	234,276,690	....	....
Zinc concentrates	172,519	4,613,158	11,424	293,259	1,409,389	....	159,543,348
Iron pyrites concentrates	69,014	132,063	....	....	....	32,580	....
Slags, residues and gold precipitates	193	1,440,349	35,146	227,776	129,659	....	....
8 mines shipped to foreign plants—							
Ores	....	....	....	....	....	....	....
Copper concentrates (†)	101,752	7,273,864	19,892	283,590	50,619,295	....	....
Zinc concentrates	92,135	7,453,208	....	....	....	....	94,931,818
Iron pyrites concentrates	310,479	1,302,108	....	....	....	150,199	....
Total	**2,323,858**	**69,147,790**	**555,969**	**5,824,065**	**315,362,425**	**182,779**	**254,475,166**
Value of process supplies, etc. (b)	....	35,459,148	....	....	....	....	....
Net Value	....	**33,688,642**	....	....	....	....	....
1943							
13 mines shipped to Canadian plants (a)—							
Ores	772,641	10,076,183	148,995	373,215	38,948,373	....	....
Copper concentrates	820,759	39,210,100	320,512	4,502,041	230,639,502	....	....
Zinc concentrates	181,032	5,960,291	12,397	310,210	1,656,227	....	167,005,660
Iron pyrites concentrates	65,395	129,947	....	....	....	32,116	....
Slags, residues, bullion, and gold precipitates	198	1,518,423	36,749	240,302	151,001	....	....
12 mines shipped to foreign plants—							
Ores	....	....	....	....	....	....	....
Copper concentrates (†)	94,714	6,238,523	20,410	299,753	45,227,248	....	....
Zinc concentrates	131,418	9,589,232	85	3,797	....	....	134,809,240
Iron pyrites concentrates	219,181	813,623	....	....	....	107,339	....
Total	**2,285,338**	**73,536,322**	**539,148**	**5,729,318**	**316,622,351**	**139,455**	**301,814,900**
Value of process supplies etc. (b)	....	29,695,643	....	....	....	....	....
Net Value	....	**43,840,679**	....	....	....	....	....

(†) Includes some copper precipitate.
(a) Certain mines operated in the Rossland area by leasers in 1942 and 1943 treated, statistically, as one mine.
(b) Includes freight on ore shipments, smelter charges and fuel and purchased electricity.
(c) In addition, cadmium, tellurium and selenium are recovered from these ores.

Table 80.—Ores Mined, Milled, and Concentrates Produced by the Copper-Gold-Silver Mining Industry, 1929-1943

Year	Ore mined	Ore milled	Copper concentrates produced (†)	Zinc concentrates produced	Iron pyrites concentrates produced	Net value of all mine and mill shipments (c)
	tons	tons	tons	tons	tons	$
1929	5,134,824	4,512,806	282,941	....	76,581	21,859,907(a)
1930	5,768,664	4,926,431	298,085	72,112	53,453	15,629,564(a)
1931	6,002,865	5,243,382	469,059	63,828	63,293	15,951,103(a)
1932	5,453,173	4,607,659	518,609	76,507	71,945	11,143,750(a)
1933	5,448,690	4,521,301	521,399	88,645	59,354	7,707,270(a)
1934	6,065,692	5,127,189	587,045	81,811	80,684	8,265,071(a)
1935	5,650,665	4,893,387	614,942	96,466	66,700	16,676,447(a)
1936	5,052,222	4,091,570	503,650	101,303	105,669	19,271,965(a)
1937	6,749,809	5,802,031	630,664	116,698	201,494	30,655,784(b)
1938	7,929,434	6,961,188	756,065	123,887	173,444	34,739,439(b)
1939	8,474,855	7,760,725	828,963	105,842	161,238	32,991,716(b)
1940	8,931,291	8,325,979	930,622	126,346	172,500	34,914,051(b)
1941	9,263,071	8,402,656	974,250	187,622	309,950	36,990,853(b)
1942	8,575,626	7,816,813 (d)	858,580	264,739	219,874	40,730,834(b)
1943	8,251,579	7,482,831	914,360	315,670	292,007	50,774,104(b)
Total 15 years	102,752,460	90,275,948	9,669,234	1,821,476	2,107,286	378,301,867

(a) Value f.o.b. mine and presumed gross value less freight and treatment charges which were not reported separately by operators prior to 1937.
(b) Gross value reported by operators less only freight and treatment costs deducted by Dominion Bureau of Statistics.
(c) Includes the value of any cyanide precipitate shipped from mills to smelters.
(d) In addition, 1,554,164 tons of tailings were retreated.
Note.—Values reported for shipments made to smelters operated by the same company are often nominal in nature resulting in annual variations in the distribution of production values between the mining industry proper and the non-ferrous smelting and refining industry. This explains to a considerable extent the apparent incongruities as the value data for 1938 and 1939.

Table 81.—Ore Mined and Milled in the Copper-Gold-Silver Mining Industry, in Canada, by Provinces, 1943

—	Manitoba and Saskatchewan	Quebec	British Columbia	Ontario	**Canada**
	tons	tons	tons	tons	**tons**
Ore mined	3,073,915	2,908,346	2,231,449	37,869	**8,251,579**
Ore milled	3,061,727	2,154,011	2,230,045	37,048	**7,482,831**
Copper concentrates produced	484,136	346,745	81,345	2,134	**914,360**
Copper precipitates produced	....	....	560	....	**560**
Pyrites concentrates produced	....	277,690	14,317	....	**292,007**
Zinc concentrates produced	221,099	92,959	1,612	....	**315,670**

Note.—In addition some cyanide precipitate is produced in the recovery of gold from copper-gold ores; this is smelted in the production of blister or anode copper; also the Manitoba-Saskatchewan boundary posses through the Flin Flon mine.

Table 82.—Content (†) of Ores, Concentrates, Etc., Shipped from Copper-Gold-Silver Mines, 1929-1941

—		Content				
		Gold	Silver	Copper	Zinc	Sulphur
To Canadian Smelters	Tons net	fine oz.	fine oz.	pounds	pounds	tons
1929—						
Copper ore	570,791	67,008	432,951	57,063,264	....	....
Copper concentrates	117,744	9,914	227,113	35,814,481	....	....
Zinc concentrates	....	....	....	....	....	....
Pyrites	....	....	....	....	....	....
1930—						
Copper ore	724,966	109,043	437,034	70,487,335	1,748,920	....
Copper concentrates	172,772	39,583	659,875	46,921,698	....	....
Zinc concentrates	20,800	2,870	52,950	767,000	13,478,000	....
Pyrites	....	....	....	....	....	....
1931—						
Copper ore	1,726,712	309,765	1,522,200	96,780,533	47,835,966	....
Copper concentrates	177,211	54,337	475,920	62,557,732	....	....
Zinc concentrates	63,828	5,808	126,379	1,928,000	35,056,199	....
Pyrites	....	....	....	....	....	....
1932—						
Copper ore	850,451	314,784	564,983	51,905,334	....	....
Copper concentrates	451,063	117,783	1,288,360	110,256,022	....	....
Zinc concentrates	76,507	7,535	157,843	2,181,377	68,258,142	....
Pyrites	3,465	....	....	....	....	598
Precipitate	54	11,573	98,302	55,174	....	....
1933—						
Copper ore	867,789	223,494	328,918	39,561,914	....	....
Copper concentrates	495,305	156,924	1,463,446	107,886,584	....	....
Zinc concentrates	80,780	....	....	....	55,938,867	....
Pyrites	....	....	....	....	....	....
Precipitate	65	15,030	155,941	65,873	....	....
1934—						
Copper ore	868,467	162,797	282,391	33,173,070	....	....
Copper concentrates	553,515	194,664	1,918,638	120,185,486	....	....
Zinc concentrates	76,149	5,417	144,559	1,324,297	69,331,636	....
Pyrites	1,199	....	....	....	....	593
1935—						
Copper ore	900,761	184,410	306,978	33,243,785	....	....
Copper concentrates	578,206	203,509	1,753,871	123,750,525	....	....
Zinc concentrates	93,195	6,482	168,298	1,591,969	84,283,903	....
Pyrites	1,149	....	....	....	....	580
Precipitate	101	12,505	135,985	76,644	....	....
1936—						
Copper ore	965,370	247,293	354,006	32,678,904	....	....
Copper concentrates	458,065	215,183	1,586,085	85,709,434	27,715,850	....
Zinc concentrates	100,615	6,017	176,085	1,465,980	91,008,760	....
Pyrites	35,435	....	....	....	....	17,796
Precipitate	66	13,583	132,154	52,534	....	....

Table 82.—Content (†) of Ores, Concentrates, Etc., Shipped from Copper-Gold-Silver Mines, 1929-1941—Continued

—		Content				
		Gold	Silver	Copper	Zinc	Sulphur
	Tons net	fine oz.	fine oz.	pounds	pounds	tons
To Canadian Smelters—Concluded						
1937—						
Copper ore	943,790	165,052	388,414	47,632,125	....	....
Copper concentrates	528,641	236,566	2,090,353	119,755,349	....	....
Zinc concentrates	106,074	8,135	184,248	1,593,711	95,941,609	....
Pyrites	1,037	....	....	....	....	523
Slag, precipitates, etc.	151	31,432	130,441	112,565	....	....
1938—						
Copper ore	924,236	167,179	470,745	55,558,860	....	....
Copper concentrates	606,255	271,099	2,565,893	138,288,971	1,668,410	....
Zinc concentrates	94,994	8,199	175,391	1,446,591	85,882,822	....
Pyrites	2,088	....	....	....	....	1,011
Slag, precipitates, etc.	234	23,916	129,478	202,519	....	....
1939—						
Copper ore	868,328	173,019	440,393	60,333,576	....	....
Copper concentrates	616,071	237,742	2,637,965	145,937,499	1,683,442	....
Zinc concentrates	96,817	7,378	182,517	1,320,610	91,116,593	....
Pyrites	2,436	....	....	....	....	1,216
Slag, precipitates, etc.	595	24,140	133,330	557,781	....	....
1940—						
Copper ore	860,237	156,857	372,408	35,648,578	....	....
Copper concentrates	768,833	258,692	3,514,614	208,421,117	2,492,666	....
Zinc concentrates	108,328	5,250	185,406	954,803	102,169,600	....
Pyrites	36,308	....	....	....	....	17,619
Slag, precipitates, etc.	566	23,739	120,970	530,712	....	....
1941—						
Copper ore	865,921	159,647	320,994	22,516,954	....	....
Copper concentrates	828,622	296,302	4,282,053	240,003,806	3,138,594	....
Zinc concentrates	135,582	6,263	212,115	1,246,645	125,006,638	....
Pyrites	94,818	....	....	....	....	45,446
Slag, precipitates, etc.	189	28,893	113,299	102,553	68,337	....
Total 13 years	....	**4,986,811**	**33,602,292**	**2,199,719,272**	**1,003,824,954**	**85,382**
To Foreign Smelters						
1929—						
Copper ore	3,352	192	5,876	333,719	....	....
Copper concentrates (x)	145,917	20,054	380,834	69,554,222	....	....
Zinc concentrates	....	....	....	....	....	....
Pyrites	76,581	....	....	....	....	38,203
1930—						
Copper ore	391	81	456	26,023	....	....
Copper concentrates and precipitates	126,250	16,877	335,134	65,656,756	....	....
Zinc concentrates	11,082	....	....	....	11,527,280	....
Pyrites	53,453	....	....	....	....	27,682
1931—						
Copper ore	55	58	150	5,345	....	....
Copper concentrates	71,015	5,396	164,957	35,012,918	....	....
Zinc concentrates	....	....	....	....	....	....
Pyrites	63,293	....	....	....	....	31,771
1932—						
Copper ore	54	157	28	....	....	....
Copper concentrates	37,558	8,868	87,346	18,625,044	....	....
Zinc concentrates	....	....	....	....	....	....
Pyrites	48,584	....	....	....	....	24,231
1933—						
Copper ore	120	132	193	11,578	....	....
Copper concentrates	28,541	12,933	65,969	14,654,498	....	....
Zinc concentrates	8,929	....	....	....	9,374,675	....
Pyrites	58,604	....	....	....	....	28,178
1934—						
Copper ore	....	....	....	....	....	....
Copper concentrates	31,866	11,261	79,358	15,348,073	....	....
Zinc concentrates	5,899	....	....	....	5,374,023	....
Pyrites	35,957	2,889	....	84,697	....	4,908

Table 82.—Content (†) or Ores, Concentrates, Etc., Shipped from Copper-Gold-Silver Mines, 1929-1941—Concluded

—		Content				
		Gold	Silver	Copper	Zinc	Sulphur
	Tons net	fine oz.	fine oz.	pounds	pounds	tons
To Foreign Smelters—Concluded						
1935—						
Copper ore	.....	.....	.....	.....	.....	.....
Copper concentrates and precipitates	62,356	13,826	86,864	19,410,963	.....	.....
Zinc concentrates	3,191	49,696	.....	.....	3,606,436	.....
Pyrites	28,056	.....	.....	.....	.....	13,942
1936—						
Copper ore	645	.....	.....	.....	727,398	.....
Copper concentrates	58,114	13,039	100,192	23,514,161	.....	.....
Zinc concentrates	.....	.....	.....	.....	.....	.....
Pyrites	91,777	.....	.....	.....	.....	45,374
Slag, etc	5,004	169	7,345	450,133	.....	.....
1937—						
Copper ore	131	43	164	13,222	.....	.....
Copper concentrates	97,553	15,120	266,874	48,759,159	.....	.....
Zinc concentrates	5,871	.....	.....	.....	6,041,690	.....
Pyrites	118,420	.....	.....	.....	.....	59,657
1938—						
Copper ore	850	479	3,191	80,245	.....	.....
Copper concentrates and precipitates	152,955	23,759	476,207	79,978,954	.....	.....
Zinc concentrates	5,966	103	12,577	133,526	6,270,471	.....
Pyrites	42,515	.....	.....	.....	.....	21,316
1939—						
Copper ore	108	101	55	5,425	.....	.....
Copper concentrates	177,884	53,866	543,600	84,062,126	.....	.....
Zinc concentrates	30,693	.....	.....	203,969	33,669,569	.....
Pyrites	225,200	.....	.....	.....	.....	113,231
1940—						
Copper ore	11	11	949	2,234	.....	.....
Copper concentrates	159,316	39,952	492,352	78,778,442	.....	.....
Zinc concentrates	30,389	456	45,552	444,808	32,558,961	.....
Pyrites	91,457	.....	.....	.....	.....	45,502
1941—						
Copper ore	21	5	72	865	.....	.....
Copper concentrates and precipitates	145,549	49,802	430,563	68,313,890	.....	.....
Zinc concentrates	51,983	471	47,051	397,450	57,515,573	.....
Pyrites	208,542	.....	.....	.....	.....	103,762
Total for 13 years	.....	**339,746**	**3,633,909**	**623,862,445**	**166,666,076**	**557,757**

(†) As determined by settlement assay and not necessarily all recovered.

(x) Includes a relatively small quantity copper precipitate for some years.

Note.—For total estimated values of annual shipments see following table.

Table 83.—Ore Reserves of Specified Copper-Gold-Silver Mining Companies*

	Tons	Copper	Zinc	Gold	Silver
		per cent	per cent	ounces per ton	ounces per ton
Noranda Mines Ltd., January 1, 1944—					
Indicated above the 2,975 foot level:					
Sulphide ore over 4 per cent copper	5,174,000	7·03	.....	0·157	(a)
Sulphide ore under 4 per cent copper	17,460,000	0·90	.....	0·186	(a)
Silicious fluxing ore	768,500	0·11	.....	0·083	(a)
Capacity of mill: 24 hours	3,000	.....	.....	.....	.....
Waite Amulet Mines Ltd., December 31, 1943—					
Waite Mine—					
Copper ore	167,831	4·2	.....	0·04	0·5
Zinc ore	111,094	.....	11·1	.....	.....

Table 83.—Ore Reserves of Specified Copper-Gold-Silver Mining Companies*—Conc.

	Tons	Copper	Zinc	Gold	Silver
		per cent	per cent	ounces per ton	ounces per ton
Waite-Amulet Mines Ltd., December 31, 1943—*Con.*					
Other Waite Amulet ore bodies—					
"F" orebody	30,000	3·2	9·9	0·01	1·01
"C" orebody	148,000	1·9	17·5	0·02	4·5
Amulet Dufault—					
Lower "A" orebody	2,872,322	5·7	4·67	0·045	1·5
Upper "A" orebody	141,100	2·0	6·5	0·07	1·6
Capacity of mill: 24 hours	1,800				
Normetal Mining Corp. Ltd., December 31, 1943—					
Capacity of mill: 24 hours	750				
Sherritt Gordon Mines Ltd., December 31, 1943—					
East orebody—					
Zinc ore	294,000	0·93	8·69	0·007	0·45
Copper ore	306,000	2·61	2·07	0·024	0·73
West orebody	2,492,000	2·45	1·99	0·017	0·57
Capacity of mill: 24 hours	2,000				
Hudson Bay Mining & Smelting Co. Ltd., January 1,1943	27,378,240 (c)	2·59	4·16	0·085	1·25
Capacity of mill: 24 hours	6,000				
Granby Cons. Mining, Smelting & Power Co. Ltd. 1943	17,341,453	1·20		(a)	(a)
Capacity of mill: 24 hours	4,800				
Britannia Mining & Smelting Co. Ltd.		Not reported			
Capacity of mill: 24 hours	6,000				
Twin "J" Mines Ltd.—April, 1943	100,000	2·0	7·0	(d)	(d)
Capacity of mill: 24 hours	125				

(a) Not reported.

(b) This makes no allowance for ore below the 2,600 foot level (lowest developed) which contains ore for a length of 1,025 feet with average width 18·4 feet averaging 3·58 per cent copper and 5·54 per cent zinc.

(c) With dilution; includes Emergency Metals Ltd.

(d) Approximately $3.00 per ton in gold and silver.

(x) Subject to revision; taken from the Companies' annual printed reports.

Table 84.—Drilling Completed on Copper-Gold-Silver Deposits in Canada, 1945

	Footage drilled
Diamond drilling for exploration (testing only)—	
By mining companies with their own personnel and equipment	107,867
By diamond drilling contractors	152,284
Other diamond drilling—	
Blast hole diamond drilling—	
By mining companies with their own personnel and equipment	943,486
By diamond drilling contractors	32,042
Drilling by percussion or other machines	6,166,551 (x)

(x) Not complete as these data are not recorded by some operators.

CHAPTER THREE

THE SILVER MINING INDUSTRY IN CANADA

(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 inasmuch as silver-bearing minerals usually occur in association with other metals of economic value—with lead and zinc; with cobalt, nickel and arsenia; with lode and placer free gold; in copper-gold and nickel-copper ores, and at Great Bear Lake, N.W.T., with silver-pitchblende. Silver-lead-zinc mining is a very important industry in British Columbia and, to a lesser extent, in the Yukon Territory. In Eastern Canada, lead and zinc ores have been mined in Ontario, Quebec and Nova Scotia.

It is to be noted that, in addition to its recovery from silver-lead ores, zinc is now produced in large quantities from copper-gold-silver ores mined in Quebec, Manitoba and Saskatchewan.

General statistical data contained in this chapter are essentially those pertaining to the mining of silver-cobalt and silver-lead-zinc ores and, to a lesser extent, silver pitchblende ores.

(a) The Silver-Cobalt Mining Industry

The mining of silver-cobalt ores in Canada is confined almost entirely to the district of Temiskaming in Northern Ontario. Veins containing these metals were discovered at or near the present town of Cobalt in 1903 and shipments of ores from this area have been continuous since 1904. Depletion and exhaustion of ore reserves during recent years have resulted in a relatively great decline in the production of metals from these deposits. In most instances, operations at properties, some of which were prominent as producers in the past, are conducted by lessees and shipments range from one to several hundred tons. The increased demand for cobalt as an alloying metal has, for some years, stimulated operations of a salvage nature at several of the older mines.

In order to encourage the production of cobalt for war requirements, United States and Canadian government agencies co-operated during a considerable period of the present war in the purchase of Canadian cobalt ores. Ores thus acquired were consigned in 1942 and 1943 to a United States Government agency stock pile located at Deloro, Ontario. These government purchases were discontinued in the latter part of 1943.

The only straight custom mill now at Cobalt is the old O'Brien 100-ton mill, now operated by C. W. J. O'Shaugnessy. In August of 1943 the concentrating plant at Cobalt of Cobalt Products Ltd. was taken over by Silanco Mining & Smelting Company. The Temiskaming Testing Laboratories, recently destroyed at Cobalt by fire, have been rebuilt by the Ontario Department of Mines. This plant renders a valuable service to many operators who depend on it for the sampling, valuation and often marketing of ores. Shipments of cobalt ore were also made in 1942 and 1943 from a deposit located at Werner Lake, some 40 miles north of Minaki near the Ontario-Manitoba boundary.

The number of operators reported as actively engaged in the mining or shipping of silver-cobalt ores in 1943 totalled 20; employees numbered 221 and salaries and wages paid amounted to $290,654. The gross value of shipments totalled $721,173 and the net value of sales was estimated at $578,861.

Table 84(A).—Statistics of the Silver-Cobalt Mines and Mill Operations in Canada (b), 1941-1943

		1941	1942	1943
Number of mines in operation (x)		14	14	21
Ore mined	tons	11,507	25,550	39,184
Ore salvaged from surface	tons	(c)	18,532	395
Ore treated (milled) (a)	tons	38,715	43,851	39,625
Tailings treated	tons	.....	.....	8,865
Concentrates produced	tons	1,396	1,415	1,346
Gross value of bullion, ore, concentrates and residues sold	$	788,815	(d) 750,250	(d) 721,173
Cost of freight	$	7,017	1,439	4,192
Smelter charges	$	18,719	16,255	15,361
Cost of fuel and purchased electricity used	$	40,875	68,349	74,691
Cost of process supplies used	$	59,761	64,000	48,068
Net value of sales	$	662,443	600,207	578,861

(x) All mines located in northern Ontario and includes properties on which the operations consisted only in salvaging of ore from dumps, etc.
(a) Does not include crude ore shipped.
(b) Partly estimated or conjectural as data are unobtainable from some shippers.
(c) Data not available.
(d) Includes value of ore consigned to United States Government stock pile at Deloro, Ontario.

Table 85.—Capital Employed in the Silver-Cobalt Mining Industry in Canada, 1943

	$
Present cash value of the land (excluding minerals)	88,707
Present value of buildings, fixtures, machinery, tools and other equipment	96,562
Inventory value of materials on hand, ore in process, fuel and miscellaneous supplies on hand	25,484
Inventory value of finished products on hand	35,048
Operating capital (cash, bills and accounts receivable, prepaid expenses, etc.)	341,238
Total	**587,039**

Table 86.—Employees, Salaries and Wages in the Silver-Cobalt Mining Industry in Canada, 1943

—		Number	Salaries and wages
SALARIED EMPLOYEES—			$
Total	(a)	40	56,570
WAGE-EARNERS—			
Surface	(b)	57	234,084
Underground		83	
Mill		41	
Total		181	234,084
Grand Total		**221**	**290,654**

(a) Includes 6 females. (b) Includes 1 female.

Table 87.—Number of Wage-Earners on Payroll or Time Record at End of Month in the Silver-Cobalt Mining Industry, 1940-1943

Month	1940	1941	1942	1943				
				Mine			Mill	
				Surface		Underground		
				Male	Female	Male	Male	Female
January	63	140	144	46	1	90	33	.....
February	72	144	109	48	1	97	33	.....
March	79	159	115	57	1	89	34	.....
April	84	97	141	61	1	79	36	.....
May	122	139	179	47	1	94	49	.....
June	138	146	183	46	1	80	54	.....
July	144	186	200	49	1	72	54	.....
August	133	193	200	54	1	70	49	.....
September	128	181	195	81	1	83	51	.....
October	127	184	180	63	1	66	37	.....
November	88	161	172	66	1	82	36	.....
December	74	154	150	55	1	71	18	.....

(b) The Silver-Lead-Zinc Mining Industry

In 1943 the silver-lead-zinc mining industry of Canada reported 31 operators or firms as being actively engaged in the mining, prospecting or development of silver-lead-zinc deposits and of these operators, 24 reported commercial shipments during the year under review. Capital employed totalled $20,603,191; employees numbered 3,097, and salaries and wages paid amounted to $6,423,724. The cost of explosives and other process supplies consumed totalled $2,044,367 and fuel and electricity used was recorded at $986,519. The gross value of production as reported by the entire industry totalled $27,072,882 and the net value of same was estimated at $21,932,644.

Quebec.—A report on "Lead in 1943" as prepared by the Bureau of Mines, Ottawa, states:

"In Quebec, the Tetreault property near Notre-Dame-des-Anges, Portneuf county, was taken over in 1942 by Siscoe Gold Mines, Ltd., and was operated under the supervision of Wartime Metals Corporation. The lead and zinc concentrates produced are contracted to the Metals Reserve Company. Production continued throughout 1943. New Calumet Mines, Ltd., operating at Calumet Island, Pontiac county, completed the erection of a 500-ton mill, which went into production in September, 1943. The property was actively explored and developed during the past two years; lead concentrates were stock-piled and zinc concentrates exported in 1943.

"Aldermac Copper Corporation is opening up a new property at Moulton Hill, Ascot township, 4 miles from Sherbrooke. The property is being developed underground and it is expected that a new 250-ton concentrator will be in operation by June 15, 1944. The sulphide ore is composed of copper, lead, and zinc sulphides with appreciable values in gold and silver. The mill will produce copper, lead and zinc concentrates for shipment to the United States. The proportion of metals in the sulphide is approximately 3 zinc, 1 lead and 1 copper. A pyrites concentrate may also be produced.

"Golden Manitou Mines, Ltd., took over in 1941 part of the holdings, near Val D'Or, of Quebec-Manitou Mines, Limited, and in 1942 completed the erection of a 600-ton mill for the production of zinc and gold concentrates. The capacity of the mill has since been increased to 900 tons. Lead and zinc-bearing concentrates and gold precipitate were produced and shipped during 1943.

"Investigation in 1943 by Hollinger North Shore Exploration Company (subsidiary of Hollinger Consolidated Gold Mines), of its concession near the Quebec-Labrador boundary, disclosed occurrences of zinc, which will be drilled in 1944.

"**Ontario.**—In Ontario, Lake Geneva Mining Company, Limited, continued producing lead and zinc concentrates throughout the year for the Metals Reserve Company. The operation is being carried on through Wartime Metals Corporation. An extensive exploration campaign was concluded during the year. This indicated the continuation of the veins and two new levels were opened up. The mill capacity is 100 tons of ore daily.

"**British Columbia**—In British Columbia, the lead and zinc concentrates produced in the concentrator at the Sullivan mine of the Consolidated Mining & Smelting Company of Canada Ltd. were shipped by rail 185 miles to the company's smelter and refinery at Tadanac, near Trail. The Monarch mine of Base Metals Mining Corporation, Limited, was reopened in the latter part of 1939 and has been in production since January, 1940. Western Exploration Company at Silverton was re-treating the tailings accumulated during previous operations, mainly for the recovery of the zinc. The company's Mammoth mine was also in production. The Lucky Jim mine, at Zincton, was taken over late in 1940 by Zincton Mines, Limited, a new company owned by Sheep Creek Gold Mines, Limited. The mine and concentrator were in production in 1943. Reco Mountain Base Metals Mines, Ltd., a subsidiary of Gold Frontier Mines, Ltd., took over the Noble Five, Surprise, and Deadman mines, near Sandon, Slocan mining division in 1942. The properties were explored by diamond drilling and underground development in 1943. The 100-ton mill of the Noble Five was rehabilitated and started to operate in September 1943, producing lead and zinc concentrates which were shipped under contract to Metals Reserve Company of the United States.

"The Whitewater mines and mill were taken over in the fall of 1942 by Kootenay Belle Gold Mines Limited, and were put into shape for production. Retallack Mines, Limited, a subsidiary of Kootenay Belle Gold Mines, Limited, was formed in December, 1943, to take over the management of the property and production is expected early in 1944. An agreement has been negotiated with U.S. Commercial Company, a subsidiary of Metals Reserve Company, for the disposal of the lead and zinc concentrates. All the mill machinery and mine equipment has been transferred from the Kootenay Belle Gold Mines at Sheep Creek, and when added to the existing facilities of the Whitewater is expected to give an initial milling capacity of 300 tons a day.

"The Van Roi mine on Four-Mile Creek, near Silverton, was being prepared for operation in 1943, after lying idle for many years. The old mill is being re-modelled and will have a capacity of 300 tons a day. The property is being operated by Van Roi Base Metals, Limited. The Highland-Bell, located at Beaverdell, was active throughout the year.

"The Kootenay Florence mine at Ainsworth, on the west shore of Kootenay Lake, was taken over in 1943 by Wartime Metals Corporation and was operated as the Kootenay Florence Project. The mill equipment and machinery of the Ymir Consolidated Mines, Ltd. were installed in the old Kootenay Florence mill building. Production was started in the spring of 1943. Several small lead-zinc properties, mainly in the Ainsworth-Slocan district, shipped crude ore to the Trail smelter. The Reeves McDonald zinc-lead mine on the Pend d'Oreille River remained idle in 1943."

The lead smelter and the electrolytic lead and zinc refineries at Trail were in continuous operation throughout 1943. The Consolidated Mining and Smelting Company of Canada Limited reported that the production of ore from the Sullivan mine reached a record high of 243,631 tons in March, 1943; the tonnage of Sullivan ore treated in 1943 totalled 2,500,714. The grade of ore mined in 1943 was again slightly lower than in the previous year; for the first time in some years development work was insufficient to maintain the ore reserves, 1,600,000 more tons of ore being mined than were actually developed during the year.

Yukon.—A relatively small tonnage of silver-lead ores was shipped from properties located at Galena Hill in the Mayo district. The ore was mined chiefly by lessees operating on deposits formerly worked by the Treadwell Yukon Corporation, which company is now in liquidation. Shipments in 1943 were consigned to the Bunker Hill smelter, at Bradley, Idaho.

General statistics relating to the production of zinc from Canadian copper-gold-silver-zinc deposits are included in chapter two.

For statistical purposes, the data pertaining to the mining of pitchblende ores in the Northwest Territories are combined with those of the Silver-Lead-Zinc Mining Industry. Both the mine and mill of Eldorado Mining and Refining, located at Port Radium, were operated continuously throughout 1943; pitchblende concentrates were shipped to the company's radium refinery located at Port Hope, Ontario.

Table 88.—Ore Mined and Milled in the Silver-Lead-Zinc Mining Industry(x) in Canada, 1942 and 1943

	Yukon and Northwest Territories	British Columbia	Quebec and Ontario	Canada
1942—Ore mined.....ton	6,669	2,810,566	134,245	**2,951,480**
Ore milled.....ton	6,369	2,944,620	122,425	**3,073,414**
Concentrates produced—Lead.....ton	60	325,597	1,920	**327,577**
Zinc.....ton	.....	390,362	12,834	**403,196**
Pitchblende-silver.....ton	292	.....	.....	**292**
Gold precipitate.....ton	.....	.....	3	**3**
1943—Ore mined.....ton	37,371	2,708,886	506,400	**3,252,657**
Ore milled.....ton	32,186	2,714,329	499,380	**3,245,895**
Concentrates produced—Lead.....ton	.....	292,407	5,383	**297,790**
Zinc.....ton	.....	331,563	55,894	**387,457**
Pitchblende-silver.....ton	903	.....	.....	**903**
Gold precipitate.....ton	.....	.....	20	**20**

(x) Includes silver-pitchblende ores mined in the Northwest Territories.

Table 89.—Drilling Completed on Silver-Lead-Zinc Deposits in Canada, 1943

	Footage drilled
Diamond drilling for exploration and testing—	
By mining companies with their own personnel and equipment	5,591
By diamond drilling contractors	64,425
Other diamond drilling—	
Blast hole diamond drilling—	
By mining companies with their own personnel and equipment	....
By diamond drilling contractors	96,963
Drilling by percussion or other machines	(x) 1,871,957

(x) Not complete as records are unobtainable at certain mines.

Table 90.—Destination of Shipments From Silver-Lead-Zinc Mines in Canada, 1942 and 1943

—	Tons shipped	Gross value at shipping point	Total metal content as determined by settlement assay			
			Gold fine oz.	Silver fine oz.	Lead pounds	Zinc pounds
		$				
1942						
To Canadian smelters—						
Lead ore	9,082	446,775	580	819,458	685,139	843,839
Lead concentrates (a)	351,849	16,951,704	6	7,975,252	479,435,732	32,967,898
Zinc ore	52	2,392	....	2,983	8,834	37,974
Zinc concentrates (x)	366,106	7,214,685	6	724,003	29,451,015	365,605,607
Dry ore	2,346	20,379	429	7,491	71,092	100,116
Gold precipitate	(b)	6,488	143	4,080	....	....
Total	**729,435**	**24,642,423**	**1,164**	**9,533,267**	**509,651,812**	**399,555,434**
To Foreign smelters—						
Lead ore	469	108,563	14	158,455	611,501	....
Lead concentrates	5,954	525,623	194	428,818	8,163,186	350,077
Zinc concentrates (x)	45,157	2,433,515	94	145,037	598,272	49,339,769
Gold precipitate	3	62,870	1,163	36,955	....	....
Total	**51,583**	**3,130,571**	**1,465**	**769,265**	**9,372,959**	**49,689,846**
Grand Total (gross)	....	**27,772,994**	....	....	....	....
Cost of freight	....	1,662,341	....	....	....	....
Cost of fuel and purchased electricity	....	791,772	....	....	....	....
Smelter charges	....	650,420	....	....	....	....
Cost of process supplies	....	1,163,819	....	....	....	....
Net Value	....	**23,504,642**	....	....	....	....
1943						
To Canadian smelters—						
Lead ore	3,033	178,543	481	341,528	193,202	11,483
Lead concentrates (a)	308,379	15,246,727	37	6,630,217	406,083,211	30,559,105
Zinc ore	....	....	....	....	....	....
Pyrites concentrates	509	19,245	471	6,054	....	....
Zinc concentrates (x)	306,769	6,253,860	13	620,190	28,129,985	303,830,945
Dry ore	1,899	31,685	408	54,674	29,926	60,212
Total	**620,589**	**21,730,060**	**1,410**	**7,652,663**	**434,436,324**	**334,461,745**
To Foreign smelters—						
Lead ore	228	41,341	3	57,442	266,853	....
Lead concentrates	8,268	937,075	7,600	492,222	10,289,890	235,785
Zinc concentrates (x)	82,627	3,751,444	86	283,606	145,593	90,270,160
Gold precipitates	20	612,962	10,408	378,797	....	....
Total	**91,143**	**5,342,822**	**18,097**	**1,212,067**	**10,702,336**	**90,505,945**
Grand Total (gross)	....	**27,072,882**	....	....	....	....
Cost of freight	....	1,655,637	....	....	....	....
Cost of fuel and purchased electricity	....	986,519	....	....	....	....
Smelter charges	....	453,715	....	....	....	....
Cost of process supplies	....	2,044,367	....	....	....	....
Net Value	....	21,932,644	....	....	....	....

(x) Does not include any zinc concentrates produced from copper-gold-zinc ores in Quebec, Manitoba, Saskatchewan or British Columbia.

(a) Includes shipments of silver-pitchblende concentrates from Northwest Territories. Information relating to content of pitchblende is not available for publication.

(b) Data not available.

Note.—In addition to the metals contained in shipments listed in Table 90, there are considerable quantities of lead and silver contained in ores shipped from certain gold mines in British Columbia. Cadmium, bismuth, antimony, tin and sulphur are also recovered from these ores (silver-lead-zinc).

Table 91.—Capital Employed in the Silver-Lead-Zinc Mining Industry in Canada, 1943

Province	Number of mines	Present cash value of land (excluding minerals)	Present value of buildings, machinery, tools, equipment etc.	Inventory value of materials on hand, ore in process, fuels, etc.	Inventory value of finished products on hand	Operating capital (cash, bills and accounts receivable, prepaid expenses, etc.)	Total
		$	$	$	$	$	$
Quebec	5	1,205,725	2,120,078	290,166	361,937	284,207	**4,262,173**
Ontario, Yukon and Northwest Territories (†)	7	80,010	711,814	561,627	697	81,586	**1,435,734**
British Columbia (x)	20	5,846,015	6,863,252	1,198,727	257,211	740,079	**14,905,284**
Total	**32**	**7,131,750**	**9,695,144**	**2,050,520**	**619,845**	**1,105,932**	**20,603,191**

(x) Data relating to several small shippers in British Columbia are unobtainable.
(†) Includes data relating to mining of pitchblende ore in the Northwest Territories.

Table 92.—Employees, Salaries and Wages in the Silver-Lead-Zinc Mining Industry in Canada, 1943

Province	On salary	Mine		Mill	Total	Salaries and wages
		Surface	Underground			
						$
British Columbia	(a) 303	(b) 415	995	(c) 390	**2,103**	4,401,956
Ontario, Quebec, Yukon and N.W.T.†	(e) 104	(d) 285	468	137	**994**	2,021,768
Canada	**407**	**700**	**1,463**	**527**	**3,097**	**6,423,724**

† Includes data on silver-pitchblende mining operations in the Northwest Territories.
(a) Includes 38 females. (b) Includes 7 females. (c) Includes 31 females.
(d) Includes 5 females. (e) Includes 10 females.

Table 93.—Number of Wage-Earners, by Months, in the Silver-Lead-Zinc Mining Industry, 1942 and 1943

Month	1942	1943				
		Mine			Mill	
	Total	Surface		Underground		
		Male	Female	Male	Male	Female
January	1,580	543	7	1,438	475	21
February	1,611	583	6	1,474	476	21
March	1,601	601	6	1,431	473	22
April	1,639	631	6	1,383	475	27
May	1,665	668	6	1,387	475	32
June	1,807	751	10	1,439	489	36
July	1,909	771	9	1,450	522	38
August	1,993	785	14	1,437	506	38
September	2,100	738	15	1,428	509	39
October	2,174	755	14	1,468	515	38
November	2,211	712	15	1,654	530	35
December	2,195	720	9	1,565	498	35
Average	**1,877**	**688**	**12**	**1,463**	**495**	**32**

ARSENIC

Canadian production of arsenic (As_2O_3) during 1943 from domestic ores totalled 3,153,538 pounds valued at $254,009 compared with 14,967,874 pounds worth $652,041 in 1942. Of the 1943 output, 2,744,921 pounds valued at $221,085 represents refined arsenic produced by the Deloro Smelting & Refining Co., Deloro, Ontario from crude arsenic recovered at the O'Brien and Beattie gold mines in the Province of Quebec together with the As_2O_3 content of crude arsenic exported from the Beattie gold mine. The balance of Canadian production in 1943, all from Ontario, was obtained in the treatment of silver-cobalt-arsenic ores at the Deloro smelter. In addition to the arsenic recovered from Ontario and Quebec ores, there is a very considerable quantity of arsenic contained in auriferous quartz ores exported to the United States from British Columbia mines; no data are available on the possible recovery of this arsenic and the Canadian mines receive no payment for any part of the arsenic content; it is therefore not credited in 1943 as commercial production. Deposits containing arsenopyrite in association with gold occur in various other parts of Canada.

A report issued by the Bureau of Mines, Ottawa, states that the world production of arsenic is estimated by the United States Bureau of Mines as in excess of 80,000 tons compared with 64,000 tons in 1939. The principal producing countries are: United States, Mexico, Sweden, France, Belgium, Australia, Japan, Brazil and Canada. Complete data on world production of arsenic are not available at present.

"Arsenic is used chiefly in the manufacture of insecticides. It is also used in the preparation of weed killers, sheep and cattle dip, wood preservatives, and in the manufacture of glass, minor uses being in pigments, tannery supplies, and pharmaceutical preparations. Arsenic salts are used to replace creosoting in the preservation of wood. The use of arsenic to manufacture chemical warfare materials has notably increased its consumption. Calcium arsenate and, to a much lesser extent, lead arsenate are the arsenicals ordinarily used in insecticides. Paris green, which is a copper acetoarsenite, is also used as an insecticide. Magnesium arsenate and manganese arsenate have also been used for this purpose. A considerable tonnage of white arsenic, in the form of crude arsenic or as sodium arsenite is used in the manufacture of weed killers. High-grade white arsenic is used in glass as a decolorizer, opacifier and refining agent. Small quantities of arsenic are used in the paint industry, as realgar or arsenic disulphide (As_2S_2) and as orpiment or arsenic trisulphide (As_2S_3).

"Although the world consumption of white arsenic has varied greatly during the past ten years, the quoted price remained steady at 3½ cents a pound up to the middle of 1941. As most of it is a by-product of metal recovery, through necessity rather than choice, and as the potential supply is far in excess of any normal demand, there seems to be little likelihood of any sustained increase in price. The New York price remained fixed at 4 cents a pound throughout 1942 and 1943. The Canadian price of white arsenic, as given by Canadian Chemistry & Process Industries, remained at 5½ to 6 cents a pound throughout 1943."

Table 94.—Production in Canada, Imports and Exports of Arsenic, 1942 and 1943

	1942		1943	
	Quantity	Value	Quantity	Value
	Pounds	$	Pounds	$
PRODUCTION—				
White arsenic (†)	14,967,874	652,041	3,153,538	254,009
IMPORTS—				
White arsenic (arsenious oxide)	2,082	203	400	124
Sulphide of arsenic	3,716	1,541	3,373	1,123
Soda, arseniate of, binarseniate	96,450	28,986	83,329	18,712
Arsenate of lead	18,000	1,993	4,432	484
Arsenate of lime	10,576	795	9,664	665
Total	....	**33,518**	....	**21,108**
Exports—Arsenic—Total	**8,386,300**	**226,018**	**6,617,100**	**353,484**

(†) Includes arsenic in ores exported from British Columbia in 1942 but not in 1943 (see text); for Canadian arsenic production in all previous years see the 1942 annual mineral production report for Canada.

Table 95.—Consumption of Arsenious Oxide and Arsenic Acid in the Manufacture of Canadian Insecticides, 1932-1943

Year	Pounds	$	Year	Pounds	$
1932	1,721,044	69,250	1938	3,029,145	93,873
1933	3,116,401	110,011	1939	4,287,435	132,584
1934	4,709,443	168,185	1940	3,607,444	122,265
1935	2,736,089	86,983	1941	5,707,499	212,687
1936	3,368,956	106,132	1942	6,106,887	273,919
1937	3,296,559	102,651	1943	4,807,049	211,998

Note.—In addition, the following calcium arsenate was used: 1940, 342,452 pounds valued at $21,671; 1941, 509,381 pounds at $34,704, 1942, 394,978 pounds worth $26,773 and 1943, 383,059 pounds at $26,373.

COBALT

Output of Canadian cobalt comes entirely from cobalt-bearing deposits located in northern Ontario and usually includes the cobalt recovered and sold in the metallic state, the cobalt content of oxides and salts sold and the metal content of cobaltiferous ores exported. No cobalt metal, oxides or salts were produced in Canada from Canadian ores in 1943 and the 175,961 pounds valued at $191,407 credited as Canadian cobalt production during the year under review represents the metal content of Canadian ores exported. Not included in this figure is the cobalt contained in ores purchased for Metals Reserve Company of the United States. These ores were stockpiled at Deloro, Ontario and their metal content will be recorded as Canadian production when exported or treated in Canada.

Deloro Smelting and Refining Company, Limited, has the only plant in Canada that treats ores for the recovery of cobalt. The plant is located at Deloro, Ontario, and produces cobalt metal, oxides, and salts, chiefly for the British market. For the past two years the company has been treating cobalt residues from Africa and has processed little or no Canadian ores. The Canadian production of cobalt ore in 1943 was largely purchased by Deloro Smelting and Refining Company as agent for the Department of Munitions and Supply, acting for Metals Reserve Company of the United States, and was stockpiled for this account.

In the United States, most of the cobalt produced is obtained from cobalt residues imported from Africa. These are converted to metal at Niagara Falls, N.Y., and to oxide at New Brighton, Wilmington, and Canonsburg, in Pennsylvania, and at Cleveland, Ohio.

The total annual world output is estimated to approximate 6,000 metric tons. The greater part of the world's requirements are now supplied from the extensive deposits of the Belgian Congo and Northern Rhodesia, the remainder being contributed mainly by India, French Morocco, and Canada. Other producing countries are Australia, Japan, Germany, and Russia.

The Bureau of Mines, Ottawa, reports that about 75 per cent of the world production of cobalt is used in the metallurgical industry and most of the remainder in the ceramic industry. The metallurgical uses are for high-speed cutting steels; for making stellite or stellite-type alloys, which contain 45 to 50 per cent cobalt, 30 to 37 per cent chromium, and 12 to 17 per cent tungsten. There are various modifications of this composition, but all contain high percentages of cobalt. Stellite is used for cutting metals at high speed and for making permanent magnets. The use of stellite continues to spread and it is of great value in the manufacture of valves for aeroplane engines. Small quantities of cobalt used with other chemicals in nickel-plating solutions are said to produce a bright nickel electro deposit as an undercoating for later chromium plating. A certain amount of cobalt is used in electroplating and as a catalyst. Cobalt oxide is used mainly in the ceramic industry owing to its fine colouring properties. Other compounds of cobalt are used as driers in paints and varnishes.

Consumption of cobalt, chiefly in the production of high-speed cutting tools and permanent magnets, increased substantially during the past two years.

The market for cobalt is uncertain at present and will remain so until the Metals Reserve Company in Washington decides on what is to be done with the surplus stocks that have been built up.

The price of cobalt has remained fairly steady in recent years. The nominal New York price for cobalt metal remained at $1.50 a pound and for black oxide in 350-lb. lots, at $1.85 a pound, throughout the year. The nominal price for cobalt ore, 10 per cent grade, f.o.b. cars, Ontario, remained at $1.10 a pound of cobalt.

Since 1904, the first year for which cobalt production was recorded in Canada, there were produced, to the end of 1943, in all forms, 34,381,103 pounds of Canadian cobalt valued at $33,692,811.

Table 96.—Production in Canada, Imports and Exports of Cobalt, 1942 and 1943

	1942		1943	
	Quantity	$	Quantity	$
PRODUCTION (In terms of metallic cobalt and cobalt in oxides and salts sold and in ores exported) pounds	(x) 83,871	88,444	(x) 175,961	191,407
IMPORTS—Cobalt ore ... pounds	4,336,200	1,485,370	2,236,300	785,721
Oxide of cobalt ... pounds	164	433	55	130
EXPORTS—Cobalt, contained in ore ... pounds	93,400	97,266	163,100	188,510
Cobalt, metallic ... pounds	943,632	1,471,024	911,107	1,507,035
Cobalt, alloys ... pounds	226,963	1,253,264	214,202	1,021,663
Cobalt oxides and cobalt salts ... pounds	232,808	285,424	67,040	135,630

(x) Exclusive of cobalt in ores placed on Government stock pile at Deloro, Ontario: this will be credited as Canadian production when exported or recovered in Canadian smelters. For Canadian cobalt production in previous years see the 1942 annual mineral production report.

Table 97.—Cobalt Salts Used in the Manufacture of Canadian Pigments and Paints, 1932-1943

Year	Pounds	$	Year	Pounds	$
1932	17,021	10,960	1938	43,703	17,993
1933	10,885	7,463	1939	52,979	21,638
1934	26,300	14,069	1940	89,332	28,111
1935	110,419	33,292	1941	74,445	39,349
1936	170,932	43,230	1942	200,228	145,433
1937	37,258	17,062	1943	179,995	75,233

SILVER

Production of newly mined silver from all types of Canadian ores totalled 17,344,569 fine ounces valued at $7,849,111 in 1943 compared with 20,695,101 fine ounces worth $8,726,296 in 1942. The average estimated price of the metal in Canadian funds was 45·254 cents per fine ounce in 1943 as against 42·166 cents in 1942. The greatest annual production of silver in Canada occurred in 1910, in which year an output of 32,869,264 fine ounces was recorded; the highest average yearly Canadian price per fine ounce for silver was 111·122 cents in 1919. Production of silver in Canada since 1887, the first year for which data are available, to the close of 1943, totalled 867,292,819 fine ounces valued at $488,706,170.

The following information is taken from the review of the 1943 Silver Market by Handy and Harman, New York:

"The year 1943 proved to be an uneventful chapter in the story of silver. War conditions necessitated the continuance of Government control, both at home and abroad, over the price of the white metal and over its allocation for industrial and monetary purposes, but this control involved no new features of importance. The only significant development during the year was the action taken by the United States Congress which made Government-owned silver available for sale or lease subject to certain restrictions. Prices in the London market did not vary throughout the year, the quotation for both spot and forward having been 23½ pence; imports and exports on private account were prohibited and, while Government operations continued, only very limited information regarding them is available.

"The making available of United States Treasury silver came at a most opportune time because there had been a shortage of newly mined metal for several months; in the case of foreign silver, priced at 45 cents, the shortage was the direct result of a decline in imports caused by Mexico's retention for coinage of an increasingly larger proportion of that country's current production; in the case of domestic silver, priced at 71·11 cents, the shortage was due to two causes: first, reduced output, occasioned by a scarcity of mine labour and materials; second, the fact that producers had reverted to making deliveries to the Treasury instead of to industry. . . . On the subject of world production, our information is particularly scanty this year and we confine our estimate to the four larger producing countries only; United States, 44,500,000 ounces; Canada, 18,500,000 ounces; Mexico, 87,000,000 ounces; Peru, 16,000,000 ounces. Compared with 1942, these figures show declines in output for the United States and Canada of 18 per cent and 16 per cent respectively, an increase in the case of Mexico of 8 per cent, and no change in Peru. For the first year since the inauguration of the silver purchase program in 1934, United States Government holdings of silver showed a decrease, and no foreign silver was purchased in 1943. . . . Of the silver consumed in the United States during 1943, approximately 65 per cent went into war production or for purposes classified as essential by the War Production Board. In these categories the largest single use was for photographic film, followed in order of quantity by silver brazing alloys and silver-lead solders, airplane engine bearings, electrical contacts and parts, military insignia, silver-plated eating utensils for the army and navy, and in considerable less volume by medical and dental products.

"In the non-essential field, the United States manufacturer of silverware and jewellery was limited throughout 1943 to using domestic silver only, and since February 25 the amount of silver for these purposes has been under quota restrictions of the War Production Board. The price at which manufacturers could obtain silver has increased during the past year and a half from the pre-war level of 35 cents per ounce to 45 cents per ounce, and for some purposes to 71·11 cents per ounce. The higher figure was established in September, 1942 by the office of the Price Administration in the case of domestic silver, and in July, 1943 by the Green Act in the case of Treasury silver. This higher price has retarded the use of silver to some extent. . . ."

Table 98.—Production of Silver From All Ores in Canada for Years Specified, 1887-1943

Year	Ounces	Cents per ounce	Year	Ounces	Cents per ounce
1887	355,083	98·00	1931	20,562,247	29·87
1891	414,523	98·00	1932	18,347,907	31·67
1898	3,205,343	67·06	1933	15,187,950	37·83
1901	5,539,192	58·95	1934	16,415,282	47·46
1906	8,473,379	66·79	1935	16,618,558	64·79
1910 (x)	32,869,264	53·49	1936	18,334,487	45·13
1911	32,559,044	53·30	1937	22,977,751	44·88
1916	25,459,741	65·66	1938	22,219,195	43·48
1919	16,020,057	(†) 111·122	1939	23,163,629	40·49
1920	13,330,357	100·90	1940	23,833,752	38·25
1925	20,228,988	69.06	1941	21,754,408	38·26
1927	22,736,698	56·37	1942	20,695,101	42·17
1929	23,143,261	52·99	1943	17,344,569	45·25
1930	26,443,823	38·15			

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

Table 99.—Production of Silver in Canada, by Provinces and Method of Computation, 1942 and 1943

	1942		1943	
	Quantity	Value	Quantity	Value
		$		$
Nova Scotia—				
In gold bullion	446	188	144	65
Quebec—				
In anode copper	1,438,907	606,730	1,509,610	683,159
In gold bullion made and in concentrates exported	216,135	91,135	702,505	317,912
Total	1,655,042	697,865	2,212,115	1,001,071
Ontario—				
In silver recovered in Canada from cobalt ores	837,615	353,189	97,411	44,082
In gold bullion	465,275	196,188	339,640	153,701
In blister copper	2,188,004	922,593	1,608,787	728,040
In ores, concentrates, residues, matte, etc., exported	961,893	405,592	625,482	283,056
Total	4,452,787	1,877,562	2,671,320	1,208,879
Manitoba—				
In blister copper	809,318	341,257	533,906	241,614
In gold bullion (gold mines) and ores exported	12,506	5,273	53,373	24,153
Total	821,824	346,530	587,279	265,767
Saskatchewan—				
In blister copper	2,658,385	1,120,935	2,812,623	1,272,825
In gold bullion and in crude alluvial gold	5,747	2,423	1	.....
Total	2,664,132	1,123,358	2,812,624	1,272,825
Alberta—				
In alluvial gold	2	1	1	.....
British Columbia—				
In alluvial gold	5,923	2,498	2,628	1,189
In gold bullion	82,031	34,589	30,431	13,771
In base bullion and in ores, etc., exported	10,508,250	4,430,909	8,962,429	4,055,858
Total	10,596,204	4,467,996	8,995,488	4,070,818
Yukon—				
In alluvial gold	17,321	7,304	8,810	3,987
In silver-lead ores exported	464,812	195,992	43,538	19,703
Total	482,133	203,296	52,348	23,690
Northwest Territories—				
In pitchblende-silver ores shipped to smelters (a) and in gold bullion	22,531	9,500	13,250	5,996
Canada—Total	**20,695,101**	(c) **8,726,296**	**17,344,569**	(b) **7,849,111**

(a) No recovery from pitchblende ores in 1942 or 1943; includes 19 oz. in gold ores exported in 1942.
(b) Silver in all crude ores, etc., exported totalled 2,345,756 ounces.
(c) Silver in all crude ores etc. exported totalled 956,193 ounces.

Note.—For 1942 silver was valued at 42·17 cents per fine ounce, the average price of the metal on the New York market adjusted and expressed in Canadian funds; for 1943 the corresponding price was 45·254 cents.

Table 100.—Source of Canadian Silver Production, by Percentages, 1939-1943

Source	1939	1940	1941	1942	1943
In silver-cobalt ores	6·5	5·38	2·6	4·13	0·81
In base bullion (†)	(x) 39·7	(x) 44·39	45·3	46·16	45·58
In gold ores (bullion and placer)	4·6	3·60	4·1	3·71	3·07
In blister and anode copper	23·6	27·62	31·8	34·28	37·28
In matte, copper ores and silver-lead ores, etc., exported (other than silver-cobalt ores)	25·6	19·01	16·2	11·72	13·26
	100·0	100·0	100·0	100·0	100·0

(†) Chiefly from silver-lead ores.
(x) Includes silver recovered in Canada from pitchblende-silver ores.

Table 101.—Canadian Silver Production According to Nature of Ores, by Provinces, 1943

Province	Crude placer gold	Auriferous quartz ores	Copper-gold-silver ores	Nickel-copper ores	Silver-lead-zinc ores	Silver-cobalt and other ores	Total
	oz.	oz.	oz.	oz.	oz.	oz.	oz.
Nova Scotia		144					144
Quebec		128,561	1,501,884		581,670		2,212,115
Ontario		859,701	1,659	1,648,888	17,921	(x) 143,151	2,671,320
Manitoba		9,893	577,386				587,279
Saskatchewan		1	2,812,623				2,812,624
Alberta	1						1
British Columbia	2,628	379,973	307,321		8,305,566		8,995,488
Northwest Territories		13,250					13,250
Yukon	8,810				43,538		52,348
Canada	**11,439**	**1,391,523**	**5,200,873**	**1,648,888**	**8,948,695**	**143,151**	**17,344,569**

(x) Exclusive of silver in cobalt-silver ores placed on United States Government stock pile at Deloro, Ont.

Table 102.—Silver Consumed in Specified Canadian Industries, 1941 and 1942

	1942		1943	
	Fine oz.	Value	Fine oz.	Value
		$		$
Scientific equipment	(x) 744,175	205,189	702,882	279,885
Fountain pens and pencils			54,712	25,497
Jewellery and silverware (fine silver)		1,476,788		1,421,459
Jewellery and silverware (silver alloys)		754,421		837,907
Medicinal and pharmaceutical preparations (bullion)	141,875	57,928	147,254	61,038
Miscellaneous chemicals	6,944	2,780		

(x) Consumed largely in the manufacture of photographic film.

Table 103.—Imports Into Canada and Exports of Silver, 1942 and 1943

	1942		1943	
	Quantity	Value	Quantity	Value
		$		$
IMPORTS (x)—				
Silver, unmanufactured	30,797	12,568		
Silver, manufactures of, n.o.p.		146,830		31,427
Toilet articles of which the most important component, in value, is sterling silver		14,355		254
Total		**173,753**		**31,681**
EXPORTS—				
Silver contained in ore, concentrates, etc.	3,534,947	1,487,045	2,253,018	1,040,207
Silver bullion (Canadian)	10,645,539	4,465,595	9,198,617	4,517,756
Silver manufactures		17,033		71,300
Total		**5,969,673**		**5,629,353**

(x) The following are the imports of films during 1942 and 1943: Photographers' 1942, value, $622,706; 1943, $407,054. Cinematograph films (positives) 1942, 4,141,479 feet, value $333,896; 1943, 4,565,195 feet $368,470. Films for aerial photography 1942, value $5,416; 1943, $65,442. Films, cinematograph (negative) value 1942, $61,867; 1943, $76,880. Educational films 1942, $171,847; 1943, $338,313.

LEAD AND ZINC

Statistics relating to Canadian primary production of lead and zinc represent the content of these metals in ores exported plus the quantity of lead in base bullion produced and refined zinc made in Canada. Refined lead is produced in Canada only by the Consolidated Mining & Smelting Company of Canada Ltd. which company operates an electrolytic lead refinery at Trail, British Columbia. Refined zinc is produced at Flin Flon, Manitoba by the Hudson Bay Mining & Smelting Company Limited and at Trail, British Columbia by the Consolidated Mining & Smelting Company of Canada Ltd.

Compared with 1942, the production of refined metal from the Trail plants showed a substantial reduction due to the falling-off in ore receipts from the Sullivan mine; production of refined lead was 224,493 tons or about 19,000 tons less than in 1942; the zinc plant produced 152,299 tons of bar zinc or about 13,000 tons less than in 1942. Production of slab zinc at Flin Flon, Manitoba by the Hudson Bay Mining & Smelting Company Limited totalled 108,498,410 pounds in 1943 compared with 101,244,017 pounds in 1942; the 1943 output was the highest on record. The estimated average values per pound for lead and zinc in 1943, in Canadian funds, were 3·754 cents and 4 cents, respectively, compared with corresponding prices of 3·362 cents and 3·411 cents in 1942.

The Mining Journal, London, in a review of lead and zinc in April, 1943, states: "Though somewhat more information has been available in 1943 regarding wartime developments in lead and zinc, the statistics are still insufficient to warrant making any estimates of world production and consumption in the last two or three years. In general, the lead position, at any rate so far as the United Nations are concerned, has been relatively easy, though consumption has probably increased somewhat in 1943, and production and consumption are probably roughly in balance. The zinc position also in 1943 was somewhat easier than in the previous two years, and sufficient supplies of zinc have been forthcoming to meet all essential requirements."

The Bureau of Mines, Ottawa, reports that the basic uses of zinc under war conditions are the same as those in peacetime, but in all fields of use the wartime demand for the metal is exceptionally large. In peacetime, the galvanizing industry uses most of the primary and secondary output of zinc. Large quantities of the metal are used also in the brass and casting industry; as paint pigments; in radio and flashlight batteries; and in making zinc oxides. In the present war lead has been the least scarce of the metals, but as a result of direct and indirect war demands and the substitution of lead for copper and brass, consumption has been increasing. Lead is the only common metal classified in the least critical group; its use is very diversified.

The agreement made in 1939 by the large base metal producers and the Imperial Government, by which the producers were to supply the Imperial Government with copper, lead and zinc at prices which prevailed shortly before the outbreak of the war, was continued with some adjustments or revisions for increases in prices due to the increased cost of labour and materials. Canada can now furnish large quantities of these metals in the refined state, whereas in 1914 no refined copper, nickel or zinc and only a comparatively small amount of refined lead were produced in this country.

LEAD

Table 104.—Production (b) of New Lead in Canada, 1925-1943

Year	Pounds	$	Price per pound (Canadian funds)	Year	Pounds	$	Price per pound (Canadian funds)
			c.				c.
1925 (x)	253,590,578	23,127,460	9·120	1935	339,105,079	10,624,772	3·133
1926	283,801,265	19,240,661	6·751	1936	383,180,909	14,993,869	3·913
1927	311,423,161	16,477,139	5·256	1937	411,999,484	21,053,173	5·110
1928	337,946,688	15,553,231	4·576	1938	418,927,660	14,008,941	3·344
1929	326,522,566	16,544,248	5·054	1939	388,569,550	12,313,768	3·169
1930	332,894,163	13,102,635	3·927	1940	471,850,256	15,863,605	3·362
1931	267,342,482	7,260,183	2·740	1941	460,167,005	15,470,815	3·362
1932	255,947,378	5,409,704	2·114	1942 (a)	512,142,562	17,218,233	3·362
1933	266,475,191	6,372,998	2·392	1943	444,060,769	16,670,041	3·754
1934	346,275,576	8,436,658	2·436				

(x) Year of maximum value of Canadian lead production.
(a) Year o, maximum output of Canadian lead.
(b) Primary lead in base bullion produced plus lead inores exported.

Table 105.—Production in Canada, Imports and Exports of Lead, 1942 and 1943

	1942		1943	
	Pounds	Value	Pounds	Value
		$		$
PRODUCTION—				
Quebec	437,634	14,713	2,435,523	91,430
Ontario	3,183,159	107,018	2,273,896	85,362
British Columbia	507,199,704	17,052,054	439,155,635	16,485,902
Yukon	1,322,065	44,448	195,715	7,347
Total	**512,142,562**	**17,218,233**	**444,060,769**	**16,670,041**
IMPORTS—				
Pig and block	18,084	2,186	19,481	3,561
Old and scrap	5,133	204	2,183	87
Bars and sheets	7,546	1,100	8,862	1,379
Litharge for storage batteries	1,904,900	169,117	2,397,300	203,677
Acetate of lead	215,574	26,338	62,307	8,013
Nitrate of lead	246,484	23,178	123,163	15,453
Other manufactures	....	81,393	....	229,644
Pipe lead	....	....	59	10
Shots and bullets	1,373	249	141,484	22,176
Lead arsenate	18,000	1,993	4,432	484
Lead tetraethyl, compounds of	8,795,358	3,063,925	10,556,057	3,568,496
Lead capsules for bottles	....	7,892	....	25,465
Lead pigments—				
Dry white lead	25,508	2,428	435,835	37,606
White lead, ground in oil	2,674	697	....	....
Dry red lead and orange mineral	163,517	16,597	114,123	11,936
Total	....	**3,397,297**	....	**4,127,987**
EXPORTS—				
Lead, contained in ore	11,859,000	409,193	11,470,200	425,306
Pig lead	421,565,000	15,243,454	308,695,300	9,222,104
White lead	472,900	38,693	205,500	20,380
Total	....	**15,691,340**	....	**9,667,790**

Production of lead in all forms and from all types of Canadian ores from 1887 to 1943 inclusive, totalled 8,262,341,389 pounds valued at $354,727,126.

The annual capacity for the production of refined lead at Trail, British Columbia, is approximately 244,000 short tons.

Table 106.—Refined Lead Production in Canada(x) 1929-1943

Year	Pounds of refined lead produced	Year	Pounds of refined lead produced
1929	304,449,673	1937	(†) 399,394,939
1930	304,471,706	1938	(†) 400,763,014
1931	278,448,457	1939	(†) 381,137,424
1932	253,136,522	1940	(†) 440,175,333
1933	254,565,861	1941	(†) 456,054,164
1934	(†) 314,457,735	1942	(†) 486,612,849
1935	(†) 327,515,277	1943	(†) 447,742,463
1936	363,449,490		

(x) Includes the electrolytic lead produced from Canadian and foreign ores at Trail, B.C., and also the pig lead from Galetta, Ont., until 1931.
(†) Primary lead only.

Table 107.—Available Statistics on the Consumption of Lead in Specified Canadian Manufacturing Industries, 1942 and 1943

Industry	Items used	1942	1943
		Pounds	Pounds
Brass and copper products	Pig lead	1,780,402	1,689,325
	Scrap and other lead	641,465	400,760
White metal alloys	Pig lead	48,281,959	51,823,690
	Scrap lead	21,194,878	22,714,238
Electrical apparatus	Pig lead	39,690,349	42,655,554
	Scrap lead	127,733	77,422
	Other	....	....
Iron and steel	Lead	6,050,628	4,281,005
Ammunition	Pig lead	10,467,968	6,883,360
Total Accounted for		**128,235,382**	**130,525,354**

ZINC

Table 108.—Production(x) of Zinc From All Types of Canadian Ores, 1929-1943

Year	Pounds	$	Price per pound (Canadian funds)
			c.
1929	197,267,087	10,626,778	5·39
1930	267,643,505	9,635,166	3·60
1931	237,245,451	6,059,249	2·55
1932	172,283,558	4,144,454	2·41
1933	199,131,984	6,393,132	3·21
1934	298,579,683	9,087,571	3·04
1935	320,649,859	9,936,908	3·10
1936	333,182,736	11,045,007	3·31
1937	370,337,589	18,153,949	4·90
1938	381,506,588	11,723,698	3·07
1939	394,533,860	12,108,244	3·07
1940	424,028,862	14,463,624	3·411
1941	512,381,636	17,477,337	3·411
1942	580,257,373	19,792,579	3·411
1943(†)	610,754,354	24,430,174	4·00

(x) Includes refined zinc and zinc in ores, etc., exported.
(†) Year of maximum Canadian zinc production.

The total value of Canadian zinc production since the first recording of Canadian zinc statistics in 1898, and inclusive of 1943, totalled $256,848,376.

Table 109.—Production in Canada, Imports and Exports of Zinc, 1942 and 1943

	1942		1943	
	Pounds	Value $	Pounds	Value $
Production—				
Quebec	73,940,811	2,522,121	128,169,810	5,126,792
Ontario	4,710,394	160,671	3,299,812	131,993
Manitoba	29,908,179	1,020,168	46,783,873	1,871,355
Saskatchewan	84,461,520	2,880,983	96,350,404	3,854,016
British Columbia	387,236,469	13,208,636	336,150,455	13,446,018
Total	**580,257,373**	**19,792,579**	**610,754,354**	**24,430,174**
IMPORTS—				
Zinc dust	7,500	920	7,500	1,014
Zinc in blocks, pigs, bars and rods, and zinc plates, n.o.p.	171,400	20,923	138,400	26,257
Zinc in sheets and strips, and zinc plates for marine boilers	833,300	105,903	987,300	141,997
Zinc spelter	11,658,200	1,043,041	27,076,400	2,429,945
Zinc slugs for dry batteries	.....	109,386	.....	64,385
Zinc white (zinc oxide)	2,072,403	156,484	2,218,564	174,075
Zinc sulphate	1,364,999	45,554	708,869	31,743
Zinc, chloride of	342,933	18,762	189,305	11,745
Zinc, manufactures of, n.o.p.	.....	361,708	.....	377,486
Lithopone	19,996,324	948,244	17,754,879	857,507
Total	.....	**2,810,925**	.....	**4,116,154**
Exports—				
Zinc, contained in ore	152,227,700	4,070,803	222,550,300	6,097,117
Zinc, scrap, dross and ashes	7,086,900	202,609	4,291,000	159,218
Zinc, spelter	304,317,100	10,783,049	258,629,700	10,260,030
Total	**463,631,700**	**15,056,461**	**485,471,000**	**16,516,365**

Canadian zinc refineries have an estimated annual capacity of 232,875 tons of cathode zinc.

Table 110.—Refined New Zinc Produced in Canada, 1933-1943

Year	Price (x) per pound	Short tons	Year	Price (x) per pound	Short tons
	cents			cents	
1933	3·21	91,946	1939	3·07	175,641
1934	3·04	134,917	1940	3·411	185,722
1935	3·10	149,523	1941	3·411	213,608
1936	3·31	151,103	1942	3·411	215,795
1937	4·90	158,542	1943	4·00	206,510
1938	3·07	171,932			

(x) In Canadian funds.

Table 111.—Canadian Zinc Production (Recoverable) According to Nature of Ores, by Provinces, 1938-1943

Year and Province	Recovered from copper-gold-silver ores	Recovered from silver-lead-zinc and other ores	Total
	Pounds	Pounds	Pounds
1938—Quebec	5,315,852		5,315,852
Manitoba	46,864,575		46,864,575
Saskatchewan	29,962,597		29,962,597
British Columbia		299,363,564	299,363,564
Total Canada	82,143,024	299,363,564	381,506,588
1939—Nova Scotia		9,152,856	9,152,856
Quebec	28,758,759		28,758,759
Manitoba	40,302,747		40,302,747
Saskatchewan	37,278,001		37,278,001
British Columbia		279,041,497	279,041,497
Total Canada	106,339,507	288,194,353	394,533,860
1940—Nova Scotia		4,755,502	4,755,502
Quebec	27,696,721		27,696,721
Manitoba	35,103,373		35,103,373
Saskatchewan	44,452,595		44,452,595
British Columbia		312,020,671	312,020,671
Total Canada	107,252,689	316,776,173	424,028,862
1941—Quebec	46,389,581		46,389,581
Ontario		1,100,949	1,100,949
Manitoba	34,879,239		34,879,239
Saskatchewan	62,142,288		62,142,288
British Columbia		367,869,579	367,869,579
Total Canada	143,411,108	368,970,528	512,381,636
1942—Quebec	67,064,536	6,876,275	73,940,811
Ontario		4,710,394	4,710,394
Manitoba	29,908,179		29,908,179
Saskatchewan	84,461,520		84,461,520
British Columbia		387,236,469	387,236,469
Total Canada	181,434,235	398,823,138	580,257,373
1943—Quebec	80,401,837	47,767,973	128,169,810
Ontario		3,299,812	3,299,812
Manitoba	46,783,873		46,783,873
Saskatchewan	96,350,404		96,350,404
British Columbia	461,776	335,688,679	336,150,455
Total Canada	223,997,890	386,756,464	610,754,354

Table 112.—Available Statistics on the Consumption of Zinc in Specified Canadian Manufacturing Industries, 1942 and 1943

Industry	Items Used	1942	1943
		Pounds	Pounds
Brass and copper products	Zinc ingots and slabs	76,990,715	84,315,181
	Zinc scrap	525,767	119,050
White metal alloys	Zinc spelter	26,581,960	17,795,100
	Zinc scrap	1,746,106	3,223,818
Electrical apparatus	Zinc ingots and bars	2,826,831	3,227,980
	Zinc sheets	1,477,013	1,627,460
Acids, alkalies and salts	Zinc metal	16,033,434	20,689,824
Iron and steel	Zinc	45,378,520	35,855,555
Miscellaneous chemicals	Zinc sheets and spelter	342,000	97,578
Grand Total		171,902,346	166,951,546

In addition, there are relatively large quantities of zinc oxide and lithopone used in the manufacture of paint.

CHAPTER FOUR

THE NICKEL-COPPER INDUSTRY IN CANADA

1. Definition of the Industry.
2. General Review.
3. Commodity statistics, including tables showing production, prices, etc., for nickel, copper and metals of the platinum group.

1. Definition of the Industry

The nickel-copper industry in Canada includes the mining, smelting and, to a certain extent, the refining of the nickel-copper ores of the Sudbury district in the province of Ontario. Smelting and copper refining operations are carried on in close proximity to the mines; nickel refining is conducted at Port Colborne, Ontario. Matte is exported for treatment in plants at Huntington, West Virginia, U.S.A., and Clydach, Wales; during recent years matte was also exported to Norway, however, exports to that country ceased after its invasion by Germany in 1940.

Mines in the copper-gold-silver group also contribute largely to the total Dominion copper output; ores from these properties contain, in the aggregate, about 11 per cent of the annual gold production. The activities of the copper-gold mines are reviewed in the chapter on the gold mining industry. Production statistics on nickel, copper and the metals of the platinum group are given in this chapter.

General Review

In addition to production of nickel, copper and the platinum metals, there is an important recovery from these ores of the associated metals—silver, gold, selenium and tellurium; sulphur for the manufacture of sulphuric acid is also salvaged in the gaseous state from waste smelter gases. The total gross value of the various primary products of this Canadian industry, considered as a whole, was estimated at $128,583,784 in 1943 compared with $128,340,860 in 1942.

Two companies operated both mines and metallurgical plants in the Sudbury area in 1943. The International Nickel Co. of Canada, Limited, conducts smelting operations at Copper Cliff and Coniston, Ontario, while the Falconbridge Nickel Mines, Ltd., smelt their ores at the Falconbridge mine located a few miles east of the town of Sudbury. This last named company treated their matte in a refinery located at Kristiansand, Norway, until the invasion of that country by Germany in 1940. Matte produced by the Falconbridge Nickel Mines Ltd. is now treated in the Canadian plants of the International Nickel Co. of Canada, Limited.

The relatively small amount of nickel oxide sometimes produced at Deloro, Ontario, is recovered from silver-cobalt-nickel-arsenic ores mined in Northern Ontario. Smelter matte made by the International Nickel Co. of Canada, Limited is treated in plants located at Clydach, Wales; Huntington, West Virginia; and at Port Colborne and Copper Cliff, Ontario. Converter copper made by the International Nickel Co. is electrolytically refined at Copper Cliff, and refined nickel is produced by the company at Port Colborne. In 1943 the International Nickel Company of Canada Limited shipped ore from the Garson, Creighton, Levack, Frood and Stobie mines, and in addition completed a very considerable amount of development work at the Murray mine located in McKim township.

In Foy township the property of Nickel Offsets Limited was operated throughout the year and crude-copper ore was shipped to the Copper Cliff smelter.

Mining operations were conducted by the Ontario Nickel Mines Limited at Moose Lake from January 1 to July 7, and trial shipments of ore were made by the company to plants of the International Nickel Company. In Norman township, the operations of the Dominion Nickel Mining Corporation were limited to prospecting and diamond drilling. At Porquis Junction, in the Porcupine district, the Harlin Nickel Mines Limited operated the old Alexo nickel mine from June 1 to the close of the year; a considerable tonnage of crude nickel-copper ore was mined and shipped to the Copper Cliff smelter. The industry reported that $27,165 were spent on prospecting in 1943.

In 1943 the industry, as a whole, employed $167,097,138 in capital, provided employment for 14,650 persons, and distributed $30,195,972 in salaries and wages. Fuel and electricity consumed totalled $12,649,118 and explosives, chemicals, drill steel and other process supplies used amounted to $17,872,418. Female wage-earners increased from an average of 96 in 1942 to 641 in 1943. Nickel output, in all forms, reached an all-time high record of 288,018,615 pounds in 1943, whereas copper production from nickel-copper ores at 276 032,919 pounds represents a 10·3 per cent decrease from the corresponding output in 1942.

Table 113.—Principal Statistics of the Nickel-Copper Mining, Smelting and Refining Industry in Canada, 1941-1943 (x)

—	1941	1942	1943
Number of firms	(a) 3	(a) 4	(a) 6
Number of mines	6	8	10
Number of smelters	3	3	3
Number of copper refineries	1	1	1
Number of nickel refineries	1	1	1
Capital employed	$ 140,844,747	159,777,493	167,097,138
Number of employees—On salary	963	1,098	1,230
On wages	11,796	12,680	13,420
Total	12,759	13,778	14,650
Salaries and wages—Salaries	$ 2,831,984	3,184,248	3,414,557
Wages	$ 22,438,513	25,171,893	26,781,415
Total	$ 25,270,497	28,356,141	30,195,972
Fuel and purchased electricity used (2)	$ 10,213,183	11,188,825	12,649,118
Process supplies used (1)	$ 13,991,741	15,911,153	17,872,418
Cost of freight and treatment (3)	$	....	130,321
Estimated gross value of matte exported and Canadian refinery products (b)	$ 117,287,713	128,340,860	128,583,784
Value of production less items (1) (2) and (3)	$ 93,082,789	101,240,882	97,931,927

(x) Does not include data for mines, power plants, etc., operated by subsidiary companies.
(a) All in Ontario.
(b) Includes value of customs material.

Table 114.—Output From Ontario Nickel-Copper Mines and Smelters, 1941-1943 (Short tons)

—	1941	1942	1943
Ore shipped from mines	9,969,843	12,072,485	12,920,917
Ore treated (x)	9,974,409	12,078,722	12,912,332
Converter copper produced in Ontario (a)	158,788	146,362	130,905
Nickel produced in Ontario (b)	97,033	102,478	106,069
Matte exported (c)	67,904	61,226	56,833
Nickel content of matte exported	43,955	40,112	37,911
Copper content of matte exported (a)	7,735	7,582	7,532

(x) Represents the tonnage of crude ore smelted together with the tonnage of ore milled.
(a) Copper content, including copper content of Ontario ores purchased.
(b) Includes nickel content of salts and oxides produced from nickel-copper ores only.
(c) Less a relatively small tonnage of matte returned to Canada for retreatment.

Table 115.—Capital Employed in the Nickel-Copper Mining, Smelting and Nickel Refining Industry in Canada, 1943

Capital employed as represented by:	$
Present cash value of the land (excluding minerals) Present value of buildings, fixtures, machinery, tools and other equipment	132,119,251
Inventory value of materials on hand, ore in process, fuel and miscellaneous supplies on hand	21,160,401
Inventory value of finished products on hand	4,950,210
Operating capital (cash, bills and accounts receivable, prepaid expenses, etc.)	8,867,276
Total	**167,097,138**

Table 116.—Dividends Paid by Specified Nickel-Copper Mining Companies

	Dividends 1943	Total Dividends Paid to end 1943
	$ (x)	$ (x)
International Nickel Co. of Canada Ltd., only (†)	34,512,046	332,022,035
Falconbridge Nickel Mines Ltd.	500,637	8,636,597

(x) Canadian.
(†) Letters patent granted July 25, 1916.

Table 117.—Employees, Salaries and Wages, in the Nickel-Copper Mining, Smelting and Refining Industry in Canada, 1943

—	On salary		Mine and smelter			Mill		Total	Salaries and wages
			Surface		Under-ground				
	Male	Female	Male	Female	Male	Male	Female		$
Salaries employees—									
Mine and mill	401	44	....	....	....	....	....	445	1,273,291
Smelters and refineries	609	176	....	....	....	....	....	785	2,141,266
Total	**1,010**	**220**	....	....	....	....	....	**1,230**	**3,414,557**
Wage-earners—									
Mine and mill	....	....	1,365	67	5,115	197	81	**6,825**	14,590,355
Smelters and refineries	....	....	6,102	493	....	....	....	**6,595**	12,191,060
Total	....	....	**7,467**	**560**	**5,115**	**197**	**81**	**13,420**	**26,781,415**
Grand Total	**1,010**	**220**	**7,467**	**560**	**5,115**	**197**	**81**	**14,650**	**30,195,972**

Table 118.—Number of Wage-Earners Employed in the Nickel-Copper Mining, Smelting and Refining Industry in Canada, by Months, 1942 and 1943

Month	1942		1943	
	Male	Female	Male	Female
January	12,112	....	13,381	511
February	12,199	....	13,379	527
March	12,014	....	13,210	599
April	12,143	....	12,844	628
May	12,560	....	12,690	648
June	12,966	....	12,844	668
July	12,870	....	12,648	673
August	12,287	....	12,510	688
September	12,234	101	12,167	708
October	12,961	262	12,159	695
November	13,216	379	12,521	670
December	13,444	411	12,978	676

Table 119.—Wage-Earners, by Months, in Nickel-Copper Mines Only, 1943 (x)

Month	Mine			Mill	
	Surface		Under ground	Male	Female
	Male	Female			
January	1,356	66	5,635	227	81
February	1,372	78	5,578	237	66
March	1,346	66	5,465	209	74
April	1,378	71	5,185	204	74
May	1,414	67	5,034	220	88
June	1,426	62	5,025	196	91
July	1,383	63	5,045	186	93
August	1,358	64	4,951	172	92
September	1,325	66	4,769	174	82
October	1,346	65	4,671	176	80
November	1,359	64	4,797	182	76
December	1,318	69	5,208	179	73

(x) Included in Tables 4 and 5.

Table 120.—Wage-Earners, by Months, in Nickel-Copper Smelters and Refineries Only, 1943 (x)

Month	Male	Female	Month	Male	Female
January	6,163	364	July	6,034	517
February	6,192	383	August	6,029	532
March	6,190	459	September	5,899	560
April	6,077	483	October	5,960	550
May	6,022	493	November	6,183	530
June	6,197	515	December	6,273	534

(x) Included in Tables 4 and 5.

Table 121.—Specified Taxes Paid by the Nickel-Copper Mining, Smelting and Refining Industry, 1943 (x)

	$
Dominion income tax, including tax on non-operating revenue	5,845,697
Dominion excess profits tax	7,222,187
Total Provincial taxes	1,179,576
Total Municipal taxes	293,880
Grand Total Taxes Paid	**14,541,340**

(x) Includes data relating only to companies who conducted both mining and smelting operations.

Table 122.—Other Expenditures (x), 1942 and 1943

	1942	1943
	$	$
Workmen's compensation	254,196	296,284
Silicosis assessment	56,204	40,660
Unemployment insurance	154,749	175,389
Aggregate cost of all supplies purchased	25,463,212	28,445,891
Aggregate cost of plant and equipment purchased	11,925,016	5,018,845

(x) Includes data relating only to companies who conduct both mining and smelting operations.

NICKEL

Production figures include nickel in matte exported from the Canadian smelters valued at 18 cents per pound; refined and electrolytic nickel produced in Canada, valued at the average price received for sales of nickel metal from the refinery during the year, and the nickel equivalent in oxides or salts produced, valued in the aggregate at the price obtained from the sales of oxides or salts. Distribution of nickel, now restricted to essential war uses, remains entirely under the direction of governmental agencies.

Table 123.—Production of Nickel (x), From Canadian Ores, 1926-1943

Year	Pounds	Value	Year	Pounds	Value
		$			$
1926	65,714,294	14,374,163	1935	138,516,240	35,345,103
1927	66,798,717	15,262,171	1936	169,739,393	43,876,525
1928	96,755,578	22,318,907	1937	224,905,046	59,507,176
1929	110,275,912	27,115,461	1938	210,572,738	53,914,494
1930	103,768,957	24,455,133	1939	226,105,865	50,920,305
1931	65,666,320	15,267,453	1940	245,557,871	59,822,591
1932	30,327,968	7,179,862	1941	282,258,235	68,656,795
1933	83,264,658	20,130,480	1942	285,211,803	69,998,427
1934	128,687,340	32,139,425	1943	288,018,615	71,675,322

(x) Usually includes a relatively small quantity of nickel recovered annually from silver-cobalt ores; Canadian nickel production comes entirely from Ontario ores with the exception of 1937 when a relatively small tonnage of nickel ore was exported from a property in British Columbia.

Table 124.—Production in Canada, Imports and Exports of Nickel, 1942 and 1943

	1942		1943	
	Quantity	Value	Quantity	Value
	lb.	$	lb.	$
PRODUCTION—				
Nickel in matte exported; Refined and electrolytic nickel produced; Nickel in oxides and salts sold or produced	285,211,803	69,998,427	288,018,615	71,675,322
IMPORTS—				
Nickel and nickel silver in ingots	67,372	19,364	60,423	17,620
Nickel rods for wire (90% nickel)	3,919	2,762	723	510
Nickel in bars and rods, strips and sheets	881,316	408,624	976,516	529,517
Nickel silver bars, rods and strips	9,446	5,259	4,612	2,594
Nickel chromium in bars	35,248	36,898	47,785	44,966
Nickel, manufactures of, not plated	.....	78,095	.....	45,846
Nickel-plated household hollow-ware	.....	1,351	.....	1,906
Nickel household hollow-ware	.....	11	.....	44
Nickel-plated ware, n.o.p.	.....	1,218,741	.....	524,455
Total Nickel and Its Products	.....	**1,771,105**	.....	**1,167,458**
Exports—Total Metal in All Forms	**277,589,100**	**68,407,207**	**271,094,400**	**68,346,346**

COPPER

The peak Canadian production of copper for all time was in 1940, when the output stood at 643,316,713 pounds. Since that year, all provinces have shown a reduction in output with the exception of Saskatchewan, which has shown a steady rise. The Saskatchewan-Manitoba production is unique in mining history in that the ore body lies across the boundary of the two provinces, and while the output for Manitoba is decreasing, that for Saskatchewan is increasing.

The most important Canadian copper-bearing ore deposits are those of the Noranda and Waite-Amulet, in Quebec, the nickel-copper mines of Ontario, the Sherritt-Gordon in Manitoba, the Flin Flon on the Manitoba-Saskatchewan boundary, and the Britannia and Granby in British Columbia. The Mandy mine, a producer in Manitoba during the first world war, was re-opened and made a considerable contribution to the output in that province during 1943.

Canada has two copper refineries, one at Copper Cliff, Ontario, owned by the International Nickel Company, and one at Montreal East, owned by the Canadian Copper Refiners Ltd. At the beginning of the first world war Canada had no copper refinery, whereas now she possesses excellent copper refinery facilities and large well-developed copper orebodies and smelters.

Curtailment in brass and copper was instituted by the Metals Controller through the surveillance of export licenses and through informal understanding with principal producers and fabricators. More formal methods were adopted so that consumption of brass and copper for non-essential purposes would be reduced. Control was effected through primary fabricators.

Perhaps the most interesting development during the year was the uncovering, by the Aldermac Copper Corporation, of a complex ore body containing gold, silver, copper, lead and zinc, which was not exposed at the surface but which had been discovered by a combination of geological and geophysical methods in one of the oldest mining sections of Canada, on the south side of the St. Lawrence River in Quebec. This discovery points to the possibilities in those areas of Canada where favourable geological conditions are known but where prospecting is difficult because of the overburden.

Table 125.—Production of Copper From Ontario Ores Only, 1926-1943

Year	Pounds	Value	Year	Pounds	Value
		$			$
1926	41,312,867	4,828,964	1935	252,027,928	19,295,965
1927	45,341,295	4,946,533	1936	287,914,078	26,898,920
1928	66,607,510	8,770,149	1937	322,039,208	41,716,364
1929	88,879,853	14,622,572	1938	309,030,106	30,405,500
1930	127,718,871	15,187,259	1939	328,429,665	32,637,305
1931	112,882,625	9,096,463	1940	347,931,013	34,742,229
1932	77,055,413	4,407,928	1941	333,829,767	33,102,644
1933	145,504,720	10,118,847	1942	308,282,414	30,625,404
1934	205,059,539	14,822,704	1943	(x) 277,840,560	32,232,027

NOTE.—Almost entirely from nickel ores. Total production of copper in Canada in 1943 from all ores and all provinces totalled 575,190,132 pounds valued at $67,170,601.
(x) Includes 276,032,919 pounds recovered from nickel-copper ores only.

Table 126.—Total Production of New Copper in Canada, by Provinces and Method of Computation, 1942 and 1943

—	1942		1943	
	Pounds	Value	Pounds	Value
		$		$
BY PROVINCES—				
Quebec	140,911,876	14,212,372	131,163,776	15,411,744
Ontario	308,282,414	30,625,404	277,840,560	32,232,027
Manitoba	47,595,586	4,800,491	38,014,872	4,466,747
Saskatchewan	56,781,466	5,726,979	85,948,719	10,098,974
British Columbia	50,015,521	5,044,565	42,222,205	4,961,109
Northwest Territories	74,963	7,561	.....	.....
Total	**603,661,826**	**60,417,372**	**575,190,132**	**67,170,601**
BY SOURCES (†)				
In blister and anode copper produced	538,020,995	54,264,798	513,106,247	60,289,984
In ores, concentrates and copper matte exported (x)	50,476,883	5,091,098	47,020,656	5,524,926
In nickel-copper matte exported	15,163,948	1,061,476	15,063,229	1,355,691
Total	**603,661,826**	**60,417,372**	**575,190,132**	**67,170,601**

(†) Where computed.
(x) Contains a relatively small quantity of copper contained in gold and silver ores shipped to Canadian smelters.

Table 127.—Production (x) of Refined Copper in Canada for Years Specified

Year	Tons	Year	Tons
1915	.....	1937	215,080
1916 (†)	483	1938	227,240
1917	3,901	1939	231,084
1918	3,809	1940	261,878
1919	3,467	1941	278,224
1935	173,290	1942	268,447
1936	191,595	1943	251,495

(x) From all sources.
(†) First electrolytic copper produced commercially in Canada.

Table 128.—Available Statistics on the Consumption of Copper in Specified Canadian Industries, 1940-1943

Industry	1940	1941	1942	1943
Brass and copper products (x)				
Ingots, wire bars, slabs, etc. ....lb.	208,302,644	176,079,478	335,793,693	339,895,762
Scrap ....lb.	5,527,865	12,199,005	12,617,777	10,253,098
Pipe and tubing ....lb.	115,778	188,074	191,106	183,822
Plates and sheets ....lb.	570,036	971,838	846,308	804,125
Wire ....lb.	351,269	384,929	348,000	213,906
Other ....lb.	151,187	Not available	.....	.....
White metal alloys—				
Scrap, all kinds ....lb.	4,098,077	10,200,476	9,669,323	9,250,095
Copper—ingots and slabs ....lb.	290,498	590,178	4,470,119	5,297,447

Table 128.—Available Statistics on the Consumption of Copper in Specified Canadian Industries, 1940-1943—Concluded

Industry	1940	1941	1942	1943
Electrical apparatus and supplies—				
Castings.....lb.	136,979	480,687	148,237	107,226
Ingots, slabs, wire bars, etc.....lb.	1,675,341	2,109,395	2,036,221	1,280,078
Rods.....lb.	50,755,124	61,700,539	62,982,899	67,704,908
Scrap.....lb.	93,356	91,333	149,731	55,598
Tubing and pipe.....lb.	452,911	641,402	542,064	339,100
Sheets and plates.....lb.	575,871	846,949	883,936	910,257
Wire, bare.....lb.	6,606,363	8,607,762	7,862,294	6,826,654
Wire, enamelled.....$	703,765	902,913	711,706	1,014,440
Wire, other insulated.....$	1,232,526	1,577,960	1,551,529	1,317,370
Iron and steel and their products—				
Copper sheets, bars, etc.....lb.	10,841,787	17,400,122	18,629,920	15,804,341

(x) A relatively large part of the copper included under this industry is rolled into wire rods, which are sold to manufacturers of electrical cable, duplication to this extent results from the inclusion of these rods in the Electrical Apparatus Industry.

METALS OF THE PLATINUM GROUP

Industrial uses of the platinum metals continued to expand in 1943. Palladium is second in consumption and iridium third. Osmium, rhodium, and ruthenium are as yet consumed in relatively small quantities.

The market situation in 1943 is explained by Charles Engelhard, President of Baker and Company, Incorporated, in the following, which is abstracted from his annual review:

"Platinum was used during the last year almost exclusively in connection with the war effort. Details of its applications in the war program are not available for publication at this time.

"Palladium experienced an active demand, principally for jewelry, dental alloys, and electrical contact. Restriction on use of platinum in non-essential uses resulted in a greater demand for palladium in the production of white metal jewelry. The trend in jewelry continued to favour the white metals.

"Previously overshadowed by iridium as a hardener of other platinum metals, ruthenium came into its own in that field during the last year With iridium in short supply, the properties of ruthenium were investigated by the industry, and this member of the platinum group now fills an important place as a precious-metal hardener.

"The future for platinum metals is encouraging because of growing interest in this group by science and industry. Increased knowledge of the properties of these metals points to their greater usefulness in the chemical and allied industries in the postwar era. Expanded production of fiberglass, rayon, and electronic equipment was made possible during the last year by platinum.

"The future of palladium is viewed as bright, particularly in jewelry to supplant white gold, in dentistry to replace gold, and in the chemical industry for catalytic purposes. Current supply of palladium is ample. Palladium is quoted at $24 an ounce troy, against $35 an ounce for gold."

Because of its importance in the war effort, the use of rhodium for electroplating jewellery has been prohibited by the United States War Production Board. This precious metal is needed to coat reflectors in anti-aircraft searchlights and as an alloy of platinum to oxidize ammonia for the production of nitric acid.

With the exception of iridium, prices for the platinum group of metals remained virtually unchanged during 1943. The average price in New York (as given by M. & M. Markets of Eng. and Min. Journal) of refined platinum remained at $36.000 per ounce throughout 1941 and 1942. From February, 1943, to the end of the year, the price of platinum was $35.00 per ounce. Palladium at $24.00 per ounce has remained stable in price since 1935. Rhodium continued to be quoted at $125 per ounce, the same quotation prevailing since 1937. Ruthenium remained at $35.00 throughout 1943. Osmium was quoted at $50.00 throughout the year. Iridium was quoted at $275.00 per ounce early in 1941, then dropped to $175.00 in February and remained at that figure until the end of May, 1942, when the price was lowered to $165.00 at which price it remained for the remainder of the year and throughout 1943.

The world production of platinum and allied metals is estimated to exceed 600,000 ounces. Canada has been the leading producer of platinum since 1934 when it displaced Russia; the other principal producers by order of importance being Russia, Columbia, and South Africa. Canada also leads as a producer of palladium, as a result of the great increase in recent years in the Canadian output of nickel. Owing to the disorganized state of the world markets and government restrictions on publication of statistics, accurate estimates on world production and consumption of platinum and allied metals for 1943 are not possible. The world consumption of platinum metals in 1939 was about equal to production (about 540,000 ozs.), a notable gain over the 1935 figure of consumption of 275,000 ounces.

Table 129.—Production of Metals of the Platinum Group from Ontario Copper-Nickel Ores, 1927-1943

Year	Platinum (x)		Palladium (†)	
	Fine ounces	$	Fine ounces	$
1927	11,217	716,653	11,545	554,190
1928	10,483	706,090	13,607	627,833
1929	12,491	845,057	17,318	309,289
1930	34,007	1,542,490	34,092	898,867
1931	44,725	1,595,117	46,918	1,217,717
1932	27,284	1,097,021	37,613	901,890
1933	24,746	856,190	31,009	645,043
1934	116,177	4,488,712	83,932	1,699,228
1935	105,335	3,444,455	84,772	1,962,937
1936	131,551	5,319,922	103,671	2,483,075
1937	139,355	6,751,750	119,829	3,179,782
1938	161,310	5,196,279	130,893	3,677,342
1939	148,877	5,221,712	135,402	4,199,622
1940	108,464	4,239,424	91,522	3,520,746
1941	124,257	4,747,860	97,432	3,396,304
1942	285,188	10,897,033	222,573	8,279,221
1943	219,706	8,458,681	126,004	5,233,068

(x) In addition, a relatively small quantity of alluvial platinum is recovered annually in British Columbia; such recovery in 1941 totalled 60 ounces, 1942, 40 ounces and 1943, 7 ounces.
(†) Includes other platinum metals except platinum and represents the entire Canadian production.

Table 130.—Platinum Consumed in Canadian Jewellery and Silverware Industry, 1933-1943

Year	Value	Year	Value
	$		$
1933	35,714	1938	85,503
1934	38,307	1939	160,688
1935	45,627	1940	148,748
1936	101,129	1941	208,318
1937	112,295	1942	361,006

Table 131.—Production of Selenium and Tellurium from Nickel-Copper Ores, 1939-1943

Year	Selenium		Tellurium	
	Pounds	Value	Pounds	Value
		$		$
1939	126,930	224,539	....	....
1940	136,350	260,429	3,491	5,607
1941	142,498	272,171	11,453	18,394
1942	76,000	145,920	9,500	15,200
1943	82,000	143,500	8,600	15,050

Table 132.—Production of Gold and Silver From Nickel-Copper Ores, 1939-1943

Year	Gold		Silver	
	Fine oz.	Value	Fine oz.	Value (x)
		$		$
1939	77,094	2,786,177	2,496,632	1,010,886
1940	90,863	3,498,225	2,803,052	1,072,167
1941	77,960	3,001,460	2,633,815	1,007,698
1942	70,861	2,728,148	2,238,177	943,839
1943	55,776	2,147,376	1,648,888	746,122

(x) Estimated.

CHAPTER FIVE

MISCELLANEOUS METAL MINING INDUSTRIES IN CANADA

Including General Statistics Relating to the Industries in this Group and Commodity Statistics Showing Production by Provinces and Prices on Aluminum, Antimony, Barium, Beryllium, Cadmium, Chromite, Iron Ore, Pig Iron and Ferro-Alloys, Steel and Rolled Products, Lithium, Magnesium, Manganese, Mercury, Molybdenum, Radium, Selenium, Tantalum, Tellurium, Tin, Titanium, Tungsten, Indium, Vanadium and Zirconium.

1. General Review

The mining of certain metal-bearing ores, other than those commonly classified as gold, silver, copper, nickel, cobalt, lead and zinc, have been grouped, for statistical purposes, as a single industry, by the Dominion Bureau of Statistics. Their production in some instances is confined to a relatively few operators and the annual extraction of certain types often fluctuates in an erratic manner according to demand and supply. Included in this report, with the finally-revised statistics relating to the Canadian production of these ores or metals, are notes and statistical data pertaining to various rare or semi-rare metals or metalliferous ores produced in other countries. Metals and metal-bearing ores produced in Canada during 1943 and classified as miscellaneous include antimony, bismuth, cadmium, chromite, iron ore, magnesium, manganese ore, mercury, molybdenite, pitchblende, selenium, tellurium, titanium ore, tin and tungsten concentrates. In addition to particulars relating to these metals or minerals, the bulletin contains notes of a summary nature on aluminum, beryllium, lithium, vanadium and a few of the rarer metals.

It is to be noted that the majority of the metals listed above as Canadian products and including bismuth, cadmium, selenium and tellurium, represent by-products recovered in the refining of lead, zinc or copper and, for this reason, such statistics as relate to their production in Canada are included with those of either the silver-lead-zinc mining industry, the copper-gold-silver mining industry, or the non-ferrous smelting and refining industry.

The number of firms reported as active in the miscellaneous metals mining industry during 1943 totalled 54; capital employed amounted to $15,603,307 and $4,295,153 were distributed in salaries and wages to 1,964 employees. The cost of fuels, porcess supplies, freight and treatment, etc., consumed aggregated $2,540,873, and the gross value of production totalled $9,062,368; the corresponding net value of same was estimated at $6,521,495.

ALUMINUM

The reduction of aluminum ores and the production of primary aluminum metal 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 works at Arvida, Shawinigan Falls, La Tuque, Isle Maligne and Beauharnois. These were all in continuous production throughout 1943 with the exception of Isle Maligne where metal output commenced in August. Secondary fabricating plants are also operated by the company at Shawinigan Falls in Quebec and at Toronto and Kingston in Ontario. No aluminum ores are mined in the Dominion and Canadian production of aluminum represents the recovery of the metal from foreign ores. During recent years imports of bauxite (aluminum ore) into Canada have come largely from British and Dutch Guiana with lesser quantities from the United States. At Arvida, Quebec, the bauxite is treated by a standard chemical process to remove impurities prior to its reduction to the metal. Cryolite, necessary in the production of aluminum, is largely imported from Greenland; synthetic cryolite is also used in making aluminum. A very large amount of electrical energy is utilized in the production of new aluminum metal from bauxite concentrates and the extensive expansion in the development of hydro power resources recently completed in the Saguenay district of Quebec has provided the aluminum industry with a greatly increased supply of electrical power.

The principal bauxite producing countries are France, Hungary, United States, Yugoslavia, Italy, British Guiana, Dutch Guiana and Russia. Complete data relating to aluminum and bauxite production by countries have not been available since 1938. Canadian production of new aluminum during 1943 totalled 991,499,296 pounds compared with 681,192,951 pounds in 1942 and 93,812,965 pounds in 1937. The output during 1943 was the largest ever attained by the Canadian aluminum industry.

According to the United States Bureau of Mines, the production of aluminum in the United States during 1943 totalled 920,179 short tons, exceeding the previous peak reached in 1942 by nearly 77 per cent; apparent United States consumption of primary aluminum in 1943 totalled an estimated 959,600 tons compared with 302,788 tons in 1941. Of the primary and secondary aluminum consumed in the form of fabricated products, about 70 per cent went into aircraft construction in airframes, landing gear, engines, propellers and fittings; the bulk of the remainder was consumed in ship construction, tank and truck engines, ordnance and other military uses, while only a minimum of essential civilian needs were met.

The Mining Journal, London, estimates that at the end of 1943 existing world capacity for production of aluminum, which was at last sufficient to meet all consumption needs, was probably not far short of 2 million tons, and total world production in 1943 can hardly have been less than 1¾ million tons.

Aluminum prices, New York, January, 1944, were: per pound delivered, commercial and mill ingot, 99 per cent, 15 cents; in pigs, 14 cents. The London home market, ingot £110 per long ton (nominal).

Data relating to employment, etc., in the Canadian aluminum industry are included with those of the Canadian non-ferrous smelting and refining industry, and are therefore not included with corresponding statistics shown in this report.

Table 133.—Production of Primary Aluminum in Canada, 1934-1943

Year	Pounds	Year	Pounds
1934	34,865,362	1939	165,680,869
1935	46,342,747	1940	218,288,565
1936	59,280,250	1941	427,746,554
1937	93,812,965	1942	681,192,951
1938	142,407,743	1943	991,499,296

Table 134.—Imports of Aluminum and Bauxite Into Canada, 1942 and 1943

Item	1942		1943	
	Cwt.	Value	Cwt.	Value
		$		$
Alumina	1,573	25,041	1,780	31,795
Bauxite ore	26,170,948	11,711,899	60,211,389	21,242,907
Cryolite	507,407	1,573,105	448,521	1,893,762
Aluminum pigs, ingots and blocks	1	58	23	650
Aluminum scrap	80	903	1,548	17,013
Aluminum angles, channels and beams	67	3,281	7,481	355,880
Aluminum bars, rods and wire	27,775	824,507	22,270	533,720
Aluminum leaf	....	3,052	....	3,054
Aluminum pipes and tubes	490	28,286	1,420	129,718
Aluminum plates, sheets and strips	457	25,191	12,578	438,034
Aluminum powder	8·5	214	38·5	2,083
Aluminum wire and cable	5	210	7	285
Aluminum household hollow ware	....	23,602	....	3,551
Aluminum manufactures n.o.p.	....	321,940	....	489,593

Cwt. = 100 pounds.

Table 135.—Exports of Aluminum From Canada, 1942 and 1943

Item	1942		1943	
	Cwt.	Value	Cwt.	Value
		$		$
Aluminum scrap	54	556	2,005	18,305
Aluminum in bars and ingots	6,289,666	112,154,078	7,507,670	124,460,894
Aluminum wire and cable	....	11,785	....	2,082
Aluminum manufactures, n.o.p.	....	5,108,108	....	4,780,904

Cwt. = 100 pounds.

The Engineering and Mining Journal, Metal and Mineral Markets, New York, September 7, 1944 stated: "In announcing cutbacks in production of aluminum on August 30, involving about 30,000,000 pounds of ingot a month, War Production Board (U.S.A.) officials said that scheduled imports from Canada had been reduced sharply for the remainder of 1944 and that delivery of 250,000,000 pounds of Canadian metal under contract had been postponed indefinitely".

Table 136.—Consumption of Aluminum in Specified Canadian Industries, 1942 and 1943

Industry	1942		1943	
	Pounds	Cost at works	Pounds	Cost at works
		$		$
Aluminum products (a)	62,442,663	12,684,015	70,423,825	14,676,377
White metal alloys*	1,357,782	276,709	1,108,762	212,754
Electrical apparatus and supplies	....	944,603	....	1,019,525
Brass and copper products (b)	3,108,889	911,757	....	799,339
Iron and steel products (b) (c)	8,892,268	2,740,947	11,487,493	3,373,018

(a) Largely for the manufacture of cooking utensils, cable, etc.
* In addition in 1942 there were consumed 4,522,083 pounds of scrap valued at $500,596, and in 1943, 5,816,697 pounds at $531,248.
(b) Includes scrap.
(c) Includes industries manufacturing cooking and heating apparatus, sheet metal products, etc.

ANTIMONY

Production of antimony metal in Canada during 1943 totalled 1,114,166 pounds valued at $189,408 compared with 3,041,108 pounds worth $516,988 in 1942. Production in both years, with the exception of 78 pounds contained in crude ore exported from Yukon in 1942, represents antimony electrolytically refined by the Consolidated Mining and Smelting Company of Canada Limited at Trail, British Columbia; the metal is recovered at Trail as a by-product from the flue dust of the company's silver refinery.

Antimony ore in the form of stibnite occurs in various parts of Canada and for a number of years prior to 1917 small amounts of refined antimony and of antimony ore were produced intermittently in the Maritime Provinces. Small shipments of antimony ore have also been made during recent years from the Fort St. James district of northern British Columbia, Nova Scotia, and from the Yukon. In 1942 an antimony deposit at Gates Lake, in the Kenora district of Ontario, was investigated. No crude antimony ores were commercially produced Canada in 1943.

The world production of antimony in 1938 (1939-1942 figures not available), as published by the United States Bureau of Mines, amounted to about 38,000 tons. The production in 1937 was 42,100 tons, the highest figure since the 1914–1918 war years. The decline in output from China has been more than made up by the large increase in production in other countries. World production at present is probably in excess of 50,000 tons a year.

Most of the production of antimony has come from China, although Bolivia and Mexico have been important producers for years. In recent years, there has been a marked increase in output from Bolivia, Mexico, Yugoslavia, Algeria and, to a lesser extent, from several other countries. In 1939 Bolivia produced 29 per cent of the world output of antimony, Mexico, 23 per cent; China, only 20 per cent; and Yugoslavia, 10 per cent. Prior to the war, most of the refined antimony was produced in the United States, Great Britain, France, and Belgium from ores of foreign origin.

Canada's requirements are now supplied mainly from the electrolytic plant at Trail, British Columbia, according to the Bureau of Mines, Ottawa.

Antimony is an important war metal. It is used largely in alloys for storage-battery plates, bearing and babbitt metals, solder, rubber goods, paints and fixtures. The use of antimony in the manufacture of chemicals increased considerably during the past two years. The principal compound is the oxide of antimony, which is employed extensively as a pigment in sanitary enamelware and nitrocellulose enamels.

The New York price of antimony metal (ordinary brand) in 1943 remained fixed at 16 cents a pound throughout the year. The price for Chinese brand, duty paid, remained at 16·5 cents throughout the year. The price of antimony ore, c.i.f. New York in 1943, per unit of antimony contained was; for 50 to 55 per cent Sb., \$2.10 to \$2.20; for 55 to 60 per cent Sb., \$2.15 to \$2.20; and for 60 to 65 cent Sb., \$2.20 to \$2.30.

Talbe 137.—Antimony Produced in Canada, 1937-1943

Year	In Ores Exported		Metal Produced in Canada		Total	
	Pounds	$	Pounds	$	Pounds	$
1937	48,163	7,394			48,163	7,394
1938	24,560	2,200			24,560	2,200
1939	25,405	3,139	1,200,180	148,330	1,225,585	151,469
1940	44,700	3,800	2,549,792	392,668	2,594,492	396,468
1941	15,292	2,141	3,169,785	443,770	3,185,077	445,911
1942	78	13	3,041,030	516,975	3,041,108	516,988
1943			1,114,166	189,408	1,114,166	189,408

Table 138.—Antimony Used in Specified Canadian Industries, 1942 and 1943

Industry	1942		1943	
	Pounds	$	Pounds	$
White metal alloys—Regulus	1,818,370	264,838	1,814,414	269,718
Antimony ore				
Electrical apparatus and supplies	234,545	35,200	251,763	39,455

Table 139.—Imports of Antimony and Specified Antimony-Bearing Products Into Canada, 1942 and 1943

—	1942		1943	
	Pounds	$	Pounds	$
Antimony of rugulus of, not ground, pulverized or otherwise treated	100	21	240,700	38,755
Antimony oxide and titanium oxide (x)	14,642,708	1,423,042	16,889,500	1,533,462
Antimony salts—tartar emetic, etc	31,927	12,331	10,990	6,006
Antimony salts for dyeing				
Type metal in blocks, bars, plates and sheets	10,097	1,524	268	63
Plates, cylinders (engravers)		152,260		144,952
Stereotypes for books (sq. inches)	1,286,933	115,686	1,756,520	131,684
Stereotypes for advertisements (sq. inches)	1,779,661	74,529	1,827,222	78,143
Printing plates for publications		125,234		162,648
Storage batteries and parts		401,945		513,463

(x) Including white pigments containing not less than 14 per cent by weight of titanium.

BARIUM

A report on barium minerals by the Imperial Institute, London, contains the following information:

"A series of lead-calcium-barium alloys known in some cases as Frary metal and others as Ferry metal, are used for bearing purposes. The amount of barium is about 2 per cent and the bulk of the alloy is lead. The alloys are manufactured electrolytically from molten chlorides using a cathode of molten lead, and are used in the same manner as other 'white' metals. Aluminium and barium form a series of alloys which have greater fluidity than pure aluminium. A range of barium-aluminium and barium-magnesium alloys are being produced by an English firm under the trade names 'Baral' and 'Barmag'. The proportion of barium varies up to as much as 50 per cent, but the consumers in the wireless valve trade usually require the 'Baral' alloy to contain 45 to 50 per cent of barium and the 'Barmag' alloy to carry 25 to 30 per cent barium. With nickel, barium forms an alloy (0·2 per cent barium) which is stated to exhibit greater resistance to the action of hot corrosive gases than does pure nickel, and on this account it has been used for the manufacture of sparking plug electrodes.

"The metal can be prepared by heating barium oxide (BaO) and peroxide (BaO_2) to 1350°C. in an electric furnace, with a metal having a high heat of oxidation, aluminium being suitable for this purpose. Barium is an extremely active deoxidizer, combines with many gases and in the radio industry is inserted, in the form of copper-clad wire, into valves (tubes) to remove the last traces of gas."

Barium has been produced in the United States, Germany, France and Great Britain, but not yet commercially in Canada. "Mineral Industry" reported in 1936 that the price of barium has been continuously reduced and it is probably now available at $5.00 per pound or less.

BERYLLIUM

The principal ore of beryllium is the mineral beryl—$Be_3Al_2(SiO_3)6$. There are several known occurrences of this mineral in Canada and shipments of beryl have been made for experimental purposes from deposits in Renfrew county, Ontario, and the Oiseau river area in Manitoba. Beryl usually occurs in pegamtites and is sometimes recovered as a by-product in the mining of the feldspar and mica content of these rocks. No commercial production of beryl has ever been officially reported in Canada.

A report "Beryl in 1943", prepared by the Bureau of Mines, Ottawa, contains the following information:

"In Ontario, the most important occurrence is near Quadville, in Lyndoch township, Renfrew county, and this is probably the richest known Canadian concentration of beryl. The beryl-bearing pegmatite is believed to extend for a considerable distance along the strike, but owing to heavy overburden it is exposed at only two points about two miles apart. The property is owned by Canadian Beryllium Mines and Alloys, Ltd., 901 Royal Bank Building, Toronto, who have recovered a few tons of cobbed crystals, and stockpiled about 200 tons of rock that will require milling to recover the contained beryl. The mine has been inactive since 1940. In 1943, a detailed examination of the main working at the east end of the property was made by officers of the Bureau of Mines, Ottawa, and of the Metals Controller's Office, in an effort to appraise the economic possibilities of the deposit. The examination revealed an average content of 0·188 per cent of beryl in the total rock excavated, with a maximum for the richest quarry sections of 1·24 per cent. The grade of selected clean beryl crystals was 10·41 per cent BeO. Universal Light Metals Company, 28 James Street South, Hamilton, Ontario, has announced plans for the development of ground adjoining the Canadian Beryllium property.

"No figures of world production of beryl are available. The mineral, however is produced on a very small scale, and the estimated output in 1940 was only about 2,500 tons. Because of increased demand and higher prices, production may have risen slightly since then.

"Brazil and Argentina are the present leading sources of beryl, and production in both countries has increased considerably in the past few years.

"The leading users of beryl on the American continent are Beryllium Corporation of Pennsylvania, Temple (Reading), Pennsylvania, and Brush Beryllium Company, 3714 Chester Avenue, Cleveland, Ohio, both of which are engaged in treating the mineral for the production of metal, alloys, and compounds. Beryllium oxide also is produced by Clifton Products Incorporated, Painesville, Ohio; and a plant for the manufacture of oxide and carbonate was being built in 1941 at Harbor City, California, by the Calloy Company.

"Importation of beryl into the United States, and purchase of the mineral, have been restricted to Government agencies, or their authorized representatives. Contracts for sale and export of beryl from Canada for United States Government account may be negotiated through the Metals Controller, Ottawa. All such exports are subject to special export permit. From February until October, beryllium was placed in Group I (supply insufficient for war and essential industrial needs) of the list of critical materials issued by the Conservation Division of the United States War Production Board, but in the latter month it was moved down into Group II, comprising materials in adequate supply for current requirements.

"In the latter part of 1942 the price of beryl was stabilized by the United States Government at $8.33 per unit of contained BeO, equivalent to $83 and $100 per ton for 10 per cent and 12 per cent grades, respectively, this price being for purchases for Government account, f.o.b. New York. In 1943, quotations for Metals Reserve Company account were raised to $120 per ton, United States funds, for clean, cobbed crystals of 10 per cent grade, f.o.b. specified Purchase Depot. A premium or penalty of $12 per ton was provided for each one per cent BeO above or below 10 per cent, the minimum acceptable grade being 8 per cent. These prices were made effective until December 31, 1943.

"The price of beryllium-copper master alloy, containing 4 per cent beryllium, has remained unchanged for some time at $15 per pound of contained Be. The base price of beryllium-copper-cobalt alloys, with from 0·5 to 3·75 per cent Be content, ranged from $0.85 to $2.00 per pound as strip, rod or wire in 1943. Beryllium-iron, beryllium-nickel, and beryllium-aluminium sold at $47.00 per pound of contained Be, in minimum 5-pound lots, and at $50.00 for small quantities. Beryllium metal, 96 per cent pure, was quoted at $47.00 per pound for lump and turnings and $50.00 cast in bars. Calcined beryllium oxide continued firm at $4.00 per pound."

According to "Metal and Mineral Markets", New York, (May 25, 1944), the demand for beryllium-copper continued at a brisk pace, and the problem of obtaining sufficient quantities of beryllium ore was receiving increased attention from the United States War Production Board. To stimulate production further, Metals Reserve Company has instructed its agents to pay up to $14.50 per short ton unit of BeO, equivalent to $145.50 per ton, on acceptable ore containing 10 per cent BeO; the previous purchasing price was $120 per ton. Before the war market quotations varied between $30 and $35 per ton, depending on the grade.

BISMUTH

Production of bismuth in Canada during 1943 totalled 407,597 pounds valued at $562,484 compared with 347,556 pounds worth $479,627 in 1942. Production during recent years usually consisted of the metal recovered from silver-lead ores smelted by the Consolidated Mining and Smelting Company of Canada Limited at Trail, British Columbia, together with the bismuth content of a silver-lead-bismuth bullion produced in the treatment of silver-cobalt ores at Deloro, Ontario. Production in 1943 came entirely from the Trail metallurgical plants. The total output of bismuth in the Dominion to the end of 1943 amounted to 2,352,945 pounds worth $2,909,279.

Statistics of the world production of bismuth are incomplete, but the output is estimated at about 1,500 tons annually. The United States, Peru, Canada, and Mexico, supply about 90 per cent of the world output, their order of importance as producers being as given. The remainder of the output is obtained from Argentina, Australia, Belgium, Bolivia, China, France, Germany, Japan, Spain, and other countries.

The demand for bismuth increased considerably during the war period owing to its greater use in metallugrical and pharmaceutical applications. Bismuth is used mostly in the manufacture of pharmaceutical products. A much larger portion than formerly is now used in the making of so-called fusible or low-melting alloys. Fusible bismuth alloys usually include lead, tin, cadmium, mercury, or antimony. An alloy of bismuth, lead, tin, and antimony has been introduced for use in mounting dies and punches. Alloys containing bismuth are used to a greater extent than formerly in the aircraft, machine tool, munitions, and other industries. Additions of 0·1 to 1·5 per cent bismuth to stainless steel, copper and aluminum alloys improve machinability. There are numerous alloys of bismuth containing from 33 to 56 per cent bismuth.

The price of bismuth in 1943 (London price in Canadian funds) remained at $1.38 a pound. The price at New York remained fixed at $1.25 a pound throughout 1943. The American product is protected by a duty of 7½ per cent ad valorem. For several years the price has been well controlled.

Imports of bismuth salts into Canada during 1943 were appraised at $15,675 compared with $11,758 in 1942; there were no imports of bismuth metal in 1943 and only 5 pounds valued at $11 in 1942. Data relating to the bismuth content of alloys imported are not available.

Table 140.—Production of Bismuth in Canada, 1930-1943

Year	Pounds	$	Year	Pounds	$
1930	12,732	6,366	1937	5,711	5,654
1931	118,207	157,650	1938	9,516	9,754
1932	16,855	7,340	1939	409,449†	466,362
1933	78,303	81,526	1940	58,529	81,004
1934	253,644	301,215	1941	7,511	10,396
1935	13,797	13,245	1942	347,556	479,627
1936	364,165	360,524	1943	407,597	562,484

(†) High record output.

Table 141.—Bismuth Used in the Manufacture of Canadian Medicinal and Pharmaceutical Preparations, 1942 and 1943

Item	1942		1943	
	Pounds	$	Pounds	$
Bismuth metal	24,420	30,534	56,019	70,107
Bismuth salts	18,153	35,793	22,080	43,786

Canadian white metal alloy foundries consumed approximately 25,979 pounds of bismuth metal in 1942 and 55,115 pounds in 1943.

BORON

According to the United States Bureau of Mines, boron alloys are supplied by United States manufacturers, small quantities being used in the non-ferrous metals industries and in steel making. In cast iron, boron opposes graphitization on solidification and exerts an energetic whitening effect, producing a hard strong iron but reducing malleability. Recently boron has been found to be one of the so-called minor elements that stimulate plant growth and inhibit the development of certain plant diseases.

"The Mineral Industry" reported in 1941 that tests demonstrated that the use of boron deoxidizers and the incorporation of 0·002—0·007 per cent boron in 0·4 per cent carbon steel increases the hardenability, ductility and toughness; the boron is best supplied as a complex alloy of B-Mn-Si-Ti, rather than as ferroboron.

Boron carbide, boron carbide shapes and calcium boride are now produced in Canada.

World reserves of boron minerals are abundant, but known sources are confined to a few countries, chiefly the United States, Chile, Argentina, Peru, Italy and Turkey, although Borax also has been reported in Tibet, Persia, India and Ceylon.

Imports of Borax into Canada during 1943, in packages of 25 pounds or over, totalled 9,482,003 pounds valued at $288,867.

CADMIUM

Cadmium production in Canada represents the recovery of the metal as a by-product in the electrolytic refining of zinc. Production up to 1935 came entirely from the treatment of zinc-bearing ores at Trail, British Columbia, by the Consolidated Mining and Smelting Company of Canada, Limited. The commercial production of the metal from the copper-gold-silver-zinc ores of the Flin Flon mine was commenced in Manitoba for the first time in 1936.

The output of new cadmium in the Dominion in 1943 totalled 786,611 pounds valued at $904,602 compared with 1,148,963 pounds worth $1,355,776 in 1942; of the 1943 production 598,675 pounds valued at $688,474 were recovered from British Columbia ores treated at Trail; 20,985 pounds at $24,130 from Manitoba ores, and 166,955 pounds worth $191,998 from Saskatchewan deposits. The production of cadmium at the Flin Flon plants of the Hudson Bay Mining and Smelting Company Limited is proportioned between Manitoba and Saskatchewan owing to the fact that the interprovincial boundary intersects the ore body of the Flin Flon mine.

Cadmium is consumed largely in the manufacture of alloys and for plating, also in the making of such pigments as cadmium lithopone, cadmium yellows, etc. A relatively large quantity of the metal is used in the production of bearing metals for high-speed internal combustion engines.

The world production is estimated at 7,500 short tons, the production in 1938, the latest year for which figures are available, being 4,200 short tons. The chief producing countries in order of output are: the United States, Germany, Canada, Mexico, Belgium, Australia (Tasmania), Poland, Norway, England, Russia, and France. The Mexican output is contained in ores exported for treatment in various countries.

Production is limited entirely to the by-product recovery from electrolytic zinc and from the manufacture of lithopone, and is thus dependent on the output of these products.

The following is from the annual 1944 review of the "Mining Journal, London":

"The shortage of cadmium in the United States in 1943, it was disclosed, was principally due to the high consumption of the metal by the aircraft industry, which was taking about 50 per cent of the total material available. Use of cadmium in the aircraft industry is mainly for corrosion-resisting electro-plating. It is interesting to note, therefore, that statistics of cadmium consumption by types of uses in the first half of 1943 showed that more than 90 per cent of the total cadmium consumption in the United States was for electro-plating compared with 62 per cent in 1941. There was thus less than 10 per cent of the total consumption for bearings, pigments, solders and fusible alloys in 1943. The use of cadmium in pigments had been considerably restricted in 1942, and in fact was only allowed for special, mostly military, purposes. Practically all of the cadmium which is in excess of Canada's own requirements was shipped to Europe, and a number of restrictions were placed on the use of cadmium and its alloys, by the Canadian Metals Controller in January, 1943."

Exports of cadmium from Canada in 1943 totalled 572,215 pounds valued at $626,379 compared with 800,710 pounds worth $855,618 in 1942.

The price of cadmium in 1943 (in Canadian funds) averaged $1.15 a pound, compared with $1.18 in 1942. The price of metallic cadmium, f.o.b. New York, in commercial sticks remained at 90 cents a pound throughout 1942 and 1943. The American product is protected by a duty of 7½ cents a pound. Previous to the Trade Agreement of November, 1938, the duty was 15 cents a pound.

Table 142.—Cadmium Production in Canada, 1936-1943

Year	British Columbia		Manitoba		Saskatchewan	
	Pounds	$	Pounds	$	Pounds	$
1936	526,034	468,170	148,133	131,838	111,749	99,457
1937	436,431	715,747	164,223	269,326	144,553	237,067
1938	510,342	410,090	115,166	92,543	73,630	59,166
1939	799,253	563,241	73,830	52,029	66,608	46,939
1940	778,791	905,734	57,742	67,154	71,594	83,264
1941	1,081,374	1,269,533	61,085	71,714	108,832	127,769
1942	972,413	1,147,447	29,236	34,498	147,314	173,831
1943	598,673	688,474	20,985	24,130	166,955	191,998

Table 143.—Cadmium Consumed by Specified Canadian Industries, 1939-1943—(Pounds)

Industry	1939	1940	1941	1942	1943
White metal alloys	3,115	4,174	6,971	2,259	39,660
Steel foundries	1,825	6,000	32,000	18,000	....
Iron foundries	2,658	9,528	12,000	34,000	....
Non-ferrous smelters	1,344	....	....	2,000	....
Other industries	73,266	122,317	247,746	337,134	200,000
Total Accounted for	**82,208**	**142,019**	**298,717**	**413,725**	**239,660**

CALCIUM

There is no commercial production of calcium metal in Canada and data relating to imports of metallic calcium into the Dominion are not published. Calcium metal was imported into the United States from France and Germany prior to the present world war. However, in 1939 a new plant was built for the production of the metal at Sault Ste. Marie, Michigan, by the Electro Metallurgical Company. Metallic calcium is utilized as a scavenger in steel and secondary aluminum, to produce magnesium castings and calcium hydride, and to harden lead. Calcium is used as a deoxidizer and final addition in obtaining particularly clean steels and in imparting better working properties to high nickel-chromium steels. Calcium-silicon (28-35 per cent calcium and 60-65 per cent silicon) and calcium-manganese-silicon are likewise employed for this purpose, although the unalloyed metal may have specific effects. Calcium-bearing alloys are now being made in Canada.

New York quotation for calcium, January, 1944, was $1.25 per pound, ton lots. Data relating to imports into Canada of calcium are not shown separately in Canadian trade reports.

CHROMITE

Canadian production of chromite during 1943 totalled 29,595 short tons valued at $919,878 compared with 11,456 short tons worth $343,568 in 1942. Commercial shipments by primary producers in both years were confined to the Eastern Townships of the province of Quebec. The 1943 annual output was exceeded only by the production of 36,725 tons valued at $499,682 in 1917.

During the year under review, there were 15 firms engaged in mining or developing chromite deposits in Canada; capital employed by these operators totalled $1,691,315 and $569,284 were distributed to 370 employees in salaries and wages. Process supplies, freight, fuel and electricity used amounted to $189,770 and the net value of production was estimated at $730,108,

The principal operations in 1943 were those conducted by Chromite Limited near St. Cyr, Quebec and those of the Wartime Metals Project at Chromeraine, near Black Lake, Quebec.

The following information is from a report "Chromite in 1943" as prepared by the Bureau of Mines, Ottawa:

"In Manitoba, large bodies of low-grade chromite deposits were discovered early in 1942 north of Bird River in the southeastern part of the Province. The chromite occurs in alternate narrow bands of high and low-grade ore and various zones have been traced for lengths of several thousand feet. The run-of-mine ore ranges between 15 and 20 per cent Cr_2O_3, but it is complex and high in iron and an economical method of bringing the chrome-iron ratio to within market requirements has not yet been devised. Many claims have been staked and drilled by Hudson Bay Exploration Company, God's Lake Gold Mines, Gunnar Gold Mines, Central Manitoba Mines, Stanmore Mines, and others. Late in 1943 Hudson Bay Exploration Company formed a subsidiary, Manitoba Chromium, Limited to work the Page claims and although no development is intended in the near future, research on the treatment of the ore is being continued. Diamond drilling is being done by Stanmore Mines, Limited on some recently discovered showings near Maskwa Lake, 16 miles north of Bird River; and Gunnar Gold Mines, Limited is exploring showings at Euclid Lake to the northeast.

"In British Columbia, during 1942 and 1943, a number of chromite deposits were examined by geologists of the Federal and Provincial Departments of Mines. There was no production in this province in 1943 and prospecting for the mineral appears to have ceased.

"Canadian consumption of chromite in 1943 was 131,276 tons, a 29 per cent increase over that of 1942.

"About 48 per cent of the total imports of nearly 112,210 tons came from Africa, mainly from Rhodesia; 29 per cent from India, which included some refractory ore purchased by the Government; aad 23 per cent from the United States, mainly from Montana.

"Canadian production of ferrochrome and other chrome addition agents was about 47,000 short tons, an increase of 40 per cent over that of 1942.

"The principal chromite-producing countries are Russia, South Africa, Turkey, Southern Rhodesia, Cuba, New Caledonia, Yugoslavia, India and Philippine Islands.

"Chromium is one of the principal alloying elements in a great variety of steels, chief of which, in the amount of chromium used, are the highly important stainless and corrosion-resistant steels. It is the vital ingredient with nickel and molybdenum in the making of armour plate, armour-piercing projectiles, and high-speed tool steels, and is used as a hard, toughening element in tank axles and frames, in aeroplane parts and in other essential war materials. Chromium is also used in some types of cast iron and in non-ferrous alloys. The ore is usually converted into ferrochrome before being added to the steel bath. Large quantities of chromite with certain specifications as to physical and chemical properties are used in the making of refractories. Chromite is the source of such chemicals as sodium and potassium chromates. It is also used in the electroplating, dyeing, tanning, and paint industries.

"Until recently, metallurgical chromite had to contain a minimum of 48 per cent Cr_2O_3 and a chrome-iron ratio of not less than 3 to 1. Basic ceiling prices are for ores of this grade and ratio, but ores as low as 40 per cent Cr_2O_3 and 2 to 1 ratio are acceptable at lower prices. When possible, lower grade ores are mixed with those of the highest grade, the proportion depending upon whether the ferrochrome produced is to be used for low or for high-carbon steels. The maximum allowance for sulphur is 0·5 per cent and for phosphorus 0·2 per cent. Although lump ores are preferred, fines and concentrates are used in quantity and in some instances they are briquetted before use. The low iron content of the ore or concentrate is of the utmost importance.

"Specifications for refractory ore suitable for bricks depend upon the kind of brick to be made. A Canadian manufacturer indicates maxima allowances of 25 per cent Fe_2O_3, 18 per cent Al_2O_3, and 4 per cent SiO_2. The silica should be as low as possible and it usually occurs in the ore as serpentine, a hydrated magnesium silicate, having a comparatively low melting point. The chromite should be present in an evenly and finely distributed form, not as coarse grains mixed with blobs of the silicate. The ore should be hard and lumpy, and the lumps should be plus 12 mesh. Provided the impurities are within the above specifications, the Cr_2O_3 content may vary within certain limits, but it is generally over 40 per cent.

"Standard grades of ferrochrome contain a minimum of 60 to 70 per cent chromium and are produced in two grades, one being high (4 to 6 per cent) in carbon and the other low (less than 2 per cent).

"The principal Canadian buyers of chromite for metallurgical use are: Chromium Mining and Smelting Corporation, Sault Ste. Marie, Ontario, and Electro-Metallurgical Company of Canada, Welland, Ontario. The only important purchaser of refractory ore is Canadian Refractories Limited, Canada Cement Building, Montreal, Quebec.

"Canadian prices for high-grade ores are based upon the United States ceiling price, which is \$43.50 per long ton at seabord for ore containing 48 per cent Cr_2O_3 with a chromium-iron ratio of 3 to 1; plus or minus 90 cents per long ton unit of 22·4 pounds of contained Cr_2O_3 above or below 48 per cent; plus or minus \$1.25 for each 0·1 chromium-iron ratio above or below 3 to 1, the limits being 3·5 to 1 and 2 to 1. The price at a Canadian mine at Black Lake in the Eastern Townships of Quebec would, for example, approximate to this basic ceiling price; plus freight of \$2.28 from seaboard to Niagara Falls (near a Canadian consuming centre); plus exchange at 11 per cent to convert into Canadian funds; less \$5.12 freight from Black Lake to Niagara Falls. For a 46 per cent Cr_2O_3 ore with Cr-Fe ratio of 2·8 to 1, this price per long ton at Black Lake would thus amount to about \$43.50, less penalties of \$4.30, plus freight of \$2.28, plus \$4.56 exchange, less \$5.12 freight, or to about \$40.83 in Canadian funds; a 48 per cent ore would be about \$42 a long ton. Prices of other grade ores can be obtained from the Metals Controller, Ottawa.

"United States prices of ferrochrome delivered on contracts are as follows: high-carbon ferrochrome, 66 to 70 per cent chromium and 4 to 6 per cent carbon, 13 to 14 cents a pound; and low-carbon ferrochrome, 67 to 72 per cent chromium and 2 per cent carbon, 19½ cents, and 0·1 per cent carbon, 22½ cents a pound of contained chromium."

Table 144.—Production of Chromite in Canada, 1928-1943

Year	Short tons	$	Year	Short tons	$
1928	...	...	1936	(x)	13,578
1929	126	900	1937	(x)	43,250
1930	...	...	1938	...	...
1931	...	...	1939	...	...
1932	78	1,113	1940	335	5,780
1933	30	343	1941	2,372	42,679
1934	111	1,578	1942	11,456	343,568
1935	1,144	14,947	1943	29,595	919,878

(x) Quantity not published.

Table 145.—Consumption of Certain Chromium Products and Chrome Ore in Specified Canadian Industries, 1942 and 1943

Industry	Item	1942		1943	
		Pounds	$	Pounds	$
Ingots and castings	Chrome ore	2,464,000	58,095	2,738,000	63,838
Ingots and castings	Ferrochrome	11,262,000	1,445,089	12,994,000	1,417,215
Paints, pigments and varnishes	Chrome colours	2,669,978	551,855	2,563,058	535,527
Paints, pigments and varnishes	Sodium bichromate	1,015,065	105,731	941,456	95,805
Leather tanning	Sodium bichromate	2,107,737	203,305	2,114,862	211,913
Glass manufacture	Chromite	16,000	460	12,000	432

NOTE.—In addition to the items listed above, a considerable quantity of chromite is utilized in the manufacture of Canadian ferro-alloys, also a relatively small quantity of sodium bichromate is consumed in the chemical industry. Chromite is also employed in Canada in the manufacture of refractories.

Table 146.—Chromite Mining in Canada, 1942 and 1943 (all in Province of Quebec)

		1942	1943
Active firms	No.	14	15
Capital employed	$	380,027	1,691,315
Employees—Salaried	No.	45	48
Wage-earners	No.	286	322
Total	No.	**331**	**370**
Salaries and wages—			
Salaries	$	57,926	108,674
Wages	$	354,529	460,610
Total	$	**412,455**	**569,284**
Gross value of production	$	343,568	919,878
Fuel and electricity used	$	34,567	75,806
Process supplies used	$	116,725	75,995
Freight	$	17,945	37,969
Net value	$	174,331	730,108

NOTE.—In addition, exploratory work, including diamond drilling, was conducted in 1942 on chromite deposits located in south-eastern Manitoba, but no data are available.

INDIUM

Indium was commercially recovered in Canada only in 1942 when 470 troy ounces valued at $4,710 were produced at Trail, British Columbia by the Consolidated Mining and Smelting Company of Canada Limited. The metal was obtained in the treatment of zinc refinery residues. The United States produces a considerable quantity of indium but data relating to entire world production are not available. Indium is used for plating and as an alloy with other metals. The Bureau of Mines, Ottawa, reports that the augmented production of engine gearings and war restrictions on ordinary plating metals have stimulated interest in indium during the past three years. "E and M J Metal Markets", New York, August, 1944, quoted indium at $7.50 per troy ounce 99.9 per cent pure.

IRON ORE

Production of iron ore in Canada during 1943 totalled 641,294 short tons valued at $2,032,240 compared with 545,306 short tons worth $1,517,077 in 1942. Of the 1943 output, 143,062 tons came from a property near Bathurst, New Brunswick and 498,232 tons from deposits in the province of Ontario. The number of firms engaged in the development, exploration or mining of Canadian iron ore deposits totalled 14 in 1943; capital employed amounted to $7,570,964; fuel, electricity and process supplies consumed and freight paid aggregated $982,282, and the net value of production was estimtaed at $1,049,958.

A report on "Iron Ore in 1943", as prepared by the Bureau of Mines, Ottawa, contains the following information:

"Deposits of iron ore in Canada are many and widespread and include hematite, siderite, magnetite, bog iron, and magnetic sand. Because of the availability of low cost, higher grade ores in the Lake Superior iron ranges of the United States and in Newfoundland, no iron ore from domestic sources was produced in Canada from 1923 until 1939.

"Dominion Ste●l and Coal Corporation, Limited, with plants at Sydney, Nova Scotia, obtained its iron ore in 1943 chiefly from its own mines at Wabana, Newfoundland. Steel Company of Canada, Limited, at Hamilton, Ontario, and Canadian Furnace, Limited, at Port Colborne, Ontario obtain their iron ore supplies from the Lake Superior region of the United States. Algoma Steel Corporation obtains most of its requirements from the United States and the remainder from the New Helen mine, Michipicoten area.

"In Ontario, Algoma Ore Properties, Limited, a wholly owned subsidiary of Algoma Steel Corporation, Limited, began in 1937 development work at its New Helen mine in the Michipicoten area, Ontario, and the first sinter was produced in July, 1939. Operations during the past three years consisted mainly in open-cut mining. The New Helen deposit is estimated by the company to contain at least 100,000,000 tons of siderite or carbonate ore, averaging about 35 per cent iron, and, to fit it for commercial use in blast furnaces, a sintering plant capable of treating 3,000 tons of ore a day was built, the sinter produced approximating 53·4 per cent iron, 7·0 per cent silica, 0·04 per cent sulphur, and 3·0 per cent manganese. The sintered ore is shipped from Michipicoten Harbour, 8 miles from the sintering plant, partly to the company's blast furnaces at Sault Ste. Marie, Ontario, and partly to United States ports on the Lower Lakes for use in United States blast furnaces. The manganese content is of special interest to users.

"Exploratory work on the hematite property of Steep Rock Iron Mines, Limited, situated near Atikokan, and about 135 miles west of Port Arthur, indicated that the deposits, which were discovered in the winter of 1937–38 under the bed of Steep Rock Lake by diamond drilling through the ice, were large and high in grade. The size of the hematite bodies can be gauged from what has been reported, namely, that the probable average widths of A, B, and C bodies are 205, 135, and 200 feet respectively, with explored lengths of over 3,000 feet in the case of A which is still open at one end, and of 5,000 and 800 feet for B and C, each of which is open at both ends. Under the A orebody the greatest depth at which the ore has been found in a borehole is 1,400 feet below the surface of Steep Rock Lake, or 1,035 feet below the ledge; under the B zone ore was encountered 700 feet below lake level. High-grade ore occurs within these deposits and presumably makes up a considerable, but as yet very incompletely defined part of them. The company reports that the property has "proven ore" totalling 17,244,000 long tons and "probable ore" 14,336,000 long tons, making a total of 31,580,000 long tons, and assuring production for a number of years to come. Most of this ore is available for open pit mining. No estimate has been prepared of "possible ore".

"Iron ore properties located in the Atikokan area were also explored in 1943 by the Great Lakes Iron Mines Limited, Midwest Iron Corporation Limited and Rebair Gold Mines Ltd. Gunflint Iron Mines Limited conducted exploratory work in Ontario on iron deposits located at Round Lake on the Gunflint Iron Range and at Shebandowan on the Mattawin iron range.

"At the Josephine mine of Michipicoten Iron Mines Ltd., underground development was carried on continuously throughout 1943. This work was mainly confined to the three lowest levels, the fourth, fifth and sixth levels, the greatest amount being done on the sixth level where a length of over 1,200 feet of continuous ore was opened up, with ore still showing at one end. Surface diamond drilling indicates that this length (1,200 feet) will ultimately be doubled. As a result of this development the tonnage of ore reserves was more than doubled during the year and the grade of ore was appreciably improved. The reserves are estimated to total 2,666,000 long tons of hematite assaying (dry analysis) 53·94 per cent iron, 15·67 per cent silica, and 1·18 per cent sulphur.

"The Ruth property, which is two miles from the Josephine and owned by the same company, was drilled extensively during 1942 and during the first three months of 1943. The indicated ore reserves to a depth of 800 feet are 28,600,000 long tons of siderite averaging 31·26 per cent iron, 13·15 per cent silica and 5·14 per cent sulphur. These reserves include 16,840,000 tons of low silica siderite averaging 34·54 per cent iron and 6·81 per cent silica. The remainder (11,760,000 tons) is high silica siderite and averages 26·57 per cent iron and 21·46 per cent silica. A pilot plant has been in operation since the summer of 1942 for testing purposes.

"The Frobisher Exploration Company, Ltd., an exploration subsidiary of Ventures Limited and associated companies, investigated in 1941 and 1942 certain magnetite deposits in Mayo township, Hastings county.

"Tomahawk Iron Mines Ltd. has been developing a property on Whetstone Lake, Lake township, Hastings county, eastern Ontario. The company reports estimated ore reserves of 500,000 tons of 60 per cent magnetite, above the 300-foot level. Test shipments have been made to steel plants in southern Ontario, and a truck road to the property is being built.

"Hollinger Consolidated Gold Mines Ltd., under an agreement with Beverly Iron Prospecting Syndicate, did some exploration in 1943 on the Beverly iron ore holdings near Milton, Halton ocunty, Ontario. From 1940 to 1942 the Syndicate made extensive dip-needal surveys followed by detailed magnetometer surveyings. In the spring of 1943 drilling to a depth of 3,000 feet was undertaken and an electric survey made by Hollinger. The option was afterwards surrenacred.

"Extensive surveys and exploration work have been carried on since 1936 by Labrador Mining and Exploration Company of Montreal, near Sawyer Lake and vicinity, along the Quebec-Labrador boundary line. Important iron ore deposits are indicated on the concession held by this company.

"Hollinger North Shore Exploration Company, a subsidiary of Hollinger Consolidated Gold Mines, was engaged in exploring an area in Quebec, immediately north of the Labrador concession and covering an area of 3,900 square miles. Many indications of iron-ore deposits were encountered, and the area on which non-ferrous minerals might be expected was also investigated. Hollinger has completed negotiations with M. A. Hanna Company of Cleveland, Ohio, for their participation in the future exploration and developments of the iron deposits in both areas. The exploitation of these deposits would necessitate the construction of a railway line from the St. Lawrence River at Seven Islands, which port is open to navigation throughout the year.

"The iron ore mining operations conducted during 1942 and 1943 at Bathurst, New Brunswick, by the Dominion Steel and Coal Corporation Limited were closed down indefinitely on November 25, 1943; the plant was dismantled and removed elsewhere.

"Bounties on the production of iron ore are offered by the provinces of Quebec, Ontario, and British Columbia. In Quebec, the premium is at the rate of four-fifths of one cent for each unit (22 lbs.) of iron metal contained in every ton of iron ore. In Ontario, the bounty is 2 cents per unit of metallic iron in the long ton of low-grade iron ore beneficiated in Ontario so as to be suitable for use in the blast furnace, or on natural ore of commercial quality smelted in Canada. In British Columbia, the bounty paid must not exceed $3.00 a ton on the proportion of pig iron produced from ore mined in the proviace, and must not exceed $1.50 a short ton on the proportion of pig iron produced from ore mined outside the province. A bounty not to exceed $1.00 a short ton is also offered on steel shapes of commercial utility manufactured in British Columbia.

"There are no official Canadian price quotations for iron ore. Prices f.o.b. Lake Erie ports, per long ton for Lake Superior, U.S.A., iron ore, 51½ per cent iron ore are: Messabi, Non-Bessemer—$4.45, Bessemer—$4.60, Old Range, Non-Bessemer—$4.60; Bessemer—$4.75. The price of Brazilian ore, f a s. Brazilian ports, 68 per cent iron, is 7 cents per long ton unit or $4.76 a long ton."

Complete data on world production of iron ores have not been available since the commencement of the present world war.

Table 147.—Production of Iron Ore(x) in Canada, 1939-1943

Year	Short tons	Value
1939	123,598	341,594
1940	414,603	1,211,305
1941	516,037	1,426,057
1942	545,306	1,517,077
1943	641,294	2,032,240

(x) Exclusive of titanium-bearing iron ores and all from Ontario with the exception of 187 tons from Quebec in 1942 and 145,062 tons from New Brunswick in 1943.

Table 148.—Imports and Exports of Iron Ore, 1942 and 1943

—	1942		1943	
	Short tons	$	Short tons	$
Imports	2,701,968	6,230,197	3,906,425	9,056,389
Exports	295,960	1,055,861	374,677	1,450,985

Table 149.—Shipments of Iron Ore from Wabana Mines, Newfoundland, 1931-1943

Year	To Nova Scotia	To United States	To Europe	Total Shipments
		(Short tons)		
1931	234,148	25,670	530,079	**789,897**
1932*	....	....	166,303	**166,303**
1933	....	....	254,383	**254,383**
1934*	346,178	....	344,769	**690,947**
1935	611,581	....	81,123	**692,704**
1936	527,540	12,656	252,676	**792,872**
1937	702,714	50,490	1,242,088	**1,995,292**
1938	555,348	....	1,305,068	**1,860,416**
1939	576,198	16,184	980,098	**1,572,480**
1940	762,310	26,118	789,578	**1,578,006**
1941	943,643	63,869	316,530	**1,324,042**
1942	†735,324	....	234,483	**969,807**
1943	*903,414	....	2,688	**906,102**

* Shipments to Europe in 1930, 1932 and 1934 were to Germany only, while from 1935 to 1938 shipments went to both Germany and Great Britain. Shipments to Germany in 1938 totalled 1,256,230 short tons, and in 1939, 768,743 tons. In 1940 and following years, European shipments went to Great Britain.
† Includes 41,203 tons lost by enemy action in 1942 and 5,969 in 1943.

Table 150.—Iron Ore Mining in Canada, 1942 and 1943(*)

	1942			1943		
	Quebec	Ontario	**Canada**	Quebec†	Ontario	**Canada**
Active firms .... No.	3	4	**7**	5	9	**14**
Capital .... $	105,927	2,402,723	**2,508,650**	4,897	7,566,067	**7,570,964**
Employees—On salary .... No.	7	35	**42**	1	98	**99**
Wage-earners .... No.	5	313	**318**	9	395	**404**
Total .... No.	12	348	**360**	10	493	**503**
Salaries and Wages—Salaries .... $	3,699	89,785	**93,484**	100	205,757	**205,857**
Wages .... $	5,140	577,495	**582,635**	10,585	1,218,513	**1,229,098**
Total .... $	8,839	667,280	**676,119**	10,685	1,424,270	**1,434,955**
Gross value of production .... $	935	1,516,142	**1,517,077**	579,990	1,452,250	**2,032,240**
Fuel and electricity .... $	....	301,778	**301,778**	569	362,785	**363,354**
Process supplies used .... $	....	347,690	**347,690**	34	396,881	**396,915**
Freight .... $	....	236,307	**236,307**	....	222,013	**222,013**
Net value .... $	935	630,367	**631,302**	579,387	470,571	**1,049,958**

*Does not include data relating to titaniferous iron ores.
† Includes 1 producer in New Brunswick for which complete data are not available; no production in Quebec.

IRON AND STEEL AND THEIR PRODUCTS

The Primary Iron and Steel Industry

Statistics for the Primary Iron and Steel Industry include data for all establishments in Canada which were engaged chiefly in the manufacture of (a) pig iron, (b) ferro-alloys, (c) steel ingots and steel castings, (d) hot rolled iron and steel products, (e) cold rolled or cold drawn steel bars, strips and shapes. Forty-six firms were included in this industry in 1943 and reports were received for 63 different plants or departments, including 4 blast furnace departments, 4 ferro-alloy plants, 37 steel furnace divisions, and 18 rolling or drawing mills. Separate reports were received for blast furnace departments, for steel furnace divisions and for rolling mills even when all three were units of a single works.

Factory sales of pig iron, ferro-alloys, steel ingots and castings and finished rolled products were 3·6 per cent lower in 1943 than in 1942, the values being $223,951,059 and $232,105,755 respectively. Twenty-seven works in Ontario accounted for 71 per cent of the total for Canada or $159,789,576; 6 plants in Nova Scotia accounted for 11 per cent or $23,931,519; 16 plants in Quebec for 14 per cent or $32,341,735, while the remaining $7,888,229 or 3 per cent was accounted for by 4 plants in Manitoba, 7 in British Columbia and 3 in Alberta.

Fixed and working capital employed in this industry amounted to $235,386,238, including $149,293,756 for the value of land, buildings and plant equipment; $47,998,199 for the value of raw and finished materials on hand and in process, and $38,094,283 for operating capital, such as cash, bills and accounts receivable. For works in Ontario, the capital was $145,658,861; in Nova Scotia, $49,399,083; in Quebec, $36,242,566; in Manitoba, $2,516,811 and in Alberta and British Columbia, $1,568,917.

In 1943 an average of 34,222 people were employed in this industry, this being an increase of 3 per cent over the 1942 average of 33,245. About 1,637 persons worked in the blast furnace departments during the year, 13,095 in the steel furnaces, 16,942 in the rolling mills and 2,548 in ferro-alloy plants (exclusive of those producing ferro-alloys as a by-product). Fifty-six per cent of the employees or 19,127 worked in plants in Ontario, 6,482 in Quebec, 6,899 in Nova Scotia, 959 in Manitoba and 755 in Alberta and British Columbia.

Payments in salaries and wages during 1943 amounted to $65,654,468, a gain of 8 per cent over the previous year's total of $60,874,818. Salaries advanced to $6,263,581 from $5,283,722 and wages to $59,390,887 from $55,591,096.

Materials used in manufacturing processes cost $101,413,794 in 1943 compared with $110,551,516 in 1942, and the cost of fuel and electricity was $18,985,135 against $18,734,178, a decreased expenditure of 8 per cent for materials and an increase of 1 per cent for fuel and powers.

Pig Iron.—Output of 1,758,269 net tons of pig iron in 1943 was 11 per cent under the 1,975,014 tons reported for the previous year. Production of basic iron amounted to 1,456,549 tons or 83 per cent of the total; foundry iron amounted to 148,653 tons and malleable iron to 153,067 tons.

Producers' sales of pig iron totalled 387,109 tons at $8,328,322 in 1943 compared with 387,997 tons at $8,366,936 in 1942.

Charges to iron blast furnaces during the year included 2,955,671 tons of imported iron ore, 302,780 tons of Canadian ore, 1,646,191 tons of coke, 321,441 tons of imported limestone and 464,497 tons of Canadian limestone.

Imports of pig iron during the calendar year increased to 7,118 tons from 1,536 tons in 1942 and exports increased slightly to 438 tons from 427 tons.

Producers' stocks at the end of 1943 totalled 28,230 tons compared with 87,955 tons at the end of the previous year.

The apparent consumption of pig iron in Canada, as calculated by deducting the exports from the sum of the production and imports, and allowing for changes in producers' stocks, amounted to 1,824,674 tons in 1943 or 5 per cent less than in 1942 when the apparent domestic supply was 1,915,217 tons.

Producers of pig iron in Canada had 14 blast furnaces at the end of 1943 which could produce 2·7 million net tons a year if operated at rated capacity. Actual production of 1,758,269 net tons in 1943 showed an operating rate of about 64 per cent. Fourteen furnaces were in blast during the year.

Ferro-alloys.—Ferro-alloys were made in 1943 by 10 different concerns, 5 of which recovered ferrosilicon as a by-product in the manufacture of abrasives. Output of ferro-alloys in 1943 amounted to 197,094 net tons, a decrease of 6 per cent over the 209,017 tons reported for 1942.

Altogether, ferrosilicon was made in nine different plants, spiegeleisen in two and ferrochrome in two. Other alloys produced by one firm only included ferromanganese, silicospiegel, silicomanganese, silicon metal, calcium silicon, calcium manganese silicon, and ferrophosphorus.

Steel Ingots and Castings.—Steel production declined 3 per cent to 3,004,124 tons in 1943 from 3,109,851 tons in 1942, the output of steel ingots to 2,846,736 tons from 2,958,906 tons and steel castings to 157,388 tons from 150,945 tons. Factory sales of ingots and castings totalled 151,924 tons at $30,057,984.

Thirty-seven steel plants were in operation during the year. At the end of 1943 these plants had 137 furnaces, including 51 basic open hearth with an annual capacity of 2,825 400 net tons, 85 electric furnaces rated at 786,000 tons, and 3 converters at 8,000 tons. There were just 12 makers of steel ingots with capacity of 3,305,900 net tons per annum. The total annual steel capacity of all plants, including ingots and castings, was 3,619,400 tons at the year end.

Operating steel furnaces in 1943 used 1,518,548 net tons of pig iron, 1,751,779 tons of scrap iron or steel, 171,040 tons of ores, 242,032 tons of limestone, 89,056 tons of dolomite, 65,856 tons of lime, 95,605 tons of silica sand, 19,427 tons of magnesite and 19,800 tons of ferro-alloys.

Rolled and Drawn Steel.—In 1943 there were 15 mills occupied chiefly in hot rolling of steel products and 3 mills making only cold drawn and cold rolled shapes. Ten of these mills were in Ontario, 3 in Nova Scotia, 3 in Quebec, 1 in Manitoba and 1 in Alberta.

Rolling mill sales advanced 0·1 per cent to $158,138,483 from $157,973,074 in 1942. The main items sold during the year under review were: 489,879 tons of hot rolled bars at $43,233,796; 391,202 tons of plates at $27,919,833; 213,908 tons of sheets, hoops, bands and strips at $17,257,901; 303,094 tons of rails and rail fastenings at $14,798,762; 279,492 tons of semi-finished rolled forms, such as blooms, billets, etc., at $13,906,485; 151,674 tons of structural shapes at $8,802,273 and 88,848 tons of wire rods at $3,621,273.

Table 151.—Provincial Distribution of Active Plants in the Primary Iron and Steel Industry, 1943

Province	Number of firms	Pig iron		Steel ingots and castings		Rolling and drawing mills	Ferro-alloys (a)
		Number of plants	Number of blast furnaces	Number of plants	Number of steel furnaces		
Nova Scotia	4	1	4	2	17	3	....
Quebec	15	....	....	12	28	3	1
Ontario	16	3	10	11	72	10	3
Manitoba	3	....	....	3	5	1	....
Alberta	2	....	....	2	3	1	....
British Columbia	7	....	....	7	12	....	....
Canada	(b) **46**	**4**	**14**	**37**	**137**	**18**	**4**

(a) Not including artificial abrasive plants which made ferrosilicon as a by-product.
(b) Some firms operate in more than one province.

Table 152.—Principal Statistics of the Primary Iron and Steel Industry, 1943

Year	Number of plants	Capital employed	Average number of employees	Salaries and wages	Cost of fuel and electricity at works	Cost of materials at works	Gross selling value of products at works
		$		$	$	$	$
Nova Scotia	6	49,309,083	6,809	11,176,181	2,189,508	12,199,604	23,931,519
Quebec	16	36,242,566	6,482	12,299,476	3,400,979	12,534,428	32,341,735
Ontario	27	145,658,861	19,127	39,265,015	12,724,046	74,591,373	159,789,576
Manitoba	4	2,516,811	959	1,499,389	435,069	1,313,557	4,154,981
Alberta	3	875,751	330	522,535	78,927	407,118	1,471,116
British Columbia	7	693,166	425	891,872	96,606	367,714	2,262,132
Canada	**63**	**235,396,238**	**34,222**	**65,654,468**	**18,985,135**	**101,413,794**	**223,951,059**
Per cent change 1943 from 1942	....	+14·4	+2·9	+7·9	+1·3	−9·0	−3·6

Note.—Profits or losses cannot be calculated from above figures as data are not available for general expense items, such as interest, rent, depreciation, taxes, insurance, advertising, etc.

Table 153.—Production of Pig Iron and Sale by the Producers, 1942 and 1943

Grade	Delivered in molten condition	Machine cast	Total tonnage made	Sales	
				Quantity	Income from sales
	Net tons	Net tons	Net tons	Net tons	$
1942					
Basic	1,487,581	158,420	1,646,001	67,242	1,307,715
Foundry	....	159,724	159,724	157,991	3,439,405
Malleable	....	169,289	169,289	162,764	3,619,816
Total	**1,487,581**	**487,433**	**1,975,014**	**387,997**	**8,366,936**
1943					
Basic	1,338,913	117,636	1,456,549	84,575	1,697,774
Foundry	....	148,653	148,653	145,713	3,128,780
Malleable	....	153,067	153,067	156,821	3,501,768
Total	**1,338,913**	**419,356**	**1,758,269**	**387,109**	**8,328,322**

Note.—Silvery pig iron has been included with ferro-alloys.

Table 154.—Materials Charged to Iron Blast Furnaces, 1942 and 1943

Material	1942		1943	
	Quantity	Cost at furnace	Quantity	Cost at furnace
	Net tons	$	Net tons	$
Iron ore—Imported (crude)	3,383,439	13,726,346	2,955,671	12,247,784
Canadian (beneficiated)	229,253	798,974	198,244	737,276
Canadian (crude)	....	....	104,536	460,160
Mill cinder, roll scale, flue dust, etc.	177,343	386,730	125,477	315,483
Scrap (net charge)	64,624	803,172	43,032	543,930
Limestone—				
From Canadian quarries	301,143	447,107	464,497	867,146
From foreign sources	559,650	799,302	321,441	362,195
Dolomite	....	....	32,064	71,945
Coke	1,795,875	13,402,828	1,646,191	13,989,052
Other materials	....	163,675	....	315,061
Total	....	**30,528,134**	....	**29,910,032**

Table 155.—Imports Into Canada and Exports of Pig Iron, 1933-1943

Year	Imports		Exports	
	Net tons	$	Net tons	$
1933	2,754	43,298	13,331	214,195
1934	7,189	108,300	10,327	176,093
1935	9,990	143,726	15,410	287,396
1936	4,435	74,589	15,572	304,682
1937	7,135	144,354	43,138	851,701
1938	2,377	62,494	11,811	224,261
1939	657	15,176	12,015	221,787
1940	29,703	672,489	4,113	101,126
1941	4,729	131,112	380	10,090
1942	1,536	42,718	427	12,175
1943	7,118	173,598	438	11,163

Table 156.—Blast Furnaces in Canada, 1941-1943

Name of Company	Location of Plants	Number of stacks	Total daily capacity (24 hours)	Number of days in blast		
				1941	1942	1943
			Net tons			
Dominion Steel and Coal Corporation, Ltd.	Sydney, N.S.	1	616	....	....	180
		1	616	365	365	358
		1	392	365	365	16
		1	336	298	365	326
Total	....	**4**	**1,960**	....	....	....
Canadian Furnace Company, Limited.	Port Colborne, Ont.	1	466	279x	304½	196½
		1	147	....	289	332
Total	....	**2**	**613**	....	....	....
The Steel Company of Canada, Limited.	Hamilton, Ont.	1	364	365	365	347
		1	728	365	365	365
		1	980	110	365	365
Total	....	**3**	**2,072**	....	....	....
Algoma Steel Corporation, Ltd.	Sault Ste. Marie, Ont.	1	336	365	360	317
		1	336	....	184	277
		1	616	202	349	346
		1	504	365	361	346
		1	1,120	....	....	32
Total	....	**5**	**2,912**	....	....	....
Total for Canada	....	**14**	**7,557**	....	....	....

(x) For making pig iron; ferro-alloys also made in this furnace.

Table 157.—Production of Ferro-Alloys, 1933-1943

Year	Net tons	Year	Net tons
1933	33,749	1939	85,540
1934	35,751	1940	149,394
1935	63,410	1941	204,354
1936	85,438	1942	209,017
1937	91,921	1943	197,094
1938	62,637		

Table 158.—Production of Steel Ingots and Steel Castings, by Grades, 1939-1943 (Net tons)

Year	Steel ingots		Steel castings			Total steel ingots and castings
	Open hearth	Electric	Open hearth	Converter	Electric	
1939	1,410,339	79,718	17,473	934	42,590	1,551,054
1940	2,041,947	135,033	21,085	2,268	52,786	2,253,769
1941	2,394,098	199,414	29,401	3,371	85,867	2,712,151
1942	2,623,853	335,053	26,627	6,515	117,803	3,109,851
1943	2,484,544	362,192	28,895	4,003	124,490	3,004,124

Table 159.—Materials Used in Steel Furnaces, 1942 and 1943

Material	1942		1943	
	Quantity	Cost of purchased materials	Quantity	Cost of purchased materials
	Net tons	$	Net tons	$
Pig iron—Own make	1,525,853	...	1,435,020	...
Purchased	89,543	2,039,095	83,528	1,873,372
Scrap iron or steel—Own make	864,537	...	947,683	...
Purchased	962,374	21,377,022	804,096	17,554,265
Spiegeleisen	2,911	153,054	367	31,474
Silicospiegeleisen	439	51,827	...	...
Ferromanganese	19,190	2,484,783	19,096	2,356,754
Silicomanganese	8,065	918,774	9,568	1,094,239
Ferrosilicon	12,150	841,900	11,545	757,911
Ferrochrome—High carbon	3,666	724,819	4,669	702,817
Low carbon	1,965	720,270	1,828	714,398
Ferromolybdenum	150	223,233	...	280,813
Ferrophosphorus	290	25,826	380	33,967
Ferroselenium	5	10,323	2	5,793
Ferrotitanium	439	66,555	614	118,416
Ferrotungsten	646	1,440,141	550	1,721,967
Ferrovanadium	203	524,007	204	558,717
Ferrozirconium	51	7,337	8	2,153
Calcium silicon	421	135,680	515	166,923
Calcium manganese silicon	289	93,191	215	70,914
Other ferro-alloys	134	238,301	...	35,761
Aluminium ingot and shot	807	285,025	951	344,785
Copper ingots	39	10,190	37	8,467
Nickel	3,392	2,025,604	2,775	1,867,729
Other metals	...	132,736	...	141,285
Ore, iron, crude	98,986	616,617	107,619	671,079
Ore, iron, calcined, roasted or treated	98,156	1,757,431	62,052	668,843
Ore, manganese	32	1,600	...	...
Ore, chrome	1,232	58,095	1,369	63,[illegible]
Bentonite	3,382	101,211	3,853	97,[illegible]
Coal, anthracite	755	8,055	1,195	9,475
bituminous	219	1,916	133	1,[illegible]
Coke—Own make	706	...	...	...
Purchased	6,113	74,555	5,158	60,770
Charcoal	224	10,333	...	7,457
Dolomite, Crude	79,091	225,393	78,746	243,793
Calcined	22,550	179,427	10,310	99,740
Fluorspar	20,133	562,480	20,790	715,991
Lime—Own make	36,226	...	29,776	...
Purchased	23,075	315,470	36,080	344,488
Limestone—Canadian	120,573	239,838	125,058	242,328
Imported	123,035	128,605	116,974	136,371
Magnesite	20,665	786,321	19,427	744,716
Electrodes	...	989,222	...	1,075,799
Silica sand	99,384	712,516	95,605	703,167
Other foundry sand	35,340	105,042	...	154,707
Firebrick, fireclay and other refractories	...	2,469,239	...	2,634,711
Calcium molybdate and molybdenum oxide briquettes	1,145	1,167,579	522	813,861
All other materials	...	3,570,856	...	3,323,942
Total Value of Metals, Ores and Other Materials Used	...	**48,611,494**	...	**43,257,235**

Table 160.—Summary of Steel Furnace Capacity, December 31, 1943

—	Number furnaces	Total annual capacity
		(net tons)
Basic open hearth	51	2,825,400
Electric	83	786,000
Converter	3	8,000
Total	**137**	**3,619,400**
Steel ingots—Basic open hearth		2,813,400
Electric		492,500
Total		**3,305,900**
Steel castings		313,500
Total Ingots and Castings		**3,619,400**

LITHIUM

The principal commercial lithium ores are amblygonite, a fluophosphate of lithium and aluminum; spodumene, a silicate of these two elements, and lepidolite, or lithia mica, also a silicate. The lithia content of these minerals, as mined, commonly ranges around 8 to 9 per cent for amblygonite, 4 to 7 per cent for spodumene, and 3 to 5 per cent for lepidolite. All of the above minerals are known to occur in Canada but there has, as yet, been only a small production, mainly of lepidolite and spodumene. The important known deposits of economic interest are all in Manitoba. The first commercial shipment of Canadian lithium ore to be officially recorded was reported during 1937. This production came from deposits located at Bernic Lake, Manitoba, and was valued at $1,694; the mineral was consigned to the United States for the manufacture of lithium compounds and possible lithium metal. No commercial shipments of lithium ores from Canadian mines were reported since 1937.

In 1942 Sherritt Gordon Mines Limited conducted an exploration by diamond drill of a spodumene-bearing pegmatite on the east shore of Crowduck Bay, Herb Lake, Manitoba; encouraging results were reported from this undertaking.

Prospecting in the Cat Lake area of Manitoba during 1943 disclosed extensive surface showings of spodumene pegmatite over considerable distances beyond the previously known Irgon deposit, with estimated contents of 25 to 30 per cent spodumene over widths of 25 to 30 feet in many sections; the discoveries were under option to the Hudson Bay Mining and Smelting Company Limited.

The principal uses of the lithium ores and salts have been in ceramics, glassware, air conditioning and pharmaceuticals. The United States Bureau of Mines reported that the use of lithium for high-conductivity copper castings more than doubled in the United States in 1941 compared with 1940, and its use in special bronzes is now on a commercial scale. The element is added either in the form of a 50-50 lithium-calcium alloy or as an alloy of 98 per cent copper and 2 per cent lithium.

"E and M J Metal and Mineral Markets", New York, quoted lithium metal, August, 1944, at $15 per pound 98 to 99 per cent in 100 pound lots. Spodumene—per unit LiO_2 contained $5 to $6 on a 6 per cent grade, carlots, North Carolina—nominal.

Data relating to imports of lithium or lithium compounds are not shown separately in Canadian trade reports, also statistics on world production of lithium minerals are not available at present; however, the United States and southwest Africa are the two principal producers of lithium minerals.

MAGNESIUM

Production of magnesium metal in Canada during 1943 totalled 7,153,974 pounds valued at $2,074,652 compared with 808,718 pounds worth $355,836 in 1942. The metal in 1943 was produced entirely by Dominion Magnesium Limited in its plant located at Haley, Ontario; recovery was made from Ontario dolomite and the ferrosilicon process was employed. In addition to extracting magnesium from Ontario dolomite in 1942, there was a recovery of the metal at Haley in that year, from brucite produced at Wakefield, Quebec and at Trail, British Columbia from magnesite mined in that province. The extraction of magnesia from sea water is being done on a very large scale in England and the United States, the material so obtained being used for making magnesium metal as well as for various industrial and pharmaceutical purposes.

The United States Bureau of Mines reported that production of primary magnesium in the United States during 1943 totalled 183,584 short tons compared with 48,963 short tons in 1942; companies using electrolytic processes for producing magnesium accounted for over 85 per cent of the total output, and the ferrosilicon and carbothermic processes accounted for the remaining 15 per cent. Of the primary magnesium shipped in 1943 (170,267 tons), approximately 64 per cent was used in the manufacture of magnesium-base alloy structural products; 8 per cent in other alloys, chiefly aluminum; 7 per cent in powder; and 21 per cent for export account (includes 20,911 tons of magnesium-base alloy). Of the magnesium-alloy structural products sold or used, the aircraft industry took 50 per cent, incendiary bomb casings 50 per cent and other industries less than 1 per cent.

According to the United States Bureau of Mines, the world production of magnesium in 1943 reached another all-time high mark of more than 269,000 metric tons—92 per cent more than the previous record of 140,000 tons set in 1942, and more than eight times the 1939 output. On the basis of estimates, it is thought that about 28 per cent of the output was under axis control and 72 per cent under control of the United Nations. Production in 1944 will not greatly exceed that of 1943, inasmuch as all the major expansion programs of the various nations are thought to be virtually complete.

"E and M J Metal and Mineral Markets", New York, quoted magnesium metal, September, 1944: Per pound, ingots (4 x 16 inches), 99·8 per cent, carload lots 20½ cents; 100 pounds or more l.c.l., 22½ cents. Extruded sticks, carload lots 27½ cents; 100 pounds or more l.c.l. 29½ cents. Data relating to Canadian imports and exports of magnesium metal are not shown separately in Canadian trade reports. Imports of magnesium oxide into Canada in 1943 totalled 1,900,513 pounds valued at $180,039 compared with 1,393,965 pounds appraised at $90,613 in 1942.

Table 161.—Production of Primary Magnesium Metal in Canada, 1916-1943

Year	Quebec		Ontario		British Columbia		Canada	
	Pounds	$	Pounds	$	Pounds	$	Pounds	$
1916–1918	(a)	(a)	....	....	(b) 200,000	(b)	....	....
1941	....	....	....	....	(c) 10,905	2,944	10,905	2,944
1942	(d) 141,081	62,076	473,910	208,520	193,727	85,240	808,718	355,836
1943	....	....	7,153,974	2,074,652	....	....	7,153,974	2,074,652

(a) Magnesium metal produced in 1918 at Shawinigan Falls, Quebec by Shawinigan Electric Metals Company Limited from imported magnesium chloride but data not available.

(b) Approximately 200,000 pounds produced at Trail from imported magnesium chloride; complete data not available.

(c) Powder.

(d) Produced in Ontario from Quebec brucite.

Table 162.—Consumption of Magnesium Ingots in Canada, 1939-1943

	1939	1940	1941	1942	1943
			(pounds)		
In non-ferrous smelters	31,990	192,000	825,717	1,072,346	1,298,650
In white metal alloy foundries	774	7,770	9,515	9,850	16,821
In brass and bronze foundries	16	163	42,821	44,553	132,465
In aluminum products	....	240	127	....	89,523
In ammunition	....	404	....	....	....
In pharmaceuticals	200	....	....	....	....
Total accounted for	**32,980**	**200,577**	**878,180**	**1,126,749**	**1,537,459**

MANGANESE

Canadian mine shipments of manganese ore in 1943 totalled only 48 short tons valued at $985 compared with 435 tons worth $8,932 in 1942. The 1943 output represents concentrates shipped by British Manganese Mines Limited from its mine and concentrator located at Jordan Mountain, near Sussex, New Brunswick. The following information is taken from a report "Manganese in 1943"as prepared by the Bureau of Mines, Ottawa:

"The manganese ores that have been mined in Canada are pyrolusite (MnO_2), psilomelane (H_4MnO_5), manganite ($Mn_2O_3H_2O$), and braunite (Mn_2O_3), all of which are black or grey-black and comparatively hard; bog manganese, a soft earthy black oxide; and a small amount of rhodochrosite ($MnCO_3$), a pink, fairly soft, mineral. Pyrolusite is the most common and most important and when pure contains 63 per cent manganese. It is much softer than the other hard rock ores and can be distinguished in the field by the ease with which it blackens the fingers. Most of the hard rock deposits are replacements in limestone, but they also occur in the form of accumulated nodules and cementing material in siliceous sediments, and as veins in metamorphosed precarboniferous rocks. Canadian production since 1918 has been insignificant. During the first three and a half years of the present war it was increasingly difficult for Canada to obtain supplies from abroad, but this is no longer the case.

"Most of the 200 deposits of manganese known in Canada are in the Maritime Provinces. They are mostly low-grade replacement or bog deposits, and a small amount of high quality ore has been mined in only a few localities.

"Since the outbreak of the war, much attention has been given to the development of known deposits to the search for new sources of supply, and to the exploration of several old properties. Little high-grade ore remains in these old properties, though it is possible that a fair tonnage of medium-grade ore is available. No new deposits have been found, however, and attempts to operate some of the better old properties have been given up after a few months' work. Manganese activities in Canada, including the aforementioned operations at Jordan Mountain have ceased and indications are that they will not be renewed. In any event, production is likely to be small and costly.

"World production is probably about 6,000,000 tons annually, the leading producing countries being Russia, British India, Gold Coast, Brazil, Union of South Africa, the United States and Cuba.

"It is estimated that over 90 per cent of the world consumption of manganese ore is used in the manufacture of iron and steel, the ore so used being termed "Metallurgical". The remainder is termed "Chemical". Metallurgical ore is used for making ferro-manganese, silico-manganese, and spiegeleisen, in which forms it is added to the steel bath. Manganese is beneficial mainly in improving the workability of the steel and in improving the product by acting as a deoxidizer, a desulphurizer, and a re-carbonizer.

"Such ore should contain at least 48 per cent of manganese and not more than 7 per cent iron, 8 per cent silica, 0·15 per cent phosphorus, 6 per cent alumina, and one per cent zinc. It must be low in copper, lead, and barium, and the ratio of manganese to iron should not be less than seven to one. The ore should be hard and in lumps of less than four inches, and not more than 12 per cent should pass a 20-mesh screen. Soft ores, such as bog manganese, are objectionable unless they are briquetted. It takes about two tons of 48 per cent ore to make one ton of standard ferro.

"The Canadian market for metallurgical ore is confined mainly to two manufacturers of manganese ferro-alloys: Electro Metallurgical Company at Welland, and Canadian Furnace Limited, Port Colborne, both in Ontario.

"Chemical grade ores are used mainly in the manufacture of dry batteries. Specifications call for high-grade pyrolusite because of its high available oxygen, which acts as a depolarizer. The ore should contain not less than 75 per cent manganese dioxide (MnO_2) and not more than 1·5 per cent iron; 1·0 per cent alumina; 6·0 per cent silica; 0·03 per cent copper; less than 0·10 per cent of any other metal; and 1·0 per cent moisture. Most of the ore is ground to 200 mesh, but some coarse ground ore of 8 to 12 mesh is also used. Canadian requirements of chemical ore range from 3,000 tons to 4,000 tons a year, most of it being ore from the Gold Coast. Nearly all of it is used by three manufacturers of dry batteries in Ontario.

"Prices of ferro-grade ore depend upon the manganese content and the amount of harmful impurities. Imported ore is usually quoted in cents per long ton unit of 22·4 pounds of contained manganese. United States prices for metallurgical ores are based on a standard duty-free ore containing 48 per cent manganese, 6 per cent iron, 11 per cent silica and alumina combined, and 0·18 per cent phosphorus. The quotation for this grade is 85 cents per long unit of contained manganese at Gulf of Mexico ports, and 90 cents at New York and other Atlantic ports. The premiums and penalties for ores varying from the standard grade can be obtained from the Metals Controller, Ottawa. The prices paid in 1943 by the Government and Canadian consumers for approximately 48 per cent manganese ore were $46.00 for Indian ore at Welland and $37.00 per long ton for Gold Coast ore at Canadian ports.

"Prices of chemical grade (battery grade) manganese ores throughout 1943 were $55 per ton for Brazilian or Cuban ores (80 per cent minimum content of MnO_2) in car lots, f.o.b. New York, exclusive of duty. The delivered price in Canadian currency for finely ground battery grade ore, in bags, imported into Canada from Africa or Montana, U.S.A., was $60 to $85 a short ton depending on mesh and origin."

Imports of manganese oxide into Canada during 1943 totalled 102,468,900 pounds valued at $1,445,252 compared with 114,777,700 pounds worth $860,248 in 1942; most of these imports, in both years, originated in the Gold Coast, British India and the United States.

Table 163.—Production (Sales) of Manganese Ore in Canada for Years Specified

Year	Tons	Value	Year	Tons	Value
		$			$
1915	201	9,360	1935	100	800
1916	957	89,544	1936	221	1,596
1917	158	14,836	1937	85	817
1918	440	6,230	1938	...	...
1924	584	4,088	1939	396	3,688
1925–1929	...	...	1940	152	4,315
1930	273	1,356	1941	(x)	(x)
1931	117	2,893	1942	435	8,932
1932–1934	...	...	1943	48	985

(x) 7,500 pounds manganese metal produced at the mine from Nova Scotia manganese ore.

Table 164.—Consumption of Manganiferous Ore and Manganese Compounds in Specified Canadian Industries, 1942 and 1943

Industry	Items	Quantity	Value
			$
1942			
Electrical apparatus and supplies	Manganese dioxide.....pound	5,377,595	202,273
Paints, pigments and varnishes	Manganese Naphthanate.....pound	68,676	8,748
Steel ingots and castings	Ore, manganiferous (foreign).....pound	64,000	1,600
	Spiegeleisen.....short ton	2,711	153,054
	Ferromanganese.....short ton	19,190	2,484,783
	Silicomanganese.....short ton	8,065	918,774
White Metal Alloys	Manganese Metal.....pound	38,267	19,508
1943			
Electrical apparatus and supplies	Manganese dioxide.....pound	6,105,401	215,613
Paints, pigments and varnishes	Manganese Naphthapate.....pound	70,271	12,880
Steel ingots and castings	Ore, manganiferous (foreign).....pound	.....	.....
	Spiegeleisen.....short ton	367	31,474
	Ferromanganese.....short ton	19,086	2,356,754
	Silicomanganese.....short ton	9,568	1,094,239
White Metal Alloys	Manganese Metal.....pound	9,431	4,704

NOTE.—In addition to the consumption recorded in the table above, a considerable quantity of manganiferous ore is employed in the manufacture of ferro-alloys.

MERCURY

Mercury production in Canada during 1943 totalled 1,690,240 pounds valued at $4,559,200 compared with 1,035,914 pounds worth $2,943,807 in 1942. The recovery of the metal in Canada is made entirely from British Columbia ores. In 1943 the Consolidated Mining and Smelting Company of Canada Limited was the largest producer; the output of this company came from its Pinchi Lake property located 15 miles northwest of Fort St. James in the Omineca mining division of British Columbia; the mine was in continuous operation throughout the year. The balance of Canadian production in 1943 originated at the Takla property of Bralorne Mines Ltd.; this mine is also situated in the Omineca mining division approximately 100 air miles north of Fort St. James; development work was conducted during the entire year and production commenced towards the latter part of November.

The following information is taken from a report "Mercury in 1943" prepared by the Bureau of Mines, Ottawa:

"Cinnabar (HgS), the principal ore of mercury, is a heavy mineral (s.g. = 8·1) with a deep cochineal-red colour and scarlet streak, and contains 86 per cent mercury. In Canada the ore occurs in porous rocks such as altered limestones (ankerite), volcanic breccias or greenstones, and green and purple andesitic lavas. The cinnabar often occurs in veins and stringers of calcite or dolomite within these rocks and may be associated with stibnite (antimony sulphide) and accompanied by globules of metallic mercury.

"The only known deposits of cinnabar in Canada are in British Columbia, by far the most important development being that on the northwest side of Pinchi Lake, Omineca Mining Division, about 40 miles north of Vanderhoof station on the Canadian National Railway. The deposit was discovered in the summer of 1937 and was optioned late in 1938 to Consolidated Mining and Smelting Company and production started in June, 1940.

"Prior to the discovery of the Pinchi Lake Deposits little mercury was produced in Canada and the successful operation of the deposits has brought about a complete change in the Canadian situation in respect to the metal. This mine is the largest single producer of mercury on the American continent and its output is far in excess of the domestic requirements. Ore reserves are estimated to be sufficient to assure continuous output at the present rate for several years.

"A number of cinnabar claims have been staked and prospected along the so-called "Pinchi fault", which runs in a northwesterly direction for at least 100 miles from Pinchi Lake. Of chief importance is the Takla property, east of the headwater of Silver Creek, 85 miles northwest of the Pinchi mine. It is being operated by Bralorne Mines, Limited and production from the 100-ton plant was started in November, 1943.

"Canadian and United States cinnabar ores seldom average over 1·0 per cent mercury but at 1943 prices, an 0·30 per cent ore can be produced at a profit. As a rule, the ore is treated by roasting the coarsely crushed material in furnaces, usually rotary kilns, through which air is circulated. The sulphur is oxidized to sulphur dioxide, which escapes into the outside air and the mercury is driven off as vapour and is condensed in cooling chambers.

"World production just prior to the war was estimated to be slightly in excess of 5,500 metric tons a year. For many years Italy and Spain have shared honours as the leading producer and prior to the war they accounted jointly for 75 per cent of the world output, while the United States contributed about 11 per cent. Production from Mexico in 1943 reached a peak and is estimated to have shown a fivefold increase since 1939. The pre-war output from Russia, then the fourth largest producer, was about 300 metric tons a year, being about the same as the output from Mexico in 1939. Czechoslovakia, China, Japan, Chile and Peru are also producers of mercury. The Union of South Africa started production at Monarch Kop in 1940 and its output has increased substantially each year since.

"The New York prices for the iron flask of seventy-six pounds of mercury averaged $75.00 in 1938. The price during most of 1943 was about $196 a flask, but it decreased to $190 in December, to $151.60 in January, 1944, and to $130 in February. Imports of mercury into Canada from the United States are not subject to duty, but are subject to a sales and war tax amounting to eighteen per cent of the value in Canadian funds. The present price of Canadian mercury is largely governed by that of the United States. Canadian imports into the United States are subject to a tariff of twenty-five cents per pound, or $19 a flask, in United States currency.

"Specifications call for a minimum of 99·5 per cent mercury and a maxima of ·03 per cent antimony and 0·1 per cent arsenic.

"Canada is capable of producing at least eight times the amount of mercury required to meet its present needs and stocks are considerable. Output in the United States is sufficient to supply all of its war demands and production from Mexico in 1943 was mainly exported to the United States. Consequently the Metals Reserve Company (United States) cancelled all contracts with producers for purchase of mercury, effective January 31, 1944. Canadian producers now depend upon domestic orders, orders from the British Government, and upon private sales to United States consumers.

"The position of the Allied countries is now so strong that there is no longer an urgent need for a search for new deposits. Only large deposits of ore that can be mined cheaply are of interest as a reserve for the future.

"In Canada about seventy-five per cent of the mercury consumed is used in the medicinal, pharmaceutical, and in heavy chemical industries, particularly in the form of mercury sulphate as a catalyst. The consumption of mercury in Canadian gold mines has decreased owing to wider use of cyanidation and improvements in the recovery of the mercury after amalgamation. Gold mining now uses about seven per cent of the total mercury consumed."

Table 165.—Production of Mercury in Canada

Year	Pounds	$	Year	Pounds	$
1895	5,396	2,343	1939	436	1,226
1896	4,408	1,040	1940	153,830	369,317
1897	684	324	1941	536,304	1,335,627
1924–1927 (x)	380	(x)	1942	1,035,914	2,943,867
1938	760	760	1943	1,690,240	4,559,200

(x) Data from a report issued by Bureau of Mines, Ottawa; value not recorded.

Table 166.—Consumption of Mercury in Specified Canadian Industries, 1939-1943

	1939	1940	1941	1942	1943
			(Pounds)		
Medicinals and pharmaceuticals	20,473	30,246	67,607	78,362	79,786
Heavy chemicals (catalyst)	58,954	30,904	35,319	50,968	72,531
Electrical apparatus	2,161	1,899	25,738	42,313	28,786
Non-ferrous smelters	857	1,636	4,635	1,201	1,838
Petroleum refineries	359	328	920	684	372
Gold mines	6,313	6,000	11,091	10,000	...
Ammunition	...	4,630	8,217	...	...
Other industries	500	...	2,591	1,050	5,752
Total accounted for	**89,617**	**75,643**	**156,118**	**185,178**	**189,065**

MOLYBDENITE

Commercial shipments of molybdenite concentrates in Canada during 1943 were made solely from Quebec and Ontario mines. Production during the year under review totalled 784,715 pounds valued at \$549,515 compared with 227,586 pounds worth \$134,963 in 1942. The output in 1943 came principally from the properties of Indian Molybdenum Limited in the Abitibi region, La Corne mine near Val d'Or, and the Quyon Molybdenum Company at Quyon, Province of Quebec. A small amount of customs ore from Mont Cerf, Quebec and from the Algoma district, Ontario, was treated in the La Corne mill.

A report on "Molybdenum in 1943" as prepared by the Bureau of Mines, Ottawa, contains the following information:

"Molybdenite, the chief ore of molybdenum, is a soft and shiny steel blue-grey sulphide containing 60 per cent of the metal. In Eastern Canada it is usually found in pegmatite dykes or along the contacts of limestone and gneiss, commonly associated with greenish-grey pyroxenites in which other metallic minerals, such as pyrite and pyrrhotite often occur. In northern and western Ontario and in British Columbia, molybdenite usually occurs in quartz veins, intruded into granites, or diorites. It generally occurs in the form of soft, pliable flakes or leaves, but is sometimes semi-amorphous, filling cracks and smearing the rock surface. It can readily be distinguished in the field by the olive grey-green smear it leaves when rubbed on glazed white porcelain or enamel. Graphite, for which it is often mistaken, leaves a grey-black smear.

"During 1941 and 1942 intensive investigation of all possible Canadian sources of molybdenum was necessitated because of the inadequate supply of the metal and the advice from Washington that there would be further curtailing of exports to Canada. As known Canadian deposits could not compete at the market price, the Metals Controller arranged to pay producers 85c per pound of contained sulphide in concentrate containing 80 per cent or more MoS_2. (U.S. market price is 45 cents). Since August, 1943, there has been a marked improvement in the supply as a result of the curtailment in production of certain armaments and of the large use of scrap metal containing molybdenum. Large stocks are on hand in Canada and the United States, consumption has decreased and production is abnormally high. Production from the Dome (Indian Molybdenum) and LaCorne mines in Quebec is more than sufficient to supply Canada's present requirements.

"Present indications are that the Abitibi area in Quebec will continue to be the principal source of production in Canada. The area is about 100 miles from the Ontario boundary and in general extends from Rouyn to Val d'Or. It is probably one of the most favourable localities for the discovery of other workable deposits.

"Owing to the greatly increased demand for molybdenum, there was much development and prospectnig activity in the first half of the year on some of the 400 occurrences and deposits known throughout the Dominion, a few of which are mentioned below.

"In Quebec, Wartime Metals Corporation took over the LaCorne property of the Molybdenite Corporation of Canada in July 1942, and made arrangements for Siscoe Gold Mines, Limited to operate the mine. Production at the 200-ton mill began in May, 1943, and by the end of December, nearly 50,000 tons of ore containing between 0·6 and 0·7 per cent MoS_2 had been treated. The mine is the largest Canadian producer of molybdenite, which occurs as relatively small flake scattered through quartz veins in which white sericite schist is abundant in places.

"In 1942 Dome Exploration Company discovered a large body of disseminated molybdenite apparently of good grade on the southern part of the old St. Maurice Mines property in Preissac township, about 20 air miles northwest of the LaCorne mine. Indian Molybdenum, Limited, the operator, is developing the property by means of a flatly inclined shaft, which extends to a vertical depth of 200 feet. Diamond drilling on the surface had indicated an ore zone about 400 feet long and nearly 40 feet wide, averaging about 0·9 per cent MoS_2, but development has shown that the grade is less than 0·5 per cent. The molybdenite is similar to the LaCorne ore; it occurs in a quartzose-sericite zone dipping about 50° northeast and is bounded by faults between red and grey muscovite and biotite granites. At the end of May 1944, the mill was operating near its capacity rate of 500 tons of ore daily and was producing a concentrate containing about 90 per cent MoS_2. The Company has a contract with the Dominion Government to deliver 2,000,000 pounds of contained molybdenum sulphide in concentrate by the end of 1944.

"About 35 miles northwest of Ottawa, Quyon Molybdenite Company, the second largest Canadian shipper of molybdenite, treated close to 150 tons of ore a day of an average grade of 0·25 per cent MoS_2. The concentrate produced is converted to molybdic oxide in a small roasting plant on the property, and is then briquetted and shipped to steel manufacturers in Canada. During the last war this mine was the world's largest producer of molybdenum and it contributed nearly 80 per cent of Canada's output before 1939. Extensive diamond drilling by the Dominion Government in 1942 indicated considerable reserves of low-grade ore. The company had a contract with the Dominion Government to produce a total of 100 tons of contained molybdenum in the oxide. The contract was fulfilled early in May, 1944. Vic-Ore Molybdenite Company which operates the old Bain mine in Masham township, 12 air miles northeast of the Quyon mine, increased the capacity of its pilot mill from the former rate of 10 tons a day to 50 tons a day and erected more buildings on the property.

"Farley Mining Company continued work on the LaFleur deposit in Egan township near Mont Cerf, 15 miles north of Maniwaki, for a few months. It shipped 76 tons of 1·15 per cent ore to the Zenith mine near Renfrew, Ontario, in the fall of 1942, and in March, 1943, a few tons of high-grade cobbed ore to the LaCorne mill; that shipped to the Zenith mine was re-cobbed and shipped to LaCorne for treatment.

"Cremar Molly Mines, Limited did considerable diamond drilling in Gaudette township, near Searchmont, Algoma district. Fairly good ore was found on the surface, but very little was found at depth by drilling. The Company shipped a car lot of ore to the LaCorne mill. About 75 miles northeast, Deep Lake Gold Mines, Limited, Akron, Ohio, prospected the Peters-Quilty showings west of Limer station. Wartime Metals Corporation discontinued its operations at the Zenith mine southwest of Renfrew, early in 1943, as the deposit proved too low grade. The Company shipped a car lot to the LaCorne mill in March 1943. Some prospecting was also done in the Tory Hill property near Wilberforce.

"Molybdenite concentrate is converted into an addition agent that is introduced into steel as molybdenum trioxide, ferromolybdenum, or calcium molybdate. The oxide is moulded into briquettes and 81 per cent of the Canadian consumption of molybdenum in 1943 was in this form and 17 per cent in the form of ferromolybdenum. There are nearly 50 users of molybdenum in Canada, but 94 per cent of the total consumption is by five steel manufacturers. Consumption in 1943, exclusive of scrap, was about 600 short tons compared with 72 tons in 19[illegible].

"Molybdenum has a widening range of uses, but by far the greater part of the output is used in steel to intensify the effects of other alloying metals, particularly nickel, chromium, and vanadium. These steels usually contain from 0·15 to 0·4 per cent molybdenum but in some instances the percentage is considerably higher.

"In Canada throughout 1943 the Metals Controller contracted to purchase all domestic molybdenum products of marketable grade at a bonus price of not less than 85 cents per pound of contained sulphide in concentrates or $1.75 per pound of contained molybdenum in the trioxide, f.o.b. Ottawa. After December 31, 1943, owing to changed conditions, no more contarcts were given. New producers will have to sell in the open market at the normal price which is about 50 cents (Canadian funds). Canadian ore and concentrate shipped to the United States is subject to a duty of 17½ cents a pound of contained molybdenum.

"The price per pound of contained molybdenum, f.o.b. Toronto in Canadian funds for the following imported compounds is approximately: Calcined molybdate (42% Mo), 98 cents; ferromolybdenum (60% Mo), \$1.15; and molybdic oxide (52% Mo), 98 cents. The calcium molybdate is sold in bags of about 12½ pounds containing exactly 5 pounds of molybdenum. The molybdic oxide briquettes weigh five pounds each and contain 2½ pounds of molybdenum.

"United States specifications for concentrate dried at 212°F. are: MoS_2, minimum 85 per cent; copper, maximum 0·6 per cent; iron, maximum 3·0 per cent; combined phosphorus, antimony and tin, maxima 0·2 per cent.

"Prior to the war, 91 per cent of the world production, estimated at 16,500 tons of metallic molybdenum, came from the United States. Climax Molybdenum Company, at Climax, Colorado, the world's largest producer, is treating daily 18,000 tons or more of ore containing about 0·5 per cent MoS_2 and probably contributes 70 per cent of United States total. The remainder is obtained as a by-product of some large copper producers in Utah, New Mexico, and Arizona. The molybdenum Corporation of America near Questa, New Mexico, is the only Company except Climax, that produces molybdenite solely for the recovery of molybdenum. The Molybdenum Corporation is also developing the Urad mine, Colorado, for the United States Government and production is expected to start in the summer of 1944.

"Production from Cananea, Mexico, is estimated at the equivalent of 850 tons of the metal a year; and a slightly smaller production is obtained as a by-product from the Braden Copper Mine at Sewell, Chile. Prior to the war, the Knaben mine in Norway was the largest producer outside the American continent, its output in 1940 being 500 short tons. Other producing countries were Peru, French Morocco, Korea, Greece, Turkey, Yugoslavia, Australia, and recently Manchuria."

Table 167.—Production of Molybdenite in Canada, 1902-1943

Year	Ores milled	Ores and concentrates shipped or used		Total MoS_2 content of shipments
	Tons	Tons	Value (a)	Pounds
			\$	
1902	(c) 3	3·3	400	(b)
1903	(c) 600	85·0	1,275	(b)
1904-1913	....	....	....	....
1914	(c) 166	16·5	2,063	3,814
1915	216	39·0	28,920	29,210
1916	9,100	610·0	188,316	156,461
1917	22,605	1,554·3	320,006	330,316
1918	33,935	461·3	428,807	378,482
1919	6,783	46·0	69,203	83,002
1920-1923	....	....	....	....
1924	668	10·0	9,370	18,739
1925	2,779	15·3	11,176	22,350
1926	4,490	12·6	10,472	20,943
1927	....	....	....	....
1928	....	....	....	....
1929	2,900	9·5	6,400	16,150
1930	....	....	....	....
1931	12	0·61	280	1,222
1932-1936	....	....	....	....
1937	5,307	8·25	8,147	(b)
1938	(b)	0·5	4,500	(b)
1939	1,492	1·3	816	(b)
1940	3,936	11·1	10,280	(b)
1941	28,100	98·3	88,470	173,991
1942	39,708	113·7	134,963	158,780
1943	120,576	392·4	549,515	653,200

(a) Value as given by the operators 1902 to 1939; 1940–1943 value estimated using market or Government prices.

(b) Not known.

(c) Mined.

Imports into Canada of calcium molybdate for the manufacture of steel totalled 1,144,455 pounds worth \$957,159 in 1943 compared with 1,453,769 pounds worth \$1,119,531 in 1942.

Table 168.—Molybdenite Mining in Canada, 1943

—		Quebec	Ontario	British Columbia	Canada
Active firms	No.	(a) 9	(b) 2	1	**12**
Capital	$	3,666,753	6,060	(d)	**3,672,813**
Employees—On salary	No.	32	5	1	**38**
Wage-earners	No.	202	17	2	**221**
Total	No.	234	22	3	**259**
Salaries and wages—Salaries	$	73,027	9,009	283	**82,319**
Wages	$	378,180	13,830	2,942	**394,952**
Total	$	451,207	22,839	3,225	**477,271**
Gross value of production	$	549,515	(c)	....	**549,515**
Fuel and electricity used	$	70,516	3,445	....	**73,961**
Process supplies used	$	76,103	3,420	1,549	**81,072**
Freight and treatment charges	$	3,118	235	....	**3,353**
Net value of production	$	399,778	(c)	....	**391,219**

(a) 3 Producing.
(b) 2 Producing.
(c) Production credited to 1944 as ore not milled in 1943.
(d) Data not available.

MONAZITE

Monazite is the principal source from which are produced thorium, cerium and other rare earth oxides. No commercial production of monazite in Canada has ever been officially reported. The Bureau of Mines, Ottawa, reports that there are a few occurrences in Nova Scotia, Quebec and British Columbia; none of which are of commercial importance; it is usually found as small crystals in granites and pegmatites in the Canadian shield and small quantities occur in association with the black sands of the Quesnel River, British Columbia. The United States Bureau of Mines states that the beach deposits of black sands in Travancore in British India, along the coasts of Espirito Santo, Rio de Janeiro and Bahia in Brazil, and in Netherlands Indies have supplied the bulk of United States monazite requirements in the past, as a by product in the recovery of ilmenite, rutile and zircon sands. Formerly, the only commercial constituent of monazite was thoria, which was used for gas mantles, and monazite is still marketed upon the basis of its thoria content, although commercial interest now centres on its content of ceria and other rare earth oxides; probably 50 per cent of monazite derivatives are consumed (chiefly as fluorides) in the cores of arc carbons to increase lighting intensity in motion picture projectors, therapeutic lamps and searchlights, in about that order. Pyrophoric alloys for use in sparking flints take about 25 per cent of the monazite consumed and the remainder is distributed among a large variety of specialty uses, principally optical glassware.

Cerium products are produced from cerium chloride in Canada at Shawinigan Falls, Quebec, by Shawinigan Chemicals Limited; sparking flints are manufactured in Montreal, Quebec by Cerium Company Limited.

Monazite was quoted by "E & M J Markets", New York, August, 1944, at $60 per ton minimum, 8 per cent thoria.

Complete data relating to world production of monazite are not at present available and imports of monazite, described, as such are not shown separately in Canadian trade reports. Imports of salts or bases of thorium in 1943 were valued at $11,187 compared with $15,587 in 1942.

PITCHBLENDE

Pitchblende, the ore from which radium and uranium products are made, is mined in Canada only in the Great Bear district of the Northwest Territories. The only company to officially report the mining and treatment of pitchblende ore in 1943 was the Eldorado Mining & Refining Company Ltd. Both the mine and mill of the company located at Port Radium, were operated continuously throughout 1943 and a considerable tonnage of pitchblende concentrates were shipped to the Eldorado radium refinery situated at Port Hope, Ontario. In January, 1944 a new company, Eldorado Mining & Refining, was formed, as a Crown company, owned by the Dominion of Canada, to take over all assets of the old company. Data relating to the production of pitchblende products in Canada have not been available for publication since 1940.

In 1942 the radium-uranium property of Bear Exploration and Radium Limited, located at Contact Lake, Great Bear Lake district of the Northwest Territories, was acquired by the International Uranium Mining Company Limited; it was reported that a geological survey of the property was being made in 1944, and also that exploration of the deposit by diamond drilling had commenced.

A report prepared by the Bureau of Mines, Ottawa, states:

"Most of the world production of radium and uranium ores has come from the Belgian Congo, Canada, and the United States. The American material consists mainly of low-uranium carnotite, found mainly in Colorado and Utah, and now mined chiefly for its vanadium content, the present recovery of uranium and radium being small. Ores of the Belgian Congo are mainly a complex assemblage of secondary uranium minerals resulting from the weathering of original pitchblende. The remainder of the world production has come mostly from Czechoslovakia, Portugal, England, Australia, and Russia, but the deposits in most of these countries are small and low-grade and are of minor importance at present."

"E and M. J. Metal Markets", New York, quoted radium at $25 to $30 per Mg of radium content, depending on quantity; August, 1944.

Table 169.—Canadian Refinery Production of Pitchblende Products

Year	$	Year	$
1933(b)	247,900	1938	1,045,458
1934	159,400	1939	1,121,553
1935	413,700	1940	410,176
1936	605,500	1941-1943	(a)
1937	876,540		

(a) Not available for publication.
(b) First production.

SELENIUM

Production of selenium in the Dominion during 1943 totalled 374,013 pounds valued at $654,523 compared with 495,369 pounds worth $951,108 in 1942. Of the 1943 output, 216,498 pounds were obtained from Quebec ores, 82,000 pounds from Ontario, 5,239 pounds from Manitoba and 70,276 pounds from Saskatchewan. The element is recovered as a by-product in Canada in the treatment of copper refinery residues by the International Nickel Company of Canada Limited at Copper Cliff, Ontario, and at Montreal East, Quebec, by Canadian Copper Refiners Limited.

According to the Bureau of Mines, Ottawa, world production of selenium is believed to approximate 600 to 700 short tons a year, the United States and Canada being the principal sources of supply. Small quantities are produced by several countries, including Russia, Rhodesia, and Mexico. It is reported that selenium is being recovered from the copper-gold-arsenical ores of the Boliden mine, Sweden.

Selenium is used chiefly in the glass and pottery industries as a coloring agent (as in ruby glass) and to neutralize the effect of objectionable oxides. A large amount of selenium is used for controlling the colour of glass, especially in the production of pink or ruby glass. It is used in the photo-electric cell, or electric eye, which has many industrial applications, and in alloying stainless steel for screw and bolt stock, where it develops improved cutting and threading qualities. It is employed to improve the machinability of copper and copper alloys. Selenium and tellurium are used in the free machining of copper alloys where they offer certain advantages in lead and sulphur. Selenium has a large potential market in certain rubber compounding industries and is being used for the vulcanizing and fireproofing of switchboard cables and to increase the resistance of rubber to abrasion, research for such uses being still under way.

It is used in the manufacture of certain kinds of paint and of certain dyes. As selenium oxychloride, it is a powerful solvent of many substances. Rapid progress is also being made in the production of high-quality selenium rectifiers, which require large quantities of selenium.

Selenium is marketed as a black to steel-gray amorphous powder, but cakes and sticks are also obtainable. Among the other products marketed are ferro-selenium, sodium selenite selenious acid, and selenium dioxide.

Since August, 1938, the nominal price for selenium, black powdered, 99·5 per cent pure at New York has been $1.75 a pound. The Glass Industry periodical gives the following quotations for selenium salts in 1943: barium selenite, $1.40 to $1.60 a pound, and sodium selenite, $1.50 to $1.65 a pound.

Consumption of selenium in the manufacture of glass in Canada during 1943 was estimated at 1,687 pounds compared with 3,647 pounds in 1942.

General statistics on employment, etc., as relating to the production of both selenium and tellurium are included with those compiled for the Canadian non-ferrous smelting and refining industry.

Table 170.—Production of Selenium in Canada, 1931-1943

Year	Pounds	$	Year	Pounds	$
1931(x)	12,500	40,850	1938	358,929	622,742
1932	.....	.....	1939	150,771	266,714
1933	48,221	70,345	1940	179,860	343,533
1934	104,924	171,311	1941	406,930	777,236
1935	366,425	703,536	1942	495,369	951,108
1936	350,857	621,017	1943	374,013	654,523
1937	397,227	687,203			

(x) First commercial production in Canada.

TANTALUM-COLUMBIUM

Canada produces no tantalite or columbite and according to the Bureau of Mines, Ottawa, the known Canadian occurrences of these minerals are scarce and of undetermined economic interest. The minerals tantalite and columbite are the tantalate and columbate, respectively of iron and manganese, with the general formula (Fe, Mn) $(Ta, Cb)_2O_6$. They grade one into the other according as whether tantalum or columbium predominates. Both tantalite and columbite are of increasing importance in the war effort and tantalite has been placed in the group of "strategic" minerals having the highest priority rating. The occurrence of all tantalum-columbian minerals is restricted to granite-pegmatites, or to residual or alluvial deposits derived from such rock. The chief world sources of tantalite proper have been Western Australia, Belgian Congo, Southern Rhodesia, Uganda, United States and Brazil. The supply of columbite has come mainly from Nigeria, Belgian Congo, Southwest Africa, Argentina and Brazil. The annual world output of tantalite-columbite is small and complete data on same are not available at present. Tantalum metal is highly resistant to corrosion and possesses remarkable conductivity for heat; one of its important uses is in equipment, such as stills, condensers, tubes and heaters in chemical plants and laboratories; it is being used to an increasing extent in the field of electronics. Columbium is employed chiefly as an alloying component in various special-purpose steels, and also in copper, aluminum and other metals

There are no users of tantalum or columbium ores in Canada, the chief world market being in the United States. The principal American consumer-buyer of tantalite is Fansteel Metallurgical Corporation, North Chicago, Illinois, and of columbite, Electro-Metallurgical Company, 30 East 42nd Street, New York City. These companies have been pioneers in the fields of industrial applications for tantalum and columbium metals, alloys, and products, respectively, and are the leading companies engaged in treating the ores.

Under the latest purchasing schedule, of May, 1943, the following provisions were made for the two classes of ore by the Metals Reserve Company in the United States:

Tantalite: Minimum tantalum oxide content, 40 per cent, with maximum tin oxide content 3 per cent, and maximum titanium oxide 3 per cent. For small lots of 100 to 200 pounds, the material must consist of clean tantalite crystals. The price for 40 per cent ore was set at $1.75 per pound of contained tantalum oxide, rising by increments of 5 cents per pound to $3.25 to 70 per cent ore, with no payment made for contained columbium oxide.

Columbite: Minimum columbium oxide content, 50 per cent, with maximum tin oxide content 5 per cent, and maximum titanium oxide 7·5 per cent. The material must be in the form of clean crystals. The price for small lots of 100 to 500 pounds was set at 25 cents per pound of ore, and for larger lots at 50 cents per pound of contained columbium oxide, with no payment for contained tantalum oxide.

Tantalum metal prices in 1943 were $160.60 a kilogram for C.P. rod, and $143 for sheet, with discounts on volume business. Columbium metal was quoted at $560 a kilogram for rod, and $500 for sheet. Ferro-Columbium, 50 to 55 per cent, sold for $2.25 per pound of contained columbium.

(NOTE: Additional information on the occurrence and distinguishing characteristics of tantalite and columbite, is contained in the Prospectors Guide, Third Edition, issued by the Mines and Geology Branch, Ottawa, in 1943.)

TELLURIUM

Canadian production of tellurium, as with selenium, represents the recovery of metal as a by product in the refining of converter copper at Copper Cliff, Ontario, by the International Nickel Company of Canada Limited, and of blister and anode copper at Montreal East, Quebec, by Canadian Copper Refiners Limited. The Canadian output in 1943 totalled 8,600 pounds valued at $15,050 compared with 11,084 pounds worth $17,735 in 1942. The 1943 production originated solely in the nickel-copper ores of the Sudbury district, Ontario; in addition to its recovery from these same ores, the metal was obtained in 1942 in the refining of blister copper produced by the Hudson Bay Mining and Smelting Company from the Flin Flon mine ores of Manitoba and Saskatchewan.

According to the Bureau of Mines, Ottawa, the world production is estimated at 150 short tons a year, or about double the pre-war figure, and Canada and the United States appear to be the main sources of supply.

Metallic tellurium, until quite recently, was of little industrial importance. Formerly it was used to a small extent in some radio work and also in the photographic arts and for blackening art-silverware. Small quantities are used as a colouring agent in the ceramic industry. When alloyed with lead, the tensile strength and toughness of the lead is increased greatly. Lead alloys containing from 0·1 to 0·5 per cent tellurium have been in use for some time in applications requiring resistance to vibration and corrosion. The use of small quantities of tellurium as a substitute for tin in the lead used for sheathing electric wire cables is reported to improve the resistance of the cables to heat and corrosion. It has also been used for improving the machining qualities of certain steels. Very finely powdered tellurium is used as rubber-compounding material. Its presence is stated to shorten the time of curing and to greatly improve the resisting qualities of the product. A new use for tellurium is as a carbon stabilizer in cast iron, when it is used in the form of a ferrotellurium.

A nominal price for tellurium of $1.75 per pound at New York prevailed throughout 1943.

Table 171.—Production of Tellurium in Canada, 1934-1943

Year	Pounds	$	Year	Pounds	$
1934 (x)	5,130	25,599	1939	2,940	4,769
1935	16,425	32,850	1940	3,491	5,607
1936	35,591	62,997	1941	11,453	18,394
1937	41,490	71,777	1942	11,084	17,735
1938	48,237	82,967	1943	8,600	15,050

(x) First commercial production in Canada.

In 1943 Canadian steel foundries consumed 135 pounds of tellurium compared with 50 pounds in 1942. White metal foundries used 453 pounds in 1943 against 612 pounds in 1942.

TIN

The following information has been supplied by the Bureau of Mines, Ottawa:

"Tin is widely distributed, but in only a few countries are the deposits sufficiently large for commercial development. Cassiterite (SnO_2) is the only important ore of tin and in the pure state it contains 78·6 per cent of the metal. Stannite, a sulphide of copper, iron, and tin, has little importance as an ore. In British Columbia, stannite is present in the ore of the Snowflake property, near Revelstoke, and cassiterite and stannite have been noted at several other places in the province. The small cassiterite content of the silver-lead-zinc ore of the Sullivan mine, at Kimberley now being recovered from the zinc tailing, is the source of Canada's production of tin. Cassiterite occurs also in many other places in Canada, but no commercial deposits have so far been found. In the unglaciated parts of Yukon, stream tin has been found in small quantities, but no serious attempt seems to have been made to test the gravels thoroughly for tin. During the past few years it has become apparent that many creeks in the Mayo district carried some crystalline cassiterite in their gold placers. Some evidence has been gathered showing the likelihood of there being some 200 to 300 tons of tin available as cassiterite in the placers of Dublin Gulch and Haggart Creek. In August, 1943, a lode source of this tin was found on the north side of Dublin Gulch assaying from ¾ to 1½ per cent in tin across an approximate width of three feet.

"The tin concentration plant of Consolidated Mining and Smelting Company at Kimberley commenced operation on March 1st, 1941, and has been functioning very satisfactorily. The plant for the production of refined tin was in commercial operation in April, 1942. The tin content of the ore is small and the recovery is proportionately small.

"The tin produced at Kimberley, British Columbia, and the small domestic recovery of secondary tin are far from sufficient to meet the Canadian requirements, which in peacetime amounted to about 3,000 tons a year, and are now much larger. They were obtained mostly from smelters in the Straits Settlements. The position of the allied countries in respect to tin became critical with the capture by Japan of these smelters and of the Malayan tin mines, and the civilian use of the metal has been greatly curtailed. The search for commercial deposits of tin in Canada was continued and some occurrences of possible economic interest were found by a Geological Survey party in the Yellowknife area, Northwest Territories. Elsewhere, the results were not encouraging.

"The prices of tin in New York were fixed in August, 1941 at 52 cents a pound and remained at that level to the end of the year and throughout 1942 and 1943."

In July, 1944 "E & M J Metal and Mineral Markets", New York, reported that the tin producers maintain that they performed a genuine economic service throughout international tin control, and hope to continue with the plan, perhaps in some modified form, in the post-war period. In reviewing tin control, the International Tin Committee holds that its inter-governmental scheme should merit the attention of economic experts of the United Nations, because the advantages of stabilizing prices of primary commodities are now generally acknowledged, and the issue may have to be decided very soon.

Total commercial production of tin from Canadian ores was as follows:—1941, 64,744 pounds valued at $33,667; 1942, 1,237,863 pounds valued at $643,689 and 1943, 776,937 pounds valued at $450,623.

Table 172.—Consumption of Tin in Canada by Industries, 1939-1943

—	1939	1940	1941	1942	1943
			(short tons)		
Brass and bronze foundries	129	277	437	217	357
White metal foundries	1,640	2,087	3,141	1,530	1,106
Steel foundries (chiefly for tin plate)	810	1,207	2,346	1,428	1,148
Iron foundries	52	84	224	40	88
Galvanizing plants	...	90	50	226	28
Jewellery and silverware plants	45	64	146	15	...
Electrical apparatus plants	34	43	56	6	42
Miscellaneous industries	77	16	36	30	10
Total accounted for	**2,787**	**3,868**	**6,436**	**3,501**	**2,779**

Production of secondary tin in Canadian plants in 1943 was estimated at 16,560 pounds compared with 64,511 pounds in 1942.

Table 173.—Imports Into Canada and Exports of Tin and Tin Products, 1942 and 1943

Item	1942		1943	
	Pounds	$	Pounds	$
IMPORTS				
Tin in blocks, pigs or bars	7,205,100	4,166,714	2,631,100	1,504,438
Tinfoil	337,691	53,366	829,394	106,174
Collapsible tubes	.....	63,600	.....	155,722
Tin bichloride and tin crystals	38,589	15,572	11,054	5,031
Oxide of tin and copper	129,713	36,427	142,086	30,274
Phosphor tin and phosphor bronze in blocks, bars, plates, etc.	711,305	329,039	708,624	321,408
Tin plate food containers	.....	426,209	.....	258,084
Tin plate containers, n.o.p.	.....	445,485	.....	84,721
Sheets, tin and lead coated	31,258,700	1,409,024	20,230,500	877,44[illegible]
Manufactures of tin plate painted, etc., manufactures of tin, n.o.p.	.....	703,298	.....	498,633
Kitchen or dairy holloware of iron or steel coated with tin	.....	149,567	.....	82,892
Arseniate, binarseniate and stannate of soda	96,450	28,986	83,329	18,712
Tin plate scrap	1,754,000	15,813	2,354,000	21,285
Tin plate, n.o.p.	.....	.....	64,485,400	3,679,160
EXPORTS				
Tinware	.....	21,805	.....	10,236
Tin plate scrap	38,799,000	222,573	26,799,600	135,557

TITANIUM

Commercial shipments of titanium ore from Canadian mines totalled 69,437 short tons valued at $308,290 in 1943 compared with 10,031 tons worth $50,906 in 1942. Production during both of these years came from deposits located at St. Urbain, Charlevoix county, Province of Quebec.

The following information is from a report prepared by the Bureau of Mines, Ottawa:

"All known occurrences of titanium in Canada of any possible economic interest are in the provinces of Quebec and Ontario.

"Ilmenite or titanic iron ($FeTiO_3$) in commercial quantities and carrying from 18 to 25 per cent of titanium is found at St. Urbain in Charlevoix county, and at Ivry in Terrebonne county, Quebec. Rutile (TiO_2), which usually contains 54 to 59 per cent titanium, is found mixed with the ilmenite in parts of one of the St. Urbain occurrences and in sufficient quantities to make it of possible importance for the rutile alone, this being the only known workable deposit of rutile in Canada. Titaniferous magnetite deposits (magnetite carrying 3 to 15 per cent titanium) occur on the Saguenay River, near Lake St. John, and at Bay of Seven Islands, both in Quebec, and on the shores of Seine Bay and Bad Vermilion Lake in western Ontario.

"A few thousand tons of ilmenite is shipped annually from the St. Urbain deposits, part of it to Niagara Falls, New York, presumably for use in the manufacture of ferrotitanium, and part of it to plants of the General Electric Company in the United States. No shipments from the Ivry deposits have been reported for several years.

"The world production of titanium ore is estimated at about 260,000 tons of ilmenite, which would yield 115,000 tons of titanium pigment, and 3,000 tons of rutile. India is the principal producer of ilmenite, the other producers being Norway, Malaya, Portugal, Australia, United States, and Canada. Brazil is the principal producer of rutile, and Norway is second in importance.

"The United States has become virtually self-sufficient in supplies of ilmenite with the completion of the plan to exploit the Adirondack titaniferous iron ores.

"Commercial uses for titanium in recent years have continued to increase independently of the trend of general business. Ilmenite continues to be used chiefly in the manufacture of white pigment, and it is used to a smaller extent for making ferro-alloys. In metallurgy, titanium is not only an effective deoxidizer and cleansing agent, but also an alloying element. By addition of titanium, chrome-nickel steels are made more resistant to corrosion and chrome-molybdenum steels become easier to weld."

"E and M J Metal and Mineral Markets", New York, August 1944, quotations for titanium ore were: Per gross ton, ilmenite, 60 per cent TiO_2, f.o.b. Atlantic seaboard, \$28 to \$30, according to grade and impurities; quotations nominal. Rutile, per pound, guaranteed minimum 94 per cent concentrate 8 to 10 cents, nominal.

Table 174.—Production of Titanium Ore in Canada(x), 1927-1943

Year	Short ton	$	Year	Short ton	$
1927	2,029	8,980	1936	2,566	18,318
1928	2,241	6,732	1937	4,229	26,432
1929	2,748	7,359	1938	207	1,449
1930	412	1,239	1939	3,694	21,267
1931	1,509	10,261	1940	4,535	24,510
1932	.....	.....	1941	12,651	49,110
1933	.....	.....	1942	10,031	50,906
1934	2,023	14,161	1943	69,437	308,290
1935	2,288	16,400			

(x) All from Quebec.

Table 175.—Consumption of Titanium Pigments in Canadian Paint Industry, 1931-1943

Year	Pounds	Cost at works	Year	Pounds	Cost at works
		$			$
1931	745,207	89,761	1937 (x)	3,748,341	362,869
1932	691,304	96,759	1938 (x)	3,903,337	378,548
1933	1,061,249	128,969	1939 (x)	5,088,234	494,914
1934	1,710,188	186,678	1940 (x)	6,138,760	616,360
1935	2,513,026	261,506	1941 (x)	8,971,865	1,004,591
1936 (x)	2,456,265	269,130	1942 (x)	7,034,376	578,894
			1943 (x)	9,558,617	769,909

(x) In 1936 includes 1,396,337 pounds of pure titanium white valued at \$193,638. In 1937 the quantity of pure titanium white totalled 1,299,857 pounds valued at \$193,107; in 1938, 1,341,359 pounds at \$200,552; in 1939, 1,855,288 pounds worth \$275,103; in 1940, 2,297,248 pounds valued at \$344,945; in 1941, 3,076,490 pounds worth \$560,621; in 1942, 4,168,097 pounds worth \$820,990, and in 1943, 4,436,382 pounds worth \$811,086.

In 1939 there were 118 tons of ferrotitanium valued at \$23,498 consumed in the manufacture of steel in Canada; in 1940, 118 tons worth \$24,233; in 1941, 181 tons valued at \$52,128 in 1942, 439 tons worth \$66,555 and in 1943, 614 tons valued at \$118,416.

TUNGSTEN

Shipments of tungsten ore concentrates from Canadian mills during 1943 totalled 1,508,621 pounds valued at \$1,083,538 compared with 520,981 pounds worth \$406,275 in 1942. The WO_3 content of the 1943 shipments totalled 817,763 pounds or an average of 54·2 per cent of the total production from all sources. Of the 1943 output of tungsten concentrates, 19,374 pounds came from mineral deposits located in Nova Scotia, 5,401 pounds from Quebec, 494,405 pounds from Ontario, 16 pounds from Manitoba, 976,622 pounds from British Columbia, 720 pounds from the Northwest Territories and 12,083 pounds from Yukon.

The following information is from a report "Tungsten in 1943" as prepared by the Bureau of Mines, Ottawa:

"Wolframite, (Fe,Mn) WO_4, is the principal ore of tungsten, the next in importance being scheelite, ($CaOW_4$), a calcium tungstate. The former is a dark brown to black heavy mineral, which contains 76·4 per cent WO_3 (tungstic oxide) when pure, and is not common in Canada. Scheelite, the chief Canadian ore of tungsten, is a heavy, fairly soft, usually buff, but sometimes white mineral with a dull lustre, which contains 80·6 per cent WO_3 when pure. It is commonly associated with quartz and frequently occurs in gold-bearing veins and in certain contact metamorphic deposits. It can be detected readily (in the dark) by its brilliant pale bluish-white fluorescence under Ultra-violet light and purple filter. Prospectors' ultra-violet lamps for this purpose are not made in Canada, but may be imported duty free from the United States. Information on these lamps may be obtained from the Bureau of Mines, Ottawa, or from the Provincial Departments of Mines. As a result of the marked improvement in the supply situation in 1943, Canadian requirements of tungsten are no longer difficult to obtain.

"Consolidated Mining and Smelting Company's Red Rose property in British Columbia, and Hollinger Consolidated Gold Mines Limited, Timmins, Ontario, contributed about 61 and 30 per cent respectively of the total WO_3 content of the shipments. About five per cent of the total was shipped by Little Long Lac Gold Mines, east of Lake Nipigon, Ontario, and Bralorne Gold Mines, Bridge River area, British Columbia. The remainder came from a number of shippers who sent their crude ore to the Bureau of Mines, Ottawa, or to Val d'Or, Quebec, for treatment. The figure for total shipments in 1943 does not include a production of approximately 135 tons of WO_3 in concentrate from the Emerald property in southern British Columbia, which was stockpiled. The property was operating during the two months ended September 30th, on which date it was closed down.

"Approximately 390 tons of tungsten metal (contained in addition agents, powders, wire, rod, etc.) were consumed in Canada in 1943. Three car lots of scheelite containing close to 43 tons of tungsten were imported from Mexico. Exports consisted of 254 tons of low-grade concentrates (containing 37 tons of WO_3) that were shipped to the United States for special treatment, chiefly to Salt Lake City.

"Atlas Steel Company, Welland, Ontario, is the only Canadian consumer of concentrate, but it takes scheelite concentrate only.

"World production of tungsten ore and concentrate in 1939, on a basis of 60 per cent WO_3, was about 40,000 metric tons, the principal producers being China, Burma, United States, Bolivia, Malaya, Portugal, Korea, Japanese controlled areas in south China, Australia, and Argentina.

"China was the chief source of tungsten for 20 years prior to 1939, the record production being 16,257 metric tons of 60 per cent WO_3 in 1937. In 1941, however, only 9,000 tons were produced. About 95 per cent of the output has come from Kiangsi, Hunan, and Kwangtung provinces, about 70 per cent being from the Nanling region in Kiangsi province. The ore mainly occurs as wolframite. Most of the mines in Kiangsi are still under Chinese control.

"During 1943 custom ores and crude concentrates were treated by the Bureau of Mines, Ottawa; by the Quebec Department of Mines Plant, Val d'Or, Quebec; and by the War Metals Research Board, University of British Columbia, Vancouver. Ores are no longer being treated in the above plants, except by special arrangement.

"Tungsten ores are concentrated to 60 per cent or higher of tungsten trioxide (WO_3). For adding to steel, the ore is generally converted into ferro-tungsten, but sometimes into tungsten oxide, calcium tungstate, or tungsten powder. Canada has no plants for the manufacture of ferro-tungsten or other tungsten addition agents and the only company making tungsten steels is Atlas Steels, Welland, Ontario. Only scheelite is used by the Company at present and the high-grade concentrate (not less than 70 per cent WO_3) is added directly to the steel bath. This is possible because of the comparative ease with which the calcium forms a slag.

"Consumption of tungsten is largely dependent upon production of high speed alloy steels, but this production has declined considerably owing to the accumulation of stocks of bars and billets and to changes in the military program. As a result of this and because of the large supply of ferro-tungsten, concentrates, and scrap on hand, the Metals Controller, before the end of 1943, instructed all producers to discontinue their operations and to immediately ship the material on hand. He also gave notice that no new contracts to purchase would be made.

"The purchase price in the United States of domestic concentrate during 1943 was \$30 per short ton unit (20 pounds) of contained WO_3 in the standard concentrate, less freight and penalties below 60 per cent WO_3 and above impurities specifications. This price is to remain until April 30, 1944, and will then be \$24 a unit until June 30, 1944. Duty into the United States is 50 cents per pound of contained tungsten metal, but there is no duty on Canadian low-grade concentrates shipped for treatment. The United States price of 75 to 80 per cent ferro-tungsten is \$1.90 per pound of contained tungsten metal. The price of tungsten metal of 99 per cent purity is \$2.50 to \$2.75 a pound; and of 99·7 per cent purity, \$5.40 a pound.

"The price in Canada of scheelite concentrate containing 70 per cent WO_3 (within specifications) was \$26.50 a short unit of WO_3, delivered at Welland, Ontario, this being equivalent to about \$1,855 a short ton of 70 per cent concentrate, delivered. All sales of Canadian concentrate were made through the Metals Controller, Ottawa.".

Table 176.—Production (Commercial Shipments) of Crude Tungsten Concentrates in Canada

Year	Pounds	$	Average per cent WO_3
1912	28,000	(a)	72
1917	580	234	69·41
1918	(c) 27,000	11,700	73·8
1939	8,825	4,917	(a)
1940	12,002	7,303	70–75
1941	(b) 82,846	38,712	51·1
1942	520,981	406,275	61·8
1943	1,508,621	1,083,538	54·2

(a) Not recorded.
(b) Includes export of considerable low-grade material to U.S.A.
(c) Included 11 tons produced at Burnt Hill, N.B., with smaller shipments from Yukon, Nova Scotia and Manitoba.

Table 177.—Tungsten Consumed in Specified Industries, 1938-1943

Year	Tungsten wire used in manufacture of Canadian electrical apparatus and supplies	Ferro-tungsten consumed in Canada in the manufacture of steel (x)		Tungsten metal consumed in Canada in the manufacture of steel and alloys (x)
	Value	Long tons	Value	Pounds
	$		$	
1938	50,594	30	69,806	....
1939	52,207	95	173,250	13,089
1940	62,175	336	829,859	15,474
1941	82,606	482	1,003,314	29,729
1942	129,265	577	1,440,141	36,882
1943	93,862	491	1,721,967	23,000

(x) Other than tungsten-chromium.

Table 178.—Tungsten Mining in Canada, 1942 and 1943

—		1942 *			1943 *		
		British Columbia	Other provinces	**Canada**	British Columbia (a)	Other provinces	**Canada**
Active firms	No.	7	(†) 8	**15**	6	....	**6**
Ore mined	Ton	8,471	9,968	**18,439**	28,860	....	**28,860**
Capital	$	712,434	87,872	**800,306**	1,982,640	....	**1,982,640**
Employees—							
On salary	No.	15	16	**31**	25	....	**25**
Wage-earners	No.	107	51	**158**	215	....	**215**
Total	No.	122	67	**189**	240	....	**240**
Salaries and wages—							
Salaries	$	18,673	17,396	**36,069**	54,995	....	**54,995**
Wages	$	183,935	69,724	**253,659**	476,878	....	**476,878**
Total	$	202,608	87,120	**289,728**	531,873	....	**531,873**
Fuel and electricity used	$	12,421	13,185	**25,606**	19,598	....	**19,598**
Process supplies used	$	18,527	23,341	**41,868**	4,452	....	**4,452**
Freight and smelter costs	$	3,473	874	**4,347**	2,655	....	**2,655**

(*) Not including data relating to the production of tungsten concentrates at auriferous quartz (gold) mines.
(†) Includes 2 in Nova Scotia; 3 in Quebec; 2 in Manitoba and 1 in Northwest Territories.

NOTE.—Owing to the difficulty of obtaining accurate production data direct from certain of these mines, the statistics of Canadian tungsten production for 1942 were compiled largely from customs mills returns and represent the combined tungsten recoveries from both "straight" tungsten ores and auriferous quartz ores. Canadian tungsten production in 1942 as thus defined totalled 520,981 pounds of concentrates valued at $406,275.

(a) Gross production of these mines in 1943 totalled $692,260 and WO_3 content of ores shipped amounted to 522,460 pounds.

VANADIUM

Some of the magnetites of the Rainy River district in Ontario are known to contain relatively small quantities of vanadium and some research has been conducted as to its economic recovery. There is no production of either the metal or its ores in Canada at the present time.

The principal occurrences of vanadium are in Arizona, Colorado and Utah in the United States; Minasragra in Peru; Broken Hill in Northern Rhodesia; and Grootfontein district in South West Africa.

The metal is employed chiefly in the manufacture of alloy steels and irons. It is also used in the form of ammonia meta-vanadate as a catalyst in the manufacture of sulphuric acid and in the non-ferrous, glass, ceramic and color industries.

The United States Bureau of Mines reports that vanadium has been and is now being obtained by some countries from other than vanadium ores, including petroleum, bauxite, phosphate rock and titaniferous magnetites; the ever-increasing demand for vanadium directs attention to all possible vanadium sources, as well as to efforts to extend known deposits. In the United States the principal ores are roscoelite and carnotite in sandstones, disseminated or in spots, bunches, lenses and seams. Vanadium was among the metals included in the inventory control provided by General Metals Order 1, May 1, 1941, issued by the United States Office of Production Management.

Data relating to possible imports of vanadium ores or vanadium compounds or alloys are not shown separately in Canadian trade reports. In 1943 there were 204 tons of ferrovanadium valued at $558,717 consumed in Canada in the manufacture of steel.

Vanadium ore was quoted August, 1944: 27½ cents per pound contained V_2O_5, f.o.b. shipping point, by "E & M J Metal and Mineral Markets", New York.

ZIRCONIUM

The metal is not produced in Canada; zircon is the most common zirconium mineral and the Department of Mines and Resources, Ottawa, states that it, or cyrtolite, commonly occurs in greater or less amount in Canadian Precambrian pegmatites, also in the pegmatitic apatite-phlogopite deposits of the Grenville areas in Ontario and Quebec.

Zircon is used to a steadily growing extent in refractories, specialized porcelains and heat-resisting glass. The United States Bureau of Mines Yearbook for 1941 reports on the metal as follows:

"Zircon is recovered from the beach sands near Melbourne, Florida, by the Riz Mineral Company, as an accessory of titanium ore and from the gravels near Lincoln, California, as a by product of gold dredging. Zirconium metal purifies, hardens, and strengthens steels and acts with aluminum to harden cupronickel. Metallic zirconium as powder or ductile metal is used in photoflash bulbs, radio tubes, ammunition primers and welding rods. In 1941 (January-September) there were 20,101 short tons of zirconium ore valued at $446,286 imported into the United States; of these 73 per cent came from Australia, 24 per cent from Brazil and 3 per cent from British India. Canadian consumption of ferrozirconium in the manufacture of steel totalled 51 short tons valued at $7,337 in 1943."

Zircon ore was quoted in August, 1944 by "E & M J Metal and Mineral Markets", New York: per ton f.o.b. Atlantic seaboard, minimum 55 per cent ZrO_2, $65 to $75 nominal. Zirconium alloy, 12 to 15 per cent Zr, 39 to 43 per cent Si, $102.50 to $107.50 per gross ton; 35 to 40 per cent Zr, 47 to 52 per cent Si, 14 to 16 cents per pound.

Table 179.—Principal Statistics(x) of the Miscellaneous Metal Mining Industry in Canada, 1942 and 1943

		1942	1943
Number of firms		68	54
Number of plants		67	59
Capital employed (†)	$	3,956,427	15,603,307
Number of employees—On salary		191	277
On wages		1,161	1,687
Total		1,352	1,9[illegible]
Salaries and wages—Salaries	$	286,932	600,[illegible]
Wages	$	2,109,799	3,694,4[illegible]
Total	$	2,396,731	4,295,153
Value of production (gross)	$	5,516,241	9,062,368
Cost of fuel and electricity	$	623,065	1,059,552
Process supplies used	$	600,900	1,215,049
Smelter charges	$	33,910	2,759
Freight	$	261,211	263,513
Value of production (net)	$	3,996,555	6,521,495

(x) Does not include data relating to smelters and refineries or to mining in the Northwest Territories.
(†) Exclusive of ore reserves.

Table 179(A).—Capital Employed in the Miscellaneous Metals Mining Industry in Canada, 1943

Capital employed as represented by—	$
Present cash value of the land (excluding minerals)	4,809,832
Present value of buildings, fixtures, machinery, tools and other equipment	7,119,387
Inventory value of materials on hand, ore in process, fuel and miscellaneous supplies on hand	1,087,909
Inventory value of finished products on hand	635,938
Operating capital (cash, bills and accounts receivable, prepaid expenses, etc.)	1,950,241
Total	**15,603,307**

Table 180.—Employees, Salaries and Wages in the Miscellaneous Metal Mining Industries in Canada, 1943

—	Number of employees		Salaries and wages
	Male	Female	$
Salaried employees—			
Total	232	45	600,684
Wage-earners—			
Surface	982	23	3,694,469
Underground	492	.....	
Mill	178	12	
Total	1,652	35	3,694,469
Grand Total	**1,884**	**80**	**4,295,153**

Table 181.—Average Number of Wage-Earners Employed, by Months, 1942 and 1943

Month	1942 Total	1943				
		Surface		Under-ground	Mill	
		Male	Female		Male	Female
January	783	949	12	530	154	.....
February	826	928	13	485	157	.....
March	858	978	13	475	150	.....
April	906	928	12	430	157	.....
May	911	957	14	451	165	23
June	1,024	1,036	15	511	197	14
July	1,152	1,081	17	525	207	19
August	1,282	1,095	34	552	200	19
September	1,344	1,004	35	460	207	22
October	1,463	931	37	480	198	22
November	1,602	930	34	521	189	20
December	1,678	825	24	475	175	5

CHAPTER SIX

THE NON-FERROUS SMELTING AND REFINING INDUSTRY IN CANADA

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 net value added by the industry in the processing of crude or semi-crude material during 1943 totalled $111,857,020 compared with $125,881,047 in the preceding year. Refined products included gold, silver, nickel, copper, lead, zinc, aluminum, tin, magnesium, antimony, bismuth, cobalt, cadmium, selenium, tellurium, pitchblende products and sulphur; other end products of individual plants or companies were copper-nickel matte, copper matte, cobalt salts, nickel salts, nickel and cobalt oxides, arsenious oxide, sulphuric acid, platinum metals residues, zinc dust, zinc oxide, and blister and anode copper.

This value added in 1943 represents a 12·3 per cent decrease from the all time high record of $125,881,047 in 1942. This does not altogether reflect a general decrease in metal output but rather the gradual increase in mining, smelting and transportation costs resulting from prolonged war-time conditions. The total costs of both foreign and domestic ores, concentrates, matte etc., treated in all Canadian non-ferrous metallurgical plants during 1943 was estimated at $317,917,186 compared with $258,903,818 in 1942. It should be noted, in a study of these data, that companies operating both mines and smelters may vary from year to year the nominal values of crude ores etc., shipped from their mines to their own smelters, with the result that in some years the mining industry proper is favoured economically at the expense of the non-ferrous smelting and refining industry and vice versa. The total annual net value of commodity production for the nation as a whole is, however, not affected by these arbitrary (internal) evaluations.

Fuels and purchased electricity consumed by the industry in 1943 totalled $43,105,101 compared with $35,748,639 in 1942. The value of chemicals and other process supplies consumed during the year under review amounted to $38,334,069 as against $27,083,695 in the preceding year.

Capital employed during 1943 by the non-ferrous smelting and refining industry was reported at $392,217,159, which figure includes the value of land, plant, material on hand and in process, finished products and operating funds, the very great expansion in new plant construction and production since the commencement of the war may be realized in a comparison of this total with the corresponding figure of $192,186,465 for 1939.

Employees during 1943 totalled 26,749 compared with 21,162 in 1942. Salaries and wages paid in 1943 amounted to $48,491,732 as against $37,340,556 in the preceding year. It is interesting to note that female wage-earners employed increased from an average of 185 in 1942 to 797 in 1943.

Table 182.—Principal Statistics of the Non-Ferrous Metallurgical Industry in Canada, 1941-1943

		1941	1942	1943†
Number of companies		9	10	9
Number of plants		13	15	16
Capital employed	$	309,903,342	356,052,965	392,217,159
Number of salaried employees		1,750	2,625	3,375
Salaries	$	4,117,398	5,286,755	7,160,290
Number of wage-earners		14,264	18,537	23,374
Wages	$	23,365,291	32,053,801	41,331,442
Value of plant products (gross) (x)	$	379,322,270	447,617,199	511,213,376
Estimated cost of ores, concentrates, etc., treated (a)	$	213,542,005	258,903,818	317,917,186
Cost of fuel and purchased electricity (b)	$	26,771,809	35,748,639	43,105,101
Process supplies, other than items (a) and (b)	$	19,272,162	27,083,695	38,334,069
Value added by smelting (net) (d)	$	119,736,294	125,881,047	111,857,020

(x) 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 represents a duplication in values.

(d) See preceding text.

(†) Data in this report for 1943 do not include those relating to the Eldorado Mining and Refining Ltd.

Table 183.—Capital Employed in the Non-Ferrous Smelting and Refining Industry in Canada, 1942

—	$
Present cash value of the land (excluding minerals)	5,022,353
Present value of buildings, fixtures, machinery, tools and other equipment	256,201,613
Inventory value of materials on hand, ore in process, fuel and miscellaneous supplies on hand	46,333,042
Inventory value of finished products on hand	7,406,503
Operating capital (cash, bills and accounts receivable, prepaid expenses, etc.)	77,253,048
Total	**392,217,159**

Table 184.—Number of Wage-Earners, by Months, 1932 and 1939-1943

Month	1932	1939	1940	1941	1942		1943	
					Male	Female	Male	Female
January	5,496	11,138	11,225	12,927	15,778	31	22,322	522
February	5,400	11,123	11,297	13,052	16,298	32	23,120	560
March	5,355	11,334	11,298	13,102	16,434	34	23,089	653
April	4,750	11,371	11,403	13,617	16,617	39	22,788	727
May	4,297	11,380	11,691	14,275	17,223	53	22,552	773
June	4,475	11,390	11,704	14,503	18,297	68	22,908	843
July	4,205	11,486	12,102	14,634	18,900	75	22,785	886
August	4,160	11,476	12,256	14,788	19,346	81	22,538	917
September	4,198	11,454	12,251	14,815	19,091	206	22,186	943
October	4,326	11,327	12,316	14,995	20,076	424	21,859	938
November	4,316	11,401	12,481	15,055	20,953	570	22,337	904
December	4,274	11,424	12,771	15,371	21,239	605	22,393	903
Average	**4,604**	**11,360**	**11,908**	**14,284**	**18,352**	**185**	**22,577**	**797**

The agreement made in 1939 by the large base metal producers and the Imperial Government, by which the producers were to supply the Imperial Government with copper, lead and zinc at prices which prevailed shortly before the outbreak of the war, was continued with some adjustments or revisions for increases in prices due to the increased cost of labour and materials. Canada can now furnish large quantities of these metals in the refined state, whereas in 1914 no refined copper, nickel or zinc and only a comparatively small amount of refined lead were produced in this country.

Tables of world metal production were omitted from this report due to the fact that recent data for most countries were unobtainable or conjectural in nature; also, data relating to capacities of Canadian metallurgical plants have been withheld for confidential use only until the termination of the war.

The following information has been abstracted from the 1943 annual reports of some of Canada's more important mining and metallurgical companies:

Canadian Copper Refiners Limited—Montreal East—Quebec.—"Except for a short period at the beginning of the year, the refinery continued to operate at full capacity during 1943. A new building for the production of selenium compounds and the housing of a new Research Laboratory is under construction. Sales of selenium and selenium compounds increased considerably. This expansion has been accelerated by war demand and research, resulting in finding new uses for this metal. In April 1944 it was hoped that work might start soon on a plant for the production of copper sulphate. Canada is presently dependent upon Great Britain and the United States for its supply of copper sulphate, which is essential in agriculture, base metal production, the processing of pulp and paper and in numerous other fields."

Noranda Mines Limited—Noranda, Quebec—"During 1943, the smelter treated 1,380,738 tons of ore, concentrate and slag, including 428,073 tons of custom ores and concentrates, and produced 137,466,885 pounds of anodes. After deducting the copper, gold and silver which was recovered from slags received from various shippers, the estimated production of new metals was 132,762,100 pounds of fine copper, 333,261 ounces of gold and 1,516,506 ounces of silver. The estimated recovery from Horne mine ore and concentrate was 66,164,400 pounds of copper, 269,732 ounces of gold and 660,780 ounces of silver. During the year under review the concentrator treated 1,090,166 tons of ore from the Horne mine, from which 187,862 tons of copper-gold concentrate were produced and sent to the smelter. The cyanide mill treated 210,205 tons of pyrite from the flotation circuit tailing, from which 14,430 ounces of gold were recovered. 186,633 tons of pyrite were recovered from the cyanide mill tailing and sold to chemical plants."

Aluminum Company of Canada Limited.—"The ore plant producing bauxite concentrates was in continuous operation at Arvida, Quebec, throughout 1943. Aluminum ingots were produced during the year under review at Arvida, Shawinigan Falls, La Tuque, Beauharnois and Isle Maligne, all in the Province of Quebec. The Beauharnois and Isle Maligne plants are new, coming into production for the first time in 1943. Production of aluminum in all plants of the company during 1943 totalled 991,499,296 pounds or an increase of 498 per cent over the output of 165,680,869 pounds in 1939. Canada is now firmly established as one of the world's greatest producers of aluminum a fact largely attributable to the immense water power resources of the Dominion."

International Nickel Company of Canada Limited.—"Since the outbreak of war in 1939, the objective of this company has been to meet effectively the wartime requirements of the governments in Ottawa, London and Washington. We have striven to provide the maximum supply of nickel and nickel products, copper and platinum metals and through our technical knowledge of uses to assist in directing the supplies into those fields of application where they would be of greatest value.

"Our central effort has been to expand the supplies of nickel. Deliveries of nickel in all forms derived from our own mine production amounted in 1943 to 265,000,000 pounds, representing an increase of 55,000,000 pounds over 1939. In order to provide this enlarged supply, the tonnage of our ore mined was forced from 7,273,000 tons in 1939 to 12,105,000 tons in 1943. Had it not been for shortage of man-power during the last six months of the year the production would have been appreciably higher. As an emergency war measure we have also refined a volume of nickel originating from the mines of others. Our own deliveries, together with this volume refined for others, totalled nearly 300,000,000 pounds.

"The company's output of copper has been subordinated to the war needs for expanded nickel production. Deliveries of our copper in all forms amounted to 265,000,000 pounds, comparable with 334,000,000 pounds in 1939. Our own deliveries, together with the volume of copper which we refined for others, totalled nearly 316,000,000 pounds. Deliveries of platinum metals reached the highest level in the company's history. Deliveries of gold and silver amounted to 58,331 ounces and 1,768,052 ounces respectively and of selenium and tellurium 80,984 pounds and 6,779 pounds respectively. During the war the technical and operating resources of the company have been devoted also to the production of a variety of special war material."

Deloro Smelting and Refining Co., Ltd., Deloro, Ontario.—the plant of the company located at Deloro, Ontario was in continuous operation throughout 1943. No Canadian silver-cobalt ores were smelted during the year, however the company treated a considerable tonnage of cobaltiferous residues received from Africa. Products in 1943 included cobalt metal, cobalt oxide, cobalt salts and cobalt alloys. A relatively large quantity of refined arsenic was produced in 1943 from crude arsenic obtained from gold mines in the Province of Quebec."

Eldorado Mining and Refining Limited—Port Hope, Ontario.—"War-time restrictions prevent the publication of data relating to the production of pitchblende products in this plant."

Falconbridge Nickel Mines Limited.—"Operation in 1943 of the treatment plants at Falconbridge in the Sudbury area of Ontario was satisfactory throughout the year. For the first quarter the operation followed the same pattern as for the preceding year. However, during the remainder of the year, a marked improvement in metallurgical efficiency was experienced due to the greater flexibility afforded by increased smelting capacity. The result is shown by a comparison of the last nine months of the year with a like period in 1942, which indicates that, while tonnage treated increased but little over 5 per cent the production was about 11 per cent higher with no change in grade of ore. After deducting 326 tons of waste picked, and applying adjustments in above-ground storage there were 807,048 tons of ore treated comprising 514,724 tons of milling grade and 292,324 tons of smelting grade; matte produced totalled 22,699·4 short tons containing 11,597·4 short tons of nickel and 6,046·6 short tons of copper metals, recovered per ton treated totalled 28·74 pounds nickel and 14·98 pounds of copper. Falconbridge matte is shipped to the Canadian plants of the International Nickel Company of Canada Limited."

Dominion Magnesium Limited.—"The plant of this company located at Haley near Renfrew, Ontario was in continuous operation during the entire year. Products included both magnesium ingots and magnesium alloys. The metal is recovered from dolomite rock by the ferrosilicon process. The average number of employees during the year totalled 408 of whom 25 were females."

Hudson Bay Mining and Smelting Co. Limited—Flin Flon, Manitoba.—"The tonnage of ore milled and the production of blister copper and slab zinc were the highest for any year on record while the production of gold and silver was only exceeded in 1942. Cadmium production was the highest it has been in any year since stockpiles of residues were depleted and production depended solely on treatment of current zinc purification residue. The tonnage of ore mined and hoisted from underground totalled 2,258,638 assaying 0·113 ounces gold; 1·88 ounces silver; 2·44 per cent copper and 5·5 per cent zinc. Included in the above were 18,441 tons of direct smelting ore. From 2,241,142 tons of ore milled there were produced 415,810 tons copper concentrates assaying 0·407 ounces gold; 7·28 ounces silver and 11·53 per cent copper and 180,970 tons of zinc concentrates assaying 0·068 ounces gold; 1·71 ounces silver; 0·46 per cent copper and 46·1 per cent zinc. The average percentage of recovery of copper in copper concentrates and the average percentage of recovery of zinc in the zinc concentrates during 1943 were the highest on record. The tonnage of flotation tailings treated in the cyanide plant during 1943 was 1,589,713 from which were recovered 22,119 ounces gold, 225,388 ounces silver and 79,999 pounds copper; this material was sent to the copper converter and included in the blister copper produced in the smelter. In 1943 the company produced 108,498,410 pounds of slab zinc. After allowing for metals due on account of custom concentrates the company shipped in 1943 for its own account 192,884 ounces gold, 3,127,331 ounces silver, 92,357,369 pounds copper and 141,733 pounds of selenium.

"The average number of employees at Flin Flon during 1943 was 2,217. The labour shortage was such during the middle of the year that most underground development work had to be discontinued and construction work curtailed. Temporary employees from the farms relieved the situation for the winter. Each year recently has seen an increase in the number of women employees, and at the end of the past year there were 220 on the payroll. There are only one-third of the employees now working who were with the company at the beginning of the war."

Consolidated Mining and Smelting Company of Canada Limited—Trail, B.C.—"Compared with 1942, the production of refined metal from Trail plants showed a substantial reduction due to the falling off in ore receipts from the Sullivan mine. Production costs increased due to lower output and the shortage of experienced men. For these reasons, the metallurgical recoveries were slightly lower. The accident record showed some improvement over 1942, the shifts lost per one thousand worked being 5·7.

"Production of refined lead was 224,493 tons or about 19,000 tons less than in 1942. The zinc plant produced 152,299 tons of bar zinc, or about 13,000 tons less than in 1942. The antimony plant was closed from the first of the year until the middle of June due to shortage of labour; consequently the year's production of antimony was only 557 tons. The sulphur plant was closed in July as the maximum output of sulphuric acid was required for fertilizers. The production of sulphuric acid at 269,394 tons was 76,000 tons above the previous record in 1942.

"In March 1943 the production of ore from the Sullivan mine reached a record high of 243,631 tons. The tonnage decreased steadily until October when the mine produced only 170,282 tons of ore. The decline in production was chiefly due to shortage of labour. This shortage affected the rate of ore extraction and caused development work to lag behind production. For the first time in some years development work was insufficient to maintain ore reserves, 1,600,000 more tons being mined than were actually developed during the year. Shipments of iron concentrates for the production sulphuric acid at Trail were commenced from the mine in September.

CHAPTER SEVEN

THE COAL MINING, COKE, NATURAL GAS AND PETROLEUM INDUSTRIES (Fuels) IN CANADA

The Coal Mining Industry in Canada.

The Coke and Gas Industry in Canada.

The Peat Industry in Canada is included under non-metals, chapter 8.

The Petroleum Industry in Canada.

1. Production of Crude Petroleum.
2. Production of Petroleum Products.

NOTE:—In order to correlate data regarding fuels in Canada, this chapter has been prepared to include statistics of the coal, natural gas, and petroleum industries. This survey presents information regarding these industries as a whole, dealing principally with the mineral industry, although supplementary data are shown for closely allied manufacturing operations.

The Bureau issues an annual report on Coal Statistics for Canada which may be referred to for complete details of the Coal Mining Industry.

THE COAL MINING INDUSTRY

Dominion Fuel Board—The Board was created in 1922 to meet the need for a permanent organization responsible to the Government for a thorough and systematic study of the fuel situation and recurrent shortages experienced throughout Canada. It is composed of permanent members of the Dominion Civil Service and the staff of the Board consitutes a division of the Bureau of Mines and Geology, Department of Mines and Resources.

In recent years the policy of the Government has been to extend the market for Canadian coal and to that end financial assistance in the form of subventions has been given to the coal industry since 1928, the Board being responsible for the administration of subvention payments. The amount of coal moved under these assisted rates increased from 146,126 short tons in 1928 to a maximum of 3,403,581 short tons in 1939 and was 1,091,887 net short tons in 1943. Of the total moved under assisted rates in 1943, 809,161 short tons were from Nova Scotia and New Brunswick and 282,726 short tons from Western Canada.

The Dominion Fuel Board also administers the Domestic Fuel Act (17 Geo. V, c. 52) authorizing a bonus on Canadian coal converted to coke and sold for domestic use, and, from April 1, 1941, the Act (20-21 Geo. V, c. 6) to place Canadian coal used in the manufacture of coke for metallurgical purposes upon a basis of equality with imported coal.

Coal Administration—Since the outbreak of war, the Dominion Fuel Board has collaborated closely with the Coal Administrator of the Wartime Prices and Trade Board, and on Aug. 6, 1941, the Coal Administrator took over, for the duration of the War and until further order, the powers, duties, functions, staff and establishment of the fuel Board.

In December, 1942, P.C. 10674 was passed establishing the Emergency Coal Production Board. On this Board the Coal Administrator acted as Chairman.

Coal Control.—Order-in-Council P.C. 1752 of March 5, 1943, transferred the Coal Administration from the Wartime Prices and Trade Board, Department of Finance, to the Department of Munitions and Supply and the Coal Control was created. The duties and functions of the Coal Control in general are to study the production and importation of coal into Canada and to maintain an equitable distribution thereof; to regulate and maintain price control and prevent infraction of the price ceilings, and to carry on the powers and duties of the Dominion Fuel Board.

The Emergency Coal Production Board formerly under Department of Finance also was transferred to Department of Munitions and Supply, by Order-in-Council 1752, dated March 5, 1943. During 1943 the Emergency Coal Production Board actively assisted coal mine operators where necessary in maintaining and increasing production, either through production subsidy or by financial assistance in the form of loans or grants. Also initiated and financed by the Board were six stripping operations in Alberta which were to provide a reserve to meet emergencies. It was also instrumental in the re-opening of a large stripping operation in southern British Columbia.

The Board, in co-operation with the Department of Mines in Quebec, assisted in developing small local peat fuel production operations in various parts of the Province, and assisted them financially.

Expenditures for these purposes since the inception of the Board up to the end of 1943, amounted to $4,624,908.

The fuel situation in Canada is somewhat anomalous, as, in spite of the enormous resources of coal in the country, about 50 per cent of the requirements is imported. The Canadian coal areas are situated in the eastern and western provinces, while the areas of densest population and greatest industrial development, in Ontario and Quebec, are more easily and economically supplied with coal from the nearer coalfields of Pennsylvania and Ohio.

Canadian coal exported in 1943 amounted to 1,110,101 tons, compared with 815,585 tons in 1942. Ports in Nova Scotia, New Brunswick, Quebec and central Ontario cleared 496,962 tons of Canadian coal and exportations through western ports reached 613,139 tons.

Imports of coal into Canada in 1943 totalled 28,852,654 tons. Anthracite imports amounted to 4,458,519 tons of which 4,073,731 tons came from the United States and 384,788 tons from Great Britain. Receipts of bituminous coal totalled 24,393,798 tons and lignite coal imported amounted to 337 tons.

Production of coal in Canada in 1943 totalled 17,859,057 tons valued at $62,877,549 as compared with 18,865,030 tons worth $62,897,581 in 1942. Output in 1942 established an all-time high record. Of the total Canadian output in 1943, Nova Scotia miners contributed 6,103,085 tons; New Brunswick 372,873 tons; Manitoba 999 tons; Saskatchewan 1,665,972 tons; Alberta 7,676,726 tons; and British Columbia 2,039,402 tons. The entire coal mining industry of Canada provided employment for 26,473 persons and distributed $47,291,919 as salaries and wages.

The rough average British Thermal Unit values per pound of Canadian coals delivered to consumers (1941) was estimated by the Department of Mines and Resources, Ottawa, as follows:—Bituminous—Maritime Provinces, British Columbia and Alberta, grade 1—14,000; grade 2, 13,000 and grade 3, 11,000 to 12,000. Sub-bituminous—Alberta and British Columbia, 10,000 to 11,500. Lignite—Domestic, Alberta and British Columbia, 7,500 to 10,000. Lignite—Saskatchewan, 6,500 to 7,500.

Nova Scotia produces bituminous coal from Cape Breton Island and the mainland collieries in the Cumberland and Pictou areas. New Brunswick produces at Minto a small portion of the bituminous coal of Eastern Canada. Lignite is produced in Saskatchewan, the main producing areas being the Bienfait and Estevan divisions.

Alberta produces all ranks of coal, including sometimes a small tonnage of anthracite coal. Bituminous coal is produced in the Crowsnest field and the mining areas of the foothills. The coal mined in the central area of the province is lower in rank and is classed as sub-bituminous and lignite.

British Columbia produces bituminous and sub-bituminous coal from Vancouver Island, the Crow's Nest area, which is adjacent to the Alberta field, and also from the inland area located near the towns of Princetown and Merritt.

Table 185.—Capital Employed in the Coal Mines of Canada, by Provinces, 1942 and 1943

Province	1942				1943			
	Capital employed as represented by:				Capital employed as represented by:			
	Cost of land, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total	Cost of land, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total
	$	$	$	$	$	$	$	$
Nova Scotia	31,838,558	2,964,078	10,034,232	**44,836,868**	30,608,710	4,006,737	12,091,633	**46,707,080**
New Brunswick	849,793	46,722	489,914	**1,386,429**	790,466	47,997	541,018	**1,379,481**
Manitoba	2,500	100	500	**3,100**	2,500	100	500	**3,100**
Saskatchewan	2,718,086	136,398	428,553	**3,283,037**	2,921,133	169,422	521,740	**3,612,295**
Alberta	28,945,543	1,165,047	7,327,893	**37,438,483**	28,258,501	1,448,085	7,774,030	**37,180,616**
British Columbia	20,045,265	372,650	1,400,865	**21,818,780**	20,907,183	529,096	1,248,185	**22,684,164**
Canada	**84,399,745**	**4,684,995**	**19,681,957**	**108,766,697**	**83,488,493**	**6,201,437**	**22,177,106**	**111,867,036**

Table 186.—Employees, Salaries and Wages in the Coal Mines of Canada, by Provinces 1943

Province	Average number of employees					Salaries and wages		
	Salaried employees		Wage-earners		Total	Salaries	Wages	Total
	Male	Female	Surface	Underground				
						$	$	$
Nova Scoria	473	138	2,083	9,814	12,508	1,222,807	22,603,104	23,825,911
New Brunswick	39	10	328	636	1,013	101,711	1,150,857	1,252,568
Manitoba	....	....	1	2	3	....	1,833	1,833
Saskatchewan	53	10	331	392	786	114,053	967,902	1,081,955
Alberta	569	63	2,380	6,151	9,163	1,448,993	14,600,364	16,049,357
British Columbia	225	27	790	1,958	3,000	615,212	4,465,083	5,080,295
Canada 1943	**1,359**	**248**	**5,913**	**18,953**	**26,473**	**3,502,776**	**43,789,143**	**47,291,919**
Canada 1942	**1,223**	**208**	**5,536**	**19,227**	**26,194**	**3,141,599**	**38,949,538**	**42,091,137**

Table 187.—Wage-earners Employed and Days' Work Done, by Months, in the Coal Mines of Canada, 1943, with Comparative Totals for 1942

Month	Number of wage-earners			Days' work done		
	Surface	Underground	Total	Surface	Underground	Total
January	5,850	19,721	25,571	141,040	430,071	571,111
February	5,877	19,471	25,348	137,368	422,192	559,560
March	5,767	19,191	24,958	149,756	467,138	616,894
April	5,428	18,085	23,513	131,104	393,920	525,024
May	5,370	17,584	22,954	131,214	380,457	511,671
June	5,613	17,631	23,244	138,356	383,844	522,200
July	5,707	17,885	23,592	141,524	400,743	542,267
August	5,874	18,192	24,066	144,289	402,283	546,572
September	6,008	19,033	25,041	145,520	404,297	549,817
October	6,253	19,588	25,841	149,971	432,347	582,318
November	6,541	20,410	26,951	144,040	409,567	553,607
December	6,666	20,649	27,315	157,585	440,930	598,515
Total for 1943	....	....	....	**1,711,767**	**4,967,789**	**6,679,556**
Total for 1942	....	....	....	**1,617,660**	**5,131,912**	**6,749,572**

Table 188.—Output of Coal in Canada, by Grades, 1918-1943

Calendar year	Anthracite		Bituminous		Sub-Bituminous*		Lignite		Total	
	Short tons	Value	Short tons	Value	Short tons	Value	Short tons	Value	**Short tons**	**Value**
		$		$		$		$		$
1918	115,405	....	11,636,190	....	....	....	3,226,331	....	**14,977,926**	**55,192,896**
1919	85,579	....	10,892,046	....	....	....	2,941,471	....	**13,919,096**	**55,622,670**
1920	127,513	....	13,122,924	....	....	....	3,696,327	....	**16,946,761**	**82,496,538**
1921	96,964	330,699	11,680,477	58,848,444	....	....	3,280,052	13,272,513	**15,057,493**	**72,451,656**
1922	40,417	122,538	11,630,488	53,348,507	....	....	3,486,526	12,047,452	**15,157,431**	**65,518,497**
1923	107	322	12,941,877	58,478,670	466,492	1,399,424	3,582,095	12,180,570	**16,990,571**	**72,058,986**
1924	....	....	9,483,732	40,662,894	590,168	1,761,086	3,564,297	11,170,008	**13,638,197**	**53,593,988**
1925	....	....	8,939,607	36,793,501	570,654	1,731,267	3,624,707	10,737,183	**13,134,968**	**49,261,951**
1926	....	....	12,393,079	48,153,572	489,736	1,458,116	3,595,316	10,263,406	**16,478,131**	**59,875,094**
1927	....	....	13,006,996	49,385,818	596,155	1,784,073	3,823,710	10,696,672	**17,426,861**	**61,867,163**
1928	....	....	12,971,744	50,584,108	740,496	2,076,212	3,852,053	11,097,513	**17,564,293**	**63,757,833**
1929	....	....	12,859,822	49,995,261	668,702	1,908,954	3,968,033	11,160,955	**17,496,557**	**63,065,170**
1930	....	....	10,824,839	41,789,061	603,358	1,705,236	3,453,127	9,355,451	**14,881,324**	**52,849,748**
1931	....	....	8,861,360	33,165,730	471,343	1,211,197	2,910,508	6,830,755	**12,243,211**	**41,207,682**
1932	....	....	7,714,279	28,073,744	560,902	1,329,316	3,463,732	7,714,635	**11,738,913**	**37,117,695**
1933	....	....	7,979,283	27,757,150	554,118	1,274,017	3,369,943	6,892,795	**11,903,344**	**35,923,962**
1934	....	....	10,058,782	34,356,274	537,598	1,256,936	3,213,903	6,432,732	**13,810,193**	**42,045,942**
1935	....	....	9,748,841	33,150,781	566,425	1,410,926	3,572,740	7,401,403	**13,888,006**	**41,963,110**
1936	....	....	10,796,135	36,256,347	566,235	1,432,741	3,866,812	8,102,846	**15,229,182**	**45,791,934**
1937	....	....	11,634,379	39,661,259	506,260	1,314,100	3,695,315	7,776,593	**15,835,954**	**48,752,018**
1938	....	....	10,329,782	35,403,781	488,915	1,269,131	3,476,021	7,309,259	**14,294,718**	**43,982,171**
1939	....	....	11,769,296	40,119,905	512,101	1,323,401	3,411,301	7,233,684	**15,692,698**	**48,676,990**
1940	....	....	13,333,037	45,350,950	598,686	1,569,771	3,635,161	7,755,123	**17,566,884**	**54,675,844**
1941	....	....	13,603,307	47,391,274	585,453	1,593,549	4,037,161	9,074,807	**18,225,921**	**58,059,630**
1942	....	....	13,616,215	49,730,504	733,547	2,100,889	4,515,268	11,066,188	**18,865,030**	**62,897,581**
1943	....	....	11,985,253	47,353,853	792,252	2,399,289	5,081,552	13,124,407	**17,859,057**	**62,877,549**

* Not separately reported prior to 1923.

Table 189.—Output and Value of Coal in Canada, by Kinds and Provinces, 1942 and 1943

(Short tons)

Province	1942 Number of mines	1942 Quantity	1942 Value	1943 Number of mines	1943 Quantity	1943 Value
			$			$
Nova Scotia (Bituminous)	36	7,204,852	29,116,118	40	6,103,085	27,121,861
New Brunswick (Bituminous)	36	435,203	1,826,403	39	372,873	1,641,069
Manitoba (Lignite)	1	1,265	3,763	1	999	2,964
Saskatchewan (Lignite)*	82	1,301,116	1,760,065	80	1,665,972	2,432,249
Alberta—						
Bituminous	15	3,807,619	11,221,161	14	3,469,893	10,942,203
Sub-bituminous	13	733,547	2,100,889	12	792,252	2,399,289
Lignite	164	3,212,887	9,302,360	159	3,414,581	10,689,194
Total†	192	7,754,053	22,624,410	185	7,676,726	24,030,686
British Columbia (Bituminous)	29	2,168,541	7,566,822	30	2,039,402	7,648,720
Canada—						
Bituminous	**116**	**13,616,215**	**49,730,504**	**123**	**11,985,253**	**47,353,853**
Sub-bituminous	**13**	**733,547**	**2,100,889**	**12**	**792,252**	**2,399,289**
Lignite	**247**	**4,515,268**	**11,066,188**	**240**	**5,081,552**	**13,124,407**
Total	**376**	**18,865,030**	**62,897,581**	**375**	**17,859,057**	**62,877,549**

* Exclusive of 30 small mines in operation during part of 1942 and 19 small mines operating during part of 1943.
† Exclusive of 13 small mines operated under special permits in 1942 and 19 small mines in 1943.

THE COKE AND MANUFACTURED GAS INDUSTRY, 1943

Production from coke plants and from illuminating and fuel gas plants in Canada during 1943 was valued at $60,900,598. This output was 9·2 per cent above the $55,788,491 of the previous year and set a new record for the industry. Output for the year under review included 3,551,773 tons of coke valued at $31,339,978 at the works, 74,731,346 M cubic feet of gas of which 74,736,078 M cubic feet valued at $24,982,378 were sold or used, and by-products valued at $4,578,242.

Thirty coke and gas works operated in 1943, including 11 by-product and bee-hive plant, 18 retort coal and water gas plants and 1 propane gas plant. Fifteen of these works were located in Ontario, 4 in British Columbia, 5 in Quebec, 2 in Manitoba, 2 in Nova Scotia, 2 in New Brunswick and 1 in Alberta. In addition to these producers, 1 company in Quebec and 2 in Ontario purchased coke-oven gas and distributed it for domestic or commercial use and data covering their operations have been included to round out the figures for the industry.

Output of coke from gas retorts, by-products and bee-hive ovens totalled 3,551,773 tons in 1943 compared with 3,265,549 tons in 1942 and 3,145,715 tons in 1941. By-product and bee-hive ovens produced 3,243,747 tons of coke in 1943 and gas retorts made 308,026 tons. In addition, 81,775 tons of petroleum coke were recovered in petroleum refineries and 17,995 tons of pitch coke in coal tar distillation plants.

Data on the distribution of coke (except petroleum and pitch coke) by the producers show that 153,349 tons were sold direct to domestic consumers; 1,706,520 tons were used in associated works operated by the producing companies; 338,472 tons were used by coke plants as fuel or to make water gas; 650,979 tons were sold direct to consumers for foundry and other uses (other than domestic); 772,063 tons were sold to dealers for resale, and 44,954 tons were sold for export. The total distribution was 3,676,337 tons, including imports by the producers of 116,000 tons. Total stocks of coke in the hands of producers amounted to 218,790 tons at the end of 1943.

Imports into Canada of coke made from coal increased to 920,955 tons in 1943 from 719,910 tons in 1942, and exports increased to 44,954 tons from 44,764 tons. Imports of petroleum coke during this period rose to 334,830 tons from 312,917 tons and exports (including re-exports of imported coke) increased to 56,671 tons from 53,080 tons.

Manufactured gas, sold and used, amounted to 74,736,078 M cubic feet in 1943, including 55,904,976 M cubic feet from by-product ovens and 18,831,102 M cubic feet from gas plants. Sales of gas by the producers totalled 20,403,544 M cubic feet, of which 11,763,455 M cubic feet were from by-product ovens and 8,640,089 M cubic feet were from gas works. Most of the remaining gas was used as fuel in the producing plants or in their associated metallurgical works. These figures do not include 55,361 M cubic feet of (Pintsch) oil gas for lighting railway cars, 10,086,340 M cubic feet of still gas recovered at petroleum refineries, nor iron blast furnace gas and some producer gas which was recovered and used by the producers but for which no records are available.

The number of customers served with manufactured illuminating and fuel gas in 1943 was 513,098, the number of active meters was 535,727, the length of distributing mains was 3,968 miles, and the average calorific value of the gas sold ranged from 450-570 B.T.U. per cubic foot.

Table 190.—Materials Used in Coke and Gas Plants, 1942 and 1943

Material	Unit of measure	1942		1943	
		Quantity	Cost at works	Quantity	Cost at works
			$		$
Bituminous coal carbonized in ovens or retorts—					
(a) Canadian	tons	1,487,994	6,835,056	1,227,015	5,702,774
(b) Imported	tons	2,979,867	17,817,276	3,548,484	23,201,694
Bituminous coal for making water gas—					
Imported	tons	4,030	35,985	5,104	47,412
Coke for gas-making—					
(a) Purchased	tons	9,356	97,281	11,322	124,853
(b) Companies' own make	tons	128,777	1,104,075	169,433	1,466,064
Oil used for enriching water gas	Imp. gals.	7,772,275	593,015	9,905,667	786,058
Absorbing and wash oil	Imp. gals.	276,019	36,317	289,869	39,864
Caustic soda	lb.	2,014,886	39,042	1,636,645	34,092
Lime	tons	2,517	27,427	2,189	23,896
Water			24,325		34,790
Iron oxide	tons	4,600	33,790	6,568	45,946
Sulphuric acid, 66° bé	lb.	64,114,815	493,332	62,203,340	460,311
All other materials			356,984		466,913
Total Cost			**27,294,505**		**32,434,667**

Table 191.—Products Made in Coke and Gas Plants, 1942 and 1943

Product	Unit of measure	1942		1943	
		Quantity	Gross selling value at works	Quantity	Gross selling value at works
			$		$
GAS MADE—					
Retort coal gas	M. cu. ft.	5,131,152	...	5,069,024	...
Coke oven gas	M. cu. ft.	43,228,790	...	44,137,447	...
Producer gas	M cu. ft.	16,171,897	...	20,354,129	...
Water gas	M cu. ft.	4,248,453	...	5,070,328	...
Propane gas	M cu. ft.	59,099	...	100,418	...
Total Gas Made	**M cu. ft.**	**68,839,292**	...	**74,731,346**	...
GAS SOLD OR USED—					
Gas sold	M cu. ft.	18,913,230	17,316,135	20,403,544	18,609,364
Gas used in own coke or gas plants	M cu. ft.	25,212,211	3,405,110	29,317,493	3,560,416
Gas used in associated metallurgical works	M cu. ft.	21,840,825	1,837,253	23,173,827	1,879,389
Gas otherwise accounted for but not sold	M cu. ft.	340,132	81,409	272,903	55,864
Gas not accounted for	M cu. ft.	1,449,551	826,134	1,568,311	877,345
Total Gas Sold or Used	**M cu. ft.**	**67,755,919**	**23,466,011**	**71,736,078**	**24,982,378**
COKE MADE—					
Coke from by-product or bee-hive ovens	ton	2,795,658	24,284,665	2,986,567	27,906,033
Coke from gas retorts	ton	284,314	2,668,673	273,202	2,425,215
Coke breeze from by-product ovens	ton	171,325	719,400	257,180	935,387
Coke breeze from gas retorts	ton	14,252	38,935	34,824	73,343
Total Coke	**ton**	**3,265,549**	**27,711,673**	**3,551,773**	**31,339,978**
OTHER PRODUCTS—					
Tar	Imp. gal.	32,288,913	1,994,224	35,534,397	2,126,163
Ammonia liquor	lb. NH_3	1,713,085	18,079	1,701,108	17,155
Ammonium sulphate	pound	72,398,424	1,055,868	65,814,889	962,704
Benzol	Imp. gal.	5,099,085	797,257	5,823,478	818,656
Toluol, xylol and naphthalene	Imp. gal.	2,004,006	708,949	1,741,321	610,452
All other products	...	...	36,400	...	43,112
Grand Total	...	...	**55,788,491**	...	**60,900,598**

THE NATURAL GAS INDUSTRY

The Bureau of Mines, Ottawa, reviewed the Natural Gas Industry in 1943 as follows:

"Natural gas has been found in most of the provinces of Canada. It is produced commercially in abundance in Alberta and Ontario, and in smaller quantities in New Brunswick, Saskatchewan, and Quebec.

"In Alberta, most of the production comes from the Turner Valley field, which supplies fuel for the field itself, and feeds the pipe line to the cities and districts of Calgary and Lethbridge. It has been unnecessary to drill gas wells in this field for some years, and production is now largely derived from the petroleum wells, in which the gas plays a vital role in the production of petroleum. The 'gas-oil ratio' of many of these oil wells, particularly in the southern part of the field, where effective measures of conservation began to be applied comparatively late in their life, has risen so much that in some cases the wells have had to be re-classified as gas wells, thus, augmenting the reserve of gas. Production of gas still remained considerably in excess of consumption, although the waste was further reduced about 12 per cent. The experiment in re-cycling of gas, using Foundation well as the input well, was continued throughout the year, the wells drawn upon being mainly Frontier and Prairie. The amount so returned to the limestone, 116,728 m.c.f., was not included in the production. No information is available as to the results achieved in this experiment.

"The Edmonton area is supplied from the gas field at Viking about 80 miles southeast of the city, supplemented by the field at Kinsella farther east, discovered in 1929 but first connected by an extension of the pipe line in the fall of 1940. Kinsella is now the principal source; seven wells were drilled and production there was nearly three times the volume of gas produced at Viking. In December six wells were producing at Viking and fourteen at Kinsella.

"In December, 34 wells were producing in the Medicine Hat area and 12 in the Redcliff area. Two wells were drilled at Medicine Hat and production increased about 10 per cent. At Vermilion, consumption increased 50 per cent, at Wainwright about two per cent; the former draws its supply from the field of the same name, the latter from Fabyan. Among other producers the more important were Foremost and Brooks.

"A small production, 1500 m.c.f., was recorded in the Northwest Territories. In Saskatchewan, the eastern part of the Lloydminster field supplies the town of Lloydminster. In the Kamsack area fifteen shallow wells were drilled, ten of the earlier wells are connected to the town and six more remained unconnected. These wells are mostly around 200 feet in depth and yield from 15 to 250 m.c.f. at a closed-in pressure of 36 lbs. Throughout the province geophysical and geological work was again active with a view to the discovery of both gas and petroleum. Decisive results from a number of deep tests have not yet been obtained.

"In Ontario, although no striking new development occurred, a small new area of Guelph gas was brought into production in Zone township. Drilling continued in Haldimand county, where a number of small producers were obtained, particularly in Walpole, Oneida, and North and South Cayuga townships, as well as in Norfolk county, notably in Woodhouse and Townsend townships, and in Welland county, where Bertie township was the main producer. The test in Lake Erie about 5,900 feet off shore from Romney township got gas from the Lower Salina and Upper Guelph in an attempt to extend Tilbury East field. The deep test to the Trenton in Romney township was unsuccessful, as were also several wells in South Norwich and Westminster townships.

"In Quebec, natural gas is produced in small quantities at several shallow wells along the St. Lawrence River and is used locally.

"In New Brunswick, the Stoney Creek field continued to supply Moncton and Hillsborough and certain localities in Albert and Westmorland counties with natural gas. Six new wells were drilled and one was deepened. Flush production of the new wells amounted to 3,730 m.c.f."

Table 192.—Production of Natural Gas in Canada, by Provinces, 1934-1943

Year	New Brunswick		Ontario		Manitoba		Alberta	
	M cu. ft.	Value	M cu. ft.	Value	M cu. ft.	Value	M cu. ft.	Value
		$		$		$		$
1934	623,601	306,005	7,682,851	4,741,368	600	180	14,841,491	3,707,276
1935	615,454	303,886	8,158,825	4,938,084	600	180	16,069,349	4,113,436
1936	606,246	298,819	10,016,743	6,052,294	600	180	17,407,829	4,376,720
1937	576,671	283,922	10,746,334	6,588,798	600	180	20,955,506	4,766,437
1938	577,492	284,689	10,952,806	6,460,764	600	180	21,822,108	4,807,346
1939	606,382	292,403	11,966,581	7,261,928	600	180	22,513,669	4,915,821
1940	616,041	300,543	13,053,493	7,745,834	600	180	27,459,898	4,923,469
1941	653,542	317,437	11,828,703	7,140,130	.....	.....	30,905,440	5,175,364
1942	619,389	299,688	10,476,770	6,809,901	.....	.....	34,482,585	6,146,146
1943	675,029	327,787	7,914,408	6,543,913	.....	.....	35,569,078	6,241,815

Year	Saskatchewan		Northwest Territories		**Canada**	
	M cu. ft.	Value	M cu. ft.	Value	**M cu. ft.**	**Value**
		$		$		$
1934	13,781	4,823	.....	.....	**23,162,324**	**8,759,652**
1935	75,558	7,555	.....	.....	**24,910,786**	**9,363,141**
1936	90,839	33,985	1,100	245	**28,113,348**	**10,762,243**
1937	100,380	35,130	1,500	335	**32,380,991**	**11,674,802**
1938	90,285	34,136	1,500	335	**33,441,791**	**11,587,450**
1939	96,423	36,640	1,500	335	**35,185,146**	**12,507,307**
1940	100,773	30,232	1,500	335	**41,232,125**	**13,000,593**
1941	106,368	31,850	1,500	335	**43,495,353**	**12,665,116**
1942	117,124	45,585	1,500	335	**45,697,359**	**13,301,655**
1943	116,201	45,568	1,500	335	**44,276,216**	**13,159,418**

Table 193.—Production of Natural Gas in Canada, by Months, 1943

—	New Brunswick	Ontario	Saskatchewan	Alberta	Canada
	M cu. ft.	M cu. ft.	M cu. ft.	M cu. ft.	**M cu. ft.**
January	86,943	943,546	19,196	4,461,798	**5,511,483**
February	70,969	849,597	16,010	3,581,742	**4,518,318**
March	65,532	892,105	15,978	4,078,951	**5,052,566**
April	69,544	823,368	8,341	2,782,318	**3,683,571**
May	59,957	652,410	6,239	2,416,741	**3,135,347**
June	47,745	451,038	4,583	2,026,296	**2,529,662**
July	36,537	354,884	3,058	1,912,885	(a) **2,307,864**
August	31,172	354,719	3,125	1,938,721	(a) **2,328,237**
September	33,877	441,508	5,392	2,248,020	(a) **2,729,297**
October	46,071	540,748	8,388	2,828,115	**3,423,322**
November	56,513	757,249	10,654	3,356,408	**4,180,824**
December	70,169	853,236	15,237	3,937,083	**4,875,725**
Total	**675,029**	**7,914,408**	**116,201**	**35,569,078**	**44,276,216**

(a) Includes production from Fort Norman, Northwest Territories.

Table 194.—Natural Gas Production in Ontario, by Fields, 1942 and 1943

County	Field	1942	1943
		M cu. ft.	M cu. ft.
Essex	Kingsville	32,419	28,732
Kent	Tilbury, Romney and Raleigh	2,528,029	2,445,565
	Declute	824,325	475,567
	Dover	310,261	220,133
	Chatham	1,127,281	313,231
Lambton	Dawn	1,526,149	1,092,293
	Oil Springs	....	9,779
Middlesex	Mosa	....	....
Oxford	South Norwich	....	3,730
	Brownsville (x)		
Elgin	Bayham	77,905	51,718
Elgin	Bayham	118,257	7,082
	Malahide	808,299	87,091
Norfolk	Norfolk	431,928	240,399
Lincoln	Lincoln		
Haldimand	Haldimand	2,124,122	2,470,967
Wentworth	Wentworth		
Welland	Welland	288,663	296,016
Brant	Onondaga	145,134	98,105
Prince Edward	Hallowell	....	....
Wells in surface drift	Harwich and Howard Tps.	14,000	14,000
Private wells	....	60,000	60,000
Total Produced		**10,476,770**	**7,914,408**

(x) Dereham Twp. .... 58,782 M cu. ft.; Bayham Twp. .... 19,123 M cu. ft.—1942
(x) Dereham Twp. .... 36,710 M cu. ft.; Bayham Twp. .... 15,008 M cu. ft.—1943

Table 195.—Number of Gas Wells in Canada, by Provinces, 1941-1943

—		New Brunswick	Ontario	Manitoba	Saskatchewan	Alberta	Canada
Productive wells at beginning of year	1941	42	3,240	....	3	95	**3,380**
	1942	40	3,277	....	3	104	**3,424**
	1943	42	3,344	....	3	108	**3,497**
Number of productive wells drilled	1941	3	173	....	....	....	**176**
	1942	2	148	....	....	4	**154**
	1943	5	149	....	....	10	**164**
Number of dry wells drilled	1941	....	143	....	....	....	**143**
	1942	....	144	....	....	....	**144**
	1943	....	105	....	....	....	**105**
Number of wells abandoned	1941	5	127	....	....	....	**132**
	1942	....	74	....	....	....	**74**
	1943	4	117	....	....	2	**123**
Productive wells at end of year	1941	40	3,277	....	3	104	**3,424**
	1942	42	3,344	....	3	108	**3,497**
	1943	43	3,346	....	3	116	**3,508**

Table 196.—Natural Gas Wells in Ontario by Townships, 1942 and 1943

Township	1942				1943			
	No. of producing wells in operation Dec. 31, 1942	No. of wells abandoned this year	No. of dry wells drilled this year	No. of producing wells drilled this year	No. of producing wells in operation Dec. 31, 1943	No. of wells abandoned this year	No. of dry wells drilled this year	No. of producing wells drilled this year
Ancaster								
Anderson			1					
Bayham	59	1	1		53	9		
Bertie	144	2		8	150		1	8
Binbrook	49		3	4	40			
Brant								7
Brantford	2		1		2			
Caistor	66	2	1	7	71	3	1	8
Camden Gore			6					1
Canboro	148	1		2	147	5		1
Cayuga N	198	9	1	2	191	12	5	21
Cayuga S	55	1	2	1	55		6	14
Charlotteville	13		2		13		3	2
Chatham	19	1	14	1	20		1	1
Colchester								
Crowland	27	1			26			
Culross			1					
Dawn	21			6	30	2	2	3
Delaware			1				1	
Delhi Village	3				3			
Dereham	8		3		18		1	
Dorchester N			2					
Dover West / Dover East	21				21	1		
Dunn	50	1		2	50	7	2	
Dunwich								
Enniskillen	1				3			
Gainsboro	15				15	3		
Glanford	10				10			
Gosfield S	25			1	24			
Hallowell								1
Harwich			1					
Houghton	4		1		2			
Humberstone	77	3		7	82	5		
Kincardine								
Malahide	63	5	19	6	65	19	5	
Malden								
Mersea	3		1		3			
Middleton	48	1	1		48	5		
Mosa						1		
Moulton	102	9		4	97			8
Nassageya							1	
Norwich S			2	1	1		1	
Nottawasaga							1	
Oneida	82	4	8	10	90	7	13	32
Onondaga	31	1	1		32	3		
Orford			2					
Oxford N								
Oxford W								
Port Dover Village	3				3			
Port Rowan	4				4			
Rainham	323	4	1	6	322	3	1	1
Raleigh	53		3		58		1	
Romney	133	2		6	141		1	1
Sarnia	13							
Seneca	161	4	2	1	157	2		
Sherbrooke	12	1	2	4	18		1	
Sombra							2	
Southwold			1					
Tilbury East	127	7	1		124		2	2
Townsend	4	1	3	8	11		14	10
Tuscarora	76	3	3	1	73	6	3	3
Wainfleet	26	1	6	6	32	1	5	2
Walpole	450	9	34	48	495	23	13	17
Walsingham N	8						2	
Walsingham S	15				23			
Westminster			1				3	
Willoughby	53		1		53			
Windham	18		5	3	21		2	
Woodhouse	76		4	3	78		6	2
Yarmouth			2					
Zone							5	4
Private Wells	300				300			
Surface wells	69				69			
Total	**3,277**	**74**	**144**	**148**	**3,344**	**117**	**105**	**149**

Table 197.—Capital Employed in the Natural Gas Industry in Canada, by Provinces, 1942 and 1943

—	1942			1943		
	Ontario	Alberta	**Canada***	Ontario	Alberta	**Canada***
	$	$	$	$	$	$
CAPITAL EMPLOYED AS REPRESENTED BY—						
Cost of land, buildings, plant, machinery and tools	43,953,488	25,644,329	**71,032,694**	43,502,716	25,754,405	**70,474,231**
Cost of supplies and stock on hand	839,411	342,640	**1,202,091**	666,682	324,924	**1,016,070**
Cash, trading and operating accounts and bills receivable	7,447,188	2,926,010	**10,533,817**	9,096,292	3,165,150	**12,472,862**
Total	**52,240,087**	**28,912,979**	82,768,602	**53,265,690**	**29,244,479**	**83,963,163**

* Includes data for New Brunswick and Saskatchewan

Table 198.—Employees, Salaries and Wages in the Natural Gas Industry in Canada, by Provinces, 1942 and 1943

Province	*Average number of employees				Salaries and wages		
	Salaried employees		Wage-earners	**Total**	Salaries	Wages	**Total**
	Male	Female					
					$	$	$
1942							
New Brunswick	11	11	71	**93**	40,610	104,901	**145,511**
Ontario	548	155	626	**1,329**	1,078,481	727,295	**1,805,776**
Saskatchewan	3	1	......	**4**	4,500	......	**4,500**
Alberta	243	60	211	**514**	573,068	297,956	**871,024**
Canada	**805**	**227**	**908**	**1,949**	**1,696,659**	**1,130,152**	**2,826,811**
1943							
New Brunswick	10	11	64	85	38,678	93,940	**132,618**
Ontario	520	142	533	**1,195**	1,077,628	656,540	**1,734,168**
Saskatchewan	5	1	......	**6**	5,500	......	**5,500**
Alberta	234	60	302	**596**	606,512	367,716	**974,228**
Canada	**769**	**214**	**899**	**1,882**	**1,728,318**	**1,118,196**	**2,846,514**

* See footnote on page 31, table 26.

Table 199.—Number of Wage-Earners in the Natural Gas Industry in Canada, by Months, 1943

Month	1943	
	Male	Female
January	678	14
February	678	10
March	675	15
April	687	15
May	784	14
June	862	16
July	945	19
August	932	18
September	898	20
October	824	21
November	776	19
December	708	16
Average	**883**	**16**

THE PETROLEUM INDUSTRY IN CANADA

Including (1) Production of Crude Petroleum, and (2) Petroleum Products

(1) Production of Crude Petroleum

Production of crude petroleum and natural gasoline in Canada during 1943 totalled 10,052,302 barrels valued at $16,470,417, compared with 10,364,796 barrels worth $15,968,851 in 1942. Of this, 9,601,530 barrels came from Alberta wells, 132,492 barrels from Ontario, 293,750 barrels from the Northwest Territories, and 24,530 barrels from New Brunswick.

The following is an excerpt from a review on petroleum in 1943 as prepared by the Bureau of Mines, Ottawa:

"Of the total Canadian production of crude petroleum, 94 per cent came from the Turner Valley Field of Alberta, in which field the Rundle (Madison) Limestone of Palaeozoic age is the source of almost all of the output, an insignificant amount being obtained from sands in the overlying Cretaceous rocks. Production comes from both petroleum an gas wells and is supplemented by natural gasoline derived through the medium of absorption plants treating the gas from these wells.

"Until June 1936, except from a few wells along the margin of the gas-cap of Turner Valley field that yielded a heavier petroleum, production was derived almost entirely from gas wells in the form of so-called naphtha, an unstabilized natural gasoline. Since then all development has been diverted towards the western deeper-lying belt of the limestone where the same porous zones yield a liquid-phase petroleum. Here the gravity of the petroleum ranges from 38° API in the lower part adjacent to the edge-water to 45° API near the gas cap.

"Efforts to extend development north and south were continued in 1943 and the limit at either end does not appear to be reached, although nothing on the scale attempted at the north end in 1941 and 1942 was repeated. Interest centred largely in the area 9 miles long in the central part of Turner Valley, in which a limited amount of drilling had been done, the results of which were not encouraging. To stimulate the drilling of wells in order to keep up the supply of light petroleum for Western Canada from Turner Valley, which had been declining from its peak reached in February 1942, a company known as Wartime Oils was formed by the Dominion Government under the Oil Controller to finance such drilling. Money is loaned to the operator on the basis of a small royalty and low interest and is to be paid back out of production. Drilling was started in the summer and by the end of the year three wells had been completed and eleven rigs were working. Depending on results, at least twenty-six wells were planned.

"The deep hole that was started in 1942 on legal sub-division 2-25-19-3-5 as a co-operative effort by a number of operators to test whether the Devonian limestone underlay the west flank of Turner Valley passed from the Banff shales into Upper Blairmore (?) at 8,795 feet, thus demonstrating its absence in that locality. Production was subsequently obtained from the usual porous zones in the Rundle limestone at 7,662 feet.

"The repressuring experiment in the south end of Turner Valley, in which gas mainly from Frontier and Prairie wells has been returned to Foundation well, was continued throughout the year. No information as to results has been published.

"At the end of 1943 a total of 214 wells were in production in Turner Valley, 24 of which were completed during the year.

"Elsewhere in the Foothills of Alberta, some oil is reported to have been trucked to Calgary from Ram River No. 2 well, but no proper test had been made. The oil was reported to have a gravity of 41·5° API and to be low in sulphur. The test at Jumping Pound, close to the strike of the northward continuation of the north end of Turner reached the top of the Palaeozoic limestone at 11,588 feet and was completed at 12,056 feet. Although porosity in the limestone was good, water was struck and the well has since been abandoned. Farther south, drilling was proceeding at Sullivan Creek, west of Nanton, and at Maxmont a hole is reported to be over 9,700 feet.

"Drilling was active again on the southern plains of Alberta and was usually preceded by careful geological and geophysical surveys. Such work is facilitated by the regulations in force in the province, and at the end of the year it was reported that a total of nearly four million acres were under permit for this purpose. No new sources of oil were discovered, but considerable success was achieved at Taber, where four wells are reported to have become major producers, the old problem of infiltration of water apparently having disappeared at the greater depths. Production from the Taber field was more than double that of 1942, and would have been greater had the market been available.

"Production from the Vermilion field increased from 2,500 barrels in May to 17,000 barrels in November. The refinery at Borradaile was closed during part of the year for the erection of new equipment.

"In the Pouce Coupe area, the hole spudded in during 1942 came in as a gas well at 2,173 feet.

"In Saskatchewan, the drilling of deep holes was continued. The hole at Radville penetrated the Silurian, and those at Ogema and Parry both reached the basement complex; at Dahinda drilling had entered the Jurassic. All of the holes, except the Radville, which was abandoned, had shows of petroleum that remain to be tested. Besides this deep drilling, much structural drilling and geophysical work was done. Another hole that penetrated sands carrying petroleum was drilled to 3,516 feet near Horsham.

"In Ontario, petroleum continues to be produced at Petrolia, Oil Springs, Bothwell, and in the townships of Dawn, Warwick, West Dover, and Mosa.

"In Quebec, Continental Petroleums, Limited began drilling on the Galt anticline on Gaspé Peninsula, where the limestone underlying the Devonian sandstone is exposed. At over 2,000 feet the hole was still in the limestone. Failing production at higher horizons it was intended to drill to the Silurian.

"In Prince Edward Island, Island Development Company, a subsidiary of Socony-Vacuum and Cities Service companies, following seismic surveys, began drilling in Hillsborough Bay. The well, which was being drilled on a pier, was intended to test Mississippi beds, hitherto not reached beneath the considerable thickness of the overlying Pennsylvanian.

"In New Brunswick, further geophysical work was done in the vicinity of the Stoney Creek field. One well was drilled and two were deepened. A slight decline occurred in production.

"In Nova Scotia, investigations were proceeding with a view to further test drilling.

"The important development started in 1942 in the Northwest Territories and known as the Canol Project was continued throughout 1943 with encouraging results. In 1942, sixteen wells were drilled at Norman Wells on the Mackenzie River, two of which failed to produce petroleum in commercial quantity, and in 1943 fourteen more were completed. In 23 of the total of 30 wells drilled oil in commercial quantities was found. Four of the others were 'wildcat' wells, and three were marginal. Including the original four wells, a total of 27 were productive at the end of the year and a fairly well defined area of over 5,000 acres was regarded as proven. Much of this lies beneath the Mackenzie River, although possibly over half of it can be reached by means of directional drilling. At this point the river, including islands, is three miles wide. Productive wells have been drilled on Bear Island and on the down-stream end of a sand bar called Goose Island.

"The productive formation at Norman Wells is a reef limestone that occurs at 1,050 to 1,150 feet in the shallow wells on the right bank of the river and at 1,706 feet in a well on Bear Island. The limestone is amenable to treatment with acid and the initial production of individual wells is up to expectations. Reservoir pressures generally are comparable to the hydrostatic head. The pipe line to connect the field with a refinery under construction at Whitehorse, Yukon Territory, was nearing completion early in June, 1944.

"The throughput of the refinery at Norman Wells was increased in September from 840 barrels to over 1,100 barrels a day. Products were aviation-base gasoline, white motor-gasoline, heavy naphtha, light Diesel fuel, reduced crude, and bottoms. A heavy Diesel fuel is blended from reduced crude, heavy naphtha, and crude petroleum.

Oil Shale

"There are large deposits of oil shale in different parts of Canada, the best known occurrences being in Pictou and Antigonish counties, Nova Scotia, and Albert and Westmorland counties, New Brunswick. As shale oil cannot compete with petroleum at present prices, none of these deposits has been actively developed on a commercial scale.

"**Developments:** In 1942, the Mines and Geology Branch, Department of Mines and Resources, Ottawa, drilled some of the oil shale occurrences in New Brunswick to determine their possibilities as a source of oil and lubricants under war conditions. A total of forty-three holes were drilled in oil shale deposits in the Rosevale area and in the vicinity of Taylor Village, New Brunswick; thirty-six holes were also drilled in deposits at Albert Mines, New Brunswick. The conclusion was reached that the over-all grade of the shales in the areas mentioned is too low to be of economic interest even under present conditions.

"**Production and Trade:** No production has been reported for a number of years and no oil shale is being imported into Canada.

"Experimental plants were erected in 1928–30 near Rosevale, New Brunswick, and New Glasgow, Nova Scotia, to treat local shales but they operated only for short periods. Activity has been confined chiefly to field exploration and to laboratory investigation. Laboratory work by the Bureau of Mines, Ottawa, has included the determination of the petroleum content of representative samples from various localities; the determination of important factors affecting the recovery of crude petroleum by destructive distillation and of the character of the petroleum recovered; and the investigation of the process designed for the distillation of oil shale.

"For many years the large-scale production of oil shale was confined to Scotland, but deposits in Manchuria and Esthonia were being developed in 1938 on a large scale. The production of these countries in 1938 was: Scotland, 1,551,346 tons; Esthonia, 1,450,885 tons; and Manchuria, approximately 3,000,000 tons. In 1939 South Africa is reported to have produced 3,000,000 gallons of shale oil. In Australia the Federal and New South Wales Governments are reported to be giving considerable assistance to the shale oil industry, the production in 1942 being 1,600,000 gallons of shale oil."

Table 200.—Production of Crude Petroleum in Canada, by Provinces, 1934-1943

Year	New Brunswick		Ontario		Alberta		Northwest Territories		Canada	
	Barrels	Value $	Barrels	Value $	Barrels	Value $	Barrels	Value $	Barrels	Value $
1934	11,106	22,277	141,385	299,874	1,253,936	3,104,823	4,438	22,188	**1,410,865**	**3,449,162**
1935	12,954	18,230	165,041	346,156	1,263,510	3,102,227	5,115	25,575	**1,446,620**	**3,492,188**
1936	17,112	24,075	165,495	359,767	1,312,368	3,019,930	5,399	20,995	**1,500,374**	**3,424,767**
1937	18,089	25,496	165,205	356,000	2,749,085	4,961,002	11,371	56,855	**2,943,750**	**5,399,353**
1938	19,276	27,246	172,641	359,268	6,751,312	8,775,094	22,855	68,565	**6,966,084**	**9,230,173**
1939	22,799	32,082	206,379	401,430	7,576,932	9,362,363	20,191	50,477	**7,826,301**	**9,846,352**
1940	22,167	31,220	187,844	397,078	8,362,203	10,691,394	18,633	37,265	***8,590,978**	**11,161,213**
1941	31,359	44,102	160,238	337,760	9,918,577	13,985,906	23,664	47,328	**10,133,838**	**14,415,096**
1942	28,089	39,467	143,845	308,242	10,117,073	15,514,665	75,789	108,477	**10,364,796**	**15,968,851**
1943	24,530	34,342	132,492	311,356	9,601,530	15,724,518	293,750	409,201	**10,052,302**	**16,479,417**

* Includes 331 barrels at $256 in Saskatchewan.

Table 201.—Production of Crude Petroleum in Canada, by Months, 1943

(Barrel=35 imperial gallons)

Month	*New Brunswick	Ontario	*Alberta	*Northwest Territories	Canada
	Barrels	Barrels	Barrels	Barrels	**Barrels**
January	2,307	8,373	835,657	10,024	**856,361**
February	1,914	8,968	752,384	12,719	**775,985**
March	2,223	11,206	824,007	19,123	**856,559**
April	2,305	10,911	797,785	21,674	**832,765**
May	2,185	11,875	837,973	16,288	**868,321**
June	2,313	12,819	787,583	19,151	**821,866**
July	2,196	11,915	811,324	17,692	**843,127**
August	1,878	12,226	820,581	18,846	**853,531**
September	1,964	11,199	792,890	17,001	**823,054**
October	1,739	11,643	815,925	25,702	**855,009**
November	1,798	11,028	767,842	48,891	**829,559**
December	1,618	10,239	757,579	66,636	**836,072**
Total	**24,530**	**132,492**	**9,601,530**	**293,750**	**10,052,302**

* These figures include total output each month.

Table 202.—Petroleum Wells in Canada, by Provinces, 1941-1943

—		New Brunswick	Ontario	Alberta	Northwest Territories	Canada
Productive wells at beginning of year	1941	20	2,028	235	3	**2,286**
	1942	20	1,956	274	3	**2,253**
	1943	21	1,852	305	20	**2,198**
Number of productive wells drilled	1941	...	35	48	...	**83**
	1942	1	13	45	17	**76**
	1943	1	1	66	9	**77**
Number of wells abandoned	1941	...	31	9	...	**40**
	1942	...	54	14	...	**68**
	1943	...	144	6	3	**153**
Number of dry wells drilled	1941	...	39	10	...	**49**
	1942	...	13	21	...	**34**
	1943	...	17	19	1	**37**
Number of productive wells in operation at end of year	1941	20	1,956	274	3	**2,253**
	1942	21	1,852	305	20	**2,198**
	1943	22	1,728	365	26	**2,141**

Table 203.—Production of Crude Petroleum in Canada, 1942 and 1943

—	1942		1943	
	Barrels	Total value	Barrels	Total value
		$		$
New Brunswick	28,089	39,467	24,530	34,342
Ontario—				
Petrolia and Enniskillen	51,917	109,315	45,308	105,300
Oil Springs	27,279	60,804	27,270	66,811
Moore Township	728	1,533	332	772
Sarnia Township	315	663	305	709
Plympton Township	24	50	26	60
Bothwell Township and Thamesville	27,946	58,842	25,908	60,212
West Dover, Romney, Raleigh, and Tilbury East	8,575	18,056	9,177	21,328
Onondaga	58	122	11	26
Mosa Township	19,209	40,446	16,327	37,945
Brooke	77	162	...	...
Dunwich	358	754	1,422	3,305
Dawn and Euphemia	597	1,257	439	1,020
Warwick, Metcalfe, and Adelaide	6,524	13,737	5,967	13,868
Chatham	...	...	...	...
Manitoulin Island	...	...	...	...
Collingwood	35	74	...	...
Private sales	203	427	...	...
Total for Ontario	143,845	306,242	132,492	311,356
Saskatchewan	...	...	...	...
Alberta—				
Turner Valley	10,080,305	15,482,846	9,452,697	15,124,315
Red Coulee (light crude)	9,546	9,400	8,928	9,107
Wainwright-Ribstone (heavy crude)	27,222	22,419	139,905	591,096
Taber-Moose Dome				
Total for Alberta	10,117,073	15,514,665	9,601,539	15,724,518
Northwest Territories	75,789	108,477	293,750	400,201
Canada	**10,261,796**	**15,968,851**	**10,052,302**	**16,170,417**

Table 204.—Capital Employed in the Petroleum Industry in Canada, by Provinces, 1942 and 1943

—	1942			1943		
	Ontario	Alberta	Canada*	Ontario	Alberta	Canada*
	$	$	$	$	$	$
Capital employed as represented by:						
Cost of land, buildings, plant, machinery and tools	1,057,720	41,932,130	**43,583,146**	894,381	41,922,779	**47,344,151**
Cost of supplies and stock on hand	15,987	2,539,811	**2,878,305**	8,921	2,548,797	**2,857,718**
Cash, trading and operating accounts and bills receivable	28,121	7,571,882	**8,245,831**	22,122	8,251,631	**8,856,753**
Total	**1,101,828**	**52,043,823**	**54,707,282**	**925,424**	**52,723,297**	**59,058,622**

Data for New Brunswick included with the Natural Gas Industry.
* Includes data for the Northwest Territories.

Table 205.—Employees, Salaries and Wages in the Petroleum Industry in Canada, by Provinces,* 1942 and 1943

Province	Average number of employees				Salaries and wages		
	Salaried employees		Wage-earners	Total	Salaries	Wages	Total
	Male	Female					
			*		$	$	$
1942							
Ontario	18	3	189	**210**	21,071	118,840	**139,911**
Alberta	337	106	1,197	**1,640**	910,688	2,279,270	**3,189,958**
Canada†	**371**	**113**	**1,488**	**1,972**	**997,609**	**2,651,356**	**3,648,965**
1943							
Ontario	13	3	146	162	16,922	109,543	126,465
Alberta	330	107	1,346	1,783	1,008,021	2,804,152	3,812,173
Canada†	**496**	**155**	**1,748**	**2,399**	**1,547,605**	**3,665,290**	**5,212,895**

* Data for New Brunswick is included in the Natural Gas Industry.
† Data for Northwest Territories included with Canada.

(2) PETROLEUM PRODUCTS INDUSTRY

Statistics for the Petroleum Products Industry cover all establishments in Canada which were occupied chiefly in (a) the refining of crude oil to produce gasoline, fuel oil, etc., and (b) the blending or compounding of lubricating oils and greases.

Thirty-five refineries and 17 blending plants, or a total of 52 works, reported under this category in 1943 and the aggregate value of production was $187,106,054, an increase of 14 per cent over the 1942 total of $163,716,515.

Output figures for 1943 included $185,830,862 for petroleum refineries and $1,140,133 for concerns engaged in blending oils and greases, against corresponding totals in 1942 of $162,628,828 and $1,087,687 respectively.

Thirty-five petroleum refineries operating in Canada during 1943 were distributed by provinces as follows: 8 in Saskatchewan, 7 in Alberta, 6 in Ontario, 4 in Quebec, 4 in Manitoba, 3 in British Columbia and 1 in each of Nova Scotia, New Brunswick and Northwest Territories. Compared with 1942, there was a decrease of 1 refinery in Alberta and an increase of 1 in Ontario. The operating refineries had a capacity of 242, 215 barrels of crude oil per day, of which Ontario had 76,250 barrels or 31 per cent; Quebec, 67,000 barrels or 28 per cent; Nova Scotia, 34,000 barrels or 14 per cent; British Columbia, 24,500 barrels or 10 per cent; Saskatchewan, 16,825 barrels or 7 per cent; Alberta 18,400 barrels or 8 per cent; Manitoba, 3,650 barrels or 1 per cent; the Northwest Territories, 840 barrels or 0·3 per cent, and New Brunswick, 250 barrels. Location, type and capacity for each of these refineries is recorded in the directory at the end of this report.

During the year, 1,746,982,235 gallons of imported crude oil and 337,070,674 gallons of crude oil and absorption gasoline from Canadian wells, or a total of 2,084,052,909 gallons was put through Canadian refineries, this amounting to about 66 per cent of the rated capacity. Of the total crude input, about 69 per cent was imported from the United States and nearly 15 per cent from other countries, while about 16 per cent came from Canadian wells. The total cost at the refineries of all crude oil and naphtha charged to stills during the year was $127,907,890. Stocks of crude oil held at the refineries on December 31 amounted to 175,148,256 gallons.

Refinery production of gasoline in 1943 amounted to 869,288,237 gallons, and in addition the refineries used for blending about 21,647,290 gallons of imported casinghead gasoline which is not included in the Canadian production figures. The gallonage of gasoline made in 1943 was 16 per cent over 1942, which, in turn, was 12 per cent under 1941. The refinery selling value of the gasoline made during the year was $110,043,999. Stocks of gasoline held by the refineries on December 31 included 81,654,646 gallons of straight run or cracked gasoline and 1,036,670 gallons of imported casinghead gasoline. In 1943 there was an output of 16,319,590 gallons of natural gasoline from absorption plants in Alberta. This was practically all sold to refineries and is included with the gallonage charged to stills, and the refined gasoline made therefrom is included in the refinery output figures.

Imports of gasoline, including casinghead, amounted to 97,504,792 gallons during 1943, which, added to the production of 869,288,237 gallons less the increase in producers', distributors', and consumers' stocks of 27,819,974 gallons and less the exports of 21,494,799 gallons, made an apparent Canadian consumption of 917,478,256 gallons. Actual sales, as reported to the Bureau on a monthly basis, amounted to 903,592,163 gallons.

Production of fuel and gas oils (excluding any made and used for cracking processes) totalled 893,649,905 gallons, of which 809,950,476 gallons were made for sale and 83,699,429 gallons for use as fuel in the producing plant. Imports amounted to 53,570,321 gallons and exports to 54,687,171 gallons. Stocks of fuel oil and distillate at the end of the year stood at 275,469,561 gallons, or about 43,669,103 gallons more than in 1942. Output of tractor and engine distillate was 39,433,111 gallons in 1943, imports amounted to 596,503 gallons, and producers' stocks declined 2,217,713 gallons. The apparent consumption of fuel oils and distillate in Canada, as calculated from the above figures, amounted to 891,111,279 gallons.

Capital employed in the petroleum refining industry in 1943 was reported at $89,643,702 of which $43,145,830 was the value placed on land, buildings, machinery and equipment, $41,329,983 represented inventories of finished products and processing materials, and $5,167,889 were for operating capital, such as, cash, bills and accounts receivable. The monthly employment averaged 5,995 persons who received $12,595,891 in salaries and wages. Expenditures for fuel and electricity amounted to $8,234,286 and $137,492,025 were paid out for crude oil and other processing materials.

For more complete information see the Dominion Bureau of Statistics report "The Petroleum Products Industry in Canada 1943".

Table 206.—Materials Used in Petroleum Refineries, 1942 and 1943

Material	Unit of measure	1942		1943	
		Quantity	Cost at works	Quantity	Cost at works
			$		$
Crude oil (under 60° A.P.I.) in its natural state, from Canadian wells	Imp. gal.	349,255,157	19,047,524	322,873,457	17,371,041
Absorption gasoline, etc., from Canadian wells (run to stills)	Imp. gal.	10,280,581	726,600	14,197,217	891,721
Crude oil, in its natural state, imported, (run to stills)—					
(a) From United States	Imp. gal.	1,146,769,895	69,828,576	1,443,428,128	91,367,996
(b) From Other Countries	Imp. gal.	396,913,456	21,572,639	303,062,252	18,203,645
Crude oil, not in its natural state (run to stills)	Imp. gal.	7,933,800	1,278,635	491,855	73,487
Benzol for blending	Imp. gal.	3,954,267	531,217	2,674,901	382,248
Phenol	pound	631,331	93,547	557,559	82,103
Sulphuric acid, 66° Be	pound	34,741,455	396,297	40,683,213	462,617
Sulphur	pound	63,375	1,561	94,432	2,360
Caustic soda	pound	5,786,123	171,668	6,218,934	178,163
Soda ash	pound	327,366	7,350	398,557	9,377
Litharge	pound	195,309	17,245	305,045	23,582
Fullers' earth and clay	pound	24,162,091	528,350	25,390,653	601,283
Compounding materials	....	....	227,931	....	287,571
Tetraethyl fluid	c.c.	1,538,594,864	3,523,276	1,752,403,904	4,024,703
Blending stocks for aviation gasoline	Imp. gal.	....	1,758,052	7,925,244	2,061,939
Other materials	....	....	677,034	....	800,930
Shipping containers	....	....	789,534	....	667,259
Total	....	....	**121,177,036**	....	**137,492,025**
Lubricating oils and greases	....	....	747,220	....	667,859
Grand Total	....	....	**121,924,256**	....	**138,159,884**

Table 207.—Products Made in Petroleum Refineries, 1942 and 1943

Product	Unit of measure	1942		1943	
		Quantity	Gross selling value at works	Quantity	Gross selling value at works
			$		$
MADE FOR SALE—					
Gasoline(1)—Straight run(1)—Aviation	Imp. gal.	90,510,113	18,074,919	118,866,138	23,250,266
Standard	Imp. gal.	288,678,830	31,961,334	273,228,417	31,567,666
By cracking(2)—Aviation	Imp. gal.	305,165	48,582	1,641,220	290,331
Standard	Imp. gal.	369,680,137	41,849,140	475,323,338	54,884,836
Stove oil (40°—42·5° A.P.I.)	Imp. gal.	24,515,578	1,652,595	27,628,033	1,689,781
Gas and light fuel oil (20°-40° A.P.I., except diesel)	Imp. gal.	141,126,499	8,616,052	131,731,939	7,986,051
Diesel fuel oil (all fuel oil sold under this name)	Imp. gal.	79,247,928	4,644,937	113,610,054	6,425,857
Residual fuel oil (10°-20° A.P.I.	Imp. gal.	548,836,428	24,978,037	536,980,450	25,754,878
Tractor and engine distillate	Imp. gal.	44,636,725	4,534,787	39,433,111	3,926,571
V.M. and P. or solvent naphtha	Imp. gal.	20,907,259	2,355,333	24,842,055	2,870,943
Kerosene	Imp. gal.	24,912,066	2,766,291	29,014,580	3,091,665
Lubricating oil	Imp. gal.	38,076,120	7,405,169	39,651,627	8,671,595
Lubricating grease	pound	20,874,531	1,171,490	21,411,920	1,216,548
Asphalt	Imp. gal.	55,008,547	4,709,563	45,879,562	3,792,572
Petroleum coke	ton	64,461	464,326	78,166	567,482
Other products(3)	....	....	1,232,878	....	2,606,815
Total—Made for Sale	....	....	**156,465,433**	....	**178,593,857**
MADE FOR OWN USE—					
Gasoline—Straight run	Imp. gal.	182,635	22,937	151,221	41,780
By cracking process	Imp. gal.	7,870	1,121	77,903	9,120
Stove oil	Imp. gal.	890	39	1,017	52
Gas and light fuel oil (20°-40° A.P.I.)	Imp. gal.	69,101	4,232	47,781	3,111
Diesel fuel oil	Imp. gal.	72,646	4,302	107,178	6,103
Residual fuel oil (10°-20° A.P.I.)	Imp. gal.	65,932,327	3,068,787	83,543,453	3,996,747
Tractor and engine distillate	Imp. gal.	39,354	3,254	....	....
Kerosene	Imp. gal.	45,730	4,814	182,622	18,510
Lubricating oil	Imp. gal.	61,516	12,755	92,198	20,182
Asphalt	Imp. gal.	57,236	5,324	27,997	2,137
Petroleum coke	ton	8,950	63,411	7,146	49,355
Still gas	M cu. ft.	7,621,105	2,734,711	8,385,106	2,953,760
Other products	....	....	237,708	....	271,207
Total—Made for Own Use	....	....	**6,163,395**	....	**7,372,064**
Fuel and gas oils and topped crude, for use in cracking process	Imp. gal.	522,046,536	....	640,764,520	....
Lubricating oils and greases—					
Grease, lubricating	pound	1,726,281	217,755	1,103,187	172,642
Oils, lubricating	gallon	1,236,595	782,436	1,295,122	860,879
Soaps and soap powders	pound	500,294	43,209	....	34,368
All other products	....	....	44,287	....	72,244
Total	....	....	**1,087,687**	....	1,140,133
Grand Total	....	....	**163,716,515**	....	**187,106,054**

(1) Includes recoveries from Turner Valley naphtha and natural gasoline run to refinery stills but does not include the imported casinghead gasoline which was used for blending at the refineries.

(2) Includes polymer gasoline.

(3) Includes wax, candles, still gas for sale, butane, propane, cumene, etc. These items were reported by fewer than three companies so, in accordance with the provisions of the Statistics Act, the figures cannot be shown separately.

CHAPTER EIGHT

THE NON-METALLIC MINING INDUSTRIES IN CANADA. (Other than Fuels)

Including detailed data relating to operations in the following industries:—

Asbestos	Miscellaneous	Magnesitic dolomite
Feldspar, Nepheline Syenite and Quartz	Barite	Magnesium sulphate
Gypsum	Diatomite	Mineral waters (natural)
Iron oxides (ochre)	Fluorspar	Phosphate
Mica	Garnet	Pyrites (sulphur)
Peat fuel	Graphite	Silica brick
Peat moss	Grindstones, etc.	Sodium carbonate
Salt	Lithium minerals	Sodium sulphate
Talc and soapstone		Strontium minerals

THE ASBESTOS MINING INDUSTRY, AND THE ASBESTOS PRODUCTS INDUSTRY

Canadian production of asbestos in 1943 totalled 467,196 short tons valued at $24,409,416 compared with 439,459 short tons worth $22,663,283 in 1942. The value of the 1943 output was the greatest ever recorded in the history of the Canadian asbestos mining industry, and the tonnage was exceeded only by that of 1941 when the mines reported a production of 477,846 tons. The mineral in 1943 came, as usual, entirely from deposits located in the province of Quebec.

Nine firms were engaged in asbestos mining during 1943; capital employed amounted to $20,831,000; employees numbered 3,844; and salaries and wages paid were reported at $5,576,734. Fuel and electricity consumed was valued at $1,625,450 and $1,651,260 were expended for explosives, drill steel, and other process supplies. The value of new equipment purchased totalled $300,738 and the industry paid, during the year under review, a total of $4,511,704 in taxes.

Exports of Canadian asbestos in 1943 included 1,990 tons of crude valued at $859,511; 210,837 tons milled fibres worth $15,673,929; asbestos waste, refuse and shorts, 230,172 tons at $5,848,031, and asbestos manufactures, $139,209. Imports of various asbestos products were appraised at $2,305,162.

The following information is from a report "Asbestos in 1943" as prepared by M. F. Goudge of the Bureau of Mines, Ottawa:

"Asbestos of commerce consists mostly of the three varieties known as chrysotile, amosite, and crocidolite or blue asbestos, with chrysotile being by far the most important and widely used. Three other varieties that have only a limited field of usefulness are fibrous actinolite, fibrous tremolite, and anthophyllite.

"The asbestos produced in Canada is practically all of the chrysotile variety and comes almost entirely from areas of serpentinized rock in the Eastern Townships, Quebec, where the producing centres are Thetford Mines, Black Lake, East Broughton, Vimy Ridge, Asbestos, and St. Remi de Tingwick. The Canadian deposits are the largest known in the world. Production has been continuous from the Thetford area since 1878 and reserves of asbestos-bearing rock are enormous. Core-drilling to depths greater than 1,700 feet has revealed the presence of fibre comparable in quantity and quality with that in the present workings. Most of the output consists of vein fibre obtained from veins ¼ to ½ inch in width, though veins exceeding 5 inches in width do occur. The fibres run crosswise of the vein and thus the width of the vein determines the length of fibre. Slip fibre, occurring in fault planes, is obtained largely in the East Broughton area.

"In 1943 there were six producing companies. Asbestos Corporation Limited worked two properties at Thetford Mines and one each at Black Lake and Vimy Ridge. Johnson's Company operated at Thetford Mines and at Black Lake. Bell Asbestos Mines, Limited operated at Thetford Mines; Quebec Asbestos Corporation, Limited, at East Broughton; Canadian Johns-Manville Company, Limited, at Asbestos; and Nicolet Asbestos Mines, Limited, at St. Remi de Tingwick.

"The asbestos-bearing rock is mined in open pits and underground. Most of the underground work consists of block-caving, though other methods of underground mining are also used.

"Small deposits of chrysotile asbestos are known in other parts of Quebec and also in Ontario and British Columbia. Several have been worked from time to time. The asbestos from some of these small deposits has a very low content of iron and is entirely free from magnetite, and should be suitable for use in making insulation for electrical machinery.

"No amosite or crocidolite have yet been found in Canada, but there are numerous deposits of fibrous tremolite, fibrous actinolite, and anthophyllite, which varieties are commercially termed amphibole asbestos. The fibres of these varieties are harsher and weaker than those of chrysotile and there is little demand for them at present. None of these deposits is being worked, although formerly fibrous actinolite was quarried near the village of Actinolite, Hastings county, Ontario, for use in the making of roofing materials. Asbestos deposits reported as having been found in recent years in Manitoba and in northern and western Ontario are of the amphibole varieties. The amphibole fibres are too harsh and brittle to be spun, but they have a higher resistance to acids than has chrysotile and it is possible that material from some of the deposits may be suitable for use in acid filters and for other purposes where long harsh fibres are required.

"Few figures on recent world production are available, but it is known that Canada maintained its position as the principal asbestos-producing country. Other countries producing relatively large quantities of asbestos are Russia, Rhodesia, Union of South Africa, Swaziland, the United States, and Cyprus. Small shipments of asbestos are made from Australia (crocidolite), Bolivia (crocidolite), China (chrysotile), India (chrysotile), and Venezuela (chrysotile). The world's largest market for asbestos is in the United States, and Canada's proximity to this market confers very real advantages on the asbestos industry in this country. Another development favouring the Canadian industry is the increasing demand for short grades of fibre for use in newly developed asbestos-cement products, and in moulded plastic articles.

"Most of the Canadian production of asbestos is exported in the unmanufactured state, i.e. either in the crude condition (long-fibred material only), in a partly opened state, or completely fluffed out and ready for manufacture. The great bulk of exports goes to the United States, but substantial quantities are also exported to the United Kingdom and Australia. Since September 20, 1939, the Dominion Government has controlled the export of asbestos. Late in 1942 some minor modifications were made in the classification of standard grades of Canadian asbestos and this revised classification has been adopted by the Quebec Asbestos Producers' Association.

"Asbestos is used for a great variety of purposes, the principal asbestos products being: brake linings, clutch facings, packings, cloth, insulation, millboard, siding, shingles, roofing, tile, and pipes.

"Current prices f.o.b. Quebec mines, in U.S. funds, tax and bags included, are as follows: No. 1 crude, \$650 to \$750 per ton; No. 2 crude, \$165 to \$385; spinning fibre, \$124 to \$233; shingle fibre, \$62.50 to \$85; paper fibre, \$44 to \$49; cement stock, \$28.50 to \$33; floats, \$19.50 to \$21; shorts \$12 to \$16.50 per ton."

A report issued by the United States Department of the Interior contains the following information:

"Ordinarily the United States produces 4 to 6 per cent of its requirements of asbestos fibres, but in 1943 according to statistics compiled by the Bureau of Mines, United States Department of the Interior, it furnished only 1 per cent. Most of the domestic production consists normally of the shorter grades of chrysotile, but the principal producer of these grades suspended operations temporarily in 1943 while opening up a new quarry.

"Canada supplied the larger part of United States needs for chrysotile, but Canadian output is chiefly of the non-spinning shorter grades. African chrysotile was imported in substantial quantities to supplement the supply of Canadian spinning fibres. Soviet Russia, Australia, and India are other sources of supply.

"Asbestos is an important mineral in the military program. The United States is dependent almost entirely for its supply of the critical grades on imports from Canada, Southern Rhodesia and the Union of South Africa. The domestic contribution of critical grades is negligible."

Table 208.—Sales and Shipments* of Canadian Asbestos, 1941-1943

—	1941		1942		1943	
	Tons	$	Tons	$	Tons	$
Crudes	2,846	980,217	2,889	1,233,184	2,016	888,099
Fibres	223,767	14,812,871	199,829	15,339,128	217,889	16,071,843
Shorts	251,233	5,675,752	236,741	6,090,971	247,291	6,209,563
Total	**477,846**	**21,468,840**	**439,459**	**22,663,283**	**467,196**	**23,169,505**
Sand, gravel, and stone (waste rock only) (a)	8,454	6,805	8,090	7,925	6,914	6,745

—	1941	1942	1943
		(tons)	
Quantity of rock mined	7,707,367	8,233,516	7,929,471
Quantity of rock milled	6,366,670	6,795,459	6,828,532
Value of containers	(b)	(b)	1,233,166

(*) All from the province of Quebec unless otherwise noted.
(a) This production is included under the sand and gravel industry.
(b) Data not available.

Table 209.—Sales and Shipments of Asbestos, 1926-1943

Year	Tons	$	Year	Tons	$
1926	279,403	10,099,423	1935	210,467	7,054,614
1927	274,778	10,621,013	1936	301,287	9,958,183
1928	273,033	11,238,360	1937	410,026	14,505,791
1929	306,055	13,172,581	1938	289,793	12,890,195
1930	242,114	8,390,163	1939	364,472	15,859,212
1931	164,296	4,812,886	1940	346,805	15,619,865
1932	122,977	3,039,721	1941	477,846	21,468,840
1933	158,367	5,211,177	1942	439,459	22,663,283
1934	155,980	4,936,326	1943	467,196	23,169,505

Table 210.—Consumption of Asbestos in Specified Canadian Industries, 1942 and 1943

Industry		1942		1943	
		Quantity	Cost at works	Quantity	Cost at works
			$		$
Electrical Apparatus and Supplies—					
Board	pound	(x)	97,604	(a)	(a)
Yarn	pound	(x)	13,597	(a)	(a)
Tape	pound	(x)	16,690	(a)	(a)
Boilers, tanks and engines		(x)	38,043	(x)	28,983
Asbestos Products—					
Fibre	ton	12,107	503,340	11,536	548,706
Other forms	ton	565	264,531	....	227,487
Roofing paper	ton	755	17,493	823	18,275
Cotton goods, n.e.s.	pound	20,515	1,118	10,768	607

(x) Not available.
(a) Not reported in 1943.

Table 211.—Imports Into Canada and Exports of Asbestos, 1942 and 1943

—	1942		1943	
	Tons	$	Tons	$
IMPORTS—				
Asbestos clutch facings for automobiles, motor vehicles and chassis	....	317,115	....	347,844
Asbestos brake linings for automobiles, motor vehicles and chassis	....	707,894	....	405,220
Asbestos brake linings and clutch facings, n.o.p.	....	96,829	....	37,439
Asbestos in any form other than crude, and all manufactures of, n.o.p.	....	1,330,179	....	1,368,216
Asbestos packing	139	158,373	140	146,443
Total	....	**2,610,390**	....	**2,305,162**
EXPORTS—				
Asbestos (crude)	2,796	1,190,989	1,990	359,511
Asbestos milled fibres	198,452	15,056,981	210,837	15,673,929
Asbestos waste, refuse and shorts	226,209	5,666,831	230,172	5,848,031
Asbestos manufactures, including asbestos roofing	....	173,361	....	139,209
Total	....	**22,088,162**	....	**22,520,680**

Table 212.—Principal Statistics of the Asbestos Industry in Canada, 1941-1943

—	1941	1942	1943
Number of firms $	9	8	9
Capital employed $	21,325,558	18,741,364	20,831,427
Number of employees—On salaries (c)	314	329	345
On wages	3,446	3,420	3,499
Total	3,760	3,749	3,844
Salaries and wages—Salaries	679,394	731,836	772,455
Wages $	4,316,707	4,567,618	4,804,279
Total $	4,996,101	5,299,454	5,576,734
Selling value of products (a) $	21,475,645	22,671,208	24,409,416
Cost of fuel and electrictiy (purchased) $	1,524,450	1,646,291	1,625,450
Cost of process supplies (b) $	2,721,796	2,747,682	1,651,260
Cost of containers $	(d)	(d)	1,233,166
Net value of sales $	17,229,399	18,277,235	19,899,540

(a) Includes value of sand and gravel.
(b) Explosives, drill steel, etc.
(c) In 1943 includes 91 females, 60 in 1942 and 45 in 1941.
(d) Not reported separately.

Table 213.—Capital Employed in the Asbestos Industry in Canada, 1943

—	$
Present cash value of the land (excluding materials)	2,620,473
Present value of buildings, fixtures, machinery, tools and other equipment	8,633,827
Inventory value of materials on hand, ore in process, fuel and miscellaneous supplies on hand	2,071,491
Inventory value of finished products on hand	885,292
Operating capital (cash, bills and accounts receivable, prepaid expenses, etc.)	6,620,344
Total	**20,831,427**

Table 214.—Wage-Earners Employed, by months in the Asbestos Mining Industry in Canada, 1940-1943

Month	1940 Total	1941 Total	1942 Total	1943 Mine Surface Male	1943 Mine Surface Female	1943 Mine Underground Male	1943 Mill Male	1943 Mill Female
January	3,634	3,072	3,366	1,318	12	509	1,629	1
February	3,614	3,148	3,343	1,304	12	524	1,640	1
March	3,465	3,194	3,335	1,304	12	521	1,685	1
April	3,587	3,138	3,352	1,295	12	528	1,689	1
May	3,707	3,198	3,380	1,283	12	517	1,694	1
June	3,801	3,290	3,377	1,299	12	513	1,693	1
July	3,811	3,554	3,480	1,321	12	502	1,682	1
August	3,799	3,640	3,483	1,287	12	516	1,697	1
September	3,723	3,806	3,510	1,304	12	521	1,687	1
October	3,278	3,821	3,532	1,301	12	511	1,710	1
November	3,190	3,756	3,532	1,252	12	519	1,713	1
December	3,180	3,740	3,323	1,200	12	525	1,650	1

Table 215.—Taxes Paid by Asbestos Mining Industry in Calendar Year 1943

—	$
Dominion Income Tax, including tax on non-operating revenue	1,172,891
Dominion Excess Profits Tax	2,719,858
Provincial Taxes—	
Mining taxes paid on net profits from production, including portion paid to Municipality	452,710
Corporation Income Tax where levied in addition to Mining Tax	....
Taxes paid on capital and places of business	30
Acreage Taxes	218
Total Provincial	452,958
Municipal Taxes—	
Based on property valuation	165,997
Based on non-operating revenue	....
Total Municipal	165,997
Grand Total Taxes Paid	**4,511,704**

Table 216.—Certain Expenditures Made by the Asbestos Mining Industry, 1942 and 1943

—	1942	1943
	$	$
Workmen's compensation	161,888	292,970
Unemployment insurance	61,833	63,629
Aggregate cost of all supplies purchased	3,503,085	3,420,456
Aggregate cost of plant and equipment purchased	440,542	309,738

THE ASBESTOS PRODUCTS INDUSTRY IN CANADA, 1943

Production by the manufacturers of asbestos goods in Canada in 1943 was valued at $5,244,738 an increase of 2·8 per cent over the 1942 total of $5,101,259 The Products included brake linings valued at $1,785,667 boiler and pipe covering at $801,017, clutch facings at $179,781, asbestos packings at $224,937, and such other lines as asbestos gaskets, cloth, yarn, dryer felts, cement, etc.

Thirteen factories were engaged in this industry, of which 6 were located in Quebec, 6 in Ontario and 1 in Nova Scotia. Fixed and working capital as represented by these works totalled $5,798,080, the number of employees averaged 948 for each month of the year and payment in salaries and wages for the year amounted to $1,396,708. Expenditures for fuel and electricity totalled $180,871 and materials for manufacturing cost $2,424,245.

Table 217.—Materials Used the Asbestos Products Industry, 1942 and 1943

Material	Unit of measure	1942 Quantity	1942 Cost at works	1943 Quantity	1943 Cost at works
			$		$
Asbestos fibre	lb.	24,214,105	503,340	23,071,434	548,706
Asbestos cloth	lb.	62,638	21,037	67,938	32,727
Asbestos paper, corrugated and plain	lb.	522,999	25,548	562,516	28,542
Asbestos sheets and strips	lb.	....	....	29,994	18,926
Asbestos yarn	lb.	543,915	217,946	325,940	147,292
Cotton cloth and yarn	....	....	164,670	....	156,373
Rubber and rubber sheets	lb.	86,757	18,877	75,194	25,670
Containers and packing material	....	....	70,173	....	107,586
All other materials	....	....	1,370,901	....	1,358,414
Total	....	....	**2,392,492**	....	**2,424,245**

Table 218.—Products Manufactured in the Asbestos Products Industry, 1942 and 1943

Product	Unit of measure	1942 Quantity	1942 Cost at works	1943 Quantity	1943 Cost at works
			$		$
Asbestos brake linings—Moulded	ft.	4,590,036	1,551,105	4,157,728	1,326,839
Other	ft.	1,492,199	403,904	1,828,829	458,828
Asbestos boiler and pipe covering	ft.	4,446,893	532,574	5,137,846	801,017
Asbestos clutch facings	No.	628,649	203,071	....	179,781
Asbestos gaskets	lb.	66,213	38,318	....	31,636
Asbestos packings of all kinds	lb.	559,828	241,929	487,798	224,937
All other Products (x)	....	....	2,130,358	....	2,221,700
Total	....	....	**5,101,259**	....	**5,244,738**

(x) Includes products made by 1 or 2 firms, such as asbestos dryer felt, hydraulic brake hose, asbestos shingles, asbestos yarn, asbestos paper, asbestos cloth, etc.

FELDSPAR AND QUARTZ MINING INDUSTRY

Owing to the very close physical association of these minerals in many Canadian deposits (pegmatites), it has been found difficult for some operators to make a separation of all data pertaining to the mining of each individual mineral and, for this reason, the general statistics relating to capital, employment, fuel and electricity, etc., have been combined in this bulletin by the Mining, Metallurgical and Chemical Branch of the Dominion Bureau of Statistics at Ottawa. Since 1936, corresponding statistics relating to the production of nepheline syenite have been included with those pertaining to the commercial production of feldspar and quartz.

During 1943 the gross value of production by the industry, and comprising the value of feldspar, quartz and nepheline syenite sold, totalled $2,138,229 compared with corresponding values of $1,998,996 in 1942 and $1,838,054 in 1941. In 1943 commercial shipments of feldspar were made only from properties located in Ontario and Quebec; quartz (silica) in various forms was produced in Nova Scotia, Quebec, Ontario, Saskatchewan and British Columbia, while production of nepheline syenite was confined to the province of Ontario.

The number of firms reported as active in the industry in 1943 totalled 35; capital employed was recorded at $2,895,131; employees numbered 535; salaries and wages amounted to $768,199 and the value of fuel, electricity and process supplies totalled $456,852. The net value of all products sold in 1943 was estimated at $1,681,377 compared with $1,586,968 in 1942.

FELDSPAR

Production (producers' sales) of feldspar, crude and ground, during 1943 totalled 23,858 net tons valued at $237,771 compared with 22,270 net tons worth $213,941 in 1942. Of the 1943 output, 17,199 net tons were shipped from Quebec properties and 6,659 net tons from quarries in Ontario. The following information is from a recent report issued by the Bureau of Mines, Ottawa:

"Most of the feldspar mined in Canada is of high potash grade, though some operators also produce small amounts of soda spar. The latter type is rather uncommon as large deposits, but is sometimes found as zonal bodies in potash-feldspar pegmatites, usually along the walls. With the exception of 5,000 tons mined in the Pointe du Bois area, Manitoba, during the years 1934 to 1936, almost the entire production has come from adjacent sections of western Quebec and eastern Ontario, in the general Ottawa region. There has been a small production, also, from scattered properties in Ontario as far west as Parry Sound and Sudbury Districts. In recent years most of the production has come from about half a dozen mines, and until 1942 it was about equally divided between Ontario and Quebec. However, in that year and in 1943 output from Ontario declined to only 25 per cent of the total.

"In Ontario, the large quarry of Bathurst Feldspar Mines, in Bathurst township, Lanark county, which had been the leading producer in the province, was closed down in 1942, having reached the limit in depth of open-cast mining. Operations were continued through 1943, however, from surface on the southerly extension of the dyke, and production on a reduced scale was maintained. Frontenac Floor and Wall Tile Company, Kingston, operated its new Charles mine, also in Bathurst township, until September, when work was suspended. Most of the remaining output from Ontario in 1943 came from the Madawaska area, Nipissing District, where Madawaska Feldspar Company, in Murchison township, was the chief producer. Other operators in the same township were Keystone Contractors, Ltd., working the old Cameron mine, and Royal Feldspar Company, conducting development operations on the Hamilton property. Keystone Contractors, Ltd. also made shipments of low-grade spar (graphic granite) from a deposit in Gratton township, south of Eganville, Renfrew county, and for a short time Canadian Flint and Spar Company operated the old Cameron property in Dickens township, Nipissing district, near Barry's Bay. Some feldspar was also recovered at the property of Purdy Mica Mines, near Eau Claire, Mattawa district.

"In Quebec, the chief source of supply continued to be the large mine of Canadian Flint and Spar Company in Derry township, Papineau county, in the Lievre River section. This company also operated its New York mine, in Buckingham township, and a property near St. Pierre de Wakefield, in Wakefield township. United Mining Industries Limited, of Montreal, made shipments from a deposit in Buckingham township, west of the Lievre River, part of which was dental spar, and later moved to the Old Lapointe mine in West Portland township.

"A considerable part of the Canadian output is exported, mainly to grinding plants of Consolidated Feldspar Corporation, and Genesee Feldspar Company, at Rochester, New York. Exports of crude spar rose 15 per cent in 1943, from 11,016 tons valued at $85,360 in 1942 to 12,724 tons valued at $96,453. Imports of ground spar totalled 526 tons valued at $12,886, compared with 563 tons valued at $12,021 in 1942.

"Feldspar for domestic use is ground in mills operated by the following:

Canadian Flint and Spar Company, Buckingham, Quebec

Frontenac Floor and Wall Tile Company, Kingston, Ontario

Bon Ami Company, Montreal East, Quebec.

"The first two companies grind material for ceramic uses, while the Bon Ami product is used in scouring compounds. Total domestic consumption of feldspar in 1942 was reported to be 12,253 tons. Of this, 4,344 tons was sold for the manufacture of scouring soaps and cleaners; 3,234 tons was used by the clay products industry; 2,880 tons by the glass trade; 1,676 tons for sheet-metal enamelling; and 119 tons in abrasive wheels, etc. Production of milled spar in the same year was 12,428 tons.

"All of the feldspar used in industry is crushed or finely ground material, usually prepared either in mills operated by producers of the crude mineral or in merchant mills supplied from independent mines. Some manufacturers of ceramic products mine and grind spar for their own use. By far the greater part of the production is used in the ceramic industries.

"Most of the feldspar sold is of high-potash type, but a certain amount of high-soda spar also is in demand and is employed mainly for blending purposes for ceramic use. Feldspar has a relatively low fusion point and serves as the fluxing ingredient in all types of ceramic bodies.

It is an essential raw material for the manufacture of white wares, in glazes, and in porcelain enamels. In glass, it serves as an economical source of alumina and alkalis. All ceramic grades of feldspar are required to have a low content of iron oxide, the tolerance for which in pottery spar is 0·15 per cent and in glass spar 0·05 per cent. For this reason, the crude shipping product should be kept free of material carrying rust stain or such iron-bearing minerals as tourmaline, mica, pyrite, etc. Most commercial feldspars contain some quartz, which acts as a diluent, decreasing the fluxing power, and the content should be kept to a minimum. The fusion point of high-soda spars is lower than that of the high-potash types, the extremes for the two varieties ranging from cone 4 (1165°C) to cone 10 (1260°C), with the general average of commercial material around cones 8 to 9 (1225° to 1250°C). Practically all colours of feldspar are equally acceptable for ceramic uses, but for cleanser purposes, pale shades of white to buff are demanded.

"Commercial No. 1 feldspar for the ceramic trade consists of crude lump cobbed free of quartz and other objectionable impurities. Inferior grades, including graphic granite, which may contain 25 to 30 per cent quartz, are used for less exacting ceramic requirements. Quarry and cobbing fines are not acceptable, and go either to waste or may be sold for stucco dash, chicken grit, etc.

"Canada has large reserves of feldspar and production could be increased to meet any likely demand. Recent reports indicate that the supply of crude potash spar from mines in the Eastern United States is proving inadequate to meet requirements, and this may result in an increase in Canada's exports to that country. One outcome of the growing shortage is that renewed attention is being directed to the possibility that feldspar grinders may ultimately be compelled to resort to milling and concentrating of sub-grade rock to fill their needs. One plant for the production of glass-grade spar by flotation methods from straight-quarry-run rock was installed during the year in North Carolina.

"Canadian feldspar prices in 1943 increased slightly over those of previous years, quotations for crude ranging from $6.50 to $8.50 per ton, f.o.b. rail for domestic mills and export. Ground spar, 200-mesh, sold at $16 to $18, and granular glass spar at $12, both f.o.b. mill, in carload lots. Special selected crude dental spar, for export, sold as high as $48.50 U.S. funds."

Table 219.—Production of Feldspar, Crude and Ground, in Canada, by Provinces, 1930-1943

Year	Quebec		Ontario		Manitoba	
	Tons	$	Tons	$	Tons	$
1930	17,074	163,802	9,722	104,667	.....	.....
1931	10,381	86,842	7,962	100,119	.....	.....
1932	3,390	39,063	3,657	42,920	.....	.....
1933	6,183	59,283	4,387	45,350	88	484
1934	9,207	78,853	7,302	61,665	1,793	6,763
1935	7,002	63,075	8,656	75,003	2,084	6,252
1936	8,115	75,703	8,499	70,840	1,322	7,932
1937	12,285	105,612	9,061	72,610	.....	.....
1938	5,874	62,878	8,106	65,964	78	451
1939	5,399	60,923	7,061	51,056	40	330
1940	8,548	89,004	12,907	98,619	.....	.....
1941	14,218	137,160	11,822	107,124	.....	.....
1942	16,802	164,588	5,468	49,353	.....	.....
1943	17,199	176,222	6,659	61,549	.....	.....

Table 220.—Feldspar Consumed in Specified Canadian Industries, 1942 and 1943

Industries	1942		1943	
	Tons	$	Tons	$
Abrasive products	119	4,113	117	5,776
Imported clay products	2,799	62,525	2,352	50,794
Soaps and cleaning preparations	4,249	43,904	12,733	63,283
Iron and steel products	.....	.....	509	10,824
Glass	2,874	45,231	2,598	41,454
Enamelling materials	331	4,965	265	3,840

(x) Quantity statistics not available.

NEPHELINE SYENITE

Producers' sales of nepheline syenite in 1943 were valued at $292,010 compared with $246,893 in 1942. Shipments during the year under review were made solely by the American Nepheline Corporation Limited. The deposit of this company is located in Methuen township, Peterborough county, Ontario. A report "Nepheline Syenite in 1943" as prepared by the Bureau of Mines, Ottawa, contains the following information:

"Nepheline syenite is a quartz-free crystalline rock consisting essentially of the feldspathoid mineral nephelite, a silicate of alumina, potash, and soda, with albite and microcline feldspars. It often contains varying amounts of iron-bearing minerals in the form chiefly of black mica and magnetite, together with such accessory minerals as zircon, corundum, calcite, scapolite, etc. It has no free silica, and is high in alumina (20 to 30 per cent in average commercial rock) as compared with straight feldspar (17 to 20 per cent), and it has thus found favour with the ceramic industries, particularly in the glass trade. For ceramic use the rock must be freed of its iron-bearing constituents, removal of which can often be readily effected by a relatively cheap process of magnetic separation at about 20-mesh size.

"The known occurrences of commercial nepheline syenite in Canada are situated mainly in Ontario, the developed deposits being in Peterborough, Hastings, and Haliburton counties. The large operation of American Nepheline Corporation (a subsidiary of Ventures Limited) at Blue Mountain, near Lakefield, in Peterborough county, has accounted for most of the output and was the only producer in 1943. Prior to that year small tonnages were produced intermittently from deposits near Bancroft, in Hastings county, and near Gooderham, in Haliburton county, the material being shipped in the crude state to grinding mills in the United States. The rock of the Blue Mountain occurrence is massive and medium-textured, whereas most of the production from the Bancroft and Gooderham areas has consisted of coarse pegmatitic material. Other known, but undeveloped occurrences in Ontario are in the French River area, Georgian Bay district, and at Port Coldwell, Thunder Bay district, on the north shore of Lake Superior. In Quebec, nephelite is a constituent of syenites of the Montreal, Labelle-Annonciation, and other areas. In British Columbia, there are extensive bodies in the Ice River district, near Field.

"Part of the output of American Nepheline Corporation's quarry is treated at the company's mill at Lakefield, which supplies the domestic trade, but most of it is shipped crude to the company's plant at Rochester, New York.

"In 1943, American Nepheline Corporation quarried 56,000 tons of crude rock and produced 28,000 tons of finished material in its Rochester mill and 6,200 tons in its Lakefield plant. In recent years, some of the milled granular product from the Lakefield mill has been custom-ground for ceramic use at the plant of Frontenac Floor and Wall Tile Company, Kingston, Ontario, but this arrangement was discontinued in 1943 and 200-mesh material for domestic use is now supplied from Rochester. Port Coldwell Mines and Metals, Ltd., which in 1943 took over nepheline syenite holdings of Port Coldwell Mining Syndicate on Lake Superior, acquired further ground in the Bancroft area and announced plans for developing a deposit there, including the erection of a 100-ton mill.

"Canadian production figures include the value of crude rock shipped to the United States for cleaning and grinding, and also that of finished products made in Canada for domestic consumption and export. Exports totalled 36,240 tons valued at $129,826, compared with 32,840 tons valued at $89,520 in 1942.

"Except for Russia, the output of which is unknown, Canada is the only producer of nepheline syenite. Russia recovers large tonnages of apatite (phosphate) from apatite-nephelite rock, extensive bodies of which occur in the Kola Peninsula, and much research has been carried out in that country on commercial uses for the by-product nephelite, including its substitution for bauxite as a raw material for the production of aluminium. Deposits of commercial grade are also reported to occur in British India. In the United States, a number of occurrences are known, but most of the material contains too much inseparable iron to be suitable for high-grade ceramic products.

"Nepheline syenite continues to be used chiefly in the glass trade, where it is preferred to straight feldspar because of its higher content of alumina. Most Canadian glass companies and also several large American plants now use the material. Some feldspar grinding plants in the United States use the syenite for blending with their granular glass spar. In the glass batch, 3 tons of syenite will replace 4 tons of feldspar, on the basis of relative alumina content, and the higher content of alkalis reduces the temperature of melting, with resultant saving of fuel and longer tank life. Research has been proceeding steadily on applications for nepheline syenite in other branches of ceramics and it has been found of advantage, owing to its higher fluxing action, as a body ingredient in a variety of products, including pottery, semivitreous ware, sanitary and electrical porcelain, floor and wall tile, and structural clay products, and also in enamels. Increased vitrification, translucency, and mechanical strength, improved glaze fit, and reduced absorption, warpage, thermal expansion, and crazing, are among the desirable properties claimed for the various types of ware made from it.

"Work has been proceeding in the Bureau of Mines, Ottawa, on the removal of the small content of corundum present in some sections of the Blue Mountain deposit, and it was found that a combination of jigging and flotation at 28-mesh was effective in reducing the corundum content to 0·134 per cent. A treatment unit, employing this method, which would provide also for the recovery of a corundum by-product, was placed in semi-commercial operation at the Rochester mill of American Nepheline Corporation during 1943.

"The fine dust product resulting from the processing of Lakefield syenite has been found of service as a substitute for pumice for grinding and polishing and in the cleanser, enamelware, and heavy clay industries.

"Glass-grade nepheline syenite for sale in Canada remained at the 1942 price of $11.75 per ton, bulk, in carload lots, f.o.b. Lakefield, and ground, 200-mesh, ceramic grade was quoted at $16.50. Grade B (dust) sold for $13.00 l.c.l. American prices also remained unchanged at $12.00 for glass grade and $15.50 for ceramic grade, all bulk, in carload lots, f.o.b. Rochester, New York."

Table 221.—Production of Nepheline-Syenite in Canada*, 1936-1943

Year	Quantity	Value	Year	Quantity	Value
		$			$
1936	(a)	(b) 37,426	1940	(a)	117,849
1937	(a)	121,481	1941	(a)	227,583
1938	(a)	142,737	1942	(a)	246,893
1939	(a)	140,148	1943	(a)	292,010

(*) Produced in Ontario only.
(a) Quantity not published.
(b) First commercial production in Canada.

Nepheline-syenite used in Canada in the manufacture of glass totalled 3,472 tons valued at $58,629 in 1939, 4,233 tons at $69,619 in 1940, 5,834 tons worth $94,091 in 1941, 6,144 tons worth $100,417 in 1942 and 5,630 tons worth $93,528 in 1943.

QUARTZ (SILICA)

The production of natural silica or quartz in Canada during 1943 totalled 1,776,749 short tons valued at $1,608,448 compared with 1,738,174 tons at $1,538,162 in 1942. Output of primary silica products by the Canadian quartz mining industry includes crude and crushed dyke quartz, quartzite, sandstone and natural silica sands and gravels. The mineral in one or more of the forms thus defined was produced during 1943 in Nova Scotia, Quebec, Ontario, Saskatchewan and British Columbia. Shipments of silica in Nova Scotia were made to steel plants largely for the making of silica brick. In Quebec, high-grade silica sands were produced for the manufacture of glass and chemicals while a considerable tonnage of these same sands was sold for sand-blasting, moulding and various other purposes; in the same province relatively large quantities of crushed quartzite were mined and milled for the manufacture of silicon carbide and other products. The greater part of the tonnage of silica shipped in Ontario during 1943 represented material intended for use in the production of silica brick, cement and ferro-silicon and for the fluxing of nickel-copper ores. Quartz production as recorded for Saskatchewan represented low-grade natural silica sands or gravels shipped as flux to the Flin Flon smelter of the Hudson Bay Mining and Smelting Co. Ltd. Production in British Columbia in 1943 consisted of quartz shipped to the Trail smelter from the Gypo and Bailey deposits located, respectively, in the Osoyoos and Greenwood Mining districts.

The price per ton of the several grades of silica varies greatly depending on its purity and on the purpose for which it is to be used. Silica generally is a low-priced commodity, and therefore the situation of a deposit with respect to markets is of great importance. The largest markets for silica are in the provinces of Quebec and Ontario, and new deposits to be of interest to these markets should be within economic reach of either Toronto or Montreal. In Western Canada the main markets are in Alberta and Manitoba.

Quotations as given by "Canadian Chemistry and Process Industries" are, silica sand, various grades, in car lots $9.00 to $9.50 a ton; silica, quartz, 99 per cent, 110–220 grade, in car lots, $14.00 to $20.00 per ton; silica, soft decomposed, 325 mesh, car, lots $30.00 to $35.00 per ton.

Table 222.—Production in Canada of Quartz, 1942 and 1943

—	1942		1943	
	Short tons	Value	Short tons	Value
		$		$
Production (x) (Shipments)—				
Nova Scotia	10,708	23,557	9,486	16,126
Quebec	203,219	543,817	214,959	605,916
Ontario	1,367,733	914,256	1,350,640	852,196
Saskatchewan	155,699	54,495	163,102	57,086
British Columbia	815	2,037	38,562	77,124
Canada	**1,738,174**	**1,538,162**	**1,776,749**	**1,608,448**

(x) Includes both crude and crushed quartz, crushed sandstone and quartzite, and natural silica sands.

Table 223.—Production* (Use) of Natural Low-Grade Silica Sand and Silica Gravel as Non-Ferrous Smelter Flux, 1941-1943

—	1941		1942		1943	
	Tons	$	Tons	$	Tons	$
Ontario	1,533,392	536,687	644,529	225,585	666,452 (†)	233,258
Saskatchewan	148,208	51,873	155,699	54,495	163,102	57,086
Canada	**1,681,600**	**588,560**	**800,228**	**280,080**	**829,554**	**290,344**

(*) Included in totals shown in Tables 4 and 6.

(†) Exclusive of low cost quartzite used in smelting nickel-copper ores.

Table 224.—Production of Quartz (Silica) in Canada, 1929-1943

Year	Ton	$	Year	Ton	$
1929	265,949	561,527	1937 (x)	1,377,448	1,129,011
1930	226,200	418,127	1938 (x)	1,380,011	961,617
1931	195,724	303,158	1939 (x)	1,582,935	1,100,214
1932	189,132	276,147	1940 (x)	1,858,302	1,203,527
1933	185,783	297,820	1941 (x)	2,052,878	1,366,187
1934	272,563	482,265	1942 (x)	1,738,174	1,538,162
1935	233,002	424,882	1943 (x)...*	1,776,749	1,608,448
1936 (x)	1,046,649	597,781			

(x) Complete data for production of this material in Ontario previous to 1936 are no available.

Prices—United States (August, 1944)—Silica, per ton, water ground and floated, in bags, f.o.b. Illinois: 325 mesh, \$21 to \$40 for 92 to 99½ per cent grades. Dry ground, air floated, 325 mesh, 92 to 99½ per cent silica, \$18 to \$30. Glass sand, f.o.b. producing plant, \$1.25 to \$5 per ton. Quartz rock crystals for fusing, all sizes, \$100 to \$150 per ton; prisms for piezo-electrical and optical use command premium. (Engineering and Mining Journal's "Metal and Mineral Markets"—New York).

Table 225.—Consumption of Quartz, Silica Sand, Etc., in Canada, by Industries, According to Census of Industry Reports, 1943*

Industry	Quantity	Cost at works
	Short tons	$
Silica sand and silica (including ground quartz)—		
Soaps and cleaning preparations	3,640	128,981
Acids and salts	39,406	145,366
Paints	1,388	45,075
Refractories	1,021	10,240
Roofing paper	2,135	21,015
Abrasives (silica sand)	89,022	511,649
Abrasives (quartz)	175	5,410
Glass	132,992	870,454
Enamelling materials	253	3,795
Products from imported clays	3,597	58,412
Foundry facings and supplies	62	609
Non-ferrous smelters (†)	1,349,610	613,894
Steel industry (silica sand)	116,374	868,316
Ferro-alloys (quartzite)	188,636	526,676
Total Accounted for	**1,928,311**	**3,809,892**

Note:—Consumption values are costs at works.

(†) The quantities reported under this industry usually contain low-grade natural silicious sands for fluxing purposes.

(*) In addition to the quantities shown, a relatively large quantity of quartz and quartzite is consumed in the manufacture of silica brick.

Table 226.—Principal Statistics of the Feldspar and Quartz Mining Industry, 1942 and 1943

		Ontario (x) (b)		Quebec	
		1942	1943	1942	1943
Number of firms (a)		17	19	19	16
Capital employed	$	1,452,823	1,632,379	1,110,425	1,262,752
Number of employees—On salary		24	41	22	27
On wages		234	227	253	240
Total		258	268	275	267
Salaries and wages—Salaries	$	39,186	69,702	52,081	49,001
Wages	$	333,791	324,248	357,845	325,248
Total	$	372,977	393,950	409,926	374,249
Selling value of products (gross)	$	1,290,591	1,356,091	708,405	782,138
Cost of fuel and purchased electricity	$	53,261	61,648	70,839	72,599
Cost of process supplies	$	204,167	234,759	83,761	87,846
Net value of sales	$	1,033,163	1,059,684	553,805	621,693

(x) In 1942 and 1943 includes 1 firm in Nova Scotia, 1 in British Columbia and 1 in Saskatchewan; data only for Nova Scotia are complete.

(a) Small shippers from whom reports were unobtainable and whose production is recorded from consumers' returns are sometimes not included in the total.

(b) Includes data relating to production of nepheline-syenite.

Table 227.—Capital Employed in the Feldspar and Quartz Mining Industry in Canada, by Provinces, 1943

	Quebec	Ontario	Canada
	$	$	$
Capital employed as represented by—			
Present cash value of the land, (excluding minerals)	55,812	104,182	159,994
Present value of buildings, fixtures, machinery, tools and other equipment	977,595	1,199,468	2,177,063
Inventory value of minerals on hand, ore in process, fuel and miscellaneous supplies on hand	94,008	286,847	380,855
Inventory value of finished products on hand	26,944	9,801	36,745
Operating capital (cash, bills and accounts receivable, prepaid expenses, etc.)	108,393	32,081	140,474
Total	**1,282,752**	**1,632,379**	**2,895,131**

Table 228.—Number of Wage-Earners on Pay Roll, by Months, 1942 and 1943

Month	1942 Totals	1943								Canada (x)
		Quebec			Ontario					
		Surface	Underground	Mill	Surface		Underground	Mill		
		Male		Male	Male	Female		Male	Female	
January	458	163	3	67	152	.....	.....	20	2	422
February	446	172	2	73	161	.....	.....	22	2	450
March	449	153	1	79	175	.....	.....	22	2	438
April	417	117	1	71	184	1	11	25	2	418
May	546	148	1	68	169	1	33	38	2	474
June	544	164	.....	76	174	1	29	39	1	503
July	531	167	.....	77	153	1	29	37	1	485
August	526	172	.....	78	163	1	28	43	1	506
September	522	174	.....	81	179	1	31	33	1	520
October	507	176	.....	75	157	1	24	33	1	488
November	473	176	.....	76	150	1	21	40	1	479
December	362	179	.....	76	120	.....	.....	26	1	416

(x) Includes a few employees in some months in Nova Scotia and British Columbia.

QUARTZ CRYSTAL

Modern mechanized warfare depends upon instantaneous two-way radio communication, which to be effective, must rely upon accurately ground wafers of crystal, two in each circuit; dozens are needed for a single tank or airplane. Brazil remained at the close of 1943 the only known commercial source of quartz suitable for radio-frequency control, and radio quartz crystal has been classified as a strategic mineral. No commercial production of domestic quartz crystals was reported in Canada during 1943; however, The Rare Metals Prospecting Syndicate reported development work during the year on a quartz crystal deposit located north of Gananoque, in the province of Ontario. Imported crystals have been dressed in Canada for war use since the beginning of the present world conflict. The following information is taken from Engineering & Mining Journal Metal and Mineral Markets, New York, February, 1944:

"Wartime consumption of quartz crystals suitable for radio frequency control has increased fiftyfold, compared with prewar levels, necessitating a large increase in output in Brazil. . . . . The value of exports of quartz crystals from Brazil at present is at approximately the same level as that of phosphate rock produced in the United States, and exceeds the combined value of United States production of crude feldspar, fluorspar and crude gypsum. During 1943 a serious attempt was made to discover and exploit United States deposits but the material recovered has proved too low grade for continued operations. Heavy consumption of radio-grade quartz crystals, including stockpiling under the established program, could not have been met, solely through increased production. A major contribution here was the energetic conservation and substitution program pushed by the Government late in 1942 and early in 1943, which resulted in discovering the usability of inferior quartz for manufacture of satisfactory radio oscillators. Scrap recovery also contributed to this program. Another outstanding part of the conservation program was the drive to increase cutting efficiency, and at the same time redesign oscillators to smaller sizes, thereby securing many more oscillators per pound of usable material."

THE GYPSUM INDUSTRY

(1) Primary Production—The Gypsum Mining and Quarrying Industry

Production (producers' sales and producers' consumption) of gypsum in Canada during 1943 totalled 446,848 short tons valued at $1,381,468 compared with 566,166 short tons worth $1,254,182 in 1942. The tonnage in both years represents various grades of crude gypsum or anhydrite shipped from quarries or mines together with the tonnage of calcined gypsum used in or shipped from quarries or "primary" plants. The quantity of crude gypsum shipped in 1943 was the lowest since 1933, reflecting largely the increasing man-power shortage, wartime restrictions in building materials, and the decrease in coastal shipping available at Nova Scotia ports.

Of the 1943 output, Nova Scotia properties contributed 255,736 tons valued at $368,639; New Brunswick 36,263 tons at $148,315; Ontario 92,448 tons at $335,637; Manitoba 37,989 tons at $380,529, and British Columbia 24,412 tons worth $148,348.

The quantity of crude gypsum mined in 1943 totalled 430,822 short tons; no anhydrite was reported as being produced during the year. Crude gypsum calcined in primary or quarry plants totalled 201,168 short tons in 1943.

In 1943 the number of firms reporting production was 6. Some of the Canadian gypsum mining companies confine their operations in the Dominion to the production and sale of crude gypsum or anhydrite while others, in addition to marketing various grades of crude gypsum, produce a calcine for sale or for consumption in their own gypsum products plants. Gypsum is exported from Canada almost entirely in the crude form.

Capital employed by Canadian gypsum mining companies totalled $5,147,424 in 1943; employees numbered 438; salaries and wages paid amounted to $617,780, and the total value of fuel, purchased electricity and process supplies used was computed at $248,043.

The following information is from a report—Gypsum in 1943—as prepared by the Bureau of Mines, Ottawa.

"Gypsum is marketed in the crude lump form; ground, as "land plaster" and "Terra alba"; or ground and calcined, as plaster of Paris or wall plaster. Each year an increasing portion of the calcined material is used in the manufacture of wallboard, gypsum blocks, insulating material, acoustic plaster, etc.

"The use of gypsum products in the building trades has made rapid progress because of their lightness, durability, fire-resisting, insulating, and acoustic properties; and tiles, wallboards, blocks, and special insulating and acoustic plasters have been developed. It is probable that the production of gypsum for domestic use will continue to decline during 1944. As most of the crude gypsum is shipped to the United States for the manufacture of gypsum products, industrial conditions in that country will continue to have an important bearing on the industry.

"The use of anhydrite for the manufacture of sulphuric acid, ammonium sulphate, cement and special plasters is increasing, and, normally, there is a good opportunity for the Canadian material in this market. Canada has extensive deposits favourably situated for commercial development, the material from which has been proved by tests carried out by the Department of Mines and Resources to be of excellent grade. Prior to 1937 the small Canadian production was exported principally for use as a fertilizer for the peanut crop, but it is possible that an industry will eventually be started in this country in which the anhydrite may be used for the manufacture of sulphur or sulphur compounds and of special plasters, similar to those being marketed in England.

"The manufacture of gypsum boards, for which there has been a large demand in recent years, has partly compensated for the decrease in use for residential building purposes.

"Crude gypsum is a low-priced commodity, and its selling price f.o.b. quarry is dependent largely upon the quantity produced and the production facilities available. For export, contracts are generally made with the producer for the year's requirements of the purchaser and these contracts are generally made early in each year. The price of crude gypsum as quoted by the Canadian Chemistry and Process Industries remained at $2.50 to $3.50 per ton f.o.b. mine throughout 1943."

Table 229.—Production in Canada, of Gypsum, 1942 and 1943

—	1942		1943	
	Quantity	Value	Quantity	Value
	tons	$	tons	$
SHIPMENTS BY GRADES—				
Crude (a)—Lump or mine run	13,176	22,240	9,277	18,632
Crushed	402,578	523,093	276,498	403,406
Fine ground	246	1,849	719	6,070
Calcined gypsum, sold and used (b)	150,166	707,000	160,354	953,360
Total	**566,166**	**1,254,182**	**446,848**	**1,381,468**
SHIPMENTS BY PROVINCES—				
Nova Scotia	394,216	512,762	255,736	368,639
New Brunswick	36,623	111,316	36,263	148,315
Ontario	82,796	304,170	92,448	335,637
Manitoba	29,218	179,780	37,989	380,529
British Columbia	23,313	146,154	24,412	148,348
Total	**566,166**	**1,254,182**	**446,848**	**1,381,468**
Total gypsum mined and quarried (a)	797,126	....	430,822	....
Total gypsum calcined (b)	183,296	....	201,168	....

(a) Includes some anhydrite quarried in Nova Scotia in 1942.

(b) Does not include gypsum calcined in manufacturing plants located in Montreal and Calgary, but includes calcine used in manufacturing plants operated in direct conjunction with the mines—the value of calcine used is its value as a process material.

Table 230.—Production (Sales) of Crude and Calcined Gypsum in Canada, 1934-1943

Year	Tons	Value	Year	Tons	Value
		$			$
1934	461,237	863,776	1939	1,421,934	1,935,127
1935	541,864	932,203	1940	1,448,788	2,065,933
1936	833,822	1,278,971	1941	1,503,406	2,248,428
1937	1,047,187	1,540,483	1942	566,166	1,254,182
1938	1,008,799	1,502,265	1943	446,848	1,381,468

Table 231.—Consumption of Gypsum in Canadian Cement Industry, 1932-1943

Year	Tons	Year	Tons
1932	27,538	1938	51,975
1933	13,319	1939	31,402
1934	19,172	1940	38,903
1935	21,611	1941	49,031
1936	25,447	1942	49,816
1937	33,691	1943	47,034

Table 232.—Imports and Exports of Gypsum, 1942 and 1943(X)

—	1942		1943	
	Quantity	Value	Quantity	Value
	Tons	$	Tons	$
IMPORTS—				
Gypsum, crude (sulphate of lime)	....	....	5,000	12,490
Gypsum, ground, not calcined	717	22,692	400	16,828
Plaster of Paris and wall plaster	1,404	49,120	1,202	47,532
Total	....	**71,812**	....	**76,850**
EXPORTS—				
Gypsum or plaster, crude	489,842	544,094	185,210	213,022
Plaster of Paris, wall plaster	213	4,902	478	8,844
Gypsum, ground	25	260	....	....
Total	....	**549,256**	....	**221,866**

(x) Subject to revision.

Table 233.—Principal Statistics of the Gypsum Mining Industry in Canada, 1939-1943

—		Nova Scotia	New Brunswick Ontario, Manitoba, British Columbia	Total Canada
Number of firms—1939		7	3(a)	10
1940		6	3(a)	9
1941		6	2(a)	8
1942		5	2(b)	7
1943		4	2(b)	6
Capital employed—1939	$	4,370,893	2,436,014	6,806,907
1940	$	2,406,561	2,242,101	4,648,662
1941	$	2,812,465	2,363,356	5,175,821
1942	$	1,913,131	2,473,400	4,386,531
1943	$	2,508,778	2,638,646	5,147,424
Number of employees—On salary—				
1939		29	37	66
1940		33	24	57
1941		34	14	48
1942		28	27	55
1943		19	32	51
On wages—				
1939		440	208	648
1940		389	248	637
1941		328	272	600
1942		201	254	455
1943		99	288	387
Salaries and wages—Salaries—				
1939	$	53,680	59,235	112,915
1940	$	60,374	51,048	111,422
1941	$	62,083	28,852	90,935
1942	$	53,314	53,163	106,477
1943	$	38,299	78,418	116,717
Wages—				
1939	$	402,134	177,109	579,243
1940	$	369,090	237,154	606,244
1941	$	338,356	315,717	651,073
1942	$	231,431	319,712	551,143
1943	$	94,588	406,475	501,063
Fuel and electricity cost—				
1939	$	90,394	103,094	193,488
1940	$	76,224	118,740	194,964
1941	$	73,784	148,780	222,564
1942	$	36,831	141,851	178,682
1943	$	22,919	179,061	201,980
Value of process supplies used—				
1939	$	85,166	20,665	105,831
1940	$	194,005	29,370	223,375
1941	$	199,875	29,569	229,444
1942	$	34,784	30,673	65,457
1943	$	11,234	34,829	46,063
Selling value of products (gross)—				
1939	$	1,340,830	594,297	1,935,127
1940	$	1,302,347	763,586	2,065,933
1941	$	1,517,297	731,131	2,248,428
1942	$	512,762	741,420	1,254,182
1943	$	368,639	1,012,829	1,381,468

(a) Includes 2 companies also operating in Nova Scotia.
(b) Includes 1 company also operating in Nova Scotia.

Table 234.—Capital Employed in the Gypsum Industry in Canada, by Provinces, 1943

Capital employed as represented by—	Nova Scotia	New Brunswick, Ontario, Manitoba and British Columbia	Canada
	$	$	$
Present cash value of the land (excluding minerals)	510,987	425,274	936,261
Present value of buildings, fixtures, machinery, tools and other equipment	788,913	540,425	1,329,338
Inventory value of materials on hand, ore in process, fuel and miscellaneous supplies on hand	93,654	94,566	188,220
Inventory value of finished products on hand	430,807	54,750	485,557
Operating capital (cash, bills and accounts receivable, prepaid expenses, etc.)	684,417	1,523,631	2,208,048
Total	2,508,778	2,638,646	5,117,424

Table 235.—Number of Wage-Earners on Payroll or Time Record on the Last Day of Each Month or Nearest Work Day, 1942-1943

Month	1942		1943				
			Mine			Mill	
	Mine	Mill	Surface		Underground (x)	Male	Female
			Male	Female			
January	194	173	68	1	83	147	4
February	210	184	74	....	88	144	3
March	266	201	83	1	82	152	5
April	270	215	87	5	85	144	8
May	336	224	93	6	82	155	10
June	331	240	112	3	82	161	9
July	345	226	136	3	78	168	14
August	338	227	172	3	69	159	20
September	268	184	159	3	74	175	24
October	188	169	162	3	71	176	22
November	191	166	177	3	79	181	18
December	157	141	186	3	79	172	18

(x) Underground work confined to New Brunswick, Ontario and Manitoba.

(2) The Gypsum Products Industry

Nine Canadian factories, operated by 4 companies, manufactured gypsum products having a factory selling value of $5,417,045 during 1943. This output was 12 per cent over the 1942 total of $4,829,962. The main products were gypsum wallboard, gypsum hardwall plaster, gypsum tile and gypsum blocks.

Capital employed in these 9 manufacturing plants amounted to $4,092,304 in 1943, including $1,482,430 as the value of buildings and equipment, $536,959 as the value of inventories at the year-end, and $2,072,915 as cash, bills receivable, etc. The average number of employees in 1943 was 436, to whom $632,212 were paid in salaries and wages. Expenditures for fuel and electricity amounted to $307,748 while materials used in manufacturing processes cost $2,707,124.

Table 236.—Materials Used in the Gypsum Products Industry, 1942 and 1943

Material	Unit of measure	1942		1943	
		Quantity	Cost at works	Quantity	Cost at works
			$		$
Gypsum, crude	ton	20,742	78,460	17,489	86,774
Gypsum, calcined (plaster of Paris)	ton	149,885	705,541	162,273	972,550
Paper	ton	14,240	868,457	16,104	1,032,802
Starch or paste	ton	499	31,488	605	40,669
Hair	ton	75	18,036	52	13,274
Retarder	ton	203	18,045	171	15,099
Sawdust and shavings	ton	165	2,259	162	2,269
Containers, etc	....	....	108,587	....	77,303
All other materials	....	....	420,561	....	466,384
Total	....	....	**2,251,434**	....	**2,707,124**

Table 237.—Output of the Gypsum Products Industry, 1942 and 1943

Product	Unit of measure Quantity	1942		1943	
		Quantity	Selling value at works	Quantity	Selling value at works
			$		$
Gypsum wallboard	sq. ft.	164,410,695	3,849,253	192,185,195	4,317,946
Gypsum hard wall plasters	ton	51,475	682,528	39,883	501,104
All other products (x)	....	....	298,181	....	597,995
Total	....	....	**4,829,962**	....	**5,417,045**

(x) Includes gypsum tile and blocks, etc.

IRON OXIDES (OCHRE) MINING INDUSTRY

Production (producers' sales) in Canada of ochreous iron oxides during 1943 totalled 8,401 short tons valued at $135,893 compared with 9,304 short tons worth $151,653 in 1942. The output in these years included the mineral in both the crude and refined state. Of the 1943 shipments, 7,998 short tons valued at $131,057 were made from deposits located in the province of Quebec and 403 short tons worth $4,836 from British Columbia.

Capital employed by the 5 firms reported as active in the production of iron oxides totalled $254,891 in 1943; employees numbered 47, and salaries and wages paid amounted to $46,554. Fuel and electricity used by the industry as a whole during the year under review totalled $19,438 and the cost of explosives and other process supplies consumed was reported at $7,590. The maximum period of mining operations as reported by any single operator in 1943 was from May 17 to December 11.

The following information relating to Canadian iron oxides is taken from a report prepared by the Bureau of Mines, Ottawa:

"Ochreous iron oxide, which is sold uncalcined and is used chiefly in the purification of illuminating gas, comprises the bulk of the minerals produced under this category. The calcined form of ochreous iron oxide is used in the manufacture of paints. A smaller quantity of natural iron oxides associated with clay-like materials in the form of umbers and siennas is produced in the raw and in the calcined state for use as pigments in paints. The Canadian iron oxide industry is small and the quantity produced shows little change from year to year. Present producing localities have met the requirements of the domestic pigment trade for the cheaper grades for many years. The production for some time past has come mostly from deposits near Trois Rivières, Quebec, but there are other deposits in different parts of Canada that could be operated were the demand sufficient to warrant doing so.

"In 1943 Sherwin-Williams Company of Canada operated deposits at Red Mill and near Champlain, Champlain county, Quebec. It was the only producer of calcined iron oxides, the others having marketed only air-dried products. Its calcined and air-floated mineral products, produced to rigid specifications, are essential for use in the war industries. An additional calcining unit of a new design was put in production in 1943. The shortage of cord wood had become so serious that the operators were faced with the closing of the plant or the rebuilding of the furnaces to utilize other fuels that might be available. It was finally decided to convert the furnaces to the use of bituminous coal as fuel, and this required considerable structural changes in the furnaces, including the installation of underfeed stokers. The problem of the sulphur gases (SO2 and SO3) from the use of bituminous coal was satisfactorily solved and the furnaces are now operating as efficiently as with fuel, with the added advantage that pyrometric control of the furnace heats can be adapted to stoker firing with coal, if deemed advisable, which was impossible with wood firing by hand. During 1943 some changes in processing of some of the oxides was made to better fit them for the requirements for war purposes.

"Deposits at Almaville and St. Louis, Champlain county, and at Les Forges, St. Maurice county, were operated by Charles D. Girardin of Yamachiche. Mauricy Oxide Company of Grand'Mère operated its property at St. Adelphe, Champlain county, and Thos. H. Argall of Trois Rivières operated his property near Pointe-du-Lac, St. Maurice county. In the past, deposits near St. Anne de Beaupré, Montmorency county; in Lynch township, Labelle county; and at St. Raymond, Portneuf county, Quebec, were operated.

"In British Columbia, there has been a small production of iron oxide from Alta Lake, New Westminster district, and from oxide beds in the Windermere district, since 1923. The oxide is used chiefly for gas purification.

"In Alberta and Saskatchewan, several deposits of ochre are known, some of which nave commercial possibilities, but they are difficult of access and the market is limited and they have received little active attention. Large deposits near Grand Rapids and Cedar Lake in northern Manitoba remain undeveloped for similar reasons. In Nova Scotia, beds of ochre and umber were operated to a small extent in the past."

The Canadian price of red iron oxide in 1943 as given by Canadian Chemistry and Process Industries remained at 2 to 7 cents a pound throughout the year.

Table 238.—Production (Sales) in Canada of Iron Oxides, 1942 and 1943

—	1942		1943	
	Quantity	Value	Quantity	Value
		$		$
Quebec*	8,866	147,049	7,998	131,057
British Columbia	438	4,604	403	4,836
Total	**9,304**	**151,653**	**8,401**	**135,893**

* Includes crude and refined grades.

Table 239.—Production of Iron Oxides in Canada, 1927-1943

Year	Quantity	Value	Year	Quantity	Value
	Short tons	$		Short tons	$
1927	6,125	103,536	1936	5,854	69,030
1928	5,414	111,198	1937	6,197	83,640
1929	6,518	115,932	1938	5,821	71,769
1930	6,596	83,873	1939	6,015	88,418
1931	5,520	49,205	1940	9,979	111,874
1932	5,240	46,161	1941	10,045	142,069
1933	4,357	53,450	1942	9,304	151,653
1934	4,959	66,166	1943	8,401	135,893
1935	5,516	77,075			

The production of iron oxides in Canada since the first recording of statistics in 1886 to the end of 1943 totalled 325,114 short tons valued at $3,409,453.

Table 240.—Consumption of Iron Oxides in Specified Canadian Industries, 1932-1943

Year	Coke and gas		Paints, pigments and varnishes		Paints, pigments and varnishes	
	Quantity	Value	Quantity	Value	Quantity	Value
	Tons (a)	$	Tons (b)	$	Tons (c)	$
1932	3,736	35,284	701	52,323	512	48,047
1933	2,734	29,076	504	43,826	491	43,671
1934	3,757	47,010	580	53,539	544	53,236
1935	3,701	46,204	990	77,758	564	56,219
1936	(d)	41,291	733	67,850	634	65,819
1937	(d)	40,414	890	81,709	566	49,082
1938	(d)	41,013	822	70,730	487	41,062
1939	(d)	35,417	882	80,274	523	46,134
1940	5,417	42,491	1,146	112,826	575	62,636
1941	5,133	36,480	1,602	187,836	464	58,385
1942	4,600	33,700	2,334	253,383	412	52,155
1943	6,508	45,946	2,321	222,858	440	68,425

(a) Oxide and purifying materials.
(b) Iron oxide pigments.
(c) Ochres, siennas and umbers.
(d) Data not available

Imports into Canada of ochres, ochrey earths and siennas totalled 2,250,850 pounds valued at $76,644 in 1943 compared with 2,067,212 pounds worth $61,488 in 1942. Exports from Canada of iron oxide in 1943 totalled 3,661,200 pounds valued at $131,830 as against 6,990,100 pounds at $237,479 in 1942.

Table 241.—Principal Statistics of the Natural Iron Oxides Industry in Canada, 1941-1943

—		1941	1942	1943
Number of firms		(a) 4	(d) 5	(d) 5
Capital employed	$	189,877	194,541	254,891
Number of employees—On salaries		(c)6	(e)6	(b)7
On wages		37	41	40
Total		43	47	47
Salaries and wages—Salaries	$	8,571	9,174	10,293
Wages	$	33,581	35,114	36,261
Total	$	42,152	44,288	46,554
Selling value of products (gross)	$	142,069	151,653	135,893
Cost of fuel and purchased electricity	$	15,697	20,835	19,438
Cost of process supplies	$	5,697	5,780	7,590
Selling value of products (net)	$	120,675	125,038	108,865

(a) Three producing in Quebec and one in British Columbia.
(b) Three females.
(c) One female.
(d) Four producing in Quebec and one in British Columbia.
(e) Two females.

Table 242.—Capital Employed in the Iron Oxides Industry in Canada, 1943

—	$*
CAPITAL EMPLOYED AS REPRESENTED BY—	
Present cash value of land (excluding minerals)	37,776
Present value of buildings, fixtures, machinery, tools and other equipment	130,494
Inventory value of materials on hand, ore in process, fuel and miscellaneous supplies on hand	53,804
Inventory value of finished products on hand	27,917
Operating capital (cash, bills and accounts receivable, prepaid expenses, etc.)	4,900
Total	**254,891**

* Quebec only; data for 1 property in British Columbia not available.

Table 243. Wage-Earners(*) Employed, by Months, 1942 and 1943

Month	Number 1942 Mine	1942 Mill	1943 Mine	1943 Mill	Month	Number 1942 Mine	1942 Mill	1943 Mine	1943 Mill
January	2	24	....	31	July	30	28	32	24
February	....	29	....	31	August	25	28	36	21
March	....	33	....	31	September	23	28	27	22
April	6	28	....	31	October	14	24	9	23
May	8	27	9	22	November	10	27	6	26
June	31	25	20	23	December	10	26	7	25

* No underground work and no female wage-earners.

THE MICA MINING INDUSTRY

Canadian production (primary shipments) of mica in 1943 totalled 8,050,692 pounds valued at $553,856 compared with 6,019,671 pounds worth $383,567 in 1942. The value of the 1943 production established an all-time high record and the quantity was only exceeded in the years 1924 and 1929. Of the total output in 1943, Ontario mines contributed 4,254,019 pounds valued at $296,189, Quebec mines, 3,086,673 pounds worth $245,846 and British Columbia 710,000 pounds at $11,821. These statistics of mica production include shipments of all classes, grades and varieties of the mineral, including phlogopite and muscovite. In 1943 mica statistics were compiled according to a new classification comprising rough mine-run or rifted; mica sold for mechanical splitting; splittings; ground or powdered; scrap (mine or shop waste and mica mined and sold for grinding); flake (mica schist); natural or recovered by milling; and trimmed mica. These classes replaced the older classification of hand cobbed, thumb trimmed, splittings, knife trimmed, scrap, ground and mica schist.

The number of Canadian primary mica producers reporting commercial shipments in 1943 totalled 71; capital employed amounted to $458,402, and $357,992 were distributed in salaries and wages to 430 employees. The total net value of shipments was estimated at $499,461.

Table 244.—Production of Mica in Canada, by Grades, 1941 and 1942 (old classification)

—	1941			1942		
	Quantity	Value, f.o.b. shipping point	Price per pound	Quantity	Value, f.o.b. shipping point	Price per pound
	Pounds	$	$	Pounds	$	$
Rough cobbed	169,315	25,977	0·15	362,000	40,055	0·11
Knife-trimmed	264,409	144,356	0·55	264,858	177,628	0·67
Thumb-trimmed	139,577	19,738	0·14	67,292	19,334	0·29
Splittings	184,830	121,879	0·66	165,610	102,666	0·62
Scrap (*)	2,729,760	23,338	0·009	5,159,311	43,884	0·009
Total	**3,487,891**	**335,288**	.....	**6,019,671**	**383,567**	.....

(*) Includes ground mica.

Table 245.—Mica Production(†) (Primary Sales) in Canada, by Classes, 1943 (New Classification)

Class	Pounds	Total value f.o.b. shipping point
		$
Rough, mine-run or rifted	1,429,365	54,450
Mica sold for mechanical splitting	190,209	26,048
Splittings	73,691	53,820
Ground or powdered; Scrap: Mine or shop waste and mica mined and sold for grinding; Flake (mica schist): Natural or recovered by milling	(*)6,065,551	63,210
Trimmed mica	291,876	356,328
Total Mica shipments	**8,050,692**	**553,856**

(†) Includes both amber and muscovite micas.
(*) Includes 60,591 pounds of unspecified valued at $1,864.

Table 246.—Production (Sales) of Mica in Canada, by Provinces, 1942 and 1943

—	1942		1943	
	Pounds	Value	Pounds	Value
		$		$
Quebec	2,657,044	285,263	3,086,673	245,846
Ontario	2,800,627	89,243	4,254,019	296,189
British Columbia	562,000	9,061	710,000	11,821
Total	**6,019,671**	**383,567**	**8,050,692**	**553,856**

Table 247.—Production(x) of Mica in Canada, 1932-1943

Year	Short tons	$	Year	Short tons	$
1932	309	6,828	1938	519	80,989
1933	944	49,284	1939	1,068	147,321
1934	998	97,071	1940	975	237,145
1935	628	82,038	1941	1,743	335,288
1936	801	74,556	1942	3,010	383,567
1937	945	133,731	1943	4,025	553,856

(x) Sales.

The total value of mica produced in Canada from the first official recording of mica statistics in 1886 to the end of 1943 amounted to $9,351,526.

Table 248.—Imports and Exports of Mica, 1942 and 1943

	1942		1943	
	Pounds	Value	Pounds	Value
		$		$
IMPORTS—				
Mica and manufactures of, n.o.p.	....	177,695	....	220,356
Vermiculite, crude	....	12,163	....	18,482
EXPORTS—				
Mica, rough and trimmed	484,700	224,481	863,100	422,710
Mica, scrap and waste	4,323,800	27,167	4,279,500	34,660
Mica splittings	148,300	112,756	65,900	47,108
Mica plate and manufactures	....	18,091	....	16,540
Total Mica Exports	....	**382,495**	....	**521,018**

Table 249.—Consumption of Mica in Canada, by Industries, as Reported to the Annual Census of Industry, 1942 and 1943

—	1942		1943	
	Quantity	Cost at works	Quantity	Cost at works
	Tons	$	Tons	$
In Electrical Apparatus Industry	102	180,740	145	324,919
In Rubber Industry	112	10,960	112	12,314
In Roofing (a)	436	25,340	395	23,160
In Mica Manufacturing Industry	196	35,151	36	41,050
Total accounted for	....	**252,191**	....	**401,443**

(a) Includes mica used in manufacture of wall paper.

The following information is taken from a report "Mica in 1943" as prepared by the Bureau of Mines, Ottawa:

"Canada and the island of Madagascar are the two chief sources of phlogopite, or amber mica, and there is also a small production from recently discovered deposits in Mexico. Deposits of phlogopite occur also in Ceylon, Korea, Tanganyika and Portuguese East Africa and the discovery of occurrences of phlogopite in the Northern Territory of Australia was reported recently. The known occurrences of phlogopite in Canada are confined chiefly to a belt of rocks extending from Kingston to Ottawa and thence northward into Quebec between the Gatineau and Lièvre Rivers. The belt is from sixty to seventy miles wide. Scattered deposits occur also in Pontiac and Argenteuil counties, Quebec, and as far east as Quebec City; and in Ontario similar deposits have been mined in Hastings and Haliburton counties. In recent years most of the Canadian production of phlogopite has come from mines in Quebec, though substantial quantities of scrap have been shipped from waste dumps of idle properties in Ontario.

"There are many known occurrences of muscovite, or white mica, in Canada, but prior to the discovery of important deposits in the Eau Claire area near Mattawa, Ontario, in the winter of 1941–42, production was negligible, as, in general, the quantity of the mica and the yield proved to be too low for profitable mining. In 1943, there was a large production from deposits in the Eau Claire area, chiefly from the Purdy property, a conspicuous feature of the mica being the phenomenal size of the crystals, or books, some of which measured up to 5 by 8 feet across. The average size of trimmed sheet produced here is far above that of most mica mines.

"Muscovite of 'ruby' quality was found a few years ago in the Saguenay district, Quebec, where there was a small production in 1942 and 1943, most of which came from the Simard mine, Bergeronnes township. A small quantity of heavily spotted muscovite was shipped out by aeroplane from a remote locality near Lac Manouan, in the Peribonka River region, north of St. John.

"There are a number of muscovite occurrences in British Columbia mainly in the Tete Jaune, Big Bend, and Fort Grahame areas. Small quantities of mica were recovered from some of these deposits years ago, but many of the deposits are located above timber line, and they could be operated only during the summer. Some mica, or sericite schist, has been mined in recent years at Baker Inlet, near Prince Rupert; this was shipped to a grinding plant in Vancouver for local roofing use. There were no shipments in 1943, however. Scrap mica mined near Oliver, south of Penticton, in the Osoyoos mining division, was ground in Vancouver in 1943.

"Black mica (biotite) occurs near Bancroft, in Hastings county, Ontario, and the deposit has been operated on a small scale for the production of grinding scrap. The mica occurs in very large sheets, but is mostly of poor splitting quality and is too high in iron for general electrical use, though some of it has been used in low voltage domestic heater appliances. The deposit was operated in 1943 and a small tonnage was shipped to the United States for grinding.

"Since 1940, permit licences have been required for the export of all mica and mica products. These are obtainable from the Export Permit Branch, Department of Trade and Commerce, Ottawa. In September, 1943, this restriction was lifted in respect to scrap and waste consigned to the United States.

"No recent figures for world production of mica are available. India has long been the chief source of supply of muscovite, and its production in 1942 and 1943 exceeded all previous records. Indian 'ruby' muscovite, obtained from Bihar Province, has long been the world standard for exacting electrical uses, particularly for magneto and radio condenser films. India also supplies green muscovite, produced in Madras.

"Muscovite and phlogopite sheet mica are used almost entirely for electrical insulation. They are cut or punched into a great variety of shapes and sizes, and in the form of splittings are bonded and pressed into large sheets that can be sawn, bored, and machined into any desired form; splittings are also similarly bonded and layered with paper, cambric, or silk to form flexible "micafolium" and tape insulation for windings and bars. Some clear mica, mostly muscovite, is used as stove windows and in lighting equipment, and there is a limited demand for special large-sized, flawless sheet for use in marine compass dials, boiler gauges, and in the inconoscopes of television transmitters. Both muscovite and phlogopite are essential in the manufacture of aviation sparkplugs; the latter for the nosewashers at the base of the plug, which are required to possess high heat-resistance, and the former, in the shape of washers, for the barrel, and as thin sheets (so-called "cigarette mica") for the spindle-wrapping and radio shield.

"Fine flake or powdered mica, made mainly from muscovite, but also from phlogopite and even biotite, has become an important industrial product, particularly in the United States where a number of plants are engaged in its manufacture by wet and dry systems of grinding. The raw material is, variously, mine and shop waste or scrap, small sheets and flakes recovered from clay-washing plants and also from schist rock mined for the purpose. In a few cases pegmatites also are mined as a source of grinding mica. Most of the production goes to the roofing and rubber trades. Other uses are in weather and corrosion-resistant paints; in resin varnishes for coating foodstuff cans; as a decorative medium in wallpaper and for Christmas tree "snow"; in the ceramic type of insulation termed "Mycalex"; and in a wide range of resin-bonded, moulded insulation and plastics. "Watsonite" is a flexible, resin-bonded insulating material made with dehydrated, heat-treated mica powder. Ground mica is also employed as a mould and core wash (trade-name "Micawash") in foundry work. Important new outlets for coarser grades are developing for use in oil drilling to prevent circulation loss of water into uncased and porous formations.

"Vermiculite is used extensively for thermal and acoustic insulation. The expanded product, also termed "Zonolite", has a specific gravity of only 6 to 8 pounds per cubic foot, is comparatively refractory, and has low thermal and sound conductivity.

"Most of the world supply of vermiculite is produced and used in the United States, where production in 1943 totalled 46,645 tons valued at $471,595. Montana, Wyoming, and North Carolina furnish most of the output, but some has been mined also in Colorado, South Carolina, California, and Nevada. There are no known occurrences of vermiculite (an altered phlogopite or biotite) in Canada.

"Dealers' quotations for phlogopite in 1943 showed little change from 1942 and were approximately as shown below, according to quality as based on colour, hardness, and splitting properties.

Knife-trimmed Block or Sheet		Splittings	
Size, Inches	Per Pound	Size, Inches	Per Pound
1 x 1 and 1 x 2	$0·25 to $0·30	1 x 1	$0·65
1 x 3 and 2 x 2	0·45 to 0·50	1 x 2	0·75
2 x 3	0·70 to 0·80	1 x 3	0·90
2 x 4	0·95 to 1·00		
3 x 5	1·50 to 2·00	(Splittings prices in U.S. funds)	
4 x 6	1·75 to 2·50		
5 x 8	2·75 to 3·25		

"Ground phlogopite sold as follows, according to fineness: 20 mesh, $30 per ton; 60 mesh, $40; 150 mesh, $65; all prices f.o.b. Ottawa, in ton lots, bags extra. Scrap phlogopite, for export sold for $10 to $11 per short ton, in carload lots.

"There is comparatively little domestic demand for block muscovite, most of the consumption being in the form of splittings for micanite manufacture, prepared films for condensers, and punched disks, segments, and washers, most of which are imported. There are thus no established trade quotations for trimmed sheet muscovite, and little is handled by Canadian mica dealers. The scale of prices set up by Colonial Mica Corporation for Canadian muscovite in 1942 was revised upward in 1943, except for No. 3 quality, which remained unchanged. The new schedule, which is to remain in effect until December 31, 1944, is shown below. All mica must be prepared in full sickle-trimmed form, with bevelled edges, no sheets to be thinner than 0·007 inch, or 7 mils. Purchase will be made subject to inspection and appraisal for quality and perfection of trim, and the proportion of No. 3 quality under 6 by 8 inches in size is limited to two-thirds by weight of the combined amount of No. 1 and No. 2 mica in any one lot. Prices shown are in Canadian funds, f.o.b. shipping point.

Size or grade inches	No. 1 quality $	No. 2 quality $	No. 3 quality $
1 x 1	1·54	0·66	0·33
1¼ x 1¼	2·09	0·88	0·44
1½ x 2	2·75	1·485	0·77
2 x 2	4·125	2·31	1·21
2 x 3	5·225	2·97	1·54
3 x 3	5·775	3·41	1·76
3 x 4	6·16	3·96	2·09
3 x 5	6·60	4·62	2·42
4 x 6	7·70	5·17	2·75
6 x 8	8·80	6·05	3·19
8 x 10	11·00	8·25	4·40
10 x 12	13·20	9·90	5·28

"Prices set for 'thins' (under 7 mils) ranged from $0·50 to $2·50 per pound, according to size and quality.

"Domestic outlets for limited amounts of No. 3 quality muscovite exist with manufacturers of heater appliances, electrical repair shops, stove manufacturers, and the hardware trade, but such material is in ample supply and prices offer little encouragement for mining for this quality alone.

"Montana cleaned and screened crude vermiculite was quoted in 1943 at $12 a short ton, f.o.b. mine, and North Carolina crude at $9.50. The expanded product weighs only 6 pounds per cubic foot, as compared with 60 pounds for the natural mineral. It is usually marketed in 24-pound bags, and American quotations average $75 to $80 a ton f.o.b. plant. Value of sales in the United States in 1942 was over $4,000,000."

Table 250.—Principal Statistics of the Mica Minining Industry in Canada, 1942 and 1943

—		1942	1943		
		Canada (*)	Quebec	Ontario	**Canada** (*)
Number of firms or operators		(a) **106**	59	17	(b) **78**
Capital employed	$	**1,460,769**	243,356	215,046	**458,402**
Number of employees—On salary		**35**	20	19	**39**
On wages		**326**	185	206	**391**
Total		**361**	205	225	**430**
Salaries and wages—Salaries	$	**45,145**	27,137	30,170	**57,307**
Wages	$	**213,469**	150,136	150,549	**300,685**
Total	$	**258,605**	177,273	180,719	**357,992**
Selling value of products (gross)	$	**383,567**	245,846	296,189	**553,856**
Cost of fuel and electricity	$	**18,152**	18,991	5,766	**24,757**
Cost of process supplies used	$	**19,161**	22,959	6,679	**29,638**
Selling value of products (net)	$	**346,254**	203,896	283,744	**499,461**

(*) Does not include general statistics for 2 operating plants in British Columbia in 1943 for which data are not available, also 2 in British Columbia in 1942.

(a) Includes 96 producing.

(b) Includes 71 producing.

Table 251.—Capital Employed in the Mica Mining Industry in Canada, by Provinces, 1943

—	Quebec	Ontario	**Canada**†
	$	$	$
CAPITAL EMPLOYED AS REPRESENTED BY—			
Present cash value of the land (excluding minerals)	22,280	63,810	**86,090**
Present value of buildings, fixtures, machinery, tools and other equipment	124,238	45,895	**170,133**
Inventory value of minerals on hand, ore in process, fuel and miscellaneous supplies on hand	31,425	15,668	**47,093**
Inventory value of finished products on hand	920	22,222	**23,142**
Operating capital (cash, bills and accounts receivable, prepaid expenses, etc.)	64,493	67,451	**131,944**
Total	243,356	215,046	**458,402**

† Data for 1 property in British Columbia not available.

Table 252.—Number of Wage-Earners on Payroll or Time Record on the Last Day of Each Month or Nearest Work Day, 1942 and 1943

Month	1942				1943			
	Mine		Shop(*)		Mine		Shop(*)	
	Surface	Underground	Male	Female	Surface	Underground	Male	Female
January	67	52	85	59	94	40	55	68
February	63	50	89	51	84	39	53	85
March	66	43	87	51	100	36	72	103
April	78	41	81	43	107	33	79	113
May	99	42	78	45	114	29	61	106
June	102	45	80	51	163	29	80	122
July	120	52	95	52	156	23	66	159
August	133	46	100	77	138	27	64	157
September	127	41	94	73	132	35	56	133
October	130	61	74	75	129	37	62	267
November	133	54	74	133	102	31	64	312
December	100	46	71	139	104	30	60	282
Average	**108**	**53**	**86**	**76**	**130**	**33**	**69**	**159**

(*) Includes outside workers.

PEAT INDUSTRY

The Canadian peat industry comprises both firms producing peat as a fuel and peat moss and humus for various other purposes. During 1943 production of peat fuel totalled 782 short tons valued at $7,000 compared with 172 tons worth $1,204 in 1942. Of the 1943 output, 522 tons valued at $4,440 originated in the province of Quebec and 260 tons worth $2,560 in Ontario. For many years past a small tonnage of peat has been produced in the St. Hyacinthe, St. Isidore and Ste. Barbe districts of Quebec for use locally as domestic fuel. The blocks of peat, dug manually with spades, are stocked and air-dried on the ground during the warm, dry season of the year and stored under cover for winter use. They form a compact and efficient fuel, slightly higher in calorific value than wood. To encourage the establishment of a peat-fuel industry in the province, the Quebec Department of Mines has developed a machine for manufacturing peat fuel; it is a modification of the "Dolberg" machine which has been used extensively in Europe. In 1943 the marked increase in the production of machine peat fuel in Quebec was the result of the assistance given by the Provincial Department of Mines and the Emergency Coal Production Board. During the year under review machine-peat fuel was produced in Ontario at Gods Hill near Stratford and at Osgoode, near Ottawa; a small amount of hand-dug peat fuel was used locally at Morewood in Dundas county.

Commercial production of peat moss in Canada during 1943 totalled 64,360 short tons valued at $1,461,422 (less cost of containers) compared with a corresponding output of 53,506 tons worth $1,069,372 in 1942. Of the 1943 shipments, 990 tons were made from New Brunswick properties, 14,398 tons from Quebec, 11,120 tons from Ontario, 2,042 tons from Manitoba, 55 tons from Alberta and 35,755 tons from British Columbia. Total Canadian production of moss in 1943, according to grades, were 24,790 tons valued at $444,488 for horticultural use; 140 tons at $3,260 as insulation; 26,324 tons worth $657,697 as poultry and stable litter; 12,974 tons at $347,900 for metallurgical purposes and 132 tons valued at $8,077 unspecified. Included in the tonnage classified under Horticulture was a considerable quantity of humus utilized in the manufacture of fertilizer. Products were marketed in the form of bales, bags, pads, fertilizer and insulation manufactures. The value of packing material or containers totalled $224,022. Canadian moss sold for metallurgical purposes was for consumption in the United States in the manufacture of magnesium metal.

The number of firms reported as active in the production of peat moss and peat fuel or the development of peat bogs totalled 44 in 1943 compared with 35 in 1942. In 1943 capital employed totalled $2,477,287 and $1,000,348 were distributed as salaries and wages to 1,012 employees. The net value of production was estimated at $1,384,770 as against $1,031,211 in 1942.

Peat is a combustible substance produced by the incomplete decomposition of vegetable matter either in water or in the presence of water, under such conditions that the atmospheric oxygen is excluded. The character of the peat depends upon the conditions under which it was formed, and on the nature of the vegetation which contributed to its formation. Many species of plants are found in peat bogs, the most abundant being mosses, such as sphagnum and hypnum; marsh and heath plants; grasses, rushes, etc.; marine plants; and sometimes trunks, roots and leaves of trees. Peat is found in every province of the Dominion.

Peat moss is the dead moss of the sphagnum plant. It is of importance because of its ability to absorb and hold from 10 to 25 times its own weight of liquids and gasses. It is also elastic and has a low heat conductivity, which makes it a good insulating material.

Prior to the war peat moss was obtained from bogs at Isle Verte, Riviere Ouelle, and Waterville in Quebec; at Grand Valley and Clinton in Ontario; at Edmonton West in Alberta; and at New Westminster, in British Columbia. It was used as a bedding litter for animals, as a filler for fertilizers, for insulating and sound proofing material and as a packing material. Most of the operations were on a relatively small scale and the annual production amounted to only a few thousand tons.

Table 253.—Principal Statistics of the Peat Industry in Canada, 1942 and 1943

—		1942	1943
Number of firms		(b) 35	(a) 44
Number of plants or bogs		35	44
Capital employed	$	3,212,921	2,477,287
Number of employees—On salary		69	64
On wages		1,247	948
Total		**1,316**	**1,012**
Salaries and wages—Salaries	$	113,781	119,156
Wages	$	1,266,361	881,192
Total	$	**1,380,142**	**1,000,348**
Selling value of products (gross)	$	1,308,297	1,692,444
Cost of fuel and electricity	$	25,866	35,118
Process supplies used	$	13,499	48,534
Cost of containers or packing	$	237,721	224,022
Selling value of products (net)	$	1,031,211	1,384,770

(a) Includes 12 producing fuel.
(b) Includes one producing fuel.

Table 254.—Capital Employed in the Peat Industry in Canada, by Provinces, 1943

Province	Capital employed as represented by:					
	Present cash value of land	Present value of buildings, fixtures, machinery, tools and other equipment	Inventory value of materials on hand, fuel and miscellaneous supplies on hand	Inventory value of finished products on hand	Operating capital (cash, bills and accounts receivable, prepaid expenses, etc.	Total
	$	$	$	$	$	$
Quebec	42,155	251,486	65,052	55,807	20,353	**434,853**
Ontario	22,325	185,634	65,356	19,171	29,596	**322,082**
Manitoba (*)	3,000	33,978	104,160	1,409	14,000	**156,547**
British Columbia	101,964	613,969	641,091	32,399	174,382	**1,563,805**
Canada	**169,444**	**1,085,067**	**875,659**	**108,786**	**238,331**	**2,477,287**

(*) Includes data for 2 firms in New Brunswick and 1 in Alberta.

Table 255.—Wage-Earners, by Months, 1942 and 1943

Month	1942 Total	1943			
		Bog		Dressing Plant	
		Male	Female	Male	Female
January	761	463	5	249	20
February	862	464	4	240	25
March	850	497	5	172	22
April	881	419	5	156	2
May	1,038	624	6	210	2
June	1,405	901	162	205	7
July	2,775	981	171	191	6
August	2,297	1,144	231	191	4
September	1,212	861	79	246	26
October	1,110	530	28	260	20
November	950	454	25	306	16
December	784	242	19	267	29

Table 256.—Peat Fuel Produced in Canada, 1928-1943 (Tons of 2,000 pounds)

Year	Tons	$
1928	1,497	5,845
1929	2,607	13,339
1930	2,847	10,932
1931	1,674	7,033
1932	3,248	7,593
1933	1,131	3,449
1934	1,878	7,343
1935	1,340	5,761
1936	1,341	7,376
1937	478	2,676
1938	620	3,500
1939	445	2,445
1940	30	75
1941	355	2,155
1942	172	1,204
1943	782	7,000

NOTE:—For information of a technical nature, please refer to report No. 614 "Facts About Peat" issued by the Bureau of Mines, Ottawa.

Table 257.—Number of Firms, Employees, Salaries and Wages, and Peat (Moss and Fuel) Sold or Used, by Provinces, 1943

Province	Number of firms	Number of employees	Salaries and wages	Fuel, electricity process supplies used and cost of containers	Production		
					Tons of peat sold or used		Value (gross)
					As fuel	Moss	
			$	$			$ (**)
Quebec	18	264	179,230	102,314	522	14,398	391,953
Ontario	10	116	110,438	48,020	260	11,120	179,893
Manitoba (*)	5	120	87,074	59,270	....	3,087	121,256
British Columbia	11	512	623,606	98,070	....	35,755	999,342
Canada	**44**	**1,012**	**1,000,348**	**307,674**	(†) **782**	**64,360**	**1,692,444**

(*) Contains data for 2 firms in New Brunswick and 1 in Alberta.
(†) Includes 112 tons used by producer.
(**) Includes cost of containers.

Table 258.—Production (Shipments) of Peat Fuel and Peat Moss in Canada, by Uses and Provinces, 1942 and 1943

Province	Fuel		Moss											
			Horticulture		Insulation		Poultry and stable litter		Metallurgy		Other uses		**Total Moss**	
	Tons	$	Tons	$	Tons	$	Tons	$	Tons	$	Tons	$	**Tons**	**$ (*)**
1942														
Quebec	....	....	4,410	74,332	81	2,104	8,491	121,124	....	....	....	....	**12,982**	**197,560**
Ontario	172	1,204	5,832	89,058	1	46	3,594	58,625	....	....	....	....	**9,427**	**147,729**
Manitoba, New Brunswick and Alberta	....	....	541	8,358	31	542	2,005	56,412	....	....	....	....	**2,577**	**65,312**
British Columbia	....	....	1,288	28,318	....	....	3,254	77,302	23,927	549,774	51	3,377	**28,520**	**658,771**
Total	**172**	**1,204**	**12,071**	**200,066**	**113**	**2,692**	**17,344**	**313,463**	**23,927**	**549,774**	**51**	**3,377**	**53,506**	**1,069,372**
1943														
Quebec	522	4,440	5,898	126,558	125	2,860	8,375	168,889	....	....	....	....	**14,398**	**298,307**
Ontario	260	2,560	9,234	85,479	....	....	1,886	51,116	....	....	....	....	**11,120**	**136,595**
Manitoba, New Brunswick and Alberta	....	....	808	22,574	15	400	2,204	78,138	....	....	....	....	**3,087**	**101,112**
British Columbia	....	....	8,850	209,877	....	....	13,790	359,554	12,974	347,900	132	8,077	**35,755**	**925,408**
Total	**782**	**7,000**	**24,790**	**444,488**	**140**	**3,260**	**26,324**	**657,697**	**12,974**	**347,900**	**132**	**8,077**	**64,360**	**1,461,422**

(*) Less cost of containers which were valued at $224,022 in 1943.

NOTE:—Data relating to exports of peat moss from Canada are not shown separately in Canadian trade reports for 1943.

THE SALT INDUSTRY

Production of common salt or natural sodium chloride in Canada during 1943 totalled 687,686 short tons valued at $4,379,378 compared with 653,672 short tons worth $3,844,187 in 1942. The quantity and value of the output during the year under review were the greatest ever realized by the Canadian salt industry. The mineral in 1943 was produced in Nova Scotia, Ontario, Manitoba and Alberta, and of the total production, Ontario contributed 594,889 short tons or 86·5 per cent. Statistics of production represent the recovery of salt from brine wells with the exception of Nova Scotia, where the output comes entirely from the underground mining or rock salt deposits.

Of the total salt produced in 1943, there were 346,145 short tons or 50 per cent consumed directly in the manufacture of caustic soda and other chemicals. Producers' sales of other salt in 1943 included 99,706 short tons of table and dairy grades; 167,547 short tons of common fine and 70,883 short tons of common coarse. The balance, other than that used direct for chemical manufacture, consisted of various grades, including salt for agriculture and for highway maintenance.

The number of Canadian firms reporting primary salt production in 1943 totalled 9; capital employed by the industry amounted to $5,490,594, of which $3,381,435 represented the value of buildings, machinery, etc., $284,652 the value of land and $1,262,469 operating capital. Employees numbered 682, including 105 females. Salaries and wages totalled $1,223,009; $596,252 were expended for fuel and electricity, and $134,272 for chemicals and other process supplies.

Statistics relating to Canadian salt production are available only since 1886 and salt output in the Dominion since that year and to the end of 1943 totalled 10,780,904 short tons valued at $62,293,839. Statistics relating to world production of salt have not been available since 1938.

Canadian exports of salt in 1943 totalled 8,061 short tons valued at $118,174; imports during the same period amounted to 84,788 short tons worth $589,108.

The following information is from a report prepared by the Bureau of Mines, Ottawa:

"At Nappan, near Amherst, Cumberland county, Nova Scotia, a well was drilled in 1931 by Imperial Oil, Limited in a search for oil and gas. The hole reached a total depth of 4,134 feet and bottomed in anhydrite. The hole penetrated alternating beds of salt, anhydrite, dolomite, limestone, and shale, the salt constituting 45 per cent of the whole. Salt was first met at a depth of 920 feet, for a length of 20 feet, and this was followed by many other salt horizons interbedded in gypsum, anhydrite, and sand. At 2,990 feet, there followed a thickness of 500 feet of salt. The geological structures in this area were worked out in detail by Imperial Oil, Limited.

"To obtain further information on this structure the Nova Scotia Department of Mines undertook a drilling campaign in 1943. No. 1 hole, drilled one mile west of Amherst, intersected 26 feet of salt between 779 feet and 805 feet. No. 2 hole drilled 650 feet north of No. 1 intersected salt at 888 feet and was stopped in salt at 1,114 feet, giving 226 feet of salt. The results of the drilling gave ample evidence of huge deposits of salt in this district.

"In New Brunswick, a salt basin was discovered in 1921, as a result of drilling in the vicinity of Goutreau, south of Moncton, on the east side of the Petitcodiac River. The extent of the basin was further determined when New Brunswick Gas and Oilfields, Limited, in drilling at Weldon on the west side of the Petitcodiac River, penetrated over 1,500 feet of salt formation. It was the second drill hole to strike salt on that side of the river. The top of the rock salt was 1,473 feet below the surface. During 1939 still another drill hole passed through the same salt formation, the thickness, however, being only about 100 feet, indicating that the northern edge of the basin was being approached. Six drill holes have penetrated the salt so that a deposit over 1½ miles wide and 4 or more miles long is already indicated, the greatest thickness so far encountered being 1,500 feet. There are, therefore, many millions of tons of salt in this basin available for future development.

"The market for salt in Canada is steadily increasing. Domestic production is sold principally to the dairy, meat curing, and canning industries; to fisheries; to highway and transport departments for use as a soil stabilizer; to the chemical industries; and as table salt.

"The use of salt in soil stabilization for the foundations of highways and for a surface veneer for gravel roads has shown marked increase in recent years. It has been used extensively also in the development of soil-stabilized bases for runways at Canadian air fields. Sand piled each fall at regular intervals along main highways remains loose and free-flowing even in the coldest weather, when mixed with salt, thus allowing easy distribution on the icy roadway.

"According to Canadian Chemistry and Process Industries (Toronto), prices for the several grades of salt were as follows in 1943: Specially purified (99·9 per cent NaCl) from January to July, and 94 cents per 100-pound lot from July to the end of the year; salt in 280-pound barrels f.o.b. plant, \$3.53 per barrel; industrial fine, in bulk car lots f.o.b. plant, \$6.53 per ton; and industrial coarse \$10.63 per ton."

Table 259.—Production of Salt in Canada, by Grades, 1942 and 1943

—	1942			1943		
	Manufactured	Sold	Value of salt sold (Not including containers)	Manufactured	Sold	Value of salt sold (Not including containers)
	tons	tons	$	tons	tons	$
Table, dairy and pressed blocks	89,588	87,743	1,698,210	100,562	99,706	1,823,446
Common, fine	147,168	150,008	890,906	164,658	107,547	1,074,229
Common, coarse	33,794	35,271	330,322	68,106	70,883	451,462
Highway salt	996	996	5,438	269	269	1,468
Land salt	514	509	3,493	132	157	1,223
Other grades	52,239	51,597	335,037	3,044	2,979	43,208
Brine for chemical works (salt equivalent sold or used)	327,548	327,548	580,781	346,145	346,145	984,342
Total	**651,847**	**653,672**	**3,844,187**	**682,916**	**687,686**	**4,379,378**
Value of containers	....	....	748,816	....	....	809,250
Grand Total	....	....	**4,593,003**	....	....	**5,188,628**

Table 260.—Production of Salt, by Provinces(*), 1932-1943

Year	Nova Scotia		Ontario		Manitoba		Alberta	
	Tons	$	Tons	$	Tons	$	Tons	$
1932	31,897	150,708	231,138	1,789,751	508	7,092	....	....
1933	34,278	161,889	244,107	1,755,087	1,499	18,388	....	....
1934	42,886	191,917	276,751	1,734,196	1,664	20,137	....	....
1935	38,701	161,659	320,003	1,698,508	1,538	18,765	....	....
1936	38,774	183,915	350,044	1,557,078	2,498	32,151	....	....
1937	46,865	216,401	407,701	1,539,599	3,391	43,465	....	....
1938	44,050	194,759	388,130	1,657,140	2,920	34,979	4,045	46,035
1939	47,885	213,029	370,843	2,200,189	2,453	35,888	3,319	37,526
1940	42,495	220,328	412,401	2,371,780	3,076	45,731	6,742	185,430
1941	54,007	307,637	477,170	2,512,160	13,051	115,367	16,617	260,995
1942	50,199	317,798	558,407	2,793,328	22,706	397,101	22,360	335,960
1943	47,775	245,157	594,889	3,356,870	27,523	497,227	17,499	280,124

(*) In addition, Saskatchewan produced 231 tons valued at \$4,510 in 1933, 452 tons at \$8,793 in 1934, and 101 tons at \$2,046 in 1935.

Table 261.—Salt Produced for Chemical Purposes(*), 1928-1943

Year	Quantity Tons (2,000 lb.)	Per cent of total salt output	Year	Quantity Tons (2,000 lb.)	Per cent of total salt output
1928	135,138	45	1936	165,882	42
1929	168,327	51	1937	205,149	45
1930	114,737	42	1938	170,938	39
1931	97,958	38	1939	187,958	44
1932	96,242	37	1940	224,009	48
1933	104,740	37	1941	258,711	46
1934	124,132	39	1942	327,548	50
1935	145,433	40	1943	346,145	50

(*) Used in the manufacture of chemicals by producers of salt.

Table 262.—Production in Canada, Imports, Exports and Consumption of Salt, 1942 and 1943

—	1942		1943	
	Tons	Value	Tons	Value
		$		$
Production	653,672	3,844,187	687,686	4,379,378
Imports—				
Salt, for the use of the sea or gulf fisheries	20,865	141,050	21,037	161,255
Salt, in bulk, n.o.p.	35,295	165,762	47,687	245,913
Salt, n.o.p., in bags, barrels, etc.	13,182	133,895	16,064	181,940
Salt, table, made by an admixture of other ingredients, when containing not less than 90 per cent of pure salt	2	141	....	....
Total	**69,344**	**440,848**	**84,788**	**589,108**
Exports	9,326	128,832	8,061	118,174
Apparent consumption of salt	713,690	4,150,203	764,413	4,850,312

Caustic soda, chlorine and hydrochloric acid are now manufactured by Canadian Industries Limited from salt obtained from the company's wells located at Sandwich. This company operates chemical plants at Windsor, Cornwall, Shawinigan Falls and Quebec.

The Brunner, Mond Canada, Limited, located at Amherstburg, Ontario, manufactures soda ash from natural brine; calcium chloride is also recovered as a by-product by this company.

Table 263.—Available Statistics on Consumption of Salt in Specified Canadian Industries, 1942 and 1943(*)

Industries	1942		1943	
	Quantity used	Cost at works	Quantity used	Cost at works
	Pounds	$	Pounds	$
Fish canning and curing (factories only)	44,918,800	460,162	48,349,100	528,320
Slaughtering and meat packing	112,575,017	775,059	120,899,226	859,676
Acids, alkalies and salts—Brine (salt content) and dry salt	613,076,907	886,119	252,083,273	681,432
Soaps and cleaning preparations	4,303,370	22,822	3,864,220	19,203
Dyeing, cleaning and laundry work	6,286,284	56,970	6,234,358	56,024
Dyeing and finishing of textiles	5,564,143	25,709	7,611,943	33,834
Artificial ice	474,440	3,720	549,990	4,516
Abrasives—artificial	784,000	4,172	820,000	4,793
Waterworks	3,596,200	(†)	4,821,900	(†)
Leather tanneries	16,412,227	85,305	16,859,409	88,867
Pulp and paper mills	28,006,000	132,161	28,546,000	136,642
Stock and poultry foods	8,158,000	63,376	13,386,000	106,991
Bread and other bakery products	15,481,319	183,393	16,978,891	199,602
Fruit and vegetable preparations	13,212,011	98,254	11,599,260	83,370
Biscuits, confectionery, etc.	1,894,910	18,615	2,158,560	23,103
Foods, breakfast	1,386,367	10,976	3,024,751	18,821
Sausage and sausage casings	637,965	7,054	612,884	9,097
Ice cream industry	458,925	2,203	393,817	9,806
Breweries	1,055,986	8,977	701,867	6,744
Malt and malt products	220,500	1,278	305,185	1,729
Macaroni, vermicelli, etc.	115,602	1,213	136,203	1,447
Ice cream cones	6,394	66	8,460	78
Foods, miscellaneous, including coffee, tea, etc.	2,693,050	27,063	4,110,262	43,447
Butter and cheese	....	240,607	....	239,184
Starch and glucose	623,360	2,625	553,268	2,633
Animal oils and fats	364,000	1,850	428,000	2,184
Condensed milk	....	409	....	330
Cheese processed	239,263	4,573	299,809	5,339

(*) In addition, large quantities of salt are used on highways.

(†) Data not available.

Table 264.—Principal Statistics of the Salt Industry in Canada, 1941-1943

—		1941	1942	1943
Number of firms (*)		9	9	9
Capital employed	$	5,559,307	5,687,511	5,490,594
Number of employees—On salary		148	134	135
On wages		520	541	547
Total		668	675	682
Salaries and wages—Salaries	$	361,661	337,050	366,555
Wages	$	656,991	777,524	856,454
Total	$	1,018,652	1,114,574	1,223,009
Selling value of products (gross)	$	3,852,499	4,604,003	5,188,628
Cost of purchased process materials	$	69,341	133,783	134,272
Cost of fuel and electricity	$	450,291	536,649	596,252
Value of containers	$	656,334	748,816	809,250
Net value of sales	$	2,676,533	3,184,755	3,648,854

(*) 6 in Ontario; 1 in Nova Scotia; 1 in Manitoba; 1 in Alberta.

Table 265.—Capital Employed in the Salt Industry in Canada, 1943

—	$
CAPITAL EMPLOYED AS REPRESENTED BY—	
Present cash value of the land (excluding minerals)	284,652
Present value of buildings, fixtures, machinery, tools and other equipment	3,381,435
Inventory value of materials on hand, salt in process, fuel and miscellaneous supplies on hand	445,963
Inventory value of finished products on hand	116,075
Operating capital (cash, bills and accounts receivable, prepaid expenses, etc.)	1,262,469
Total	**5,490,594**

Table 266.—Wage-Earners, by Months, 1939-1943 (On last day of each month or nearest work day)

Month	1939	1940	1941	1942	1943		
					Male		Female
					Surface	Underground	Surface
January	440	431	428	515	455	55	35
February	426	439	435	526	447	48	40
March	407	442	449	516	457	42	44
April	424	463	484	522	455	41	41
May	439	490	516	539	460	30	44
June	459	477	543	560	465	31	46
July	460	493	558	565	482	25	55
August	416	503	564	548	480	28	58
September	431	490	565	548	446	30	63
October	458	483	574	542	452	26	63
November	449	492	563	569	458	28	65
December	408	396	558	545	468	29	63
Average	**434**	**466**	**520**	**541**	**461**	**34**	**5[illegible]**

POTASH

Complete statistics relating to world production of potash are not available for 1941 or 1942 as publication of potash production statistics by European governments virtually ceased in the summer of 1939, and no adequate data are available since.

Natural potash salts are not yet mined or recovered on an extensive commercial scale in Canada. Potash occurs in small quantities in rock salt strata at Malagash, Cumberland County, Nova Scotia, and at Gautreau, Westmorland County, New Brunswick. Potassium chloride occurs at Malagash in a number of definite bands in the salt mass in the form of crystalline beds of pink and yellowish green sylvite in the matrix of halite.

Table 267.—Potash Salts Used in the Manufacture of Canadian Mixed Fertilizers, 1942 and 1943

—	1942		1943	
	Tons	Cost at works	Tons	Cost at works
		$		$
Nitrate of potash	90	876	....	....
Kainite and potash manure salts	30,182	587,489	23,753	447,619
Muriate of potash	41,648	1,686,724	51,500	1,969,055
Sulphate of potash	4,525	196,754	5,480	248,702

Table 268.—Sales of Potash Salts for Fertilizer Purposes, Other Than For the Manufacture of Mixed Fertilizers, Years Ended June 30, 1942 and 1943

	1942	1943
	(short tons)	
Muriate of potash	5,419	5,376
Sulphate of potash	122	99

TALC AND SOAPSTONE INDUSTRY

The value of crude and refined talc and soapstone sold by Canadian producers of these minerals totalled $266,685 in 1943 compared with a corresponding value of $310,824 in 1942. Mine shipments of soapstone and talc reported in 1943 by operators in the province of Quebec amounted to 14,204 tons worth $135,469. Production of the higher grades of talc in Canada is confined chiefly to the province of Ontario, and the 1943 shipments totalling 11,959 tons valued at $131,216 were made almost entirely from a deposit located near Madoc, Hastings county. Included in the Ontario output was a relatively small tonnage of talc obtained from a property situated near Ompah in Frontenac county. In British Columbia, crude talc imported from the United States was treated in a Vancouver mill. From October to December development work was carried on at a talc deposit located at Red Mountain in the Kootenay National Park of British Columbia; this operation is known as the Lava Talc Project and was conducted by the Wartime Metals Corp.; a trial shipment was made to the United States economic Administration.

Imports of talc or soapstone into Canada in 1943 totalled 12,899,800 pounds valued at $130,813; exports of talc in the same year amounted to 22,729,200 pounds worth $146,510.

During 1943 there were 8 firms reported as active in the industry, 5 in the province of Quebec, 2 in Ontario and 1 in British Columbia; of these, 6 made commercial shipments. Capital employed by the industry totalled $576,691; employees numbered 90, and $101,719 were distributed as salaries and wages. Fuel and purchased electricity consumed were appraised at $24,104 and the cost of explosives and other process supplies used was reported at $33,927. The net value of sales in 1943 was estimated at $208,654 compared with $251,711 in 1942.

The following information is from a report "Talc and Soapstone in 1943" as prepared by the Bureau of Mines, Ottawa:

"Annual production of ground talc in Canada in the five-year period 1939–1943, inclusive, ranged from 16,000 to 32,000 tons, these figures including also material classed in statistical records as soapstone, part of which was ground in mills other than those of primary producers. All of the output came from Ontario and Quebec.

"Most of the material from Ontario consists of white, foliated talc, which occurs as veins in crystalline dolomitic limestone of the Madoc area, Hastings county, where an established talc industry has existed for the past forty years. Total output from the Madoc area to the end of 1943 is about 400,000 tons. Since 1937, Canada Talc Limited, operating the Conley and Henderson mines, has been the only important producer. W. C. Spry and Company in recent years has been milling a small tonnage of finely schistose, cream-coloured talc in the plant of Canada Slate Products, about a mile north of Madoc. The crude rock is trucked in from a deposit near Ompah, in Frontenac county, 65 miles distant.

"In Quebec, the talc produced is also of foliated type, but it occurs in bands in highly-metamorphosed basic rocks, mainly serpentine and pyroxenite, and is often associated with bodies of soapstone, an impure talcose rock. It contains much iron, present mainly in chlorite, and varies rather widely in carbonate content. It yields a slightly off-colour, grey powder, and is used chiefly in the rubber, paper, and roofing trades. The entire production is obtained from the Eastern Townships, mainly from the Thetford Mines area, and there are also a mine and mill at Highwater close to the Vermont boundary. All of Canada's output of sawn soapstone blocks, sold chiefly for use in the alkali recovery furnaces of domestic kraft mills, and also of talc crayons, comes from the Thetford Mines area. Some of the sawing dust from these operations is sold to domestic roofing firms, and a large tonnage of quarry and sawing waste is shipped to the grinding plant of Pulverized Products, Limited, 4820 Fourth Avenue, Rosemount, Montreal.

"Prior to the war, the world production of talc, including ground material, cut soapstone, steatite, and pyrophyllite (a mineral closely resembling talc and used for many similar industrial purposes) amounted to about half a million tons a year, more than half of which was produced in the United States. Manchuria, with an output of about 100,000 tons, was the second largest producer, followed by France and Italy, each with about 50,000 tons, Norway, British India, Canada and Germany (including Austria).

"Many grades of ground talc are marketed, and the price range is wide. Value is dependent upon purity (determined by freedom from lime and gritty or iron-bearing substances, slip, and colour), particle shape, and fineness of grinding, the specifications for which vary in the different consuming industries. Roofing and foundry talcs are the cheapest grades, the trades in these being satisfied with coarser, grey or off-colour material, often soapstone powder or sawing dust, which sells at about \$5 to \$7 a ton f.o.b. rail. Domestic grey talc, suitable for rubber and paper use, sold in 1943 for an average of \$7.50 to \$9 per ton. White talc from the Madoc area was quoted at \$8 to \$10 for the coarser grades, \$12 to \$18 for finer mesh sizes, and \$44 for minus 400-mesh material.

"American talcs include high-grade, white Californian material, which sold for \$17.50 to \$43 a ton; fibrous New York 'Asbestine', 'Tremoline', and 'Loomite' grades, which were quoted at \$13 to \$21; and the lower-grade, grey Georgia and Vermont products, which sold for \$8 to \$14; all prices f.o.b. mines. Lava steatite and crayon talc sold for \$100 to \$150 a ton.

"Pyrophyllite (hydrous silicate of alumina) closely resembles talc in appearance and physical characteristics. It is difficult to distinguish from talc even by microscopic means and often requires chemical analysis for its identification. In the ground state it can be employed for many of the industrial uses of talc. Commercial deposits are relatively scarce. Most of the recorded world production comes from North Carolina, where the industry has expanded rapidly in recent years. A large part of the American output goes to the ceramic trade, the remainder being sold for fillers in various products. When fired, pyrophyllite does not flux, as does talc, and it is of value in a wide range of high-grade ceramic products, including refractories.

"Important deposits are known in Newfoundland, and are at present owned and operated by Industrial Minerals Company of Newfoundland, Limited, Box 435, St. John's.

"In 1943, pyrophyllite was quoted at \$10 to \$13 a ton, f.o.b. North Carolina mills, for 200-mesh and 325-mesh material, respectively. The material was in easy supply and was placed throughout the year in Group III of the list of materials issued by the Conservation Division of the United States War Production Board.

"Steatite, is the mineralogical name given to compact, massive talc having no visible grain, that can be sawn, turned, drilled, and otherwise machined into any desired form. Such material has been widely used for the production of fired shapes, used mainly as electrical insulators. There is now a large demand for steatite for use as grid spacers in high-frequency ship and tank radio transmitters, and for the cores, bushings, resistors, etc., in radio, radar, and other electronic equipment. It is used to an important extent also for carbon black and other gas burner tips. An alternative trade name for steatite is "lava talc". Because of the small amount of natural steatite available, its high cost, and excessive machining and firing losses, the aforementioned articles are now made largely by die-pressing powdered talc. Suitable talc for the purpose is required to be high-grade material, low in lime and iron, and such talc is now commonly termed steatite, or steatitic talc, irrespective of its texture. There is still a limited demand, however, for sawn steatite shapes, and suitable crude is in short supply. The chief sources of supply at present are British India, Sardinia, Maryland, Montana, and California. Specifications call for compact texture, good structural strength, freedom from hair-cracks and parting lines and from gritty impurities, and a low content of lime and iron. In general, grade and suitability are determined by machinability and firing behaviour, followed by tests for electronic performance. Chemical analysis is of secondary importance."

Table 269.—Production (Sales) in Canada of Talc and Soapstone(†), 1941-1943

—	1941		1942		1943	
	Quantity	Value	Quantity	Value	Quantity	Value
	tons	$	tons	$	tons	$
Soapstone (Quebec) (*)	16,461	155,925	14,369	136,529	14,204	135,469
Talc—Ontario	18,171	204,884	15,499	174,295	11,959	131,216
Total Canada	**34,632**	**360,809**	**29,868**	**310,824**	**26,163**	**266,685**

(*) Shipments by some firms usually include a considerable quantity of material classified as talc.
(†) Includes both crude and milled grades.

Table 270.—Production of Talc and Soapstone in Canada, 1930-1943

Year	Value	Year	Value
	$		$
1930	186,216	1937	163,814
1931	157,083	1938	144,848
1932	159,038	1939	170,066
1933	190,836	1940	229,639
1934	180,777	1941	360,809
1935	171,532	1942	310,824
1936	177,270	1943	266,685

Production of talc and soapstone in Canada from 1886 to the end of 1943 totalled 577,832 short tons valued at $5,394,790. The largest annual tonnage produced during these years was 34,632 in 1941, also, the greatest annual value was $360,809 in 1941.

Table 271.—Consumption of Talc in Canada, by Industries, as Reported in the Annual Census of Manufactures, 1943

Industry	Short tons	Cost at works
		$
Rubber industry	1,839	34,243
Electrical apparatus	356	9,891
Paints	6,601	174,757
Soaps and cleansing preparations	550	10,556
Toilet preparations	565	24,868
Polishes	25	496
Products from imported clays	354	5,586
Prepared roofing	3,859	42,519
Pulp and paper	1,469	25,178

Table 272.—Imports and Exports of Talc, 1942 and 1943

—	1942		1943	
	Pounds	$	Pounds	$
Imports—Talc or soapstone	10,881,900	114,852	12,899,800	130,813
Exports—Talc	32,110,200	214,033	22,729,200	146,516

Table 273.—Principal Statistics of the Talc and Soapstone Industry in Canada, 1941-1943

—		1941	1942	1943
Number of firms		8(c)	10(a)	8(b)
Capital employed	$	695,581	567,665	576,691
Number of employees—On salary		8	8	10
On wages		140	107	80
Total		148	115	90
Salaries and wages—Salaries	$	21,564	22,729	23,794
Wages	$	107,256	90,872	77,925
Total	$	128,820	113,601	101,719
Selling value of products (Gross)	$	360,809	310,824	266,685
Cost of fuel and purchased electricity	$	26,882	25,905	24,104
Cost of explosives and other process supplies	$	28,324	33,208	33,927
Selling value of products (net)	$	305,603	251,711	208,654

(a) 7 firms in Quebec and 3 in Ontario; data for a firm in Quebec, other than sales not available.
(b) 5 firms in Quebec, 2 in Ontario and 1 in British Columbia.
(c) 5 firms in Quebec and 3 in Ontario.

Table 274.—Capital Employed, by Classes (x), 1941-1943

—	1941	1942	1943
	$	$	$
Present value of land, buildings, fixtures, machinery, tools and other equipment	590,303	458,036	482,633
Inventory value of materials on hand, stocks in process, fuel and miscellaneous supplies on hand	18,343	9,465	9,893
Inventory value of finished products on hand	8,915	21,385	11,018
Operating capital	78,020	78,779	73,147
Total	**695,581**	**567,665**	**576,691**

(*) By active firms.

Table 275.—Wage-Earners(x), by Months, 1942 and 1943

Month	Total 1942	1943		
		Surface	Under-ground	Mill
January	141	37	21	26
February	145	32	21	27
March	129	29	21	26
April	117	32	17	22
May	110	35	19	22
June	117	41	17	20
July	110	36	15	17
August	93	41	18	18
September	85	39	18	18
October	82	40	16	23
November	81	53	20	20
December	79	50	17	21

(*) All male.

MISCELLANEOUS INDUSTRIAL OR NON-METAL MINING INDUSTRIES

Included in this section are the following non-metallic minerals and mineral products:—

Barite	**Graphite**	**Phosphate**
Brucite	**Grindstones**	**Silica Brick**
Corundum	**Kyanite**	**Sodium Carbonate**
Diamonds	**Lithium Minerals**	**Sodium Sulphate**
Diatomite	**Magnesitic Dolomite**	**Strontium Minerals**
Fluorspar	**Magnesium Sulphate**	**Sulphur (Pyrites)**
Garnet	**Natural Mineral Waters**	

Canadian operators producing certain industrial minerals, and who are usually relatively few in number, have been segregated for statistical purposes into a single group designated as the Miscellaneous Non-Metal Mining Industry. Minerals or primary mineral products produced (or deposits developed) by this industry during 1943 included barite, brucite, diatomite, fluorspar, graphite, grindstones, lithium minerals, magnesitic dolomite (crude and refined), mineral waters, phosphate, silica brick, sodium carbonate, sodium sulphate and volcanic ash. For convenience, the sulphur content of pyrites shipped and sulphur recovered from smelter gas are recorded with the various miscellaneous minerals listed above; the value of sulphur production, however, is not included in the total for the miscellaneous non-metallic or industrial minerals as the value of this element is credited to the copper-gold-silver mining and non-ferrous smelting industries.

The number of firms reported as active in the industry during 1943 was 52; capital employed totalled $3,522,842; employees numbered 911 and salaries and wages paid amounted to $1,363,526. The cost of fuel, purchased electricity, containers and process supplies used during the year was reported at $1,208,470, and the gross value of production totalled $3,476,707 compared with $3,006,167 in 1942.

BARITE

Canadian mine shipments of barite during 1943 totalled 24,474 short tons valued at $279,253 compared with 19,667 tons worth $188,144 in 1942. Production of the mineral in both years was confined to the provinces of British Columbia and Nova Scotia and of the 1943 output the latter province contributed 22,550 tons valued at $263,419. The following information is from a report on barite prepared by the Bureau of Mines, Ottawa.

"The most important development in the history of the industry was the discovery in 1940 of a deposit of exceptional size and richness near Walton, Hants county. This deposit is being actively developed, and since the commencement of operations, three years ago, it has produced about 45,000 tons, or approximately 50 per cent of the total recorded Canadian output.

"Scattered occurrences of barite are known in Ontario, the chief of which are in the Elk Lake, Porcupine, and Sudbury areas. Spasmodic attempts at development have been made, but with limited success and only a small total output.

"In British Columbia, development was commenced in 1941 of a deposit near Parson, 25 miles south of Golden, and this is now supplying a substantial part of the domestic requirements.

"Only Nova Scotia and British Columbia recorded sales of barite in 1943. The fluorspar ores of the Madoc area, Ontario, and of a deposit operated in 1942-1943 at Lake Ainslie, Nova Scotia, contain important amounts of barite. A small tonnage of handpicked barite has been stock-piled at the Lake Ainslie operation. Tests made by the Bureau of Mines, Ottawa, on ores from these two areas indicate the possibility of recovering a marketable barite by-product from them by flotation.

"The barite deposit at Walton, Nova Scotia, shows promise of proving to be one of the largest known world occurrences of the mineral. Preliminary drilling of the property indicated reserves of 1½ million tons to a depth of 200 feet, and this tonnage was increased by further drilling in 1943 to a total of 3,000,000 tons, with one hole showing over 100 feet of barite. The deposit is being operated by Canadian Industrial Minerals, Limited (subsidiary of Springer-Sturgeon Gold Mines, 67 Yonge Street, Toronto), which to date has given chief attention to the production of a 325-mesh product for use in oil-well drilling. Shipments of crude ore have been made to the United States for use in the manufacture of lithopone and barium chemicals. The Walton barite is mostly off-colour material and rather heavily stained by iron, and is thus not suitable for the general pigment and filler trade without bleaching.

"Commercial deposits of witherite (barium carbonate), the only other ore of barium, are rare and no occurrences of economic interest are known in Canada. Most of the world supply has come from England, but in 1942 a small amount was mined in California. American imports in recent years have been running at around 3,000 to 3,500 tons a year.

"World production of barite prior to the war approximated one million tons a year, of which Germany supplied 50 per cent and the United States 30 per cent. The remainder came mainly from the United Kingdom, Italy, Greece, France, and India.

"Ground barite has a number of industrial uses, the chief of which are as a heavy, inert filler or loader in rubber, paper, oilcloth, textiles, leather, and plastics. It is one of the most important pigments and extenders in paints, and it is used extensively as a weighting material in oil drilling muds to overcome gas pressures. In the United States, 66 per cent of the ground and crushed barite sold in 1942 was used in oil-well drilling; 12 per cent in the glass industry, where it serves as a batch fluxing ingredient for moulded flint glass; and 10 per cent in the paint trade.

"For most filler and loader uses, and also for paints, barite is required to contain not less than 95 per cent barium sulphate and to have a good white colour; some off-colour material is also employed for less essential purposes. The best grades of prime white barite are produced by bleaching with sulphuric acid. A 325-mesh material is usually specified. For use in glass, barite must contain not less than 96 per cent barium sulphate, under 3 per cent moisture, and not over 0·4 per cent iron oxide, with a fineness within the range of 20 to 100 mesh. Colour is immaterial in barite for use in oil-well drilling, the requirements for which are a minimum specific gravity of 4·25 (corresponding to a barium sulphate content of 93 per cent) and a grind of 325-mesh. The Walton product more than meets this specification, having an average gravity of 4·40 and a barium sulphate content of 95–96 per cent.

"Large quantities of barite are used in the lithopone and barium chemicals trades. In 1942, consumption of barite for lithopone use in the United States was 32 per cent of the total, and for barium chemicals 23 per cent, the remaining 45 per cent representing ground material employed for oil-well drilling, paints, and general filler and loader use. Barite for use in lithopone should contain not less than 96 per cent barium sulphate and not more than 3 per cent silica and 1 per cent iron (Fe_2O_3). The ore must be crushed to not larger than 1½ inches.

"Certain barium chemicals, notably the nitrate and carbonate, are used in making green flares, tracers, incendiary bombs, shell primers, etc., and for case-hardening of steel. Blanc fixe, or precipitated barium sulphate, is used in white paints, rubber, linoleum, and oilcloth. Barium carbonate is the principal intermediate salt used in the manufacture of other barium chemicals, particularly the peroxide and nitrate. It is also used to inhibit scumming in bricks and other heavy clay products. Barium chloride, obtained by crystallization from a solution of barium sulphide and calcium chloride, is used to purify salt brines for the manufacture of chlorine and sodium hydroxide; in coatings for photographic paper; as an extender in titanium pigments; in colour lakes; in finishing white leather, and in the purification of beet sugar. Barium hydroxide is used in the purification of beet sugar, and in refining animal and vegetable oils. Barium metal has only limited industrial uses.

"Barite is a relatively low-priced commodity. Canadian quotations for good white crude range from $7 to $10 per ton, f.o.b. mines, freight costs governing the price offered. Domestic ground barite sold in 1943 for $40 per ton, f.o.b. works, and prime white imported for $50.

"In the American market, crude barite is usually sold on a penalty-premium basis, with a content of 95 per cent barium sulphate and 1 per cent iron oxide considered as standard. A premium or penalty of 25 cents per short ton is set for each per cent of barium sulphate above or below 95 per cent, and a similar premium or penalty for each 0·1 per cent of iron oxide below or above 1 per cent. Average prices for standard crude in the American market have been showing an upward tendency in recent years, and in 1942 stood at $7.25 per ton, f.o.b. mines, with the average overall figure for all grades $6.22. Early in 1943, the Office of Price Administration authorized price increases for crude from mines in the Georgia-Tennessee field, with a ceiling at $8.50 per ton for 1943 contracts. Total United States consumption of barite in 1942 was 450,000 short tons."

Table 276.—Production of Barite in Canada, 1929-1943

Year	Short tons	$	Year	Short tons	$
1929	105	2,341	1939	323	3,639
1930	66	1,484	1940	338	4,819
1931	16	363	1941	6,890	74,416
1932	....	....	1942	19,667	188,144
1933	20	60	1943	24,474	279,253

Table 277.—Barite and Blanc Fixe Used by the Canadian Paints, Pigments and Varnishes Industry in Canada, 1934-1943

Year	Barite		Blanc Fixe (*)	
	Pounds	$	Pounds	$
1934	2,393,330	44,690	93,918	2,481
1935	2,308,628	43,702	141,975	4,223
1936	2,533,275	41,087	97,016	3,148
1937	2,630,366	42,821	125,743	4,136
1938	2,729,212	46,288	116,545	3,287
1939	2,884,985	49,659	139,408	4,455
1940	3,281,747	71,492	99,422	3,873
1941	4,906,829	112,760	169,583	8,010
1942	6,833,584	150,927	104,948	5,328
1943	5,519,352	121,727	87,369	4,441

(*) Artificial barium sulphate.

Table 278.—Imports and Exports of Barite and Specified Commodities, 1942 and 1943

—	1942		1943	
	Pounds	$	Pounds	$
IMPORTS—				
Blanc fixe	620,498	24,224	345,536	16,694
Lithopone	19,996,324	948,244	17,754,879	857,507
Barite	5,072,300	68,196	3,372,500	43,239
EXPORTS—				
Barite	Data not shown separately in Trade Reports			

CORUNDUM

Corundum is found in an area embracing several townships in Renfrew and Hastings counties in the province of Ontario. Corundum mining as an industry made its appearance there in 1900 and production reached a maximum in 1906. Shipments of the mineral in Canada during the period 1900–1921 totalled 19,524 short tons valued at $2,104,251. No commercial shipments have been reported since 1921. No imports of corundum into Canada were shown in Customs reports for either 1942 or 1943. Imports of emery, in bulk, during 1943 were appraised at $78,303; imports of manufactures of emery, n.o.p., in the same period were valued at $81,984. It is interesting to note that a shipment of corundum-bearing material was made in 1943 from old mine dumps located in the Renfrew-Hastings district of Ontario; this was exported to the United States for experimental purposes.

Work has been proceeding in the Bureau of Mines, Ottawa, on the removal of the small content of corundum present in some sections of the Blue Mountain nepheline syenite deposit, located near Lakefield, Ontario, and it was found that a combination of jigging and flotation at 28-mesh was effective in reducing the corundum content to 0·134 per cent. A treatment unit, employing this method, which would provide also for the recovery of a corundum by-product, was placed in semi-commercial operation at the Rochester mill of American Nepheline Corporation during 1943.

The fine dust product resulting from the processing of Lakefield syenite has been found of service as a substitute for pumice for grinding and polishing and in the cleanser, enamelware, and heavy clay industries.

South Africa is the world's largest corundum producer and imports from that country into the United States have increased rapidly during the last few years. The material is crushed and sized, and the coarse grain products are sold to manufacturers of grinding wheels, especially snagging wheels, and the finer products to optical lens grinders.

"E & M J Metal Markets", New York, quoted corundum August, 1944—natural, per pound, size 8 to 60 inclusive, 8¾ cents; 70 to 275, 9¾ cents; 500, 30 cents; 850, 45 cents; 1,000, 45 cents; 1,200 to 1,600, 65 cents; 2,600, 70 cents.

DIAMONDS

Diamonds are not produced in Canada and requirements for stones in the Dominion are supplied entirely by imports. In 1943 imports of black diamonds for borers were appraised at $1,631,019 compared with $1,382,935 in 1942. Imports of unset white diamonds in 1943 were valued at $1,407,044 as against $957,348 in the preceding year. The "Mining Journal", London, in a review on South Africa for 1943 stated: The favourable market conditions which the diamond trade experienced in 1942 showed a considerable expansion in 1943. The total sales made by the Diamond Trading Company in 1943 were approximately £20,000,000, which constitutes a record in the history of the industry. As in 1942, the Diamond Trading Company and its associates continued to give their fullest support to the war industry, sales of industrial diamonds being somewhat in excess of £5,000,000, all of which were made at pre-war prices. In addition, the various companies operating outside the Union, which are the principal producers of industrial diamonds, have, in association with the Diamond Corporation and the Diamond Trading Company, transferred a substantial quantity of industrial diamonds to Canada, where they will be retained as a reserve stock against any emergency during the continuation of hostilities. These producers continued during 1943 to supply the allied powers with their needs of industrial diamonds.

DIATOMITE

Canadian production of diatomite during 1943 totalled 98 short tons valued at $3,331 compared with 365 tons worth $9,088 in 1942. The 1943 output comprised 82 tons produced in Nova Scotia and 16 tons in British Columbia.

"Diatomite consists of the microscopically small remains of siliceous shells of diatoms, a form of algae that at one time lived under water. The material of recent fresh water origin, which is the most common in Canada, usually occurs as a grey or brown mud or peat, whereas the Tertiary diatomite is in more or less dry and compact beds, very light in weight and white to cream in colour.

"For many years International Diatomite Limited, Tatamagouche, Nova Scotia, has been the principal producer, but operations in the ponds near New Annan ceased in the fall of 1940. The two producers during the past 3 years were G. Wightman, from a deposit on Digby Neck, Nova Scotia; and R. L. Marsh for L. T. Fairey of Vancouver, from lot 1122 on the west bank of Fraser River, north of Quesnel in the Cariboo district, British Columbia.

"Northern Diatomite Company of Toronto started the erection of a treatment plant on its deposit south of Gravenhurst in the Muskoka district in the fall of 1942, but it was not completed. Some prospecting was done on deposits in Quebec and in British Columbia.

"In 1943 slightly more than 70 per cent of the diatomite consumed in Canada was used in the form of filter-aids, mainly in the refining of cane sugar. Eleven per cent was used for insulation, including a small amount for the slow cooling and tempering of steel parts; and the remainder was used principally as a filler in the paint, chemical, paper, rubber, soap, and textile industries, and to a small extent in silver polish bases and as an admixture in concrete. In the United States diatomite is used for blocks and pipe insulation in combination with asbestos in the naval construction program; in light weight fireproof structural sheets for minimizing fire hazards on warships; and as an extender for painting army equipment to cut down lustre.

"The price of Canadian diatomite for insulation varies from $25 to $40 and of imported diatomite for insulation and filtration from $26 to $75 per ton; for material suitable for polishes the price for small lots ranges up to $200 a ton. Imported insulation bricks vary in price from $85 to $140 per 1,000, according to grade and density."—(Bureau of Mines, Ottawa).

Table 279.—Production of Diatomite in Canada, 1928-1943

Year	Short tons	$	Year	Short tons	$
1928	368	8,960	1936	615	13,650
1929	429	10,330	1937	643	18,606
1930	554	13,247	1938	398	13,842
1931	1,610	32,789	1939	301	10,388
1932	1,496	29,509	1940	248	7,957
1933	1,789	36,648	1941	344	9,935
1934	1,372	54,910	1942	365	9,088
1935	823	33,140	1943	98	3,331

Table 280.—Consumption of Infusorial Earth by the Canadian Sugar Refining Industry, 1932-1943

Year	Pounds	Value	Year	Pounds	Value
		$			$
1932	2,577,585	73,309	1938	4,908,597	101,473
1933	2,507,469	70,191	1939	4,819,811	105,711
1934	2,562,552	69,116	1940	4,984,362	112,369
1935	4,307,142	96,560	1941	5,343,131	138,973
1936	4,375,999	98,954	1942	3,007,180	75,295
1937	4,586,786	95,532	1943	3,451,142	89,075

Imports into Canada of diatomaceous earth or infusorial earth, ground or unground, during 1943 totalled 11,246,800 pounds valued at $184,010 compared with 8,588,500 pounds worth $155,802 in 1942.

FLUORSPAR

Canadian mine shipments of fluorspar in 1943 totalled 11,210 short tons valued at $318,424 compared with 6,199 tons worth $146,039 in 1942; of the 1943 output, 825 tons originated in Nova Scotia and 10,385 tons in Ontario.

Fluorspar is not widely distributed in Canada, and commercial deposits are restricted to a few local areas which have supplied practically all of the comparatively small production, totalling about 75,000 tons to the end of 1943. Chief centre of production has been the Madoc area, Hastings county, Ontario. In 1943 seven producers reported shipments from the Madoc district. No beneficiation, other than cobbing and picking, is practised on Madoc ores and shipments consist of screened fines sweetened with clean picked lump. Most of the activity in the Madoc field in 1943 resulted from financial assistance given by the Dominion Government in an effort to stimulate production. Interest also developed during the year in the commercial, possibilities of fluorspar occurrences in the Harcourt-Wilberforce area, Haliburton county about 50 miles north of Madoc. The only other fluorspar mined in 1943 came from the old MacKay property at Lake Ainslie, Cape Breton, Nova Scotia. In British Columbia an important deposit of fluorspar exists at the Rock Candy mine, near Grand Forks.

World production of fluorspar prior to the war averaged about 500,000 short tons annually, the United States and Germany supplying about 75 per cent of the total. The remainder came mainly from Russia, the United Kingdom, Newfoundland, France, Korea, Italy and the Union of South Africa.

Around 55 per cent of fluorspar shipments in the United States in 1943 went to the steel industry and 29 per cent to manufacturers of hydrofluoric acid. The remainder was used for ceramic purposes, chiefly in the glass industry.

"By arrangement with consumers, the price of domestic metallurgical fluorspar was set in 1942 by the Metals Controller on the following basis: $24 in U.S. funds, per short ton, f.o.b. Kentucky-Illinois mines, plus 11 per cent exchange, plus 10 per cent war exchange tax, plus freight from above field to Canadian consuming point, less freight from Canadian mine to same point, less 25 cents for each per cent CaF_2 below 85 per cent. As an example, this would work out at $36.36 per short ton for standard 85 per cent grade, f.o.b. Madoc, for shipment to Sault Ste. Marie, Ontario, or $32.38 for shipment to Hamilton, Ontario. Although revised maximum prices went into effect in the Illinois-Kentucky field in July, 1943, there was no change in the above agreement as a result of the increases. The revised prices were in the nature of premiums offered in an effort to increase production and were as follows:

70 effective units and over			$33	per ton
65 to 70	"	"	$32	"
60 to 65	"	"	$31	"
Under 60	"	"	$30	"

"Glass and enamel grades call for not less than 95 per cent CaF_2, with a maximum of 2½ to 3 per cent silica and 0·12 per cent iron (Fe_2O_3). The material must be in ground form, in mesh sizes ranging from coarse to extra fine.

"Acid-grade spar has the most rigid specification, namely, a minimum of 98 per cent CaF_2 and not over 1 per cent silica. Like the ceramic grade, it must be in powder form, and most of the material supplied to both the acid and ceramic trades is a flotation concentrate. In July, 1943, the United States price for both acid and ceramic spar was raised to $37 per short ton, f.o.b. mines, an increase of $2 to $3 over the 1942 levels. There has been little or no production of these grades in Canada, so that no price has been set for them.

"It is estimated that 95 per cent of all fluorspar now being used in the United States and Canada is consumed in war industries."—(Bureau of Mines, Ottawa).

Table 281.—Production of Fluorspar in Canada, 1924-1943

Year	Short tons	$	Year	Short tons	$
1924	76	1,343	1935	75	900
1925	3,886	19,234	1936	75	900
1926–1928	...	...	1937	150	2,550
1929	17,870	268,120	1938	217	3,906
1930	80	1,240	1939	240	4,995
1931	40	620	1940	4,454	59,317
1932	32	464	1941	5,534	97,767
1933	73	1,064	1942	6,199	146,039
1934	150	2,100	1943	11,210	318,424

Table 282.—Consumption of Fluorspar in Canada, by Uses, as Reported to the Annual Census of Industry, 1942 and 1943

	1942		1943	
	Quantity	Cost at works	Quantity	Cost at works
	tons	$	tons	$
Steel furnaces	20,133	562,480	20,790	715,991
Chemicals (acids, alkalies and salts)	21,689	684,194	41,409	1,320,106
Glass	231	10,273	273	13,360
Ferro-alloys	853	21,203	1,407	37,802
Enamelling and glazing	103	4,120	74	2,960
Total accounted for	**43,009**	**1,282,270**	**63,953**	**2,090,219**

NOTE:—Considerable fluorspar is also consumed in the manufacture of aluminum.

Table 283.—Imports of Fluorspar Into Canada, 1929-1943

Year	Tons	$	Year	Tons	$
1929	12,092	159,798	1937	11,444	158,082
1930	12,651	160,995	1938	15,057	212,131
1931	3,216	31,257	1939	16,322	258,796
1932	1,009	22,965	1940	30,312	628,719
1933	2,219	21,165	1941	26,539	567,656
1934	7,220	56,628	1942	47,784	1,046,526
1935	11,591	92,775	1943	77,436	1,738,609
1936	11,194	95,268			

GARNET

There were no commercial mine shipments of garnet in Canada during 1943. In 1942 some 17 tons of crude garnet rock valued at $176 were shipped to the United States for experimental purposes; the mineral was obtained from a deposit located in Dana township near River Valley, about fifty miles northwest of North Bay, Ontario.

Commercial garnet belongs to a group of complex silicate minerals of which almandite, the brownish-red iron-aluminum silicate is generally considered the hardest and best as an abrasive. Garnet is a rather common mineral constituent of certain rocks distributed throughout the Dominion and it usually occurs as a garnetiferous-gneiss, large areas of which are known in parts of Ontario and Quebec. Garnet, crushed and suitably graded as to size, is used for making abrasive-coated papers and cloth. The specifications for garnet for use in the making of high-quality abrasives are somewhat exacting. The individual crystals should be clear and free from embedded impurities and from minute fractures. They should be of a deep wine-red colour and not smaller than pea size, walnut size or larger being preferable. The deposit should be extensive and the garnet content not less than 25 per cent. It should also be close to rail transportation and industrial centres. About 80 per cent of the world output of garnet comes from the United States. Canadian consumption of prepared garnet grain suitable for "sand paper" manufacture has decreased and is now less than 200 tons annually.

The price in the United States of the best-quality concentrate from which grain is prepared for abrasive papers and cloths ranges from $65 to $80 a ton f.o.b. mines and of graded grain, $90 a ton. Canadian prices of crushed garnet rock for sand-blasting were $7 to $10 a ton in 1942, but none was sold in 1943.

Crude garnet ore or ungraded mixed concentrate enters the United States duty free, the duty on grain graded into separate sizes and specially prepared garnet being one cent a pound.

GRAPHITE

Production of graphite in Canada in 1943 continued to be confined to the old-established Black Donald mine at Whitefish Lake, near Calabogie, Renfrew county, Ontario, which now has a record of 35 years of operation. The output during the year under review totalled 1,903 tons valued at $197,431 compared with 1,192 tons worth $117,904 in 1942. The following information is from a report "Graphite in 1943" as prepared by the Bureau of Mines, Ottawa:

"Flake graphite is widely distributed in the Archæan gneisses and crystalline limestones of western Quebec and eastern Ontario, and this region formerly supported a somewhat extensive graphite industry; but growing dependence on Madagascar as a source of supply, more especially of high-grade crucible flake, led to a gradual closing down of operations, and all of the plants except that of the Black Donald Company were dismantled many years ago.

"In 1942, owing to the possibility of supplies from Madagascar being cut off, renewed investigation of deposits in Canada was encouraged and surface stripping was done by established mining companies on some of the discoveries that were made, with a view to possible development. Various properties, including old idle mines, were examined by the Bureau of Mines and the Metals Controller, Ottawa, in company with representatives of the United States War Production Board, and several sample shipments were tested by the Bureau of Mines. The threatened emergency was averted by the British occupation of Madagascar, and it was not found necessary to take further steps to encourage interest in the development of a Canadian supply. Ore reserves at many of the old properties are believed to be considerable, and could probably be used in an emergency, though this would entail the erection of new mills, or possibly of a central custom mill, to treat the ore.

"World production of natural graphite of all grades and including flake, crystalline (plumbago) and amorphous, averaged about 140,000 short tons a year prior to the present war. Madagascar, Germany, Austria and Czechoslovakia were the principal producers of flake graphite; Ceylon of Crystalline; and Mexico and Korea of the amorphous variety. The United States obtains most of its requirements of graphite from Madagascar and Ceylon, but there was a production of flake in 1943 from Alabama, Texas, and Montana; of low-grade amorphous graphite from Nevada and Michigan; and of anthracite-graphite (so-called "sea-coal") from Rhode Island.

"Graphite has many uses in industry, but is employed principally in foundry facings, lubricants, crucibles, retorts and stoppers, packings, pencils and crayons, paints, and stove polish. Dry batteries, electrodes, and commutator brushes use important quantities, mostly amorphous or artificial.

"Canadian graphite requirements are principally for the foundry, dry battery, packings, lubricants, and paint trades. Foundry needs are met in part by domestic (Black Donald) production, and in part by imported Ceylon plumbago. The battery trade uses mainly Mexican amorphous; and paint requirements are filled largely by low-grade amorphous and flake.

"Prices showed little change in 1943 from those of the previous year. Average quotations in the American market were as shown below. Ceylon graphite, which is marketed in a considerable range of types and qualities, sold as follows: crude lump, 97 per cent carbon, 15 cents per pound; high carbon lump, 85 to 98 per cent, 10 to 13 cents; chip, 85 to 90 per cent, 11 to 12½ cents; crystalline dust, 65 to 80 per cent, 6½ to 9 cents; flying dust, 55 to 80 per cent, 4½ to 8 cents; carbon dust, 55 to 60 per cent, 4 to 5 cents. Madagascar crucible flake, 85 per cent carbon and up, was nominal, under allocation control, at 10 to 11 cents. Domestic lubricating flake, 90 per cent plus, sold at 15 to 20 cents, and domestic fine flake, 65 to 70 per cent, for use in the manufacture of foundry facings, at 4½ cents. Metals Reserve Company prices, per pound, for domestic flake, were as follows: No. 1A, 14 cents; No. 1, 13 cents; No. 1B, 12 cents; No. 2, 11 cents; No. 3, 7 cents; No. 4, 5 cents. Mexican amorphous, 80 to 90 per cent carbon, crude lump, sold for $20 per ton, f.o.b. Sonora, and powdered, for 4 to 6 cents per pound.

"At the beginning of the year, all graphite was placed in Group 1 (supply insufficient for war and essential industrial needs) of the list of materials in critical supply issued by the Conservation Division of the United States War Production Board.

"Canadian exports of milled products in 1943 were valued at $42,987, compared with $58,572 in 1942. Imports of unmanufactured graphite were valued at $23,773; of manufactured, at $286,583; and of graphite crucibles at $191,296. Exports of Canadian graphite and graphite products have been subject to special export licence, since January, 1941."

Table 284.—Mine Production (Sales) of Graphite in Canada, 1931-1943

Year	Short tons	$	Year	Short tons	$
1931	548	32,149	1938	(*)	41,590
1932	346	18,483	1939	(*)	61,684
1933	405	18,367	1940	(*)	94,038
1934	1,518	71,424	1941	(*)	132,924
1935	1,782	79,781	1942	1,192	117,904
1936	(*)	88,812	1943	1,903	197,431
1937	(*)	125,343			

(*) Not available for publication.

Table 285.—Consumption of Graphite or Plumbago in Canada, by Industries, as Reported to the Census of Industry, 1942 and 1943

Industry	1942		1943	
	Quantity	Cost at works	Quantity	Cost at works
	Short tons	$	Short tons	$
Paints and varnishes	103	11,855	94	9,837
Polishes	39	5,020	57	6,525
Foundries	410	59,874	606	72,150
Acids and salts	114	34,582	167	45,654
Prepared foundry facings	316	19,108	202	19,789
Total accounted for	**982**	**130,439**	**1,126**	**153,955**

GRINDSTONES AND PULPSTONES

Production of grindstones and sharpening stones in Canada during 1943 totalled 164 short tons valued at $6,225 compared with 216 tons worth $10,000 in 1942. Comprising the 1943 output were 2 tons of sharpening stones valued at $225 and 162 tons of grindstones worth $6,000. There was no production of pulpstones in 1943. The production of both grindstones and sharpening stones during the year under review came entirely from the quarries of the Read Stone Company, located near Stonehaven, New Brunswick.

Material suitable for these stones occurs in certain sandstone beds in Nova Scotia, New Brunswick, and on the coast of British Columbia. Many years ago the output was considerable, but most of the known beds have been depleted and the demand for natural stones has decreased.

The large-size Canadian grindstones are used mainly for sharpening pulp-mill and tobacco knives; and in the United States in the file, machine-knife, granite tool, and sheer manufacturing industries. The small stones are used for grinding scythes and axes. Because of the competition from the artificial grinding wheel and from foreign natural stones, production of grindstones from quarries continues to decline.

Good pulpstones are in demand, particularly for use in the large magazine grinders, but known Canadian deposits containing thick beds of sandstone of the proper quality appear to have been worked out and production has ceased. There is also an increasing competition from Canadian-made artificial segmental pulpstones, mainly of silicon carbide grit, and about 620 of these stones are in use and in stock in the various Canadian pulp mills. The imported natural pulpstones come mainly from West Virginia.

Canadian trade reports show the following imports in 1943: grinding wheels, $493,247; grinding stones, $115,561; grindstones, 36 inches or over, $64,731 and grindstones n.o.p. $2,266.

Table 286.—Production of Grindstones, Pulpstones and Scythestones in Canada, 1931-1943

Year	Tons	$	Year	Tons	$
1931	621	38,103	1938	306	16,198
1932	328	15,735	1939	304	15,278
1933	498	21,919	1940	341	14,543
1934	987	46,478	1941	188	11,500
1935	708	34,010	1942	216	10,000
1936	569	24,724	1943	164	6,225
1937	412	21,429			

Table 287.—Production of Natural Abrasive Stones, by Kinds, 1943

—	Pulpstones		Sharpening Stones		Grindstones	
	Tons	$	Tons	$	Tons	$
Nova Scotia	...	...	...	...	...	...
New Brunswick	...	...	2	225	162	6,000
Canada	...	...	**2**	**225**	**162**	**6,000**

Table 288.—Consumption of Pulpstones by the Canadian Pulp and Paper Industry, 1934-1943

Year	Number for 2 ft. wood	Value	Number for 2·5 ft. wood	Value	Number for 4 ft. wood	Value
		$		$		$
1934	378	103,811	84	29,680	268	292,359
1935	417	116,501	52	20,297	237	243,805
1936	463	120,227	61	19,478	253	281,265
1937	392	123,598	84	21,700	280	382,084
1938	306	92,822	37	13,351	186	238,488
1939	242	60,622	60	22,443	203	238,620
1940	311	96,957	110	49,899	163	257,628
1941	295	127,349	77	35,843	97	215,913
1942	237	100,466	53	23,898	94	208,986
1943	197	102,888	54	20,000	66	151,411

THE ARTIFICIAL ABRASIVES INDUSTRY

The factory selling value of all products made during 1943 by the manufacturers in Canada of artificial abrasives and artificial abrasive products amounted to $36,609,928. This value represented a gain of 16 per cent over the total of $31,516,161 for 1942.

There were 15 firms engaged in manufacturing artificial abrasives and their products during the year, and of these, 13 were located in Ontario and 2 in Quebec.

The average number of employees in the industry was 3,336 and payments in salaries and wages totalled $6,453,769. Expenditures for manufacturing materials amounted to $11,581,923, and $2,988,814 was paid out for fuel and electricity. Capital investment in the industry totalled $13,172,836, of which $5,208,394 was the value placed on land, buildings and equipment.

Artificial abrasives were made by 4 plants in Ontario and 2 in Quebec. The output of these 6 works was valued at $31,275,860 and included 190,727 tons of crude fused alumina at $20,543,657; 51,281 tons of crude silicon carbide at $6,846,087, and other products and by-products, such as, ferrosilicon, firesand, refractory brick, refractory cements, calcium boride, boron carbide and abrasive wheels. An average of 2,773 people were employed and salaries and wages totalled $5,318,749.

Nine other plants were occupied chiefly in making abrasive products, such as, wheels, paper, pulpstones and sharpening stones; 7 made abrasive wheels and segments, 4 made sharpening stones and files, and 3 made abrasive cloth and paper. The value of all products made in these establishments was $3,589,579. The number of employees was 563 and payments for salaries and wages amounted to $1,135,020.

Table 289.—Materials Used in Manufacturing, 1942 and 1943

Material	Unit of measure	1942 Quantity	1942 Cost at works	1943 Quantity	1943 Cost at works
			$		$
Bauxite and pure alumina	ton	197,377	5,427,524	227,662	5,902,898
Coal (not for fuel)—					
For fused alumina	ton	662	4,243	245	1,614
For silicon carbide	ton	7,379	60,434	8,019	60,343
Coke (not for fuel)—					
For fused alumina	ton	11,959	75,950	14,443	89,545
For silicon carbide	ton	48,024	664,699	58,146	904,557
Electrodes	ton	3,617	437,663	4,279	520,236
Feldspar	ton	119	6,113	117	5,776
Iron borings	ton	20,830	261,304	20,889	283,311
Salt	ton	392	4,172	410	4,793
Sawdust	ton	10,820	36,243	12,766	44,223
Silica sand	ton	76,943	416,806	89,022	511,640
Artificial abrasive grains—					
Fused alumina	ton	5,106	904,578	4,106	826,967
Silicon carbide	ton	1,849	318,198	1,543	298,675
Natural abrasive grains—					
Garnet	lb.	350,314	33,982	343,929	29,7[illegible]
Emery	lb.	321,853	22,614	308,548	19,[illegible]
Quartz or flint	lb.	459,991	7,640	349,340	5,[illegible]
Other	lb.	72,575	7,415	76,545	5,[illegible]
Bonding and bushing materials—					
Clay bonds	lb.	988,632	38,869	1,152,171	55,[illegible]
Silicate (quantity in equivalent solid form)	lb.	15,930	881	....	2,7[illegible]
Elastic mixture	lb.	48,528	12,729	12,291	3,221
Bakelite and synthetic resins	lb.	409,614	140,954	365,704	123,057
Lead for bushings	lb.	111,130	5,870	107,341	5,978
Cotton cloth	....	....	97,310	....	340,709
Kraft paper	....	....	23,250	....	21,425
Containers and packing material	....	....	102,788	....	114,823
All other materials	....	....	1,133,450	....	1,398,649
Total	....	....	**10,245,679**	....	**11,581,923**

Table 290.—Products Manufactured, 1942 and 1943

Product	1942		1943	
	Short tons	Selling value at works	Short tons	Selling value at works
		$		$
Crude silicon carbide	44,410	5,494,257	51,281	6,846,087
Crude fused alumina	160,935	17,750,623	190,727	20,543,657
Silicon carbide firesand, etc.	268	17,062	229	14,336
Abrasive wheels and segments	....	5,075,258	....	5,114,962
Sharpening stones and files	....	251,320	....	303,913
Ferrosilicon	12,875	187,664	15,860	240,430
Other products (*)	....	2,739,977	....	3,546,543
Total	....	**31,516,161**	....	**36,609,928**

(*) Includes abrasive cloth, abrasive paper, tiles, artificial pulpstones, artificial graphite, boron carbide, boron carbide shapes, calcium boride, fused magnesia, refractory cements, firebrick, etc., each of which was reported by one or two companies.

KYANITE

Kyanite is usually a rock-forming mineral, and only rarely does it occur in large monomineralic masses as segregations in quartz-kyanite gneiss or schist. Indian kyanite is the most popular at the present time; the production in India commenced in 1924 and amounted to 24,787 tons in 1936. The mineral also occurs in Nyasaland, British East Africa and Western Australia.

The leading andalusite mine in the world is operated by Champion Sillimanite, Inc., in the White Mountains, California; this company is a subsidiary of the Champion Spark Plug Co., Detroit, Mich.

None of the minerals, kyanite, sillimanite or andalusite are commercially mined in Canada at the present time and any imports of these minerals into Canada are not shown separately in the Canadian Customs classification. "Metal and Mineral Markets", New York, October, 1944, quoted kyanite—per ton f.o.b. point of shipment, crude, $19; 35 mesh, $37.50; glass grade $40 nominal.

LITHIUM MINERALS

Commercial mine shipments of Canadian lithium minerals were only recorded in 1937. These were made by the Lithium Corporation of Canada, Limited, from deposits located at Bernic Lake, near Pointe de Bois, Eastern Manitoba. For further details refer to chapter 5.

MAGNESITIC DOLOMITE AND BRUCITE

Canadian production of magnesitic dolomite, including brucite granules totalled $1,260,056 in 1943 compared with $1,059,374 in 1942. The following information has been supplied by the Bureau of Mines, Ottawa:

"Magnesitic dolomite consisting of an intimate mixture of magnesite and dolomite is quarried at Kilmar and at Harrington East, Argenteuil county, Quebec, and is processed for use as refractory materials. Products at present marketed include caustic calcined magnesitic dolomite, dead-burned or grain materials, bricks and shapes (both burned and unburned), finely ground refractory cements, and, in combination with chrome, the dead-burned material is used as an ingredient in certain other types of refractory. Magnesia products made in Canada from imported magnesite and magnesia include fused magnesia (artificial periclase), optical periclase, and '85 per cent magnesia' pipe covering.

"Large deposits of magnesite containing considerable silica and alumina occur in British Columbia near Marysville, between Cranbrook and Kimberley. They are owned by Consolidated Mining and Smelting Company of Canada, Limited, and experimental work to remove the silica and alumina by flotation has been done, but there has been no commercial production to date. A number of other deposits of magnesite are known in British Columbia and Yukon, but either because of their limited extent or remoteness from transportation they are not of commercial importance at present.

"Deposits of earthy hydromagnesite occur in British Columbia near Atlin and Clinton, and at various times some have been worked on a small scale, but there has been no production in recent years.

"Brucite (magnesium hydroxide) in the form of granules thickly disseminated through a matrix of crystalline limestone occurs in large deposits at Rutherglen, Ontario, and at Bryson and Wakefield in the province of Quebec. By a process developed in the Bureau of Mines laboratories, Ottawa, it is possible to recover these brucite granules in the form of magnesia of a high degree of purity and to have hydrated lime as a co-product. A plant using this process is now in operation near Wakefield, Quebec. The granular magnesia produced is at present used mostly for making basic refractories, and for making a special grade of paper.

"Magnesite is available in many countries; Russia is probably the world's greatest producer of magnesite, but almost all is for domestic use.

"Magnesite is usually calcined before shipment and the resultant magnesia is used for the making of refractory products to withstand extremely high temperatures, for making oxychloride cement, and for magnesium metal. It is also the basis of a number of magnesium salts and has many minor uses. The worldwide demand for magnesium metal has greatly stimulated interest in deposits of magnesite. Although until 3 years ago almost all the world's magnesium was made from magnesium chloride brine and from waste water used in treating potash minerals, magnesite is now an important source of this light metal in continental Europe, England, and the United States.

"Brucite is much less common than magnesite. The only deposits being worked commercially are in Canada and the United States. The magnesia obtained by calcining brucite may be used for the same purposes as that obtained from magnesite and also has some special applications of its own."

Table 291.—Production of Magnesitic Dolomite (Calcined) in Canada, 1930-1943

Year	Tons	Value	Year	Tons	Value
		$			$
1930	13,336	336,162	1937	(a)	677,207
1931	11,411	295,579	1938	(a)	(†) 420,261
1932	(a)	262,860	1939	(a)	474,418
1933	(a)	360,128	1940	(a)	897,016
1934	(a)	382,027	1941	(a)	831,041
1935	(a)	486,084	1942	(a)	(b)1,059,374
1936	(a)	768,742	1943	(a)	1,260,056

(†) Represents value of magnestite (dead-burned, etc.) only, whereas the values for years immediately preceding include the value of some end products containing imported material; for this reason the 1938 to 1943 values are not entirely comparable with those for preceding years.

(a) Not available for publication.

(b) 1942 and following years include the value of brucite shipped.

Table 292.—Magnesite and Dolomite Used in the Canadian Primary Iron and Steel Industry, 1931-1943

Year	Calcined Dolomite (b)		Dolomite, crude		Magnesite	
	Short tons	Value	Short tons	Value	Short tons	Value
		$		$		$
1931	....	....	15,773	76,317	(a)	(a)
1932	....	....	6,725	32,523	420	14,500
1933	....	....	6,874	30,557	399	14,798
1934	....	....	14,748	69,104	2,733	105,072
1935	....	....	18,394	79,914	3,891	149,987
1936	....	....	43,562	145,502	6,432	230,656
1937	....	....	53,066	181,146	8,994	326,091
1938	....	....	40,540	137,127	9,219	336,811
1939	14,858	99,838	40,592	78,904	11,401	351,680
1940	21,949	136,360	59,284	123,429	13,673	506,032
1941	21,608	160,602	71,087	159,037	18,127	682,742
1942	22,550	179,427	79,091	225,393	20,665	786,321
1943	10,310	99,740	78,746	243,793	24,494	1,057,962

(a) Information not available.

(b) Included with crude dolomite prior to 1939.

Relatively large quantities of magnesite or magnesium refractories are also used in the smelting of non-ferrous ores but complete data relating to this consumption are not yet available.

Table 293.—Calcined Magnesite Used by the Artificial Abrasive and Abrasive Products Industry in Canada, 1934-1943

Year	Tons	Value	Year	Tons	Value
		$			$
1934	104	6,370	1939	121	7,735
1935	40	2,448	1940	302	19,331
1936	418	25,256	1941	809	77,508
1937	484	29,242	1942	398	58,648
1938	....	....	1943	150	12,164

Prices of calcined magnesite in 1943 f.o.b. Montreal or Toronto, as quoted by Canadian Chemistry and Process Industries, were $70 to $90 a ton. This price has continued since November, 1939 when the price rose from the $48 to $60 range that had prevailed for more than a year previously.

Trade reports show the following imports into Canada during 1943: magnesite firebrick, $1,111,754; crude magnesite rock, 82,000 pounds valued at $1,583; dead-burned magnesite, 15,897,200 pounds valued at $365,080; magnesite for insulating material, 1,237,100 pounds at $40,536; magnesia pipe covering, $249,634; magnesium carbonate for rubber, 860,007 pounds, $47,068; magnesium oxide, 1,900,513 pounds, $180,039.

Exports from Canada during 1943 included 792 tons calcined magnesite valued at $16,398 and 8,610 tons of dead-burned refractories worth $94,578.

MAGNESIUM SULPHATE (EPSOM SALTS)—NATURAL

There were no commercial mine shipments of natural magnesium sulphate in 1943; in 1942 production totalled 1,140 short tons valued at $38,760, the mineral being obtained in that year from deposits located about 14 miles from Ashcroft in British Columbia.

The following information is from a report prepared by the Bureau of Mines, Ottawa:

"Natural hydrous magnesium sulphate (Epsom Salts or Epsomite) occurs in deposits in lake bottoms or in solution in brine lakes in British Columbia. In Saskatchewan, it is found associated with sodium sulphate. Attempts have been made to produce refined salts, and a number of years ago there was a considerable production from several of the "lakes" in British Columbia, and experimental shipments have been made from one of the lakes in Saskatchewan.

"Canada's output of magnesium sulphate has come chiefly from a deposit in Basque, British Columbia, production from which was discontinued in the autumn of 1942. The salt was refined at Ashcroft, 15 miles south of the deposit and the grade of the product was high. The refinery, owned by Ashcroft Salts Company, Limited, was dismantled in 1943. There are a number of other occurrences in British Columbia, near Clinton, north of Kamloops, and in Kruger's Pass, south of Penticton.

"In Saskatchewan, to lakes south of Wiseton contain brines high in magnesium sulphate, and Muskiki Lake, just north of Dana, contains brine high in magnesium and sodium sulphate, which at certain times of the year, crystallizes into a bedded deposit with layers of both salts.

"In the chemical industries, Epsom salt has many uses. It is employed for tanning and in dyeing, and for the textile and medicinal use. Magnesium sulphate is used in the paper industry for weighting paper. In the sole leather industry it is used to obtain a clean shiny cut, and it also helps to retain moisture in the leather and increases its weight. Magnesium salt is used to a small extent in the dyeing industry. In some cases it is used in the after treatment of leather to increase the fastness of the colour in washing. It is used extensively and in large quantities in medicine and for various purposes in the manufacture of textiles. In bleaching wool, magnesium sulphate is added to destroy the corrosive effect of sodium peroxide. It is also used for weighting textile fabric, especially silk. Mixed with gypsum and ammonium sulphate it is used in the manufacture of non-inflammable fabrics.

"Prices for Epsom salts remained steady, due to the discontinuance of supplies from European countries, hitherto the main sources of supply. Quotations for the technical grade, as given by Canadian Chemistry and Process Industries for Toronto or Montreal delivery, ranged from \$63.00 to \$65.00 per short ton in bags, whereas the B.P. material was quoted at \$3.60 per barrel throughout the year."

Imports of magnesium sulphate or Epsom salts into Canada during 1943 totalled 6,757,551 pounds valued at \$137,372 compared with 3,376,767 pounds worth \$68,532 in 1942.

Table 294.—Production of Natural Magnesium Sulphate in Canada(x), 1935-1943

Year	Tons	Value	Year	Tons	Value
		$			$
1935	340	7,965	1939	550	9,000
1936	654	13,712	1940	....	....
1937	727	14,456	1941	265	7,343
1938	470	9,400	1942	1,140	38,760
			1943	....	....

(*) Produced entirely in British Columbia.

Table 295.—Magnesium Sulphate Used in Canadian Pharmaceutical Preparations and in Tanning, 1935-1943

Year	Pharmaceutical preparations		Tanning	
	Pounds	Value	Pounds	Value
		$		$
1935	826,082	22,647	759,744	12,254
1936	878,120	23,162	1,115,965	15,120
1937	919,825	23,881	992,203	16,165
1938	855,547	23,687	1,272,549	14,153
1939	830,927	24,091	1,139,670	17,808
1940	925,948	31,554	1,646,217	34,242
1941	1,043,110	35,389	1,508,824	43,400
1942	1,077,601	38,352	1,782,479	45,956
1943	1,154,065	41,031	1,870,046	52,447

MINERAL WATERS

Shipments of natural mineral waters from Canadian springs in 1943 totalled 139,611 gallons valued at \$67,541 compared with 157,085 gallons worth \$74,505 in 1942.

Production during both years originated in Ontario and Quebec. Some of the more prominent Canadian mineral waters possessing special therapeutic or hygienic properties include the following: in Quebec, the Abenakis springs on the St. Francois river in Yamaska county; Potton Springs in Brome county and the Colombia spring at L'Epiphanie. In Ontario, saline, sulphur and gas springs occur at Caledonia Springs and at Carlsbad Springs, near Ottawa; the waters range from alkaline to strongly saline. St. Catharines, near Niagara, is one of the oldest Canadian mineral water resorts and sulphur waters are found at the Preston mineral springs in Waterloo county. The most famous of all Canadian springs is undoubtedly the group of hot sulphur springs at Banff, Alberta. In British Columbia the Harrison Hot Springs in the Fraser Valley and the Halcyon Hot Springs on Arrow Lake are noted for their curative properties.

The total number of firms reporting production of natural mineral waters in the Dominion was 17 in 1943, of which 12 were located in the province of Quebec and 5 in Ontario.

Table 296.—Shipments of Natural Mineral Waters From Canadian Springs, 1931-1943

Year	Quebec		Ontario		Canada	
	Imp. gal.	$	Imp. gal.	$	Imp. gal.	$
1931	19,868	4,746	197,540	8,578	217,408	13,324
1932	15.506	4,697	61,208	2,473	76,714	7,170
1933	9,024	3,094	29,794	2,347	38,818	5,441
1934	75,665	16,116	21,775	1,622	97,440	17,738
1935	126,616	15,113	19,900	1,477	146,516	16,590
1936	131,186	17,399	23,100	1,117	154,286	18,516
1937	198,319	19,697	26,700	889	225,019	20,586
1938	159,893	19,033	28,416	2,586	188,309	21,619
1939	104,629	17,503	19,140	1,602	123,769	19,105
1940	109,025	18,466	31,638	2,426	140,663	20,892
1941	144,441	58,062	36,623	14,469	181,064	72,531
1942	129,062	60,316	28,023	14,189	157,085	74,505
1943	125,605	61,793	14,006	5,748	139,611	67,541

Table 297.—Sales of Natural Mineral Waters (*) by the Canadian Aerated Waters Industry, 1930-1943

Year	$	Year	$
1930	178,348	1937	102,648
1931	140,730	1938	105,872
1932	92,066	1939	95,531
1933	77,125	1940	89,013
1934	52,113	1941	104,364
1935	45,100	1942	125,157
1936	63,687	1943	117,214

(*) Whether fortified or not.

PHOSPHATE

Shipments of apatite from Canadian mines in 1943 totalled 1,451 short tons valued at $18,385 compared with 1,264 short tons worth $17,431 in 1942; of the 1943 output, 1,050 tons worth $14,272 came from properties located in the province of Quebec and 401 tons valued at $4,113 from Ontario. The following information is from a report prepared by the Bureau of Mines, Ottawa:

"All of the phosphate produced in Canada consists of apatite, a common associate of phlogopite mica occurring in the Precambrian crystalline pyroxenites of adjacent sections of southwestern Quebec and eastern Ontario. Since about 1900, the mining of straight apatite has been on a limited scale and a large part of the mineral sold has been by-product material from mica mines. Since the commencement of the present war, there has been a slight revival of interest in the production of apatite and several of the larger old mines, mainly in Quebec, have produced small tonnages. The largest total annual output from these recent operations has been only 2,487 tons (in 1941), but this exceeded the production in any other year since 1900.

"For many years, Electric Reduction Company, Buckingham, Quebec, has purchased most of the apatite produced, for use in the production of elemental phosphorus and various phosphorus compounds. Canadian Refractories Ltd., Kilmar, Quebec, also are in the market for small tonnages.

"Sedimentary phosphate rock occurs in Canada in beds of Carboniferous and Permo-Jurassic age along the Rocky Mountains divide, notably in the Crowsnest area. The rock, however, is rather low-grade and is not considered to be of present economic interest. An attempt to develop the deposits in the Crowsfeet-Michel area was made about ten years ago by Consolidated Mining and Smelting Company, as a source of phosphate for its Trail fertilizer plant, but the project was abandoned in favour of higher-grade rock obtained from Garrison, Montana, Eastern Canadian plants using phosphate for fertilizer or other purposes employ mainly Florida rock.

"No form of beneficiation of Canadian apatite has ever been employed other than picking and cobbing, and the shipping product has consisted of picked crude lump, sometimes mixed with screened mine and cobbing fines. The average grade is comparatively low and often erratic, commonly ranging from about 60 to 70 per cent tricalcic phosphate. The usual impurities are calcite, iron sulphide, pyroxene, mica, and other silicate minerals.

"In this connection, it should be noted that although Canadian apatite reserves, doubtless, are substantial, the deposits tend to be erratic and pockety, and are incapable of supplying more than a small fraction of domestic requirements for phosphate, which amount to about 250,000 tons annually. Total production since the inception of mining in 1870 is estimated at about 350,000 tons.

"Phosphate is used chiefly for the manufacture of superphosphate fertilizers. It is used also in the manufacture of phosphoric acid and its derivatives; phosphorus; ferrophosphorus; in stock and poultry feeds; as fertilizer filler; as a calcined phosphate addition in pig iron blast furnaces; and for direct application to soils.

"Total world reserves of phosphate have been estimated to be in excess of 26 billion tons, of which about half is in the United States, one-third in Russia, and one-eighth in North Africa, with the remainder scattered over Oceania, South America, and Asia.

"Purchase price basis for Canadian apatite remained at $16 per short ton for 80 per cent material, with a penalty or premium of 20 cents per unit below or above that figure. The average price of imported Florida phosphate, laid down, during 1943 was about $17.50 per long ton for 73 per cent grade."

Phosphate prices were quoted by "E & M J Metal and Mineral Markets", New York, October, 1944, as follows: per long ton f.o.b. mines, Florida pebble, 77 to 76 per cent, $5.20; 75 to 74 per cent, $4.20; 72 to 70 per cent, $3.20; 70 to 68 per cent, $2.60 and 68 to 66 per cent, $2.20.

Canadian imports of phosphate rock during 1943 totalled 260,846 tons valued at $1,085,080 compared with 271,372 tons worth $1,053,229 in 1942.

Table 298.—Production of Phosphate in Canada, 1929-1943

Year	Short tons	$	Year	Short tons	$
1929	1,185	5,380	1937	100	900
1930	40	760	1938	208	1,886
1931	...	...	1939	157	1,712
1932	1,316	12,333	1940	358	4,039
1933	2,214	5,475	1941	2,487	33,376
1934	81	683	1942	1,264	17,431
1935	186	1,103	1943	1,451	18,385
1936	525	4,927			

Table 299.—Phosphate Rock and Superphosphate Used in the Manufacture of Canadian Fertilizers, 1931-1943

Year	Superphosphate		Phosphate Rock	
	Short tons	$	Short tons	$
1931	51,639	595,789	48,373	395,547
1932	36,005	306,462	41,114	316,518
1933	59,443	657,123	21,961	164,614
1934	73,182	839,980	48,007	396,133
1935	86,701	986,674	74,507	610,118
1936	97,515	1,103,222	60,924	438,948
1937	137,801	1,661,243	101,704	726,572
1938	180,243	2,193,699	102,125	765,816
1939	174,989	2,026,293	96,319	711,508
1940	175,045	2,175,615	143,667	1,262,847
1941	143,420	1,719,674	156,038	1,573,165
1942	177,421	2,748,290	207,842	2,253,517
1943	214,340	3,846,027	226,350	2,528,062

PYRITES (Sulphur)

Canadian sulphur production is computed as the sulphur in iron pyrites shipped plus the sulphur recovered from non-ferrous smelter gases. Production in 1943, as thus defined, totalled 257,515 short tons valued at $1,753,425 compared with a corresponding output of 303,714 tons worth $1,994,891 in 1942.

No iron pyrites deposits, known as such, have been mined in Canada for some years, and statistics published regarding recent pyrites production refer to by-product iron pyrites recovered in the mining and concentrating of copper-gold-silver ores.

Sulphur employed in the manufacture of sulphuric acid was recovered from smelter gases in 1943 in Ontario and British Columbia. In Ontario, Canadian Industries Limited continued the operation of its acid plant at Copper Cliff, using sulphur dioxide obtained from the smelter of the International Nickel Company, while in British Columbia the Consolidated Mining and Smelting Company of Canada Limited manufactured sulphuric acid and other chemical products at Trail, using the by-product gases of its metallurgical plants.

Iron pyrites was produced in 1943 in the treatment of copper-gold-silver ores at the Aldermac and Noranda mines in northwestern Quebec, and at the Britannia mine in British Columbia; operations at the Aldermac property were discontinued in August and the plant dismantled. In September, the Consolidated Mining and Smelting Company of Canada Limited commenced shipment of iron pyrites from the Sullivan mine for the manufacture of sulphuric acid at Trail.

World production of elemental sulphur in 1942 is estimated by the United States Bureau of Mines at over 4,300,000 long tons.

The United States is the main source of the world production of crude sulphur. The output in 1942 amounted to 3,460,700 long tons, chiefly from the states of Texas and Louisiana.

Sulphur is used in Canada chiefly in the production of sulphide pulp and for use in the making of artificial silk and newsprint. It is used to a large extent also in the manufacture of sulphuric acid, explosives, and rubber, and in the production of fertilizers.

With the construction of new sulphuric plants in Canada and the United States, the consumption of sulphur was increased in 1941 and was further increased in 1942 and 1943.

Sulphur is one of the essential raw materials for war—such as, in the form of sulphuric acid for making explosives. The rayon industry consumes large quantities of sulphur. The expansion of the pulp and paper industry has also created increased demand for sulphur.

According to "Metal and Mineral Markets", New York, the price of sulphur in 1943 remained unchanged at $16 a long ton, f.o.b. mines. The prices at consumers' plants in Canada vary from $20 to $32 according to location, the difference being due to transportation costs. The average for the Dominion in 1943 was about $27.

Pyrites was quoted October, 1944—per long ton unit of sulphur, c.i.f. United States ports, guaranteed 48 per cent sulphur, Spanish 12 cents, nominal.

Table 300.—Production of Sulphur (x) in Canada 1934-1943

Year	Tons	$	Year	Tons	$
1934	51,537	515,502	1939	211,278	1,668,025
1935	67,446	634,235	1940	170,630	1,298,018
1936	122,132	1,033,055	1941	260,023	1,702,786
1937	130,913	1,154,992	1942	303,714	1,994,891
1938	112,395	1,044,817	1943	257,515	1,753,425

(*) Sulphur in iron pyrites shipped plus sulphur recovered from non-ferrous smelter gases.

Table 301.—Production in Canada of Pyrites with Sulphur Content, including Sulphur Contained in Sulphuric Acid, Etc., Made From Smelter Gases, 1941-1943

—	Pyrites (*)			Smelter gas		Total sulphur	
	Sales	Sulphur content		Sulphur content		Tons	Value
	Tons	Tons	Value	Tons	Value		
			$		$		$
1941							
Quebec	298,761	146,826	575,422	....	....	146,826	575,422
Ontario	....	....	....	10,057	100,570	10,057	100,570
British Columbia	4,599	2,303	18,424	(†) 100,837	1,008,370	103,140	1,026,794
Canada	**303,360**	**149,129**	**593,846**	**110,894**	**1,108,940**	**260,023**	**1,702,786**
1942							
Quebec	351,570	168,832	673,965	....	....	168,832	673,965
Ontario	....	....	....	18,634	186,340	18,634	186,340
British Columbia	27,923	13,947	111,576	(†) 102,301	1,023,010	116,248	1,134,586
Canada	**379,493**	**182,779**	**785,541**	**120,935**	**1,209,350**	**303,714**	**1,994,891**
1943							
Quebec	277,690	136,007	545,229	....	....	136,007	545,229
Ontario	....	....	....	16,907	169,070	16,907	169,070
British Columbia	6,886	3,442	27,536	(†) 101,159	1,011,590	104,601	1,039,126
Canada	**284,576**	**139,449**	**572,765**	**118,066**	**1,180,660**	**257,515**	**1,753,425**

(*) Recovered from copper ore deposits.
(†) Includes elemental sulphur and sulphur in sulphuric acid and direct ammonium sulphate.

Imports into Canada of sulphur or brimstone totalled 218,527 short tons valued at $3,524,006 in 1943. The sulphur content of iron pyrites exported from Canada in 1943 totalled 104,509 short tons appraised at $409,597.

Table 302.—Consumption of Sulphur by Specified Canadian Industries, 1940-1943

Industry	1941		1942		1943	
	Tons	$	Tons	$	Tons	$
Wood-pulp	201,575	5,062,266	211,466	5,687,331	206,766	5,739,113
Petroleum refining	51	2,649	31	1,561	47	2,360
Acids, alkalies and salts	44,784	1,091,913	65,050	1,694,232	69,236	1,866,322
Matches	65	3,393	80	4,119	76	3,997
Explosives	2,934	58,486	2,057	57,631	1,806	55,717
Insecticides	962	35,722	1,293	50,310	1,246	34,449
Adhesives	82	3,031	89	3,087	93	2,847
Chemicals, miscellaneous	½	40	½	27	7	393
Rubber	2,067	106,411	1,728	93,042	1,412	76,032
Sugar	147	6,877	142	7,411	104	4,913
Fruit and vegetable preparations	59	5,206	130	10,685	215	15,610
Other industries (*)	278	11,603	287	12,248	272	11,466

(*) Starch and glucose, dyeing and finishing of textiles.

SILICA BRICK

The production of silica brick in Canada during 1943 totalled 4,165 M valued at $295,505 compared with 4,273 M worth $263,006 in 1942. The manufacture of these refractories was confined, in both years, to the plants of the Dominion Steel and Coal Company, Ltd., at Sydney, Nova Scotia, and the Algoma Steel Corporation, Ltd., Sault Ste. Marie, Ontario. The brick manufactured by both of these companies are processed from crushed silica rock and are utilized in furnace construction and repairs.

Table 303.—Production of Silica Brick in Canada, 1928-1943

Year	M	$	Year	M	$
1928	3,224	155,502	1936	2,393	97,285
1929	3,951	173,581	1937	3,744	181,126
1930	2,418	97,379	1938	1,788	100,403
1931	900	35,746	1939	2,493	124,807
1932	93	4,304	1940	3,438	182,786
1933	636	23,185	1941	4,111	238,433
1934	2,528	85,945	1942 (*)	4,273	263,006
1935	2,461	96,194	1943	4,165	295,505

(*) Largest annual output.

SODIUM CARBONATE (NATURAL)

Production of natural sodium carbonate in Canada during 1943 totalled 468 short tons valued at $5,148 compared with 256 tons worth $2,048 in 1942. The output in both years came entirely from deposits located in the province of British Columbia.

Deposits of natural sodium carbonate in the form of "Natron" (sodium carbonate with 10 molecules of water) and also as brine, occur in a number of "lakes" throughout the central part of British Columbia, chiefly in the Clinton mining division near 70 mile House about 20 miles northeast of Clinton, and in the neighbourhood of Kamloops. Since 1921 there has been a small intermittent production from several of these deposits; and the production is marketed in Vancouver for use in the manufacture of soap.

Sodium carbonate, or "soda ash", has many industrial uses, such as in the manufacture of glass and soap, in the purification of oils and of bauxite for the production of aluminium, and in the flotation of minerals. Owing to technical advances, the use of soda ash in the glass industry continued to grow. The next largest use of sodium carbonate is in the production of sodium hydroxide or caustic soda. An interesting new use for sodium carbonate is in the manufacture of "synthetic salt cake" (anhydrous sodium sulphate). Considerable quantities of soda ash are also consumed in the smelting of iron ores.

The price of "soda ash" in 1943 as reported by Canadian Chemistry and Process Industries remained at $2.00 per bag of 100 pounds throughout the year.

Imports into Canada of soda ash or barilla in 1943 totalled 70,557 short tons valued at $1,213,818 compared with 65,589 tons worth $1,540,247 in 1942.

Table 304.—Production of Sodium Carbonate (Natural) in Canada, 1930-1943

Year	Tons	$	Year	Tons	$
1930	364	4,550	1937	286	2,574
1931	712	7,351	1938	252	2,268
1932	495	5,450	1939	300	2,400
1933	559	5,773	1940	220	1,760
1934	244	1,920	1941	186	1,488
1935	242	2,430	1942	256	2,048
1936	192	1,677	1943	468	5,148

Table 305.—Consumption of Soda Ash (Sodium Carbonate) in Specified Canadian Industries, 1942 and 1943

Industry	Unit of measure	1942		1943	
			$		$
Chemicals and allied products (a)	pound	60,781,598	900,378	55,539,946	769,619
Manufactures of non-metallic minerals (b)	ton	109,077,366	1,471,513	93,602,000	1,266,581
Pulp and paper	pound	3,476	120,465	3,465	117,941
Textiles (dyeing and finishing)	pound	573,909	11,027	692,854	13,294
Sugar refineries	pound	378,112	8,762	347,958	8,257
Dyeing, cleaning and laundry work	pound	1,075,469	28,724	1,037,873	28,988
Municipal waterworks	pound	843,232	(c)	801,297	(c)

(a) Includes acids, salts, explosives, soap, etc.
(b) Includes coke and gas, glass and petroleum refining.
(c) Not available.

SODIUM SULPHATE

(Glauber's Salt and Salt Cake)

Commercial shipments of natural sodium sulphate in 1943 from Canadian deposits totaled 107,121 short tons valued at $1,025,151 as compared with the all-time high of 131,258 tons worth $1,079,692 in 1942. The production in both years came from deposits located in the province of Saskatchewan. The mineral occurs as crystals or in the form of high concentrated brines in many lakes throughout Western Canada. Investigations of the sodium sulphate deposits of Western Canada was started by the Bureau of Mines, Ottawa, in 1921, and over 120,000,000 tons of hydrous salts was proved in the few deposits examined in detail. The operating plants in Western Canada are capable of producing over 900 tons of dried salts a day, and if necessary the tonnage could be greatly increased. Complete data on the world production of salt cake are not available; Germany, before the war, was probably the largest producer of total salt cake and Canada was among the first ten producers. Canada is, however, one of the largest producers of salt cake from natural deposits. Glauber's salt is used widely in the chemical industries, and the demand is increasing. Sodium sulphate is used extensively in the pulp and paper, glass, dye, and textile industries, and to a smaller extent for medicinal purposes and for tanning. It is also used extensively in the smelting of nickel-copper ores for the separation of these metals.

The price for natural anhydrous sodium sulphate from deposits in Western Canada ranged from $9 to $10 per short ton f.o.b. plant.

In 1943 Canada imported 11,903 short tons of crude sodium sulphate (salt cake) valued at $150,496 compared with 7,071 tons worth $85,479 in 1942. Imports of Glauber's salt in 1943 totalled 1,132,033 pounds valued at $16,399. Data relating to exports of sodium sulphate are not shown separately in Canadian trade reports.

Table 306.—Production of Natural Sodium Sulphate (x) in Canada, 1930-1943

Year	Short tons	$	Year	Short tons	$
1930	31,571	293,847	1937	79,804	617,548
1931	44,957	421,097	1938	63,009	553,307
1932	22,466	271,736	1939	71,485	628,151
1933	50,080	485,416	1940	94,260	829,589
1934	66,821	587,986	1941	115,608	931,554
1935	44,817	343,764	1942	131,258	1,079,692
1936	75,598	552,681	1943	107,121	1,025,151

(*) All produced in the province of Saskatchewan with the following exceptions:
Includes production in: Alberta, 1937, 80 tons, value $480
1938, 89 tons, value $1,127
1939, 10 tons, value $186
1940, 10 tons, value $50
1941, 8 tons, value $32.

Table 307.—Sodium Sulphate or Salt Cake Used in Specified Canadian Industries, 1942-1943

Industry	1942		1943	
	Tons	$	Tons	$
Textile industry	860	24,831	734	21,039
Acids, alkalies and salts industry	107	2,040	120	1,868
Medicinal and Pharmaceutical industry	40	4,626	38	4,142
Pulp and Paper industry	70,078	1,303,461	67,292	1,306,215
Glass industry	641	12,316	892	18,741
Leather Tanning industry	201	7,547	189	7,104
Miscellaneous chemicals industry	283	16,591	377	24,173
Copper nickel smelting and refining	21,531	(a)	33,885	(a)

(a) Not reported.

STRONTIUM MINERALS

There was no commercial production of strontium minerals in Canada during 1943. In 1941—27 tons of celestite valued at $280 was shipped from old dumps located on lots 6 and 7, concession 10 of Bagot township, Renfrew county, Ontario.

The following, relating to strontium, is from a review prepared by the Bureau of Mines, Ottawa:

"Several occurrences of celestite (strontium sulphate) of possible economic interest are known in Canada, and in 1920-21, some ground material produced from a deposit in Bagot township, Ontario, was sold to the paint trade. The material from this deposit is coarsely-fibrous in character and is not very pure, containing about 18 per cent of barium sulphate It is accordingly not favoured for chemical use, but is regarded as suitable for paints and general filler or loader use. The old pit was pumped out in 1941 and a few tons of ore were scaled down from a small drift. This, along with some stockpile material was shipped to Montreal for grinding. The product was used in the paint trade as a substitute for barite, but is reported to have found little favour, and no further work was done. Celestite of similar character and analysis occurs at some of the old fluorspar mines of the Madoc area in Ontario, and part of it might be recoverable from the waste dumps.

"Celestite, analyzing 98 to 99 per cent strontium sulphate occurs as a small vein of coarse platey crystals in Lansdowne township, Ontario and some of it was mined many years ago.

"World production of strontium minerals is estimated at 5,000 to 7,000 tons a year. England is the principal source of supply, with Germany next. The United States produced about 350 tons in 1940, exclusive of celestite used for oil-drilling. Important deposits are reported to occur in India and Newfoundland, but there has been no production from these sources as yet.

"Celestite is the principal source of strontium used in the manufacture of the various strontium salts, and strontianite a less common mineral, is used for the same purpose. The nitrate, carbonate, and hydrate are the most important of the strontium compounds used in industry and medicine. Strontium nitrate is employed mainly in pyrotechnics, for fireworks, railroad signal flares, and military flares and rockets, to which it imparts the characteristic strong red flame colour of the element. Other strontium compounds are employed in tracer bullets and shells. The hydrate is used chiefly in the refining of beet sugar by the Scheibler process. In North America, however, sugar is refined mainly by the Steffens, or lime, process. The carbonate is reported to be used to some extent as a batch ingredient in the manufacture of certain kinds of glass, glazes, and enamels, and as a fluxing and desulphurizing and dephosphorizing agent in iron and steel. Strontium chloride powder finds limited use in refrigerators working on the solid absorption principle. Ground celestite is used in fairly large quantities for purifying caustic soda in the rayon industry, and some impure material has been ground and employed as a barite substitute for weighting oil-drilling muds. Interest has also been shown in the possibilities of the carbonate and the sulphate in glass and white wares.

"Strontium metal, made from either the natural sulphate or carbonate, is used in limited quantities in certain alloys, mainly of copper, tin, lead, zinc, and cadmium."

"E and M J Metal and Mineral Markets", New York, quoted celestite, October, 1944—per ton in carload lots, 92 per cent $SrSO_4$ finely powdered, $45. Strontianite—per ton, lump in carload lots, minimum 84 to 86 per cent $SrCO_3$, $55 nominal.

Data pertaining to imports of strontium minerals or compounds are not shown separately in Canadian trade reports.

VOLCANIC DUST

Commercial mine shipments of volcanic dust in Canada during 1943 totalled 50 short tons valued at $257. These were made from a deposit located at Rockglen in the province of Saskatchewan. The 1943 output was the first to be reported in Canada since 1934, when production amounted to 31 tons valued at $620, one tone of which came from Waldeck, Saskatchewan and 30 tons from Williams Lake, British Columbia.

The Bureau of Mines, Ottawa, describes volcanic dust (pumicite or pumice dust) as a natural glass or silicate, atomized by volcanic explosions and thrown into the air in great clouds which ultimately settle, forming beds of varying thickness, often hundreds of miles from its source of origin. Deposits are found in Canada in Saskatchewan, Alberta and British Columbia.

The war cut off supplies of high quality Italian pumice from Lipari Island near the north coast of Sicily, but suitable material is being produced in California.

In the past, about 60 per cent of the United States output was used as the abrasive base in scouring and cleansing compounds and to a lesser extent for glass bevelling, polishing aluminium, etc., but in 1942, about 43 per cent was used for these purposes and 36 per cent as a concrete admixture and concrete aggregate. Some of the United States volcanic dust was used in the manufacture of fireproof walls, building tiles and slabs, and in the refining of petroleum. The use of volcanic dust as a ceramic raw material has not been extensive in the United States, although its suitability for such use has been indicated by laboratory and industrial applications, but only on material relatively free from iron. In most of the deposits, however, this iron is in the form of a complex silicate and attempts to remove it by concentration, magnetic separation, leaching, and other methods have been unsuccessful. Volcanic dust of a certain purity has been used in place of feldspar in ceramic bodies whose colour is of secondary importance. Some promising results have been achieved, however, with decolorizers, such as selenium and arsenic trioxide. Volcanic dust has possibilities for use as glaze component, in low-cost glass, and in bricks when mixed with plastic clays.

Imports are grouped with a number of similar products (pumice, pumice stone, lava, and calcareous tufa) the value of which totals approximately $40,000 annually.

Prices are not quoted, but in the United States sales values for cleansing and scouring were about $7.50 per ton; for acoustic plaster, $27, for concrete admixture and aggregate, $1.25 per ton.

Table 308.—Production of Miscellaneous Non-Metallic Minerals in Canada, 1942 and 1943

Item	Unit of measure Quantity	1942		1943	
		Quantity	Value	Quantity	Value
			$		$
Barite	ton	19,667	188,144	24,474	279,253
Diatomite	ton	365	9,088	98	3,331
Fluorspar	ton	6,199	146,039	11,210	318,424
Garnets (schist)	ton	17	176	...	...
Graphite	...	...	117,904	...	197,431
Grindstones (b)	ton	216	10,000	164	6,225
Magnesium sulphate	ton	1,140	38,760	...	...
Magnesitic dolomite (c)	...	...	1,059,374	...	1,260,056
Mineral waters	Imp. gal.	157,085	74,505	139,611	67,541
Phosphate (a)	ton	1,264	17,431	1,451	18,385
Silica brick	M	4,273	263,006	4,165	295,505
Sodium carbonate	ton	256	2,048	468	5,148
Sodium sulphate	ton	131,258	1,079,692	107,121	1,025,151
Volcanic dust	ton	...	...	50	257
Total (Gross)	...	...	**3,006,167**	...	**3,476,707**
Sulphur production (*)	ton	303,714	1,994,891	257,515	1,753,425

(a) Represents apatite mined in Quebec and Ontario, usually a by-product in mica production.
(b) Includes sharpening stones, etc.
(c) Includes the value of calcined brucite granules shipped from Wakefield, Quebec.
(*) Includes sulphur content of pyrites at its sales value and estimated figures for quantity and value of sulphur in smelter gases used for acid making or recovered as elemental sulphur, or in ammonium sulphate (direct). General statistics relating to production of sulphur included with those of the copper-gold mining and non-ferrous smelting industries.

Table 309.—Principal Statistics Relating to Miscellaneous Non-Metal Mining Industries in Canada, 1942 and 1943

—		1942	1943
Number of plants		64	54
Capital employed	$	4,919,871	3,522,842
Number of employees—On salary		88	84
On wages		723	827
Total		811	911
Salaries and wages—Salaries	$	142,266	155,593
Wages	$	999,806	1,207,933
Total	$	1,142,072	1,363,526
Selling value of products (gross)	$	3,006,167	3,476,707
Cost of fuel and electricity	$	656,538	823,347
Cost of process supplies used	$	296,322	382,648
Cost of containers	$	...	2,475
Selling value of products (net)	$	2,053,307	2,268,237

Table 310.—Capital Employed in the Miscellaneous Non-Metal Mining Industries in Canada, 1943

—	$
Present cash value of the land (excluding minerals)	229,019
Present value of buildings, fixtures, machinery, tools and other equipment	1,630,727
Inventory value of materials on hand, ore in process, fuel and miscellaneous supplies on hand	529,714
Inventory value of finished products on hand	165,055
Operating capital (cash, bills and accounts receivable, prepaid expenses, etc.)	967,727
Total	**3,522,842**

Table 311.—Wage-Earners, by Months, in the Miscellaneous Non-Metal Mining Industries in Canada, 1940-1943

Month	1940	1941	1942	1943				
				Mine			Mill	
				Surface		Underground		
				Male	Female		Male	Female
January	352	451	561	246	....	97	490	2
February	352	463	594	230	....	94	472	2
March	392	452	600	237	....	96	487	2
April	359	473	622	265	....	90	453	2
May	482	559	639	266	....	89	481	2
June	472	682	827	295	....	85	497	2
July	548	667	789	302	....	77	468	2
August	517	698	819	294	....	88	485	2
September	604	695	770	255	....	93	510	2
October	614	718	789	253	....	77	449	2
November	581	659	803	227	....	78	502	2
December	451	603	759	161	....	55	493	2
Average	**480**	**601**	**723**	**257**	....	**84**	**484**	**2**

CHAPTER NINE

CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS

Including Cement, Clay and Clay Products (Brick, Drain Tile, Kaolin, Sewer Pipe, Structural Tile, Stoneware and Pottery made from Domestic Clays, Fireclay, Firebrick, Fireclay Blocks and Shapes, Imported Clay Products), Lime, Sand and Gravel, Sand-Lime Brick, and Stone, including Slate.

Grouped in this Chapter are those industries producing structural materials from non-metallic minerals, rocks and clays of Canadian origin. These industries include those firms engaged in the production of Clay Products, Portland Cement, Lime, Sand, Gravel and Stone.

The combined production of these domestic materials in 1943 totalled $42,010,254 compared with $45,729,807 in 1942, or a decrease of 8 per cent. Compared with the preceding year, declines in both quantities and values were recorded for clay products, cement and stone. The value of sand and gravel produced was approximately the same as in 1941, and relatively small increases were realized in the quantity and value of the lime output.

The quality of structural materials produced in Canada compares favourably with that of other countries. Most of the larger plants producing cement, clay products, lime, stone and sand and gravel are equipped with modern machinery and the Dominion is endowed with practically inexhaustible deposits of most primary materials required in any building or construction project of the future.

There has been an increasing consumption of stone and lime for other than building purposes. This has been particularly evident in recent years and is the result of expansion in certain industries where these materials are utilized in various chemical processes. Shipments of stone and lime for these purposes are classified, for convenience, with data relating to production of these same materials for structural purposes. However, statistics pertaining to their consumption for industrial purposes are segregated in the following tables.

Table 312.—Gross Value of Clay Products and Other Structural Materials Produced in Canada, by Provinces, 1938-1943

Province	1938	1939	1940†	1941	1942	1943
	$	$	$	$	$	$
Nova Scotia	1,611,111	1,829,207	1,855,771	1,330,888	1,980,912	1,597,701
New Brunswick	2,188,889	1,911,041	936,161	1,145,412	1,305,343	911,121
Quebec	11,619,514	12,319,773	15,001,749	16,631,657	17,723,293	15,863,115
Ontario	11,997,177	12,856,694	16,636,844	18,652,999	16,557,804	15,414,525
Manitoba	1,805,875	1,646,797	2,600,304	2,107,095	2,317,933	2,402,647
Saskatchewan	781,224	556,973	906,181	631,732	707,123	932,412
Alberta	1,627,462	1,947,453	2,971,550	2,626,277	2,836,160	2,752,839
British Columbia	2,247,414	2,314,821	2,795,389	3,416,996	3,564,405	3,246,623
Canada—Gross Value	**33,878,666**	**35,382,759**	**43,703,949**	**46,633,056**	**46,992,973**	**43,121,073**
Net value	**28,446,299**	**29,628,817**	**34,893,571**	**35,865,916**	**35,334,369**	**32,464,633**

† Includes value of cement containers 1940 to 1943.
NOTE: For statistics relating to employment, etc., in these combined industries see totals in Tables 27 and 28, Chapter 1.

Table 313.—Value of Construction Contracts Awarded, by Provinces, 1938-1943

(MacLean Building Reports Ltd.)

Province	1939	1940	1941	1942	1943
	$	$	$	$	$
Maritimes	16,146,300	21,142,100	36,736,400	26,305,500	14,875,400
Quebec	62,846,600	96,320,300	154,541,200	92,235,500	61,816,700
Ontario	82,605,500	146,806,100	145,598,600	108,679,500	83,025,300
Manitoba	5,374,400	28,003,700	11,701,600	13,914,300	10,083,900
Saskatchewan	3,246,100	12,566,700	11,098,700	5,480,200	3,970,000
Alberta	5,234,900	23,940,100	15,598,800	14,401,100	18,529,300
British Columbia	11,724,700	17,224,800	18,716,000	20,578,000	13,803,300
Canada	**187,178,500**	**346,009,800**	**393,991,300**	**281,594,100**	**206,103,900**

Table 314.—Total Value of Work Performed in Canada by General and Trade Contractors (including Subcontractors), Municipalities, Harbour Commissions, Provincial and Dominion Government Departments 1937 to 1943

(Construction Branch, Dominion Bureau of Statistics)

—	$
1937	351,874,114
1938	353,223,285
1939	373,203,680
1940	474,122,778
1941	639,750,624
1942	635,649,570
1943	572,426,551

Table 315.—Types of Canadian Construction 1940-43

(Construction Branch, Dominion Bureau of Statistics)

*Type of Construction	1940	1941	1942	1943
	$	$	$	$
Total Value of Construction	474,122,778	639,750,624	635,649,570	572,426,551
Building Construction	257,800,560	374,491,173	351,774,680	301,884,888
Residential	59,925,197	87,586,340	76,346,090	63,684,367
Insitutional	17,208,419	15,174,464	14,246,025	13,148,233
Commercial	41,748,521	41,157,146	30,638,095	26,439,561
Industrial (includes factories, warehouses, mine buildings, etc.)	80,624,101	177,698,268	159,346,630	140,396,554
Other (includes armouries, barracks, hangars, etc.)	58,294,322	52,874,955	71,197,840	58,216,173
Engineering, Harbours, Rivers, etc.	164,831,545	200,656,038	217,279,062	203,527,830
Streets, highways, etc.	60,468,279	68,358,529	59,619,536	66,582,959
Bridges, watermains, sewers, dams, reservoirs, etc.	23,093,053	40,490,145	34,044,730	30,256,377
Electric stations and transmission lines	33,718,009	37,090,038	60,697,808	30,843,814
Docks, wharves, piers, etc.	4,809,071	6,475,872	10,099,471	10,282,332
Other engineering (includes landing fields, parks, canals, dredging, pile driving, etc.)	42,743,133	48,241,454	52,817,517	65,562,348
Building Trades (Jobbing)	51,490,673	64,603,413	66,595,828	67,013,833

* This survey is based on reports received from General and Trade Contractors and Subcontractors, Municipalities, the Harbours Board and Dominion and Provincial Departments, and covers alterations, maintenance and repairs, as well as new construction.

Table 316.—The following table gives the total value of construction contracts awarded in Canada from 1925 to 1943, also index numbers of wholesale prices of building materials, and index numbers of wage rates.

Year	Value of construction contracts awarded in Canada (a)	Average index numbers of employment in building construction (1926=100) (b)	Average index numbers of wholesale prices of building materials (1926=100) (c)	Index of wage rates in the building trades (1935-39=100) (d)
	$			
1925	297,973,000	75·8	102·9	103·1
1926	372,947,900	100·0	100·0	104·2
1927	418,951,600	108·7	96·1	108·5
1928	472,032,600	112·0	97·4	112·3
1929	576,651,800	135·3	99·0	119·6
1930	456,999,600	134·3	90·8	123·0
1931	315,482,000	104·3	81·9	118·5
1932	132,872,400	54·1	77·2	107·9
1933	97,289,800	38·5	78·3	95·6
1934	125,811,500	47·8	82·5	93·7
1935	160,305,000	55·4	81·2	96·7
1936	162,588,000	55·4	85·3	97·3
1937	224,056,700	60·1	94·4	100·1
1938	187,277,900	60·1	89·1	102·5
1939	187,178,500	62·1	89·7	103·3
1940	346,009,800	83·5	95·6	105·7
1941	393,991,300	139·5	107·3	111·7
1942	281,594,100	157·9	115·2	118·4
1943	206,103,900	160·3	121·2	128·8

(a) Compiled by MacLean Building Reports Ltd.
(b) Employment Statistics Branch, Dominion Bureau of Statistics.
(c) Internal Trade Branch, Dominion Bureau of Statistics.
(d) Labour Department; 8 trades 1921-1926; 9 trades from 1927 to 1942; and 8 in 1943; 13 cities to 1927; 14 cities to 1930, hereafter 31 to 42 cities.

THE CEMENT MANUFACTURING INDUSTRY

Producers' sales of Portland cement in 1943, as reported by the Canadian cement industry, totalled 7,302,289 barrels (350 pounds each) valued at $11,599,033 compared with 9,126,041 barrels valued at $14,365,237 in 1942. Of the 1943 sales, 3,394,895 barrels were produced in Quebec plants; 1,972,009 barrels in Ontraio; 793,913 barrels in Manitoba; 606,703 barrels in Alberta, and 534,769 barrels in British Columbia. Imports into Canada of cement, other than in cement manufactures, totalled 18,577 barrels valued at $83,975 in 1943; exports of cement in the same period amounted to 172,601 barrels worth $344,004. The high and low Canadian producers' prices per barrel in 1943 were, respectively, $2.70 and $1.25.

The following tonnages of primary materials of mineral origin were used during 1943 in the manufacture of the final product: Limestone, 1,918,742; clay, 165,345; shale 75,460; gypsum, 47,034; silica sand, 19,473 and iron oxides, 1,502.

The number of firms reporting commercial production of Portland cement in Canada during 1943 was 3 and the plants in operation numbered 8. Capital employed totalled $50,438,932 and the industry distributed $2,154,218 in salaries and wages to 1,209 employees. The total value of fuel and electricity used during the year under review amounted to $3,089,380, of which $2,259,931 were expended for coal and $783,806 for purchased electricity. Process supplies consumed, including chemicals, explosives, drill steel, gypsum, silica sand, purchased limestone, etc., were valued at $1,356,890.

Portland cement, the principal raw materials for which are limestone and clay, is manufactured in five provinces of Canada. In addition to the standard or ordinary variety of Portland cement several other varieties, including high-early-strength, alkali-resistant, and white cement are made in this country, the last named, however, is made from imported clinker.

All Canadian plants except one making cement from domestic raw materials are using the wet process. Remarkable uniformity in the chemical and physical properties of the standard variety of cement is achieved throughout the country as the result of close technical control and improvements in plant equipment.

Production was at first greatly stimulated by the war where cement played an important part in the wartime construction program, but now that this program is completed the demand for Portland cement has lessened. A report issued by the Bureau of Mines, Ottawa, states that when the war is over, a large increase in demand for Portland cement is to be expected in connection with the lifting of restrictions on non-military construction. This will permit a start on the program of highway, public works, and industrial construction, plans for which are already made.

Complete data relating to world production of cement have not been available for some years.

Table 317.—Summary Statistics of Cement Production, Sales, Etc., in Canada, 1942 and 1943

—	1942		1943	
	Barrels (*)	Value	Barrels (*)	Value
		$		$
Output	8,634,184	....	8,025,113	....
Sold or used	9,126,041	14,365,237	7,302,289	11,599,033
Stocks on hand December 31	873,819	....	1,596,643	....
IMPORTS—				
Portland cement and hydraulic or water lime	26,320	116,126	18,577	83,975
Manufactures	....	26,807	....	27,723
Total Imports	....	....	....	....
EXPORTS—				
Portland cement	273,880	476,284	172,601	344,304
Apparent Consumption	**8,878,481**	....	**7,148,265**	....

(*) 1 barrel=350 pounds.

Table 318.—Production and Apparent Consumption of Cement in Canada, 1934-1943

Year	Sold or Used		Apparent Consumption
	Barrels	$	Barrels
1934	3,783,226	5,667,946	3,727,521
1935	3,648,086	5,580,043	3,610,217
1936	4,508,718	6,908,192	4,479,656
1937	6,168,071	9,095,867	6,157,485
1938	5,519,102	8,241,350	5,478,180
1939	5,731,264	8,511,211	5,591,328
1940	7,559,648	11,775,345	7,272,886
1941	8,368,711	13,063,588	8,069,824
1942	9,126,041	14,365,237	8,878,481
1943	7,302,289	11,599,033	7,148,265

Table 319.—Producers' Sales of Cement in Canada, by Provinces, 1941-1943

Province	1941		1942		1943	
	Barrels	Value (*)	Barrels	Value (*)	Barrels	Value (*)
		$		$		$
Quebec	4,048,749	5,798,188	4,446,416	6,487,078	3,394,895	4,899,578
Ontario	2,748,854	4,019,056	2,784,782	3,998,294	1,972,009	2,872,732
Manitoba	576,648	1,274,392	654,855	1,374,498	793,913	1,503,416
Alberta	492,515	985,030	668,043	1,307,353	606,703	1,176,442
British Columbia	501,945	986,322	571,945	1,198,014	534,760	1,146,865
Canada	**8,368,711**	**13,063,588**	**9,126,041**	**14,365,237**	**7,302,289**	**11,599,033**

(*) Less value of containers.

Table 320.—Number and Capacity of Kilns in Canadian Cement Plants, 1934-1943

Year	Total kilns		Kilns in use during the year	
	Number	Total capacity barrels per 24 hours	Number	Total capacity barrels per 24 hours
1934	41	43,722	(*)	(*)
1935	20	32,650	(*)	(*)
1936	19	33,000	(*)	(*)
1937	18	33,900	(*)	(*)
1938	21	35,200	10	23,100
1939	21	35,000	11	23,700
1940	21	35,000	13	27,950
1941	20	33,050	16	30,350
1942	19	34,650	17	32,450
1943	19	33,750	15	30,296

(*) Data not recorded.

Table 321.—Specified Materials Used in Canadian Cement Plants, 1934-1943

Year	Shale	Limestone	Gypsum	Silica sand	Clay	Iron oxides (†)
	Tons	Tons	Tons	Tons	Tons	Tons
1934	(*)	806,546	19,172	(*)	(*)	(*)
1935	(*)	818,443	21,611	5,047	(*)	(*)
1936	(*)	1,180,358	25,447	8,549	94,943	(*)
1937	(*)	1,465,168	33,691	9,281	195,877	444
1938	13,821	1,344,868	51,975	9,465	143,421	22
1939	27,241	1,379,858	31,492	7,942	105,982	16
1940	18,347	1,765,944	38,903	15,298	144,152	170
1941	26,837	2,086,781	49,031	16,110	185,954	614
1942	30,498	2,155,750	49,816	20,711	188,202	2,094
1943 (a)	(b) 75,460	1,918,742	47,034	19,473	165,345	1,502

(*) Data not recorded.
(†) Produced from iron pyrites by the chemical industry.
(a) Value of these materials purchased in 1943 totalled $408,289.
(b) Prior to 1943 shale consumed in British Columbia plants was included with limestone.

Table 322.—Coal Used in Canadian Cement Plants, 1934-1943

Year	Canadian		Foreign	
	Tons	$	Tons	$
1934	69,853	367,890	60,877	330,432
1935	78,477	433,347	53,338	291,741
1936	119,903	635,631	66,460	367,740
1937	145,791	760,766	90,925	513,417
1938	127,812	656,187	89,172	499,812
1939	190,538	1,010,071	16,141	82,336
1940	185,325	1,108,287	85,885	513,224
1941	125,740	772,829	203,905	1,331,448
1942	156,544	1,003,490	192,105	1,305,383
1943	98,135	595,385	225,741	1,664,546

Table 323.—Quantity and Value of Electricity Purchased by Canadian Cement Companies, 1934-1943

Year	Kilowatt hours	$ (*)	Year	Kilowatt hours	$ (*)
1934	48,457,250	496,138	1939	105,938,210	589,190
1935	51,958,859	494,538	1940	126,737,622	690,266
1936	62,038,700	553,212	1941	151,845,680	748,631
1937	61,045,600	606,969	1942	154,502,140	771,092
1938	59,705,200	583,858	1943	150,929,220	783,806

(*) Includes service charges.

Table 324.—Principal Statistics of the Cement Manufacturing Industry in Canada, 1941-1943

—		1941	1942	1943
Number of firms		3	3	3
Number of plants		8	8	8
Capital employed	$	51,108,294	51,121,894	50,438,932
Number of employees—On salary		87	89	91
On wages		1,148	1,152	1,118
Total		1,235	1,241	1,209
Salaries and wages—Salaries	$	190,771	200,779	215,137
Wages	$	1,670,160	1,858,558	1,939,081
Total	$	1,860,931	2,059,337	2,154,218
Selling value of products (Gross)	$	14,323,372	15,628,403	12,709,852
Cost of fuel and electricity	$	2,897,383	3,127,264	3,089,380
Cost of process supplies (*)	$	887,041	1,024,057	1,356,890
Value of containers	$	1,259,784	1,263,166	1,110,819
Net value of products sold	$	9,279,164	10,213,916	7,152,763

(*) Other than fuel and electricity.

Table 325.—Capital Employed in the Cement Industry in Canada, 1943

—	$
CAPITAL EMPLOYED AS REPRESENTED BY—	
Present cash value of the land	9,327,061
Present value of buildings, fixtures, machinery, tools and other equipment	30,414,868
Inventory value of materials on hand, ore in process, fuel and miscellaneous supplies on hand	1,040,989
Inventory value of finished products on hand	1,695,452
Operating capital (cash, bills and accounts receivable, prepaid expenses, etc.)	7,960,562
Total	**50,438,932**

Table 326.—Wage-Earners on the Last Day of Each Month, or Nearest Representative Date, 1940-1943

Month	1940	1941	1942	1943		
				Quarry	Mill	
				Male	Male	Female
January	736	1,051	1,078	152	946	....
February	711	1,058	1,092	154	959	....
March	795	1,084	1,111	157	956	....
April	974	1,169	1,148	132	978	....
May	1,021	1,177	1,141	149	898	21
June	1,041	1,219	1,182	168	944	33
July	1,046	1,221	1,212	166	951	48
August	1,052	1,177	1,193	161	956	58
September	1,111	1,197	1,188	165	927	55
October	1,146	1,158	1,149	155	916	55
November	1,100	1,145	1,175	153	910	26
December	923	1,124	1,128	151	889	19

THE CLAY AND CLAY PRODUCTS INDUSTRY

The industrial clays of Canada may be classified as common clays, stoneware clays, fireclays, and china clays. Statistically, the ceramic industry of Canada is conveniently classified into two divisions: (1) Production from domestic clays, which includes the production of building brick, structural tile, drain tile, roofing tile, stoneware, sewer pipe, pottery and refractories, and (2) production from imported clays, which includes the manufacture of electrical porcelains, sanitary ware, sewer pipe, table ware, pottery, ceramic floor and walltile, and various kinds of fireclay refractories. Data relating to the production of glass, cement and artificial abrasives are contained in separate reports.

A total of 129 plants, representing in the aggregate, a capital investment of $22,701,065, operated in the domestic and imported clay products industries in Canada during 1943. These two industries provided employment for 3,290 persons during the year; their earnings totalled $4,678,202. The combined production in 1943 was valued at $10,993,609 compared with $12,478,951 in 1942.

1. PRODUCTION FROM DOMESTIC CLAYS

The gross value of Canadian producers' sales of domestic clays and products made from same totalled $6,608,193 in 1943 compared with $7,081,723 in 1942, and $13,904,643—the all-time high record established in 1929. Commercial production of domestic clay products in 1943 was reported from every province except Prince Edward Island; no output of these materials has as yet been recorded for the Yukon and Northwest Territories. Of the total value of sales in 1943, Ontario and Quebec firms contributed $2,453,829 and $1,504,428, respectively.

Sales of building brick in 1943 totalled 138,678M, valued at $2,808,764. Sewer pipe shipments aggregated $1,116,846; hollow blocks, roofing and floor tile $847,311; drain tile $390,377; pottery, including earthenware, $701,144; bentonite $117,047, and fireclay, firebrick and fireclay blocks $491,395.

The number of firms reported as active in the Canadian domestic clay products industry during 1943 totalled 101; of these, 51 were located in Ontario, 15 in Quebec, 10 in Alberta, 7 in British Columbia and the remainder in Nova Scotia, New Brunswick, Saskatchewan and Manitoba. Capital employed by the industry was reported at $17,162,747, employees numbered 2,173, and salaries and wages paid amounted to $2,909,841. Fuel and electricity used in 1943 totalled $1,157,471 and chemicals and various other process supplies consumed were valued at $104,336.

Imports into Canada of clay and various clay products in 1943 were appraised at $13,446,817 compared with $14,918,338 in 1942. The value of clay products exported from Canada in 1943 was $458,529 as against $423,636 in the preceding year.

The following information is taken from a report "Clays and Clay Products 1943" as prepared by the Bureau of Mines, Ottawa:

"Compared to world production, the value of ceramic products manufactured in Canada is small, and large quantities of the various kinds are imported annually.

"Common clays suitable for the production of building brick and tile are found in all the provinces of Canada.

"The largest production in Canada of stoneware clay or semi-fireclays comes from the Eastend and Willows area, Saskatchewan. Large quantities of the clays from the area are selectively mined and shipped to Medicine Hat, Alberta, where, owing to the availability of cheap gas fuel, they are used extensively in the manufacture of stoneware, sewer pipe, pottery, tableware, etc.

"Stoneware clays and moderately refractory fireclays occur near Shubenacadie and Musquodoboit, Nova Scotia. Some of the Musquodoboit clay is used for the production of pottery, but it has not been extensively developed for ceramic use.

"Stoneware clays or low-grade fireclays occur near Williams Lake, and Chimney Creek Bridge in British Columbia; in the Cypress Hills of Alberta; and near Swan River, Manitoba; but they are difficult of access and have not been developed.

"Two large plants and a few small plants manufacture fireclay refractories from domestic clay. At one plant, about 50 miles south of Vancouver, a high-grade, moderately plastic fireclay is extracted by underground mining from the clay beds in the Sumas Mountain, and the plant manufactures firebrick and other refractory materials. Another plant at Claybank, Saskatchewan, by selective mining, utilizes the highly plastic refractory clays from the "White Mud" beds of southern Saskatchewan.

"A small amount of the most refractory clays in the deposits near Shubenacadie is mined and used by the steel plant at Sydney, Nova Scotia, for refractory purposes and some of the Musquodoboit clay is used for stove linings. Almost all other manufacturers of fireclay refractories (including high temperature cements, plastic refractories, etc.) use imported clay.

"China clay (kaolin) has been produced commercially in Canada only from the vicinity of St. Remi d'Amherst, Papineau county, Quebec, where mining operations were carried on for several years prior to 1923. The large-scale operation of this deposit has been under consideration for a number of years and a company was organized a few years ago to extract the kaolinized material by underground mining, to refine it into high-grade china clay, and to recover washed silica sand as a by-product. Following its reorganization as Canada China Clay and Silica Products, Limited, the company constructed a modern plant equipped to carry out the washing process in accordance with the most up-to-date and scientific methods. The plant has been producing glass sand regularly. The Canadian production of grades of silica sand suitable for the glass trade is of importance, now that the Belgian source of supply has been cut off. Canadian Kaolin-Silica Products' property at Lac Remi, Quebec, which was operated chiefly for the producton of high-grade silica sand, has been idle since the destruction of the plant by fire a few years ago.

"Several other interesting occurrences of kaolin have been discovered in Quebec in recent years. One of these, located on Thirty-One Mile Lake, near Point Comfort, Hull county, is being explored and portions of the deposit yield china clay of a high grade in the crude state. The extent and uniformity of the deposit is not as yet proved, but its possibilities as a source of high-grade fireclay are receiving attention. Kaolin has also been discovered near Brebeuf; on Lake Labelle; and near Chateau Richer in Quebec, but there has been little exploratory work on the deposits.

"Important deposits of high-grade, plastic, white-burning and buff-burning clays occur on the Mattagami, Abitibi, and Missinabi Rivers in northern Ontario. Some of these can be classed as china clays, others as fireclays, and still others as ball clays. The deposits have attracted considerable interest in recent years, but effort to develop them have been handicapped owing to the distance of the deposits from industrial centres, and to the lack of transportation facilities.

"In British Columbia, along the Fraser River, about 25 miles above Prince George, is an extensive clay deposit, parts of which yield a high grade of china clay. As china clay from England is difficult to obtain on the West coast, owing to shipping risks, consideration is being given to the possibility of using material from this deposit as a source of china clay suitable for the pulp and paper trade.

"In the manufacture of porcelain, sanitary ware, dinner ware, ceramic floor and wall tile, etc., china clay and ball clay from England has been used almost entirely. Separate production figures are not published for these classes of ceramic ware as there are only one or two producers in each case. Canada also imports large quantities of china clay for use in the production of paper; in the rubber industry; and for other industrial purposes.

"Ball clays of high bond strength occur in the "White Mud" beds of southern Saskatchewan, but as yet they have not been developed.

"Activated clays for oil bleaching are largely imported. The value of such clays imported into Canada by oil refineries in 1943 was $295,066, compared with $348,068 in 1942. Fuller's and infusorial earths are also imported for use in sugar refineries, vegetable oil mills, etc. It has been reported that certain western bentonitic materials have been finding a market in Canada for oil bleaching purposes."

Table 327.—Production (Total Sales) of Clay Products From Domestic Clays, 1934-1943

Year	$	Year	$
1934	2,680,410	1939	5,151,236
1935	3,012,563	1940	6,344,547
1936	3,471,027	1941	7,575,336
1937	4,516,859	1942	7,081,723
1938	4,536,084	1943	6,608,193

Table 328.—Production (Total Sales) of Clay Products, by Provinces, 1939-1943 (Gross Values)

Province	1939	1940	1941	1942	1943
	$	$	$	$	$
Nova Scotia	339,952	490,543	529,435	618,441	478,571
New Brunswick	129,985	171,745	193,643	246,041	216,446
Quebec	1,274,776	1,546,246	1,944,358	1,741,297	1,504,428
Ontario	2,346,638	2,508,540	3,087,616	2,549,486	2,453,829
Manitoba	78,892	102,906	84,817	80,890	132,382
Saskatchewan	148,774	164,828	224,897	271,325	348,725
Alberta	461,079	838,856	952,144	1,013,497	978,649
British Columbia	371,140	520,883	558,426	560,746	495,163
Canada	**5,151,236**	**6,344,547**	**7,575,336**	**7,081,723**	**6,608,193**

Table 329.—Production (Sales) of Domestic Clay and Clay Products in Canada, 1942 and 1943

Product	Unit of measure	Sales or shipments 1942 Quantity	1942 $	1943 Quantity	1943 $
Clay—Bentonite	ton	1,616	44,204	(*)	117,047
Fireclay	ton	5,601	40,722	5,653	42,122
Kaolin	ton	408	6,130	93	1,531
Other clay	ton	24,803	71,826	20,638	101,036
Fireclay blocks and shapes	....	....	210,246	....	256,655
Firebrick	M	3,816	197,830	3,644	192,618
Brick—Soft mud process—Face	M	11,385	233,251	9,260	206,826
Common	M	20,387	325,762	14,195	209,508
Stiff mud process—Face	M	39,104	872,287	34,623	867,630
(wire cut) Common	M	59,901	893,488	51,000	829,365
Brick—Dry press—Face	M	12,871	278,701	10,504	256,362
Common	M	25,145	404,730	15,681	243,446
Fancy or ornamental brick (including special shapes, embossed and enamelled brick)	M	11	676	3,190	191,424
Sewer brick	M	513	9,480	225	4,203
Paving brick	M	153	9,353	151	8,967
Structural tile—					
Hollow blocks (including fireproofing and load-bearing tile)	ton	109,905	1,082,573	84,469	819,535
Roofing tile	....	....	32	....	827
Floor tile (quarries)	....	....	23,705	....	26,949
Drain tile	M	11,059	329,035	13,001	390,377
Sewer pipe (including copings, flue linings, conduits, etc.)	....	....	1,392,545	....	1,116,846
Pottery, glazed or unglazed (including coarse earthenware, sanitary ware, stoneware, flower pots, and all other pottery)	....	....	646,088	....	701,144
Other products	....	....	9,050	....	23,775
Total	....	....	**7,081,723**	....	**6,608,193**

In addition to the clays recorded in the above table, there were 165,345 tons of ordinary clay consumed in Canada during 1943 in the production of Portland cement; the corresponding consumption in 1942 was 188,202 tons. Also consumed by the Canadian cement industry in 1943 were 75,460 tons of shale.

(*) Not published.

Table 330.—Production of Building Brick in Canada, 1934-1943

—		Soft mud process Face	Soft mud process Common	Stiff mud process (wire cut) Face	Stiff mud process (wire cut) Common	Dry press Face	Dry press Common	Fancy or ornametal brick	Sewer brick	Total
1934	M	4,904	14,256	23,800	30,317	6,005	6,440	43	307	**86,072**
	$	76,247	183,585	494,341	424,131	130,392	66,616	2,625	5,992	**1,383,929**
1935	M	6,695	21,197	25,289	32,334	8,454	6,381	13	175	**100,538**
	$	122,215	259,504	500,066	437,123	175,042	55,253	728	5,236	**1,555,167**
1936	M	6,097	24,180	30,218	35,592	8,961	10,241	25	418	**115,732**
	$	111,378	302,690	575,765	484,078	165,924	100,785	1,374	6,778	**1,718,773**
1937	M	9,904	23,636	37,610	55,689	12,565	14,136	55	175	**153,770**
	$	175,544	316,534	735,615	755,630	233,542	152,662	2,972	2,777	**2,375,276**
1938	M	10,838	24,104	34,179	50,734	13,125	15,536	63	228	**148,807**
	$	208,610	313,082	671,471	681,744	266,039	192,741	4,175	3,581	**2,311,443**
1939	M	10,927	26,652	45,993	51,114	12,263	17,790	68	217	**165,024**
	$	182,376	372,116	941,696	692,224	242,518	236,597	4,601	4,506	**2,676,631**
1940	M	15,946	40,395	41,552	52,777	14,932	24,870	47	694	**191,213**
	$	323,634	611,750	903,636	738,416	333,717	351,335	2,477	12,222	**3,277,187**
1941	M	14,288	30,664	52,419	69,750	15,621	25,449	36	644	**208,871**
	$	285,260	455,385	1,218,632	1,043,832	363,908	386,097	2,100	10,279	**3,765,493**
1942	M	11,385	20,387	39,104	59,901	12,871	25,145	11	513	**169,317**
	$	233,251	325,762	872,287	893,488	278,701	404,730	676	9,480	**3,018,375**
1943	M	9,260	14,195	34,623	51,000	10,504	15,681	3,190	225	**138,678**
	$	206,826	209,508	867,630	829,365	256,362	243,446	191,424	4,203	**2,808,764**

Table 331.—Production of Building Brick in Canada—Per Capita of Population, for Years Specified

Year	M per capita	Year	M per capita
1905	0·087	1936	0·010
1914	0·070	1937	0·014
1929	0·046	1938	0·013
1930	0·031	1939	0·015
1932	0·010	1940	0·017
1933	0·006	1941	0·018
1934	0·008	1942	0·014
1935	0·009	1943	0·012

Table 332.—Production (Sales) of Building Brick (*) in Canada, by Provinces, 1941-1943

Province	1941		1942		1943	
	M	$	M	$	M	$
Nova Scotia	5,402	84,394	7,086	129,679	6,411	108,963
New Brunswick	7,219	119,370	7,580	146,335	6,858	121,359
Quebec	78,700	1,384,875	61,300	1,067,253	52,428	976,370
Ontario	88,484	1,786,717	69,960	1,359,817	56,389	1,381,796
Manitoba	4,686	79,260	2,753	42,090	1,546	21,954
Saskatchewan	921	10,864	494	6,494	296	5,358
Alberta	15,441	152,827	13,991	145,379	12,026	130,534
British Columbia	8,018	147,186	6,153	121,328	2,726	62,430
Canada	**208,871**	**3,765,493**	**169,317**	**3,018,375**	**138,678**	**2,808,764**
Average value per M		$18·00		$17·83		$20·25

(*) Includes fancy and sewer brick.

Table 333.—Production of Paving Brick in Canada, 1934-1943

Year	Quantity	Value
	M	$
1934	10	382
1935	15	627
1936	116	3,149
1937	3	131
1938	1	34
1939	157	6,089
1940	19	819
1941	120	7,312
1942	153	9,353
1943	151	8,967

Table 334.—Production of Structural Tile in Canada, 1934-1943

Year	Hollow Blocks(*)		Roofing Tile		Floor Tile (Quarries)	
	Short tons	$	No.	$	Sq. ft.	$
1934	31,136	244,122	44,115	1,852	80,356	17,491
1935	(a) 47,195	344,608	82,015	3,669	51,765	7,629
1936	58,501	467,860	52,730	2,139	97,738	13,798
1937	64,526	533,843	60,542	3,302	73,101	12,169
1938	70,648	591,416	150,504	5,196	100,958	15,330
1939	86,120	714,291	148,291	4,964	90,812	15,233
1940	105,073	788,478	41,772	1,839	(b)	13,631
1941	117,530	1,063,120	(b)	750	(b)	21,349
1942	109,905	1,082,573	(b)	32	(b)	23,705
1943	84,469	819,535	(b)	827	(b)	26,949

(*) Including fireproofing and load-bearing tile.
(a) In addition, there was produced $615 worth of ceramic tile.
(b) Data not available.

Table 335.—Production of Structural Tile in Canada, by Provinces, 1943

Province	Hollow Blocks (*)		Roofing Tile	Floor Tile (Quarries)
	Short tons	$	$	$
Nova Scotia	11,875	124,687	....	....
New Brunswick	1,610	15,536	....	....
Quebec	25,378	261,874	....	....
Ontario	35,980	333,256	744	26,864
Manitoba	....	....	....	....
Saskatchewan	725	6,055	....	....
Alberta	6,353	49,667	....	....
British Columbia	2,548	28,460	83	85
Canada	**84,469**	**819,535**	**827**	**26,949**

(*) Including fireproofing and load-bearing tile.

Table 336.—Production of Sewer Pipe, Copings, Flue Linings, etc., in Canada, 1934-1943

Year	Value	Year	Value
	$		$
1934	436,433	1939	813,208
1935	481,559	1940	1,152,603
1936	588,485	1941	1,422,389
1937	790,210	1942	1,392,545
1938	778,107	1943	1,116,846

Table 337.—Production of Drain Tile in Canada, 1934-1943

Year	Quantity	Value	Year	Quantity	Value
	M	$		M	$
1934	7,385	180,553	1939	14,361	353,973
1935	7,124	205,336	1940	10,550	277,551
1936	8,148	214,549	1941	12,319	333,364
1937	11,391	298,970	1942	11,659	329,035
1938	12,862	322,774	1943	13,001	390,377

Table 338.—Production of Pottery† from Domestic Clays in Canada, 1934-1943

Year	Value	Year	Value
	$		$
1934	213,733	1939	*280,420
1935	220,711	1940	474,452
1936	218,402	1941	502,212
1937	232,209	1942	646,088
1938	235,890	1943	701,144

† Including coarse earthenware, stoneware flower pots, and all other pottery.
* In addition $2,292 worth of sanitary ware was produced.

Table 339.—Production of Kaolin* and Fireclay in Canada, 1934-1943

Year	Kaolin		Fireclay		Year	Kaolin		Fireclay	
	Quantity	Value	Quantity	Value		Quantity	Value	Quantity	Value
	Tons	$	Tons	$		Tons	$	Tons	$
1934	48	504	1,043	12,598	1939	....	....	10,045	30,824
1935	170	1,520	2,272	15,574	1940	....	....	4,881	30,564
1936	....	....	2,437	17,639	1941	2	30	5,431	35,475
1937	....	....	4,123	26,081	1942	408	6,130	5,601	40,722
1938	....	....	2,344	17,243	1943	93	1,531	5,653	42,122

* Produced in the province of Quebec.

Table 340.—Production of Firebrick and Fireclay Blocks and Shapes in Canada, from Domestic Clays, 1934-1943

Year	Firebrick		Fireclay blocks and shapes	Year	Firebrick		Fireclay blocks and shapes
	Quantity	Value	Value		Quantity	Value	Value
	M	$	$		M	$	$
1934	2,109	101,219	62,388	1939	2,331	119,346	95,256
1935	1,817	90,149	71,344	1940	3,167	165,525	85,127
1936	2,538	118,923	65,171	1941	3,643	183,897	190,497
1937	2,950	142,827	75,431	1942	3,816	197,830	210,246
1938	2,213	113,581	73,512	1943	3,644	192,618	256,655

Table 341.—Production (Sales) of Bentonite in Canada, by Provinces, 1934-1943

Year	Bentonite							
	Manitoba		Alberta		British Columbia		**Canada**	
	tons	$	tons	$	tons	$	**tons**	**$**
1934	....	....	....	....	63	1,578	**63**	**1,578**
1935	....	....	....	....	41	781	**41**	**781**
1936	....	....	....	....	(a) 120	180	(a) **120**	**180**
1937	132	1,154	....	....	31	817	**163**	**1,971**
1938	....	....	1,136	3,444	43	215	**1,179**	**3,659**
1939	99	591	889	2,850	....	....	**988**	**3,441**
1940	710	2,023	714	2,240	45	225	**1,469**	**4,488**
1941	760	1,330	1,317	5,882	95	618	**2,172**	**7,830**
1942	....	38,800	....	5,404	....	....	(b)	**44,204**
1943	....	110,428	....	5,262	....	1,357	(b)	**117,047**

(a) Partly for experimental purposes.
(b) Quantity not published.

Bentonite is a variety of clay derived from volcanic ash. Known commercial deposits in Canada are confined to the Prairie Provinces and British Columbia. All the clay is of the highly-colloidal or swelling variety.

In southern Manitoba, deposits have been under development for several years in the Morden area. In southern Saskatchewan numerous occurrences of bentonite exist in the Willowbunch-St. Victor-Eastend district, but so far there has been very little development there. Most of the production in Alberta has come from the Red Deer Valley region in the vicinity of Drumheller. In southern British Columbia, bentonite occurs in beds of considerable thickness near Merritt and Princeton. Canada exports little or no bentonite. Substantial quantities of activated clay are imported from the United States for bleaching in oil refineries and for packing house products, and possibly also some ground natural bentonite for similar use.

The chief uses for bentonite are as a bonding ingredient in foundry sands; for the bleaching of mineral and vegetable oils and packing-house products; and to control the viscosity of oil-well drilling muds. In the United States, in 1942, 84 per cent of total bentonite sales went to these three major uses. For bleaching purposes, both natural and activated clay are employed.

In 1943, Wyoming dried and granulated clay continued to sell for $7.50 per ton f.o.b. mines, in carload lots, and air-floated 200-mesh material for $9.50, bagged. Special-grade, selected, air-floated clay was priced at $26 per ton, f.o.b. Chicago. Freight rates from Wyoming points to Montreal are about $14 per ton. Imported activated (Filtrol-type) bentonite has been costing $75 to $80 per ton, in carload lots, delivered eastern Canadian points, and American natural bleaching clay has sold for $25 per ton laid down. Alberta oil-drilling bentonite sold in 1943 for $40.75 per ton, f.o.b. Calgary plant, or $42.75 delivered at Turner Valley, inclusive of 8 per cent sales tax. Effective January 1, 1944, the sales tax was cancelled, and 1944 prices have been reduced to $38 and $40, respectively.

Table 342.—Fuller's Earth Used in Canada in the Manufacture of Soaps and Washing Compounds and in the Petroleum Products Industry, 1934-1943

Year	Petroleum Products Industry		Soaps and Washing Compounds	
	Pounds (*)	$	Pounds	$
1934	18,588,514	230,357	508,316	6,562
1935	18,487,148	260,885	660,018	13,694
1936	18,907,295	243,164	1,328,219	20,601
1937	18,843,458	240,309	1,167,768	20,393
1938	19,687,467	281,668	1,195,208	19,575
1939	19,814,473	304,214	1,586,163	30,924
1940	23,828,660	406,185	1,651,471	40,695
1941	30,155,750	571,010	1,486,000	39,332
1942	24,162,091	528,350	1,350,000	37,831
1943	25,390,653	601,283	2,410,000	83,233

(*) Includes all clays.

Table 343.—China Clay (Kaolin) Used in the Manufacture of Paper in Canada, 1934-1943

Year	Tons	Value	Year	Tons	Value
		$			$
1934	27,550	357,286	1939	32,769	430,092
1935	33,766	422,584	1940	36,931	558,659
1936	39,165	520,121	1941	32,844	588,535
1937	41,738	578,223	1942	28,734	578,199
1938	34,968	488,147	1943	26,374	561,285

Table 344.—Clays and Earths Used in Canadian Rubber Goods Industry, 1934-1943

Year	Tons	Value	Year	Tons	Value
		$			$
1934	2,391	54,368	1939	3,438	80,745
1935	2,639	63,553	1940	3,586	90,867
1936	3,017	70,709	1941	4,059	101,441
1937	3,614	79,300	1942	1,523	37,186
1938	2,942	81,935	1943	1,257	35,266

Table 345.—Firebrick and Fireclay Used in the Manufacture of Iron and Steel and Their Products in Canada, 1932-1943

Year	Firebrick		Fireclay		Other Fireclay, Firebrick and Cupola Blocks
	Number	Value	Tons	Value	
		$		$	$
1932	3,409,000	123,532	5,910	52,492	36,395
1933	1,846,016	141,784	7,615	62,602	(b) 11,628
1934	2,590,452	192,538	8,248	75,906	21,488
1935	(a)	451,604	11,510	101,601	28,064
1936	(a)	(a)	(c) $ 779,014	(a)	(a)
1937	(a)	(a)	(c) $1,058,787	(a)	(a)
1938	(a)	(a)	(c) $ 838,012	(a)	(a)
1939	(a)	(a)	(c) $ 939,495	(a)	(a)
1940	(a)	(a)	(c) $1,597,898	(a)	(a)
1941	(a)	(a)	(c) $2,581,813	(a)	(a)
1942	(a)	(a)	(c) $3,268,181	(a)	(a)
1943	(a)	(a)	(c) $3,717,826	(a)	(a)

(a) Not published separately.
(b) From 1933 includes only cupola blocks.
(c) Combined value for firebrick, fireclay and other fireclay, etc.

Table 346.—Fuller's and Infusorial Earth Used in Specified Canadian Industries, 1933-1943

Year	Sugar Refineries		Vegetable Oil Mills	
	Pounds	$	Pounds	$
1933	(a)	(a)	126,880	2,730
1934	(a)	(a)	115,120	2,171
1935	(a)	(a)	88,980	2,425
1936	(b) 59,200	1,730	243,720	10,044
1937	(c) 4,580,786	95,532	(x) 212,997	9,349
1938	(c) 4,908,597	101,473	190,253	9,063
1939	(c) 4,819,811	105,711	(b) 207,105	10,166
1940	(c) 4,984,362	112,369	(b) 216,254	7,731
1941	(c) 5,333,131	133,129	(b) 275,290	10,604
1942	(c) 3,007,180	75,295	(b) 437,120	20,154
1943	(c) 3,451,142	89,075	(b) 484,380	20,302

(a) Not recorded.
(b) Fuller's earth, in 1942, includes 97,785 pounds clarex earth valued at $4,657, and in 1943 it includes 104,130 pounds valued at $7,836.
(c) Infusorial earth.
(x) Includes other earth.
NOTE.—In addition to the consumption recorded, there is a considerable quantity of fuller's earth used by the slaughtering industry.

Table 347.—Principal Statistics of the Domestic Clay Products Industry in Canada, 1942 and 1943

—	1942	1943
Number of plants	124	105
Capital employed $	17,793,931	17,162,747
Number of employees—On salary	281	248
On wages	2,242	1,925
Total	2,523	2,173
Salaries and wages—Salaries $	590,545	570,300
Wages $	2,482,466	2,339,541
Total $	3,073,011	2,909,841
Selling value of products (gross) $	7,081,723	6,608,193
Cost of fuel and purchased electricity $	1,451,239	1,157,471
Cost of process supplies $	158,866	104,336
Net value of sales $	5,630,484	5,346,386

Table 348.—Capital Employed in the Domestic Clay Products Industry in Canada, by Provinces, 1943

Industry and province	Capital employed as represented by:					
	Present value of land†	Present value of buildings, fixtures, machinery, tools and other equipment	Inventory value of materials on hand, stocks in process, fuel, etc.	Inventory value of finished products on hand	Operating capital, including cash, bills and accounts receivable, etc.	Total
	$	$	$	$	$	$
By Industries—						
Brick and tile (*)—						
Nova Scotia	113,006	561.144	31,278	27,490	70,892	803,810
New Brunswick	19,568	160,862	2,931	5,800	23,761	212,922
Quebec	767,218	2,153,389	99,048	204,683	809,697	4,034,035
Ontario	1,157,979	4,121,036	104,312	259,239	2,162,005	7,804,571
Manitoba	14,000	14,500	....	3,100	60,000	91,600
Saskatchewan	227,840	384,911	29,103	33,228	117,779	792,861
Alberta	119,455	1,537,431	17,245	51,079	262,875	1,988,085
British Columbia	120,725	324,587	8,604	103,688	138,196	695,800
Total	**2,539,791**	**9,257,860**	**292,521**	**688,307**	**3,645,205**	**16,423,684**
Stoneware and pottery—						
Total	**41,669**	**471,458**	**15,818**	**45,220**	**164,898**	**739,063**
By Provinces—						
Total for clay and clay products—						
Nova Scotia	113,006	561.144	31,278	27,490	70,892	803,810
New Brunswick	26,760	174,317	7,149	8,402	35,721	252,349
Quebec	768,418	2,164,189	100,648	206,283	811,197	4,050,735
Ontario	1,170,479	4,141,036	105,112	264,988	2,177,705	7,859,320
Manitoba	14,000	14,500	....	3,100	60,000	91,600
Saskatchewan	227,840	384,911	29,103	33,228	117,779	792,861
Alberta	140,232	1,964,634	26,445	86,348	398,613	2,616,272
British Columbia	120,725	324,587	8,604	103,688	138,196	695,800
Total	**2,581,460**	**9,729,318**	**308,339**	**733,527**	**3,810,103**	**17,162,747**

(*) Clay, sewer pipe, firebrick products and other clays included under brick and tile.
(†) Excluding unmined material.

Table 349.—Employees, Salaries and Wages in the Clay Products Industry in Canada, by Provinces, 1943

Province	*Average number of employees					Salaries and wages		
	Salaried employees		Wage-earners		Total			
	Male	Female	Male	Female		Salaries	Wages	Total
						$	$	$
Nova Scotia	9	5	162	....	176	38,227	176,177	214,404
New Brunswick	6	3	64	22	95	11,450	69,858	81,308
Quebec	42	8	359	26	435	121,393	491,382	612,775
Ontario	77	27	610	3	717	241,340	867,741	1,109,081
Manitoba	9	1	55	2	67	20,180	59,923	80,103
Saskatchewan	12	....	36	....	48	23,091	57,751	80,842
Alberta	22	9	290	154	475	70,339	412,440	482,779
British Columbia	13	5	142	....	160	44,280	204,269	248,549
Canada	**190**	**58**	**1,718**	**207**	**2,173**	**570,300**	**2,339,541**	**2,909,841**
Industry								
Brick and tile	181	48	1,540	12	1,781	546,738	2,018,842	2,565,580
Stoneware and pottery	9	10	178	195	392	23.562	320,699	344,261
Canada	**190**	**58**	**1,718**	**207**	**2,173**	**570,300**	**2,339,541**	**2,909,841**

* See note page 31.

In 1913 there were 455 active firms in the Canadian domestic clay products industry; men employed numbered 11,193 and $4,682,801 were distributed in salaries and wages. In 1918 the number of active firms was 230 and $2,131,614 were paid in wages to 3,423 employees.

Table 350.—Average Number of Wage-Earners, by Months, 1940-1943

Month	1940	1941	1942	1943		
				Pit	Plant	
					Male	Female
January	1,190	1,907	1,966	72	1,437	183
February	1,051	1,792	1,811	72	1,404	187
March	1,287	1,871	1,829	79	1,433	196
April	1,739	2,427	2,106	94	1,449	207
May	2,647	3,250	2,382	138	1,565	195
June	3,143	3,369	2,570	179	1,685	208
July	3,191	3,281	2,588	170	1,782	215
August	3,027	3,070	2,560	168	1,789	212
September	2,812	2,869	2,389	143	1,745	213
October	2,530	2,628	2,326	128	1,072	221
November	2,300	2,424	2,218	117	1,566	226
December	2,151	2,153	1,920	103	1,502	225

II. PRODUCTS FROM IMPORTED CLAYS

This industry covers the operations of Canadian plants which were occupied chiefly in making ceramic products from imported clays. Products made in these plants during 1943 included high tension insulators, vitreous china sanitary ware, china dinnerware, firebrick, sewer pipe, floor and wall tile, refractory cements, electrical porcelains, etc.

Twenty-four plants reported in this group for 1943 and their output was valued at $4,385,416, against last year's total of $5,397,228 and the 1941 figure of $5,371,853. Capital employed amounted to $5,542,318. The average number of workers was 1,117 and payments for salaries and wages totalled $1,768,361. Fuel and electricity cost $332,902 and materials for use in manufacturing processes cost $929,854.

Table 351.—Products Made in the Imported Clay Products Industry, 1942 and 1943

Product	1942	1943
	Gross selling value at works	Gross selling value at works
	$	$
Firebrick and stove linings—Rigid	1,138,761	608,482
Plastic	213,712	254,523
High temperature cements	131,478	112,737
High tension porcelain insulators, china sanitary ware, clay sewer pipe, floor and wall tile, pottery, china tableware, etc. (Separate figures cannot be shown for these items as there were only one or two producers in each case)	3,913,277	3,409,674
Total	**5,397,228**	**4,385,416**

Table 352.—Materials Used in the Imported Clay Products Industry, 1942 and 1943

Material	1942		1943	
	Short tons	Total cost at works	Short tons	Total cost at works
		$		$
Imported clays—Ball clay	2,614	53,881	2,230	43,901
China clay	3,344	80,003	2,889	70,479
Fireclay	35,391	249,635	30,297	244,788
Saggar clay	847	14,347	812	13,828
Other imported clays	733	16,848	....	18,991
Canadian clays—Fireclay	23	1,615	12	300
Other clays	164	836	18	54
Feldspar	2,799	62,525	2,352	50,794
Silica and ground quartz	3,753	63,259	3,597	58,412
Talc	565	7,774	354	5,586
Other glazing materials	....	24,401	....	18,277
Insulator hardware	....	125,662	....	75,316
Shipping containers and packing materials	....	109,255	....	94,424
All other materials	....	360,897	....	234,704
Total	....	**1,170,938**	....	**929,854**

PRICES (a)

Bentonite.—per ton, carload lots, f.o.b. Wyoming mines, dried and crushed, in bulk, $7.50; pulverized, 200 mesh, $9.50 in 100-lb. paper bags.

China Clay (Kaolin).—per ton, f.o.b. South Carolina and Georgia mines, in bulk; saggar clays, $2.50 to $3.50; tailings, $4.50 to $5.00. No. 2 grades, $5.50 to $6.00; No. 1 grades, air-floated, crude, $6.75 to $8.00; No. 1 washed, $8.00. Florida: washed, crushed, bulk, $11.75; air-floated and washed, $14 to $15. Maryland: ball clays, shredded bulk, $3.00 to $7.00; air-floated, in paper bags, $10.10 to $18.25. New Jersey: plastic kaolin, pulverized, in paper bags, $10.25 to $10.75. Insecticide clay, $11.50 to $16.50. Imported English, per long ton, C and F. American ports: lump, $26 to $28 in bulk; air-floated $40 to $60 nominal.

Fuller's Earth.—per ton, f.o.b. Colorado, $9; f.o.b. Georgia or Florida, 30 to 60 mesh, $14.50; 15 to 30, $14; 200 and up, $10; 100 and up $7.

(b)—**Fuller's Earth.**—English, long ton, nominal; Georgian, carlots, long ton $27.78.

China Clay.—Imported, carlots, bulk, ton $25 to $50 (U.S. only). Pigment clay for rubber, carlots, bags, ton $23.00 less carlots, ton, $26.50. Kaolin, colloidal, lb. 10 cents, Osmo 14 cents a pound.

(a) "Engineering & Mining Journal's Metal & Mineral Markets"—New York, September, 1944 and July, 1943.

(b) F.O.B. market at Toronto—"Canadian Chemistry & Process Industries"—Toronto, July, 1944 and June, 1943.

Table 353.—Imports Into Canada and Exports of Clay and Clay Products, 1942 and 1943

—	1942		1943	
	Quantity	$	Quantity	$
IMPORTS				
Building brick ... ton	1,400	17,603	1,102	17,403
Building blocks and fireproofing tile	...	13,574	...	22,354
Clays—China ... cwt.	924,856	528,580	674,008	392,651
Fire ... cwt.	1,926,652	369,845	1,668,888	320,809
Pipe ... cwt.	174,953	20,722	211,750	25,248
Other clays, n.o.p.	...	154,963	...	186,842
Zirconium silicate	...	10,707	...	15,146
Zirconium oxide	...	37,523	...	41,745
Drain tile, unglazed	...	14	...	1,417
Drain, sewer pipe and earthenware fittings therefor, chimney linings or vents, chimney tops or inverted blocks, glazed or unglazed, n.o.p.	...	6,164	...	2,958
Tiles or blocks of earthenware or stone prepared for mosaic flooring	...	31,231	...	23,680
Tiles, earthenware, for roofing purposes	...	149	...	254
Tiles, earthenware, n.o.p.	...	82,568	...	56,638
Insulators, electric, porcelain	...	231,064	...	241,335
Pottery, chinaware and earthenware, n.o.p.	...	4,926,563	...	4,371,530
Brick, fire, other, valued ar not less than $100 per M, rectangular shaped: the dimensions of each not to exceed 125 cubic inches; for use exclusively in the construction or repair of a furnace, kiln, etc.	...	117,940	...	70,129
Brick, fire, n.o.p., for use exclusively in the construction or repair of a furnace, kiln or other equipment of a manufacturing establishment (not made in Canada)	...	2,195,994	...	1,972,956
Firebrick, n.o.p.	...	1,717,146	...	1,661,129
Firebrick, chrome	...	317,894	...	256,093
Magnesite brick (fire)	...	1,175,015	...	1,111,754
Silica brick (containing not less than 90 per cent silica)	...	1,135,408	...	847,456
Paving brick ... ton	786	6,742	944	7,753
Artificial teeth, not mounted	...	752,096	...	768,425
Baths, bathtubs, basins, laundry tubs, etc., of earthenware, cement or clay, n.o.p.	...	236,339	...	359,978
Saggars	...	33,240	...	46,778
Crucibles, clay or sand	...	78,583	...	21,799
Other manufactures of clay, n.o.p.	...	340,952	...	259,897
Activated clay to refine oil	...	348,068	...	205,066
Grog for refractory materials ... ton	1,401	31,651	2,070	46,894
Total	...	**14,918,338**	...	**13,446,817**
EXPORTS				
Building brick ... M	1,435	25,159	1,711	30,305
Clay, manufactures of	...	106,475	...	221,104
Earthenware	...	27,763	...	31,181
Porcelain insulators	...	204,394	...	81,361
Refractories, dead-burned ... ton	1,880	59,845	8,610	94,578
Total	...	**423,636**	...	**458,529**

LIME INDUSTRY

Production of quick and hydrated lime in Canada during 1943 totalled 907,768 short tons valued at $6,832,992 compared with 884,830 short tons worth $6,530,839 in 1942. The 1943 output was the greatest ever recorded in the history of the Canadian lime industry and comprised 766,147 tons of quicklime valued at $5,990,088 and 141,621 tons of hydrated lime at $842,904. During the year under review, 730,499 short tons of quicklime valued at $5,642,420 and 94,224 short tons of hydrated lime worth $381,250 were sold or used, by producers, for chemical manufacture, while the balance of Canadian lime production was sold or used for building, agricultural and other purposes.

Stone used in the production of lime in Canada includes calcium, high calcium and dolomitic varieties of limestone. Included in the total figures of Canadian lime production is a considerable tonnage of lime recovered as a by-product in the manufacture of chemicals or allied products. It is estimated that approximately 1,614,481 tons of limestone were consumed in the production of lime in 1943. Lime was produced during 1943 in all Canadian provinces with the exception of Prince Edward Island and Saskatchewan; no commercial production of lime in the Northwest Territories has ever been officially reported. Of the total Canadian output of lime in 1943, Ontario plants produced 411,921 short tons or 45·5 per cent and Quebec 382,432 short tons or 42 per cent.

Imports of lime into Canada during 1943 totalled 9,077 short tons appraised at $64,303 compared with 6,231 short tons at $43,854 in 1942. Exports of lime from Canada in 1943 amounted to 15,391 short tons valued at $133,320 as against 8,431 short tons worth $74,517 in the preceding year.

During 1943 the lime industry, comprising 41 firms, reported 45 plants as active; capital employed totalled $4,607,651, and $1,408,393 were distributed to 898 employees. The cost of fuel and purchased electricity used amounted to $1,747,012 and the value of explosives, chemicals, drill steel and other process supplies consumed aggregated $177,470.

A report on lime for 1943, as prepared by the Bureau of Mines, Ottawa, states:

"The steadily increasing demand for lime by the war industries has raised production above all previous records. Most of the forty-five plants throughout the country operated at capacity during 1943, and in the early part of the year there was a serious shortage of high-calcium chemical lime in Eastern Canada. At Beachville, Ontario, which is one of the most important centres of chemical lime production in Canada, the diversion of the Thames River in the quarry area was begun in 1943, to make available much more rock for quarrying and to lessen the danger from floods.

"There are many prospective lime-producing localities in Canada because of the abundance of limestone throughout the country, but in the more industrialized areas, particularly in Ontario and Quebec, large unworked deposits of pure high-calcium limestone that will yield a white lime suitable for chemical purposes are becoming scarce. With the northward development of the mining industry considerable interest is being manifested in making lime from limestone deposits in the more northerly parts of the country.

"Lime is marketed in the form of quicklime and in the hydrated state, the latter being specially prepared slaked lime in the form of fine powder that is marketed in 50-pound, multi-wall paper bags. Quicklime is marketed in the lump, pebble, crushed, and pulverized forms, lump lime and pebble lime are sold either in bulk or packed in barrels; crushed lime (1-inch and under) and pulverized lime (ground to minus 20 mesh, and in some plants to minus 50 mesh) are sold in airtight, multi-wall paper bags. In these various forms lime finds a multitude of uses in chemical and metallurgical processes, in agriculture, in construction, and for various other purposes. It is one of the great basic raw materials of the chemical industry and well over 90 per cent of the present production is used in chemical processes.

"Prices of the various lime products vary over a wide range, depending on the geographical position of the plants and on difference in quality of the lime. No significant change occurred in prices of lime during 1943."

Table 354.—Production of Lime in Canada, by Provinces, 1943, Showing Purposes for Which Used (*) or Sold

—		Nova Scotia and New Brunswick	Quebec	Ontario	Manitoba and Alberta	British Columbia	Total Canada
		(1 ton=2,000 pounds)					
QUICKLIME							
Building trades—							
Finishing lime	ton	...	...	916	3,105	...	**4,021**
	$	...	...	8,245	27,559	...	**35,804**
Masons' lime	ton	272	6,252	7,722	495	...	**14,741**
	$	2,992	90,418	70,562	5,863	...	**169,835**
Sand-lime brick	ton	781	1,543	2,951	...	...	**5,275**
	$	7,810	7,332	25,455	...	...	**40,597**
Agriculture	ton	34	77	217	...	...	**328**
	$	374	1,335	1,500	...	...	**3,209**
CHEMICAL—							
Smelters (non-ferrous)	ton	...	24,914	9,364	2,133	89	**36,500**
	$	...	160,844	70,653	17,114	649	**249,260**
Iron and steel furnaces (†)	ton	11,172	5,128	28,870	720	315	**46,205**
	$	128,658	46,757	208,198	5,750	2,298	**391,661**
Cyanide and flotation mills	ton	...	1,870	14,049	7,858	462	**24,239**
	$	...	13,148	96,840	74,220	3,370	**187,578**
Pulp and paper mills	ton	10,675	101,806	4,992	11,688	18,635	**147,796**
	$	101,451	742,021	34,275	88,444	166,115	**1,132,306**
Glass works	ton	...	...	14,086	120	...	**14,206**
	$	...	...	101,315	1,319	...	**102,634**
Sugar refineries	ton	167	5	3,385	13,249	50	**16,856**
	$	1,803	92	38,785	110,538	365	**151,583**
Tanneries	ton	6	565	4,524	...	...	**5,095**
	$	65	4,441	31,858	...	...	**36,364**
Fertilizer plants	ton	...	578	184	...	...	**762**
	$	...	3,951	1,351	...	...	**5,302**
Insecticide plants	ton	...	...	1,099	...	564	**1,663**
	$	...	...	7,686	...	4,114	**11,800**
Other chemical works	ton	138	139,080	290,015	2,067	5,877	**437,177**
	$	1,506	1,222,219	2,093,148	14,186	42,873	**3,373,932**
Uses unspecified	ton	...	3,976	576	1,009	5,722	**11,283**
	$	...	38,735	4,200	13,546	41,742	**98,223**
Total Quicklime	**ton**	**23,245**	**285,794**	**382,950**	**42,444**	**31,714**	**766,147**
	–	**244,659**	**2,331,293**	**2,794,071**	**358,539**	**261,526**	**5,990,088**
HYDRATED LIME							
Building trades—							
Finishing lime	ton	...	517	14,847	5,350	...	**20,714**
	$	...	5,226	184,823	94,145	...	**284,194**
Masons' lime	ton	223	5,565	6,426	...	...	**12,214**
	$	2,470	16,529	59,770	...	...	**78,769**
Sand-lime brick	ton	27	...	...	...	...	**27**
	$	270	...	...	...	...	**270**
Agriculture	ton	58	4,039	3,060	...	4,347	**11,504**
	$	650	13,873	29,612	...	30,129	**74,264**
CHEMICAL—							
Smelters (non-ferrous)	ton	...	79,500	1	25	355	**79,881**
	$	...	244,775	11	250	2,461	**247,497**
Iron and steel furnaces	ton	...	12	86	...	...	**98**
	$	...	168	863	...	...	**1,031**
Cyanide and flotation mills	ton	...	1,123	315	289	18	**1,745**
	$	...	3,475	3,308	2,890	125	**9,798**
Pulp and paper mills	ton	3,405	3,518	675	...	45	**7,643**
	$	37,687	29,895	7,072	...	312	**74,966**
Sugar refineries	ton	35	90	...	...	...	**125**
	$	390	877	...	...	...	**1,267**
Tanneries	ton	...	180	620	...	...	**800**
	$	...	1,582	6,407	...	...	**7,989**
Fertilizer plants	ton	...	13	692	...	...	**705**
	$	...	65	5,709	...	...	**5,774**
Insecticide plants	ton	122	13	...	...	50	**185**
	$	1,586	65	...	...	347	**1,998**
Other chemical works	ton	...	1,016	1,881	145	...	**3,042**
	$	...	9,817	19,663	1,450	...	**30,930**
Uses unspecified	ton	...	1,052	368	...	1,518	**2,938**
	$	...	9,751	3,885	...	10,521	**24,157**
Total Hydrated Lime	**ton**	**3,870**	**96,638**	**28,971**	**5,809**	**6,333**	**141,621**
	$	**43,053**	**336,098**	**321,123**	**98,735**	**43,895**	**842,904**
Grand Total	**ton**	**27,115**	**382,432**	**411,921**	**48,253**	**38,047**	**907,768**
	$	**287,712**	**2,667,391**	**3,115,194**	**457,274**	**305,421**	**6,832,992**

(†) Includes calcined dolomite used as a refractory material.
(*) Not necessarily consumed in provinces where produced; includes by-product lime.
NOTE.—Of the total quantity of 907,768 tons of lime produced, 423,591 tons were consumed by the producers themselves.

Table 355.—Production of Lime in Canada, 1931-1943

Year	Sold or used (*) Short tons	Sold or used (*) Value	Year	Sold Short tons	Used by producer Short tons	Total value
		$				$
1931	344,785	2,764,415	1939	288,252	263,957	4,003,514
1932	320,650	2,394,537	1940	359,180	357,550	5,194,555
1933	323,540	2,432,306	1941	451,361	409,524	6,357,941
1934	368,113	2,745,797	1942	470,882	413,948	6,530,839
1935	405,419	2,925,791	1943	484,177	423,591	6,832,992
1936	468,401	3,335,970				
1937	549,353	3,824,917				
1938	486,922	3,542,652				

(*) Separate data for Sold and Used not available until 1939.

Table 356.—Lime Sold or Used for Chemical and Other Purposes in Canada, 1934-1943

Year	Lime sold or used for chemical purposes				Lime sold or used for building or other non-chemical purposes			
	Quicklime		Hydrated Lime		Quicklime		Hydrated Lime	
	Short tons	$	Short tons	$	Short tons	$	Short tons	$
1934	201,609	1,440,221	28,297	158,685	106,513	798,035	31,694	348,856
1935	229,597	1,596,518	31,288	179,139	112,450	828,904	32,084	321,230
1936	349,940	2,499,074	39,384	171,192	41,559	290,898	37,518	374,806
1937	421,867	2,922,482	44,929	189,665	44,071	329,901	37,886	382,869
1938	373,278	2,587,329	30,547	159,598	42,483	365,762	40,614	429,963
1939	424,287	2,887,244	30,861	172,062	50,466	439,403	46,595	504,805
1940	568,479	3,944,748	44,421	256,570	55,324	477,010	48,506	516,227
1941	665,319	4,797,078	86,202	496,531	58,545	490,633	50,819	573,699
1942	712,307	5,314,653	89,252	386,809	36,975	331,396	46,296	497,981
1943	730,499	5,642,420	94,224	381,250	35,648	347,668	47,397	461,654

Table 357.—Principal Statistics of the Lime Industry in Canada, 1942 and 1943

—		1942	1943
Number of firms		44	41
Number of plants		48	45
Capital employed	$	4,742,066	4,607,651
Number of employees—On salary		98	99
On wages		924	799
Total		1,022	898
Salaries and wages—Salaries	$	161,777	158,629
Wages	$	1,150,543	1,249,764
Total	$	1,312,320	1,408,393
Selling value of products (gross)	$	6,530,839	6,832,992
Cost of fuel and electricity	$	2,421,292	1,747,012
Process supplies used	$	177,268	177,470
Selling value of products (net)	$	3,932,279	4,908,510

Table 358.—Capital Employed in the Lime Industry in Canada, by Provinces, 1943

Province	Capital employed as represented by:					
	Present cash value of land	Present value of buildings, fixtures, machinery, tools and other equipment	Inventory value of stone on hand, fuel and miscellaneous supplies on hand	Inventory value of finished products on hand	Operating capital (cash bills and accounts receivable, prepaid expenses, etc.)	Total
	$	$	$	$	$	$
New Brunswick (*)	25,387	120,853	9,536	3,972	42,293	**202,041**
Quebec	16,050	449,052	234,515	4,983	196,943	**902,143**
Ontario	91,466	1,735,557	302,032	8,035	25,736	**2,162,826**
Manitoba	....	487,949	30,808	3,913	....	**522,670**
Alberta	2,500	194,868	10,556	6,287	47,352	**261,563**
British Columbia	5,000	290,826	63,439	8,086	189,057	**556,408**
Canada	**141,003**	**3,279,105**	**650,886**	**35,276**	**501,381**	**4,607,651**

(*) Includes data for 2 firms in Nova Scotia.

Table 359.—Number of Firms, Employees, Salaries and Wages and Lime (Quick and Hydrated) Sold or Used, by Provinces, 1943

Province	Number of firms	Number of employees	Salaries and wages	Fuel electricity and process supplies used	Production	
					Tons of lime, sold or used	Value (gross)
			$	$		$
1943						
New Brunswick (*)	5	102	152,150	89,035	27,115	287,712
Quebec	15	337	429,155	661,787	382,432	2,667,391
Ontario	11	241	435,158	890,323	411,921	3,115,194
Manitoba	4	84	110,071	139,908	30,038	307,819
Alberta	4	42	63,147	43,969	18,215	149,455
British Columbia	2	92	218,712	99,460	38,047	305,421
Canada	**41**	**898**	**1,408,393**	**1,924,482**	**907,768**	**6,832,992**

(*) Includes data relating to two firms in Nova Scotia.

Table 360.—Number of Wage-Earners on Payroll or Time Record on the Last Day of Each Month or Nearest Work Day, 1941-1943

Month	1941		1942		1943			
					Quarry		Kiln	
	Quarry	Kiln	Quarry	Kiln	Male	Female	Male	Female
January	300	605	285	628	322	....	518	1
February	319	630	297	619	309	....	500	1
March	343	656	314	647	275	....	503	....
April	350	665	311	640	310	....	509	....
May	375	668	318	643	281	....	525	....
June	368	674	331	637	274	....	529	....
July	379	705	327	633	266	....	517	....
August	372	666	307	604	275	....	506	....
September	375	660	299	587	260	....	513	2
October	373	674	261	631	261	....	539	2
November	365	659	271	614	261	....	538	2
December	333	631	272	590	245	....	505	2

SAND-LIME BRICK INDUSTRY

Four plants in Canada were engaged chiefly in making sand-lime building brick during 1943. Two of these were located in Ontario, 1 in Quebec and 1 in Manitoba. Production, including some cement blocks and brick, was valued at $213,247 a decrease of 29·8 per cent from the 1942 total of $303,762.

Capital invested in these works amounted to $358,158. An average of 56 people were employed and they were paid $84,313 in salaries and wages. Expenditures for fuel and electricity amounted to $22,025 and for processing materials to $66,673.

Production of sand-lime brick amounted to 9,088M valued at $123,268, a decline in both quantity and value from the output of 12,472M brick at $169,716 in the previous year. Production value of sand-lime building blocks dropped to $22,365 from $30,691.

Table 361.—Materials Used in Manufacturing, 1942 and 1943

Material	Unit of measure	1942 Quantity	1942 Cost at works	1943 Quantity	1943 Cost at works
			$		$
Portland cement	bbl.	7,949	17,295	4,482	8,678
Quicklime	ton	3,518	29,037	2,441	20,435
Sand and gravel	cu. yd.	36,206	35,756	18,990	26,955
Cinders	cu. yd.	4,964	4,080	6,000	4,500
Other materials	....	....	13,556	....	6,105
Total	....	....	**99,274**	....	**66,673**

Table 362.—Products Made, 1942 and 1942

—		1942 Quantity	1942 Selling vlaue at works	1943 Quantity	1943 Selling value at works
			$		$
Sand-lime brick	M	12,472	169,716	9,088	123,268
Sand-lime building blocks	M	213	30,691	139	22,365
Other products (*)		....	103,355	....	67,614
Total		....	**303,762**	....	**213,247**

(*) Includes cement blocks, cinder blocks and insulating brick.

SAND AND GRAVEL INDUSTRY

Commercial production of sand and gravel in Canada duirng 1943 totalled 25,744,469 short tons valued at $9,005,857 compared with 26,349,907 short tons worth $9,005,414 in 1942. Included in the totals for both years are sands and gravels from various sources, including recoveries by dredges and material used by railroads as ballast and by mines as backfill.

Quebec and Ontario are Canada's largest sand and gravel producing provinces, the tonnage in these provinces in 1943 being, respectively, 10,601,376 and 8,285,309; in 1943, the quantity of material washed or screened at Canadian sand and gravel plants totalled 2,842,803 short tons as against 3,656,889 tons in 1942, and the quantity of bank or pit-run grades amounted to 22,901,666 short tons compared with a corresponding tonnage of 22,693,018 in the preceding year.

Of the total sand and gravel (mixed) output in 1943, there were 16,060,686 short tons used for concrete, roads, etc., and 3,837,111 short tons as railroad ballast. In addition, there were produced 1,970,316 short tons of straight-run sand for building, concrete, etc.; 42,656 tons for moulding; 1,335 short tons as core sand and 75,888 short tons for other purposes. The quantity of crushed gravel produced during the year under review amounted to 2,269,892 short tons. Sand used as mine fill in 1943 amounted to 1,486,585 short tons.

Firms (including individuals) reported as active in the Canadian sand and gravel industry numbered 1,387 in 1943; of these, 812 were located in Quebec, 517 in Ontario, 23 in British Columbia and lesser numbers in Nova Scotia, New Brunswick, Manitoba, Saskatchewan and Alberta. Capital employed by the industry totalled $3,674,501; employees were reported at 2,320; salaries and wages paid totalled $2,683,257; fuel, electricity and process supplies used aggregated $379,435 and the total net value of production was estimated at $8,626,422.

Deposits of gravel and sand are numerous throughout Eastern Canada, with the exception of Prince Edward Island, where gravels are scarce. Owing to the widespread occurrence of gravels and sands and to their bulk in relation to value, local needs for these materials are usually supplied from the nearest deposits, as their cost to the consumer is governed largely by the length of haul; hence the large number of small pits and the small number of large plants. Some grades of sand particularly suitable for certain industries command a much higher price than does ordinary sand.

Every province except New Brunswick and Prince Edward Island produces natural bonded moulding sand. One deposit in New Brunswick was operated in 1918 and another in 1921 and 1922. By far the greater part of the output has come from the Niagara Peninsula, Ontario. Occasionally new deposits have been opened up, mostly in Ontario and in the western provinces.

The results of a general investigation of moulding sands in Canada were published in 1936 by the Bureau of Mines, Ottawa, in Report No. 767, "Natural Bonded Moulding Sands of Canada". This report directs attention to the large number of deposits from which supplies have been obtained for local foundries and the possibility of replacing imported material with Canadian sands.

Canadian exports of sand and gravel totalled 382,319 short tons valued at $212,503 in 1943 compared with 508,950 tons worth $219,223 in 1942. Imports of sand and gravel in 1943 totalled 83,482 short tons valued at $53,377 as against 132,452 tons worth $89,974 in 1942.

Imports into Canada of silica sand for manufacturing totalled 509,043 short tons valued at $1,011,117 in 1943 as against 540,904 tons worth $1,011,476 in 1942.

Table 363.—Production in Cnaada of Sand and Gravel, 1942 and 1943

—	Washed or screened	Bank or pit run	Total Value
	tons	tons	$
PRODUCTION (*)— 1942			
Sand—			
Moulding sand	25,753	10,054	**41,825**
Building sand and sand for concrete, roadwork, etc.	1,617,886	917,480	**934,777**
Core sand	2,454	240	**3,670**
Mine filling	......	836,757	**147,602**
Other sand (including blast sands, engine sands, etc.)	2,727	51,302	**12,534**
Sand and Gravel—			
Sand and gravel for railway ballast	275,814	4,334,509	**957,781**
Sand and gravel for concrete, road-building, etc.	1,342,011	14,797,848	**6,010,412**
Crushed gravel	390,244	1,744,828	**895,813**
Total	**3,656,889**	**22,693,018**	**9,005,414**
Cost of fuel, electricity and process supplies used	......	......	677,149
Total net value	......	......	**8,328,265**
PRODUCTION (*)— 1943			
Sand—			
Moulding sand	28,013	14,643	**76,199**
Building sand and sand for concrete, roadwork, etc.	1,153,953	816,363	**775,392**
Core sand	1,335	......	**2,032**
Mine filling	118,838	1,367,747	**270,863**
Other sand (including blast sands, engine sands, etc.)	4,959	70,929	**15,577**
Sand and Gravel—			
Sand and gravel for railway ballast	81,607	3,755,414	**712,140**
Sand and gravel for concrete, road-building, etc.	1,247,057	14,813,629	**6,155,625**
Crushed gravel	206,951	2,062,941	**998,029**
Total	**2,842,803**	**22,901,666**	**9,005,857**
Cost of fuel, electricity and process supplies used	......	......	379,435
Total net value	......	......	**8,626,422**

(*) Does not include production of natural silica sand or of silica sand manufactured from quartz or silica rock; production of these are recorded under quartz in the bulletin "The Feldspar and Quartz Mining Industry".

Table 364.—Production (*) of Sand and Gravel in Canada, 1934-1943

Year	Tons	$	Year	Tons	$
1934	14,854,159	4,035,477	1939	31,294,341	11,241,102
1935	21,213,489	6,389,440	1940	31,375,415	11,759,245
1936	22,124,160	6,921,399	1941	31,604,806	10,375,723
1937	27,001,301	10,492,696	1942	26,349,907	9,005,414
1938	32,223,882	12,002,554	1943	25,744,469	9,005,857

(*) Does not include production of natural silica sand or of silica sand manufactured from quartz or silica rock; production of these are recorded under quartz. Also, does not include sand used for back filling at mines prior to 1936.

Table 365.—Production of Sand and gravel in Canada, by Railway Operators, 1942 and 1943

Kind	1942		1943	
	Tons	Value	Tons	Value
		$		$
Sand—				
Moulding sand	300	600	330	990
Building sand and sand for concrete, roads, etc.	1,350	150	86,257	12,779
Other sand (including blast and engine sands)	45,517	7,645	57,811	10,053
Sand and gravel—				
Sand and gravel for railway ballast	3,821,861	742,668	3,578,115	604,202
Sand and gravel for concrete, roads, etc.	140,285	25,049	258,538	41,023
Crushed gravel	128,125	68,717	219,517	153,420
Total	**4,137,438**	**844,829**	**4,200,568**	**823,067**

Table 366.—Production of Sand and Gravel in Canada, by Operators, Other Than Railways, 1942 and 1943

Kind	1942			1943		
	Washed or screened	Bank or pit-run	Value	Washed or screened	Bank or pit-run	Value
	tons	tons	$	tons	tons	$
Sand—						
Moulding sand	25,753	9,754	41,225	28,013	14,313	75,209
Building sand and sand for concrete, roads, etc	1,617,886	916,130	934,627	1,153,953	730,106	762,613
Core sand	2,454	240	3,670	1,335	....	2,032
Other sand (including blast and engine sands)	2,727	5,785	4,889	4,959	13,118	5,524
Sand and gravel—						
Sand and gravel for railway ballast	275,814	512,648	215,113	81,697	177,299	107,938
Sand and gravel for concrete, roads, etc.	1,342,011	14,657,563	5,985,363	1,247,057	14,555,091	6,114,002
Mine filling	....	836,757	147,602	118,838	1,367,747	270,863
Crushed gravel	390,244	1,616,703	828,096	206,951	1,843,424	844,609
Total	**3,656,889**	**18,555,580**	**8,160,585**	**2,842,803**	**18,701,098**	**8,182,790**

Table 367.—Production of Sand and Gravel in Canada, by Provinces, 1943

—	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
Sand—								
Moulding sand ... tons	1,219	....	....	40,082	863	20	....	472
$	4,571	....	....	69,935	1,385	45	....	263
Building sand and sand for concrete, roadwork, etc. ... tons	84,232	....	935,680	811,043	22,490	1,018	9,685	106,168
$	12,479	....	274,246	432,404	10,161	87	13,572	32,443
Core sand ... tons	....	....	....	1,335	....	....	....	....
$	....	....	....	2,032	....	....	....	....
Other sand (including blast sand, engine sand, etc.) ... tons	....	....	1,754	17,109	....	48,021	8,275	729
$	....	....	426	4,631	....	8,545	1,867	108
Sand and gravel—								
Sand and gravel for railway ballast ... tons	134,887	228,190	1,140,313	1,235,220	263,879	456,684	152,107	225,831
$	20,640	36,722	214,545	214,656	44,229	71,348	21,593	88,407
Sand and gravel for concrete, roads, etc. ... tons	518,568	460,439	6,700,039	5,141,510	761,441	781,621	456,090	1,240,978
$	420,815	313,026	1,194,112	2,616,766	238,163	503,416	272,357	596,970
Mine filling ... tons	....	....	....	893,441	....	890	....	592,245
$	....	....	....	174,103	....	246	....	96,514
Crushed gravel ... tons	178,470	30,902	1,823,590	145,569	....	....	....	91,361
$	120,502	23,188	679,306	106,325	....	....	....	62,708
Total ... tons	**917,376**	**719,531**	**10,601,376**	**8,285,309**	**1,048,673**	**1,288,263**	**626,157**	**2,257,784**
Gross value ... $	**585,007**	**372,936**	**2,362,635**	**3,620,852**	**293,938**	**583,687**	**309,389**	**877,413**

Table 368.—Production of Washed and Screened and Pit Run Grades, 1943

Province	Washed or screened	Bank or pit run	Total Value
	tons	tons	$
Nova Scotia	33,973	883,403	585,007
New Brunswick	....	719,531	372,936
Quebec	391,297	10,210,079	2,362,635
Ontario	1,652,094	6,633,215	3,620,852
Manitoba	113,008	935,665	293,938
Saskatchewan	....	1,288,263	583,687
Alberta	54,499	571,658	309,389
British Columbia	597,932	1,659,852	877,413
Total	**2,842,803**	**22,901,666**	**9,005,857**

Table 369.—Production of Sand for Building and Concrete, Roads, etc., and Sand and Gravel for Railway Ballast and for Concrete, Roads, etc., 1934-1943

Year	Sand		Sand and Gravel			
	For building, concrete, roads, etc. (*)		For railway ballast		For concrete, roads, etc.	
	tons	$	tons	$	tons	$
1934	686,631	209,002	1,454,618	266,292	12,418,408	3,411,751
1935	787,412	264,435	2,267,195	415,092	17,531,047	5,357,331
1936	956,502	362,542	6,318,681	1,054,703	14,336,640	5,216,942
1937	1,356,269	476,824	2,764,639	533,876	19,453,188	8,340,764
1938	1,750,187	685,976	2,359,703	443,936	22,513,256	9,101,882
1939	1,169,899	364,829	3,223,718	603,288	22,899,751	8,988,114
1940	1,961,604	537,937	3,834,904	699,518	21,465,961	9,100,612
1941	2,192,405	729,901	4,836,908	916,979	19,769,798	7,135,258
1942	2,535,366	934,777	4,610,323	957,781	16,139,859	6,010,412
1943—						
Nova Scotia	84,232	12,479	134,887	20,640	518,568	420,815
New Brunswick	....	....	228,190	36,722	460,439	313,026
Quebec	935,680	274,246	1,140,313	214,545	6,700,039	1,194,112
Ontario	811,043	432,404	1,235,220	214,656	5,141,510	2,616,766
Manitoba	22,490	10,161	263,879	44,229	761,441	238,163
Saskatchewan	1,018	87	456,684	71,348	781,621	503,416
Alberta	9,685	13,572	152,107	21,593	456,090	272,357
British Columbia	106,168	32,443	225,831	88,407	1,240,978	596,970
Canada	**1,970,316**	**775,392**	**3,837,111**	**712,140**	**16,060,686**	**6,155,625**

(*) Exclusive of engine and other sands and mine fill.

Table 370.—Principal Statistics of the Sand and Gravel Industry in Canada (*), 1941-1943

—		1941	1942	1943
Number of firms		1,399	1,419	1,387
Capital employed	$	4,287,789	4,477,547	3,674,501
Number of employees—On salary		109	113	89
On wages		3,143	2,028	2,231
Total		**3,252**	**2,141**	**2,320**
Salaries and wages—Salaries	$	214,840	224,868	182,034
Wages	$	2,780,686	2,179,887	2,501,223
Total	$	**2,995,526**	**2,404,755**	**2,683,257**
Selling value of sand and gravel produced by railway companies (Gross)	$	821,789	844,829	823,067
Selling value of sand and gravel produced by other operators (Gross)	$	9,553,934	8,160,585	8,182,790
Total Selling Value of Sand and Gravel Produced (Gross)	$	10,375,723	9,005,414	9,005,857
Cost of fuel and electricity	$	389,643	509,190	322,202
Cost of process supplies used	$	85,004	167,959	57,233
Total net value of production	$	**9,901,076**	**8,328,265**	**8,626,422**

(*) Includes data relating to sand production by dredgers and railways.

Table 371.—Capital Employed, Number of Employees, Salaries and Wages Paid, and Fuel and Electricity Consumed, by Provinces, 1943

Province	Number of operators	Capital employed (*)	Number of employees	Salaries and wages	Cost of fuel and electricity used	Cost of process supplies used	Net value of production
		$		$	$	$	$
1943							
Nova Scotia	5	(*)	614	552,647	(*)	(*)	585,007
New Brunswick	4	5,000	138	119,670	(*)	(*)	372,936
Quebec	812	250,077	781	810,722	34,158	11,889	2,316,588
Ontario	517	1,260,097	336	469,591	221,425	14,638	3,384,789
Manitoba	10	543,568	187	291,308	10,733	15,099	268,106
Saskatchewan	10	113,692	36	68,238	811	12,212	570,664
Alberta	6	58,071	84	143,576	11,388	1,572	296,429
British Columbia	23	1,443,996	144	227,505	43,687	1,623	831,903

(*) Complete data not available.

Table 372.—Employees, Salaries and Wages in the Sand and Gravel Industry, by Provinces 1943

Province	Average number of employees			Salaries and wages		
	Salaried Employees	Wage-earners	Total	Salaries	Wages	Total
				$	$	$
Nova Scotia	1	613	614	250	552,397	552,647
New Brunswick	....	138	138	....	119,670	119,670
Quebec	14	767	781	13,287	797,435	810,722
Ontario	26	310	336	53,089	416,502	469,591
Manitoba	16	171	187	40,088	251,220	291,308
Saskatchewan	1	35	36	100	68,138	68,238
Alberta	5	79	84	24,485	119,091	143,576
British Columbia	26	118	144	50,735	176,770	227,505
Canada	***89**	**†2,231**	**2,320**	**182,034**	**2,501,223**	**2,683,257**

* Includes 12 females. † Includes 4 females.

Table 373.—Average Number of Wage-Earners, by Months, 1939-1943

Month	1939	1940	1941	1942	(*) 1943
January	203	274	450	369	333
February	245	268	440	434	358
March	340	346	517	524	367
April	821	629	815	782	665
May	11,054	3,275	4,400	3,796	3,310
June	13,444	8,182	8,493	5,352	5,155
July	13,591	11,504	8,023	4,787	5,753
August	12,451	11,526	7,225	3,183	4,247
September	10,253	8,644	3,421	1,835	2,870
October	5,199	3,372	2,570	1,142	2,095
November	1,032	886	764	954	714
December	382	628	412	528	480

(*) Average for year 2,227 males and 4 females.

THE STONE INDUSTRY IN CANADA

The Stone Industry in Canada comprises two main divisions: 1. **The Stone Quarrying Industry**, including quarries and dressing works operated in conjunction with quarries, and 2. **The Stone Products Industry**, comprising the operations of firms having no quarries but who operate dressing works where stone for building and monumental purposes is cut, polished or otherwise finished. In the Census of Industry, statistics on the stone quarrying industry are included under mining, while statistics of the Stone Products industry are included under manufactures. For convenience, this report carries data for both of these industries.

These two major divisions, constituting the Canadian stone industry, represented a capital investment of $14,300,581 in 1943. Production during the year totalled $10,402,844, which figure includes the value of the quarry output and the value added by manufacturing in the secondary stone industry. Salaried employees and wage-earners employed in 1943 numbered 3,330 and their combined earnings amounted to $4,786,170.

The two industries are treated separately in the following review:

1. PRIMARY PRODUCTION—THE STONE QUARRYING INDUSTRY

The kinds of stone quarried in Canada include granite (trap rock, syenite and other igneous rock), limestone, marble, sandstone, and slate. Stone of almost every known variety occurs in Canada; rocks of the igneous areas of British Columbia, Manitoba, Ontario, Quebec and the Maritime Provinces exhibit a wide range of physical characteristics, some varieties being especially noted for their richness of colour and beauty of crystallization. The sedimentary rocks, including limestones, sandstones and marbles are quarried at various points in Canada. The products from quarries operating in these different formations not only yield high class structural and decorative materials but provide the chemical and other allied industries with many of their increasing requirements.

The gross value of all varieties of stone produced in Canada during 1943 totalled $7,964,179 compared with $8,746,594 in 1942. The tonnage shipped in 1943 included 6,265,181 tons of limestone valued at $6,105,749; 780,422 tons of granite (igneous rocks) valued at $1,522,072; 164,163 tons of sandstone valued at $250,603; 11,848 tons of marble valued at $68,022, and 1,336 tons of slate worth $17,733. Of the total value of domestic stone produced in 1943, quarries in the province of Quebec contributed 50·2 per cent, Ontario 37·1 per cent, and Nova Scotia 5·3 per cent.

The number of firms in the stone quarrying industry in 1943 totalled 407; capital employed amounted to $10,954,939; employees numbered 2,473; salaries and wages paid aggregated $3,529,755, and the cost of fuel, electricity and process supplies used was reported at $1,533,627.

Table 374.—Production (Sales) of Stone from Canadian Quarries, by Kinds and by Provinces, 1942 and 1943

Province		Granite (a)	Limestone (b)	Marble	Sandstone	Slate	Total
1942							
Nova Scotia	tons	429	185,232	...	43,856	...	229,517
	$	41,985	645,680	...	76,502	...	764,167
New Brunswick	tons	964	82,623	...	4,350	...	87,937
	$	29,334	281,296	...	10,650	...	321,280
Quebec	tons	1,178,765	2,926,964	9,429	72,894	158	4,188,210
	$	1,449,840	2,565,029	58,714	92,724	158	4,166,465
Ontario	tons	90,530	2,992,885	4,295	18,835	...	3,106,545
	$	288,828	2,636,431	27,675	33,004	...	2,985,938
Manitoba	tons	133	43,355	...	...	...	43,488
	$	2,452	69,514	...	...	...	71,966
Alberta	tons	...	12,028	...	...	...	12,028
	$	...	40,436	...	...	...	40,436
British Columbia	tons	95,604	199,496	100	13,930	1,211	310,341
	$	133,810	230,139	1,820	13,930	16,643	396,342
Canada	**tons**	**1,366,425**	**6,442,583**	**13,824**	**153,865**	**1,369**	**7,978,066**
	$	**1,946,249**	**6,468,525**	**88,209**	**226,810**	**16,801**	**8,746,594**
1943							
Nova Scotia	tons	703	174,933	...	72,232	...	247,868
	$	28,407	264,197	...	128,265	...	420,869
New Brunswick	tons	1,522	51,406	...	655	...	53,583
	$	15,856	128,915	...	2,600	...	147,371
Quebec	tons	634,920	2,709,320	7,596	75,298	191	3,427,325
	$	1,164,463	2,696,205	41,720	94,388	191	3,996,967
Ontario	tons	79,582	3,114,460	4,167	7,818	...	3,206,027
	$	212,136	2,704,205	24,852	17,190	...	2,958,383
Manitoba	tons	...	37,974	...	...	...	37,974
	$	...	50,784	...	...	...	50,784
Alberta	tons	...	13,961	...	...	...	13,961
	$	...	47,899	...	...	...	47,899
British Columbia	tons	63,695	163,127	85	8,160	1,145	236,212
	$	101,210	213,544	1,450	8,160	17,542	341,906
Canada	**tons**	**780,422**	**6,265,181**	**11,848**	**164,163**	**1,336**	**7,222,950**
	$	**1,522,072**	**6,105,749**	**68,022**	**250,603**	**17,733**	**7,964,179**

(a) All igneous rocks included.

(b) Includes dolomite, also marl for agricultural purposes.

NOTE.—Not included in the above limestone statistics are 2,155,750 tons of limestone consumed in the cement industry in 1942 and 1,918,742 tons in 1943. Limestone used in the Canadian lime industry is also not included; it is estimated that approximately 1,574,508 tons of limestone were burned in the manufacture of lime in 1942 and 1,614,481 tons in 1943.

Table 375.—Production (Sales) of Stone from Canadian Quarries, by Provinces, Showing Purposes for Which Used, 1943 (*)

For use as follows:		Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Alberta	British Columbia	Canada
1943									
Building stone—Rough	tons	660	116	3,718	2,397	...	...	1,636	**8,527**
	$	4,445	1,506	10,509	8,307	...	...	1,727	**26,494**
Dressed	tons	...	235	7,329	956	40	...	...	**8,560**
	$	...	4,607	255,329	25,983	2,015	...	...	**287,934**
Monumental and ornamental stone—Rough	tons	48	286	5,668	150	...	...	1,158	**7,310**
	$	747	9,686	92,330	1,882	...	...	12,090	**116,735**
Dressed	tons	275	...	3,180	50	130	...	290	**3,925**
	$	27,000	...	322,259	1,050	4,700	...	42,519	**397,528**
Flagstone	tons	...	30	...	2,167	45	...	...	**2,242**
	$	...	700	...	4,903	275	...	...	**5,878**
Curbstone	tons	...	...	327	...	...	...	...	**327**
	$	...	...	2,364	...	...	...	...	**2,364**
Paving blocks	tons	...	...	800	...	...	...	...	**800**
	$	...	...	7,014	...	...	...	...	**7,014**
Lining open-hearth furnaces	tons	5,463	...	...	14,783	...	...	...	**20,246**
	$	9,560	...	...	11,087	...	...	...	**20,647**
Chemical—									
Flux in iron and steel furnaces	tons	123,728	6	1,743	420,797	4,921	1,210	2,032	**554,437**
	$	148,475	13	1,481	340,358	8,255	3,030	3,589	**505,201**
Flux in non-ferrous smelters	tons	...	...	132,670	111,617	...	...	38,830	**283,117**
	$	...	...	71,150	82,618	...	...	23,666	**177,434**
Glass factories	tons	...	...	319	...	...	3,838	...	**4,157**
	$	...	...	1,580	...	...	5,757	...	**7,337**
Pulp and paper mills	tons	2,846	4,270	129,480	30,299	1,365	...	47,122	**215,382**
	$	14,246	7,902	176,139	86,521	1,502	...	88,570	**374,880**
Sugar refineries	tons	...	...	...	11,180	...	...	...	**11,180**
	$	...	...	...	9,503	...	...	...	**9,503**
Other chemical uses	tons	...	...	...	244,697	...	...	16,256	**260,953**
	$	...	...	...	239,229	...	...	16,543	**255,772**
Pulverized Stone—									
Whiting (substitute)	tons	...	...	...	2,715	...	...	190	**2,905**
	$	...	...	...	15,480	...	...	2,280	**17,760**
Asphalt filler	tons	196	...	17,359	3,486	...	...	1,703	**22,744**
	$	1,764	...	61,314	12,825	...	...	9,157	**85,060**
Dusting coal mines	tons	5,271	...	...	...	...	2,552	368	**8,191**
	$	6,325	...	...	...	...	10,208	2,484	**19,017**
Agricultural purposes and fertilizer plants	tons	34,616	46,678	154,465	28,665	2,379	2,285	1,948	**271,036**
	$	81,014	120,911	246,804	63,558	5,946	9,140	5,844	**533,217**
Other uses	tons	...	...	140	7,272	3,413	42	90	**10,957**
	$	...	...	763	24,313	2,963	168	1,160	**29,367**
Crushed stone for manufacture of artificial stone	tons	...	...	116	121	...	...	...	**237**
	$	...	...	542	524	...	...	...	**1,066**
Roofing granules	tons	...	...	...	7,239	...	...	873	**8,112**
	$	...	...	...	97,266	...	...	15,284	**112,550**
Poultry grit	tons	...	...	3,622	9,094	130	4,034	1,327	**18,207**
	$	...	...	20,324	52,427	1,040	19,596	6,710	**100,097**
Stucco dash	tons	...	...	662	319	35	...	448	**1,464**
	$	...	...	4,296	962	155	...	4,333	**9,746**
Terrazzo chips	tons	...	...	642	850	...	...	...	**1,492**
	$	...	...	3,206	5,000	...	...	...	**8,206**
Rock wool	tons	...	...	...	13,237	...	...	...	**13,237**
	$	...	...	...	12,660	...	...	...	**12,660**
Rubble and riprap	tons	2,760	1,962	355,586	121,905	4,500	...	53,914	**540,627**
	$	4,837	2,046	238,865	128,546	4,900	...	39,731	**418,925**
Crushed stone—									
Concrete aggregate	tons	57,006	...	1,428,719	492,797	2,000	...	700	**1,981,222**
	$	64,267	...	1,253,110	408,182	1,700	...	630	**1,727,889**
Road metal	tons	14,999	...	735,721	1,282,286	16,255	...	59,167	**2,108,428**
	$	58,189	...	848,229	1,010,752	14,910	...	57,429	**1,989,509**
Railroad ballast	tons	...	...	445,059	396,948	2,761	...	8,160	**852,928**
	$	...	...	379,359	314,447	2,423	...	8,160	**704,389**
Total Canada	**tons**	**247,868**	**53,583**	**3,427,325**	**3,206,027**	**37,974**	**13,961**	**236,212**	**7,222,950**
	$	420,869	147,371	3,996,967	2,958,383	50,784	47,899	341,906	**7,964,179**
Per cent of total	Quantity	3·43	0·74	47·45	44·39	0·52	0·19	3·28	**100·00**
	Value	5·28	1·85	50·19	37·15	0·64	0·60	4·29	**100·00**

(*) Includes the production of slate and marl.

Table 376.—Production (Sales) of Stone from Canadian Quarries, by Kinds, Showing Purposes for Which Used, 1942 and 1943

For use as follows:		Granite (a)	Lime-stone (b)	Marble	Sand-stone	Slate	Total
1942							
Building stone—Rough	tons	2,354	11,818	214	1,298	.....	15,684
	$	12,540	25,250	10,692	7,034	.....	55,516
Dressed	tons	2,497	6,230	146	340	.....	9,213
	$	108,807	169,382	19,476	8,600	.....	306,265
Monumental and ornamental stone—							
Rough	tons	6,858	.....	53	.....	.....	6,911
	$	99,011	.....	1,349	.....	.....	100,360
Dressed	tons	3,827	218	.....	.....	.....	4,045
	$	356,459	4,513	.....	.....	.....	360,972
Flagstone	tons	.....	223	.....	1,042	.....	1,265
	$	.....	1,276	.....	5,363	.....	6,639
Curbstone	tons	5,571	.....	.....	.....	.....	5,571
	$	28,781	.....	.....	.....	.....	28,781
Paving blocks	tons	2,008	.....	.....	25	.....	2,033
	$	12,776	.....	.....	280	.....	13,056
Lining open-hearth furnaces	tons	.....	20,311	.....	.....	.....	20,311
	$	.....	15,238	.....	.....	.....	15,238
Chemical—							
Flux in iron and steel furnaces	tons	.....	581,373	.....	.....	.....	581,373
	$	.....	920,241	.....	.....	.....	920,241
Flux in non-ferrous smelters	tons	.....	178,037	.....	.....	.....	178,037
	$	.....	123,042	.....	.....	.....	123,042
Glass factories	tons	.....	3,358	1,177	.....	.....	4,535
	$	.....	4,197	5,483	.....	.....	9,680
Manufacture of magnesium	tons	.....	5,267	.....	.....	.....	5,267
	$	.....	3,051	.....	.....	.....	3,051
Pulp and paper mills	tons	.....	207,994	.....	.....	.....	207,994
	$	.....	330,933	.....	.....	.....	330,933
Sugar refineries	tons	.....	19,956	.....	.....	.....	19,956
	$	.....	21,527	.....	.....	.....	21,527
Other chemical uses	tons	.....	236,812	1	7,336	.....	244,149
	$	.....	237,681	5	8,873	.....	246,559
Pulverized Stone—							
Whiting (substitute)	tons	.....	3,942	.....	.....	.....	3,942
	$	.....	23,682	.....	.....	.....	23,682
Asphalt filler	tons	.....	13,494	.....	.....	51	13,545
	$	.....	56,205	.....	.....	408	56,613
Dusting coal mines	tons	.....	1,698	.....	.....	.....	1,698
	$	.....	7,757	.....	.....	.....	7,757
Agricultural purposes and fertilizer plants	tons	.....	285,924	20	.....	240	286,184
	$	.....	639,182	98	.....	1,920	641,200
Other uses	tons	.....	9,570	250	.....	.....	9,820
	$	.....	25,960	1,370	.....	.....	27,330
Crushed stone for manufacture of artificial stone	tons	.....	239	127	.....	.....	366
	$	.....	952	618	.....	.....	1,570
Roofing granules	tons	35,204	310	.....	.....	840	36,354
	$	181,352	1,240	.....	.....	13,461	196,053
Poultry grit	tons	3	5,326	3,445	.....	27	8,801
	$	70	26,433	19,782	.....	324	46,609
Stucco dash	tons	6	814	953	.....	53	1,826
	$	80	8,445	6,953	.....	530	16,008
Terrazzo chips	tons	.....	443	2,513	.....	.....	2,956
	$	.....	1,329	16,866	.....	.....	18,195
Rock wool	tons	.....	9,942	.....	.....	.....	9,942
	$	.....	9,799	.....	.....	.....	9,799
Rubble and riprap	tons	83,966	289,188	4,925	34,291	158	412,528
	$	51,201	234,940	5,517	38,458	158	330,274
Crushed Stone—							
Concrete aggregate	tons	1,051,168	1,818,625	.....	54,944	.....	2,924,737
	$	897,444	1,444,013	.....	82,900	.....	2,424,357
Road metal	tons	171,228	2,063,819	.....	40,659	.....	2,275,706
	$	196,102	1,619,999	.....	61,372	.....	1,877,473
Railroad ballst	tons	1,735	667,652	.....	13,930	.....	683,317
	$	1,626	512,258	.....	13,930	.....	527,814
Total Canada (b)	**tons**	**1,366,425**	**6,442,583**	**13,824**	**153,865**	**1,369**	**7,978,066**
	$	**1,946,249**	**6,468,525**	**88,209**	**226,810**	**16,801**	**8,746,594**

Table 376.—Production (Sales) of Stone from Canadian Quarries, by Kinds, Showing Purposes for Which Used, 1942 and 1943—Concluded

For use as follows:		Granite (a)	Lime-stone (b)	Marble	Sand-stone	Slate	Total
1943							
Building stone—Rough	tons	1,754	4,014	79	2,680	...	8,527
	$	3,497	7,859	4,427	10,711	...	26,494
Dressed	tons	3,148	5,314	73	25	...	8,560
	$	103,691	172,198	10,745	1,300	...	287,934
Monumental and ornamental stone—							
Rough	tons	7,310	...	...	...	...	7,310
	$	116,735	...	...	...	...	116,735
Dressed	tons	3,795	130	...	...	...	3,925
	$	392,828	4,700	...	...	...	397,528
Flagstone	tons	...	1,185	...	1,057	...	2,242
	$	...	1,185	...	4,693	...	5,878
Curbstone	tons	327	...	...	...	...	327
	$	2,364	...	...	...	...	2,364
Paving blocks	tons	800	...	...	...	...	800
	$	7,014	...	...	...	...	7,014
Lining open-hearth furnaces	tons	...	20,246	...	...	...	20,246
	$	...	20,647	...	...	...	20,647
Chemical—							
Flux in iron and steel furnaces	tons	...	554,422	15	...	...	554,437
	$	...	504,951	250	...	...	505,201
Flux in non-ferrous smelters	tons	...	283,117	...	...	...	283,117
	$	...	177,434	...	...	...	177,434
Glass factories	tons	...	3,928	229	...	...	4,157
	$	...	6,094	1,243	...	...	7,337
Pulp and paper mills	tons	...	215,382	...	...	...	215,382
	$	...	374,880	...	...	...	374,880
Sugar refineries	tons	...	11,180	...	...	...	11,180
	$	...	9,503	...	...	...	9,503
Other chemical uses	tons	...	260,953	...	...	...	260,953
	$	...	255,772	...	...	...	255,772
Pulverized Stone—							
Whiting (substitute)	tons	...	2,905	...	...	...	2,905
	$	...	17,760	...	...	...	17,760
Asphalt filler	tons	...	22,530	...	...	214	22,744
	$	...	83,348	...	...	1,712	85,060
Dusting coal mines	tons	...	8,191	...	...	...	8,191
	$	...	19,017	...	...	...	19,017
Agricultural purposes and fertilizer plants	tons	...	271,036	...	...	...	271,036
	$	...	533,217	...	...	...	533,217
Other uses	tons	...	10,467	490	...	...	10,957
	$	...	26,504	2,863	...	...	29,367
Crushed stone for manufacture of artificial stone	tons	...	121	116	...	...	237
	$	...	524	542	...	...	1,066
Roofing granules	tons	6,921	320	...	...	871	8,112
	$	96,920	400	...	...	15,230	112,550
Poultry grit	tons	3	12,996	5,208	...	...	18,207
	$	74	68,502	31,521	...	...	100,097
Stucco dash	tons	5	717	682	...	60	1,464
	$	66	4,384	4,696	...	600	9,746
Terrazzo chips	tons	...	148	1,344	...	...	1,492
	$	...	444	7,762	...	...	8,206
Rock wool	tons	...	13,237	...	...	...	13,237
	$	...	12,660	...	...	...	12,660
Rubble and riprap	tons	181,096	298,968	3,612	56,760	191	540,627
	$	105,644	244,821	3,973	64,296	191	418,925
Crushed Stone—							
Concrete aggregate	tons	308,341	1,604,224	...	68,657	...	1,981,222
	$	258,078	1,386,337	...	83,474	...	1,727,889
Road metal	tons	260,830	1,820,774	...	26,824	...	2,108,428
	$	430,592	1,480,948	...	77,969	...	1,989,509
Railroad ballast	tons	6,092	838,676	...	8,160	...	852,928
	$	4,569	691,660	...	8,160	...	704,389
Total Canada (b)	**tons**	**780,422**	**6,265,181**	**11,848**	**164,163**	**1,336**	**7,222,950**
	$	**1,522,072**	**6,105,749**	**68,022**	**250,603**	**17,733**	**7,964,179**

(a) Includes all igneous rock.

(b) Does not include limestone used in Canadian lime and cement industries but includes marl used for agricultural purposes.

GRANITE

Table 377.—Production of Granite (*) in Canada, 1934-1943

Year	Short tons	$	Year	Short tons	$
1934	200,285	781,739	1939	1,102,395	2,119,501
1935	326,354	1,126,287	1940	1,147,747	1,884,410
1936	941,743	1,319,313	1941	600,922	1,498,786
1937	1,135,099	1,827,433	1942	1,366,425	1,946,249
1938	705,307	1,379,417	1943	780,422	1,522,072

(*) Includes all igneous rock.

The following abstracts are from a report on granite prepared by the Bureau of Mines, Ottawa:

"The stone quarried consists of granite and related crystalline igneous rocks used for building, decorative, ornamental, or constructional purposes. Producing properties are situated in Nova Scotia, New Brunswick, Quebec, Ontario, Manitoba, and British Columbia. Large areas in Canada are underlain by granite and the prospects of finding stone suitable for its various uses are good.

"Granite for monumental use is produced in the Maritime Provinces and in Quebec, Ontario, Manitoba, and British Columbia. Early in 1939 an appreciable amount of foreign stone, principally of the black and red varieties, was imported, mainly from Finland and Sweden. Black granite has been quarried in Canada, notably in the vicinity of Lake St. John, Quebec, and from quarries along the north shore of Lake Superior, and stone from these areas should find a ready market for monumental use. Other deposits of 'black granite' in the Maritime Provinces, Quebec, Ontario, and Manitoba show promise of yielding stone of good quality.

"Much of the granite produced in Canada is used for foundations for highways; for the permanent ballasting of railway roadbeds; for heavy aggregate in large concrete structures; for the filling of breakwaters; and for bridge piers. Granite from quarries in Quebec has been used in the construction of public buildings in different parts of Canada, in competition with local stone. Most operations in which granite is used have been greatly curtailed during the war.

"Some granite is being imported from the United States for monumental use, but Canadian granite is being used to an increasing extent for this purpose. Stone for monumental use which has enjoyed a steady market for a number of years may later be completely superseded by another variety. At present the so-called 'black granite' and the 'grey' varieties seem to be in most demand for monuments, although the various shades of reds are still popular in many districts.

"Canadian producers would be well advised to give careful study to the market possibilities of a monumental stock, especially for the black and red varieties.

"In the building trade, coloured granites are being used to an increasing extent in the form of thin polished slabs for trim for buildings in which the main colour scheme calls for contrast. Canadian granites are suitable for all the purposes for which granite is used, and with persistent advertising there is no reason why this industry should not have a flourishing future."

LIMESTONE

Table 378.—Production of Limestone (*) in Canada, 1934-1943

Year	Short tons	$	Year	Short tons	$
1934	3,747,779	3,157,832	1939	4,149,589	3,817,551
1935	3,631,665	3,253,573	1940	6,108,591	5,126,075
1936	3,731,548	3,143,872	1941	7,151,049	6,057,727
1937	5,542,806	4,673,942	1942	6,442,583	6,468,525
1938	4,288,507	3,864,619	1943	6,265,181	6,105,749

(*) Includes dolomite and marl: production of marl totalled 23,026 tons in 1942 and 22,913 tons in 1943.

The following abstracts are from a report prepared by the Bureau of Mines, Ottawa:

"Limestone is the most widely used of all rocks because of the great variety and importance of its industrial uses and because of its widespread occurrence. It is quarried in all provinces of Canada except Prince Edward Island and Saskatchewan, but by far the greater part of the production comes from Ontario and Quebec. The 1943 production of limestone for all purposes, including the manufacture of lime and cement, constituted about 90 per cent of the total production of Canadian stone.

"Limestone is available in great bedded formations and in massive highly metamorphosed deposits, the former being much more common and yielding most of the production. At present almost all Canadian limestone is won by open pit methods, though underground mining of the rock has been adopted by several companies producing limestone for chemical and metallurgical uses and for making lime. Underground mining will undoubtedly become more common particularly for the production of high-grade stone for chemical purposes, as the readily accessible parts of deposits become worked out.

"For industrial use limestone is marketed in a variety of forms ranging from huge squared blocks of dimension stone used in construction, to extremely fine dust used chiefly as a mineral filler. Some of the products are processed little if at all from the condition in which the rock is obtained from the quarry (as, for example, limestone used in the wood pulp industry), but the bulk of the output is crushed and screened for use as road metal, concrete aggregate, railroad ballast, and as flux in metallurgical plants. Large quantities are used in the manufacture of Portland cement, lime, and various chemical products.

"The great bulk of limestone used in chemical and metallurgical industries is of the high-calcium variety, but dolomite is rapidly increasing in importance as an industrial raw material. Argillaceous dolomite is used for the manufacture of rock-wool, a widely used insulating material. Pure dolomite is now an important source of magnesia and magnesium metal.

"A use for limestone that is capable of enormous development is in agriculture. Though the necessity of applying limestone or lime to agricultural land in order to maintain or increase soil fertility has been emphasized for many years by authorities on agriculture, the quantity so used in Canada is still very small, whereas if the proper quantity were applied it would constitute one of the principal outlets for limestone.

"Limestone in blocks of large dimensions for sawing into building stone is quarried in Quebec, Ontario, and Manitoba. In Quebec, quarries at St. Marc des Carrières, Portneuf county, produce grey limestone, and several in and near Montreal yield limestone of similar colour. In Ontario, two quarries near Queenston in the Niagara Peninsula yield silver-grey limestone as well as small quantities of buff and of variegated buff and grey. At Longford Mills, near Orillia, buff, silver-grey, and brown limestone for use as marble and as building stone is available, but has not been quarried for the past several years. The Manitoba quarries are near Tyndall and yield mottled buff, mottled grey, and mottled variegated limestone. Besides these large quarries, the products of which have a wide shipping range, small quarries producing building stone for local use are worked near Quebec City, Montreal, and Hull in Quebec; and at Ottawa, Kingston, and Wiarton in Ontario. Rubble is their chief product.

"Some of the quarry companies market stone in all stages of manufacture, from the mill block to elaborately carved material; others sell stone only in the mill block. Waste material is utilized for crushed stone, rubble, riprap, flagging, chemical and metallurgical purposes, and for lime manufacture.

"Prices of limestone in the mill block f.o.b. quarry have remained almost stationary in recent years, and range from 50 cents to $1 a cubic foot, depending on the size of block and grade of stone."

MARBLE

Table 379.—Production of Marble in Canada, 1934-1943

Year	Short tons	$	Year	Short tons	$
1934	13,783	69,475	1939	14,124	200,054
1935	15,975	85,369	1940	13,739	75,409
1936	22,866	169,698	1941	17,649	126,081
1937	21,642	88,595	1942	13,824	88,209
1938	19,375	87,274	1943	11,848	68,022

The following abstracts are from a report prepared by the Bureau of Mines, Ottawa:

"Marble quarries are operated in Quebec, Ontario, Manitoba, and British Columbia. The products include squared blocks for sawing into slabs and for making monuments, and broken marble for rubble and for making terrazzo, stucco dash, whiting substitute, poultry grit, marble flour, and artificial stone. Waste from some of the quarries is sold for chemical uses and for road metal.

"In Quebec, several varieties of clouded grey marble and also a black marble are quarried at Phillipsburg by Missisquoi Stone and Marble Company, Limited. Some brown marble used for counters and wainscoting is obtained from the building stone quarries in the Trenton limestone at St. Marc des Carrières, Portneuf county. Dolomitic white marble is quarried and crushed by White Grit Company at Portage du Fort, Pontiac county, and by Canada Marble and Lime Company at L'Annonciation, Labelle county, for the making of terrazzo chips, stucco dash, poultry grit, artificial stone, and for chemical and ceramic uses. A small quantity of dark red marble has been quarried at Cap St. Martin near Montreal, chiefly for making tombstones.

"In Ontario, black marble in beds up to 40 inches thick is quarried at St. Albert, near Ottawa, by Silvertone Black Quarries Limited. White marble is quarried at Marmora by Bonter Marble and Calcium Company, Limited, and at Haliburton by Bolender Brothers for making terrazzo chips, poultry grit, stucco dash, and artificial stone. Buff, red, white, green, and black marbles are quarried north of Madoc by Karl Stocklosar and by Connolly Marble, Mosaic and Tile Company, Limited for use as terrazzo.

"In Manitoba, a number of highly coloured marbles are available, but there is only a small production to supply terrazzo chips and building rubble.

"In British Columbia there are many deposits of marble, but there is only a small production of white marble from near Victoria and from Texada Island for use as terrazzo, poultry grit, marble sand, and whiting substitute.

"Many known deposits of beautifully coloured marbles have never been fully investigated, chiefly because the present demand in Canada for marble of any one colour, other than for a staple variety, such as white, is comparatively small.

"The war has adversely affected the Canadian marble industry, for in 1943 most of the buildings erected were of the industrial type in which little or no standing marble was used. Few of the quarries were in active operation and such shipments as were made of block or slab marble were from stock. Some of the operators have recently taken on as a side line the production of terrazzo and poultry grit from waste marble. Most of the terrazzo previously originated in Europe but now a good range of colours is available in domestic material. Colours that are still in short supply are deep reds and some shades of yellow.

"There is a wide range in the price of marble depending on quality and rareness of colouring."

SANDSTONE

Table 380.—Production of Sandstone in Canada, 1934-1943

Year	Short tons	$	Year	Short tons	$
1934	115,169	143,283	1939	176,265	331,830
1935	342,824	838,005	1940	176,475	305,543
1936	285,508	495,856	1941	169,885	305,528
1937	235,165	343,871	1942	153,865	236,810
1938	101,854	218,405	1943	164,163	250,603

Canadian sandstone has been utilized extensively in the construction of many important public buildings in Canada and is finding increasing favour as a material in the construction of the better type home. The rock occurs in Canada in a variety of colours, including white, reddish brown, yellow and grey. Shipments of sandstone were made in 1943 from quarries located in all of the provinces with the exception of Prince Edward Island, Manitoba, Saskatchewan and Alberta.

The greater part of the crude output in 1943 was employed as rubble and riprap and in the crushed state for concrete, highway construction and railroad ballasting. Sandstone in British Columbia, New Brunswick and Nova Scotia has been employed in the manufacture of abrasive wheels and sharpening stones; such production is included with natural abrasives manufacture. Crude, crushed or ground quartzite sold for fluxing purposes or as silica sand is included under quartz as production.

SLATE

Table 381.—Production of Slate in Canada, 1934-1943

Year	Short tons	$	Year	Short tons	$
1934	738	4,802	1939	1,149	6,760
1935	1,129	4,329	1940	1,113	7,522
1936	1,247	5,414	1941	1,296	12,562
1937	900	5,519	1942	1,369	16,801
1938	979	6,311	1943	1,338	17,733

Canadian slate production in 1943 came entirely from the provinces of Quebec and British Columbia and represented shipments of the stone in the form of granules for roofing purposes, riprap and asphalt filling. No Canadian deposits of slate suitable for the production of high grade roofing slates or shingles have been reported as being under development in recent years.

Table 382.—Production of Stone for Building Purposes, Chemical Use, Cement Manufacture, Concrete Aggregate, Road Metal and Railroad Ballast, 1934-1943

Year		Building stone (a)	For chemical purposes (b)	For concrete aggregate	For road metal	For railroad ballast	For cement manufacture (c)
1934	tons	52,665	489,580	821,099	2,062,487	345,802	806,546
	$	490,095	447,429	608,240	1,668,927	209,296	....
1935	tons	200,809	537,799	804,719	1,976,363	351,302	818,443
	$	1,258,741	483,709	523,847	1,987,351	211,993	....
1936	tons	42,335	615,207	1,014,145	1,903,927	784,081	1,180,358
	$	714,616	553,597	730,617	1,653,134	659,656	....
1937	tons	49,098	693,947	1,497,655	3,169,136	642,248	1,465,168
	$	746,370	626,297	1,214,181	2,522,080	570,606	....
1938	tons	49,666	551,737	981,739	2,721,922	86,019	1,358,689
	$	725,402	468,000	791,971	2,347,010	58,816	....
1939	tons	71,288	577,278	1,344,636	2,131,306	600,266	1,407,099
	$	1,344,340	523,579	1,109,028	1,773,337	522,882	....
1940	tons	97,336	725,685	2,673,078	2,300,613	896,408	1,784,291
	$	722,514	681,796	2,171,487	1,885,744	741,772	....
1941	tons	54,262	965,690	2,581,583	2,958,613	446,505	2,113,618
	$	653,077	889,574	1,986,226	2,484,393	322,348	....
1942	tons	24,897	1,236,044	2,924,737	2,275,706	683,317	2,186,248
	$	361,781	1,651,982	2,424,357	1,877,473	527,814	....
1943	tons	17,087	1,329,226	1,981,222	2,108,428	852,928	1,994,202
	$	314,428	1,330,127	1,727,889	1,980,509	704,389	....

(a) Does not include monumental or ornamental stone.

(b) Does not include limestone used in Canadian lime industry.

(c) Includes shale 1937-1943. (Includes 13,821 tons shale in 1938; 27,241 tons in 1939; 18,347 tons in 1940; 26,837 tons in 1941; 30,498 tons in 1942 and 75,460 tons in 1943).

WHITING SUBSTITUTE

(Bureau of Mines, Ottawa)

Whiting substitute, as the name implies, is a material that may be used in place of chalk whiting, all of which originates in England or in continental Europe. It may be made from white limestone or white marble, marl, lime, or the waste calcium carbonate sludge resulting from the manufacture of caustic soda.

The products made from white marble or white limestone are pulverized to various degrees of fineness ranging from 200 to 400 mesh, and the raw material used contains very little magnesium carbonate, though in the past a whiting substitute made from white dolomite was produced in Eastern Canada for making putty.

The principal differences between whiting made from chalk and whiting substitute made from marble or limestone are that the latter is usually whiter, has a low capacity for absorbing oil, and the individual particles are subangular rather than rounded. Most of the whiting substitute made in Canada is made from white marble.

Marl suitable for making whiting substitute should be white or nearly so, be nearly free from grit and clayey material, and have a very low content of organic matter. This last-named constituent, which is present to some extent in all deposits of marl, renders the product unsuitable for use as a filler in products such as putty and paint where it will come in contact with oils. The oil-absorptive capacity of whiting substitute made from marl is usually greater than that of whiting, but in other respects the physical characteristics of the two products are much the same. Two plants have been built to make whiting substitute from marl, but only one was in operation in 1943. The output of that plant was utilized entirely as a filler for newsprint.

By-product precipitated chalk, made from waste sludge resulting from the manufacture of caustic soda from soda ash and lime, is classed as a whiting substitute, but its usefulness is restricted by the fact that it almost invariably contains a small amount of free alkali. The raw materials for the manufacture of by-product precipitated chalk are available, but it is not yet being made in Canada.

Producers of whiting substitute are: Pulverized Products, Limited, Montreal; Claxton Manufacturing Company, Toronto; White Valley Chemicals, Limited, Toronto; Marlhill Mines, Limited, Marlbank, Ontario; Gypsum, Lime and Alabastine, Canada, Limited, Winnipeg; and Beale Quarries, Limited, Van Anda, Texada Island, British Columbia.

No separate record is kept of production of whiting substitute, but it is known that the industry has experienced a steady growth in recent years because improvements in grinding equipment and the maintenance of close technical control have enabled products to be marketed that are very consistent in chemical and physical properties. Many manufacturers now use the domestic products with entire satisfaction in place of imported whiting, and with all European sources of whiting cut off because of the war the domestic industry is largely supplying the Canadian market.

Whiting substitute made in Canada is used mostly in the manufacture of oilcloth, linoleum, in certain kinds of rubber products, in putty, in explosives, and as a filler in newsprint, book, and magazine paper. In lesser quantities it is used in the manufacture of moulded articles, cleaning compounds and polishes, as a ceramic glaze, and for a number of other purposes.

Prices per ton, bagged and in carload lots, range from $8 to $15 a ton f.o.b. plants.

Table 383.—Consumption of Whiting, (and Chalk), by Uses, as Reported to the Annual Census of Industry, 1942 and 1943

Industry	1942 Tons	1942 Cost at works	1943 Tons	1943 Cost at works
		$		$
Paints and pigments	8,274	241,646	7,773	239,832
Rubber	4,495	83,129	3,202	58,215
Miscellaneous textiles*	4,575	50,254	4,147	45,342
Explosives (a)	436	10,454	271	4,472
Toilet preparations (a)	115	10,991	238	18,985

* Includes oilcloth and linoleum.
(a) Chalk, ground and precipitated.

Table 384.—Imports into Canada and Exports of Stone, by Kinds, 1942 and 1943

—	1942 Quantity	1942 Value	1943 Quantity	1943 Value
		$		$
IMPORTS—				
Curling stones and handles therefor ... pair	380	8,069	392	8,784
Flagstone, sandstone, and all building stone, not hammered, sawn or chiselled ... ton	800	6,135	422	1,651
Flagstone and building stone, other than marble or granite, sawn on not more than two sides ... ton	318	2,975	432	4,000
Granite, rough, not hammered or chiselled		44,022		47,291
Granite, sawn only		17,488		16,450
Granite, monuments		609		
Granite, manufactures of, n.o.p.		2,129		5,828
Marble, rough, not hammered or chiselled		4,446		5,462
Marble, sawn or sand rubbed, not polished		8,951		10,282
Marble, not further manufactured than sawn for tombstones		15,091		25,971
Marble, manufactures of, n.o.p.		5,476		8,915
Refuse stone ... ton	633,086	349,776	807,561	447,850
Slate roofing ... square	454	4,338	460	5,229
Slate pencils and school writing slates		7,838		7,843
Slate mantels and manufactures of slate, n.o.p.		26,679		29,666
Chalk, china, cornwall or cliff stone and mica schist		16,800		33,404
Mineral wool ... ton	807	54,776		72,780
Whiting, gilders' whiting and Paris white ... ton	11,889	255,414	11,198	257,496
Manufactures of stone, n.o.p.		22,913		18,346
Lithographic stones not engraved		464		467
Chalk, prepared		12,321		12,290
Pumice and pumice stone and lava tufa		28,919		19,479
Grindstones, not mounted and not less than 36 inches in diameter ... No.	1,100	97,981	612	64,731
Grindstones, n.o.p. ... No.	594	2,967	1,068	2,266
Burrstones, rough, in blocks ... No.	70	2,747	36	452
Ganister ... ton	949	8,865	484	3,970
Total		**1,008,189**		**1,110,903**
EXPORTS—				
Crushed stone ... ton	608	617	1,173	999
Granite and marble, unwrought ... ton	3,245	47,155	3,762	47,258
Dressed stone of all kinds		14,433		7,819
Grindstones, manufactured		4,546		5,032
Total		**66,751**		**61,108**

Table 385.—Employees, Salaries and Wages, Specified Costs and Net Values, in the Stone Industry in Canada, by Provinces, 1943

Province	Firms	Average number of employees: Salaried employees, Male	Salaried employees, Female	Wage-earners	Salaries and wages: Salaries	Wages	Cost of fuel, electricity and process supplies used	Net value of production
	No.				$	$	$	$
Nova Scotia	36	6	1	130	16,922	162,721	26,614	394,255
New Brunswick	7		2	14	2,188	8,366	1,550	145,821
Quebec	161	168	45	1,344	240,604	1,811,313	874,671	3,122,296
Ontario	179	60	18	515	193,258	837,153	599,887	2,358,496
Manitoba	5	4	1	13	9,519	12,578	6,510	44,274
Alberta	2	(a)	(a)	(a)	(a)	(a)	(a)	47,899
British Columbia	17	14	1	137	22,499	212,634	24,395	317,511
Canada	**407**	**252**	**68**	**2,153**	**484,990**	**3,044,765**	**1,533,627**	**6,430,552**

(a) Data not available.

Table 386.—Capital Employed in the Stone Quarrying Industry of Canada, by Provinces, 1943

—	Plants	Capital employed as represented by: Present cash value of the land*	Present value of buildings, fixtures, machinery, tools and other equipment	Inventory value of materials on hand, stocks in process fuel and miscellaneous supplies on hand	Inventory value of finished products on hand	Operating capital (cash, bills and accounts receivable, prepaid expenses, etc.)	Total
	No.	$	$	$	$	$	$
Nova Scotia	40	20,691	69,947	30,000	2,500	19,910	143,048
New Brunswick	7	31,131	33,680	494	.....	12,667	77,972
Quebec	170	1,131,475	3,105,357	315,743	232,268	922,663	5,707,506
Ontario	183	1,499,776	2,076,447	108,517	120,840	679,395	4,484,975
Manitoba	6	44,590	79,558	186	.....	.....	124,334
Alberta	2	(a)	(a)	(a)	(a)	(a)	(a)
British Columbia	45	139,495	165,364	7,908	13,646	90,691	417,104
Canada	**453**	**2,867,158**	**5,530,353**	**462,848**	**369,254**	**1,725,326**	**10,954,939**

* Excluding unmined materials.
(a) Not available.

Table 387.—Average Number of Wage-Earners, by Months, 1942 and 1943

Month	1942 Total	1943 Quarry Surface Male	1943 Quarry Surface Female	1943 Quarry Underground Male	1943 Dressing works Male
January	1,462	1,282	3	.....	261
February	1,349	1,358	3	.....	299
March	1,732	1,405	3	.....	289
April	2,348	1,632	3	.....	320
May	2,862	2,053	4	.....	340
June	2,909	2,111	4	.....	355
July	2,987	2,202	4	.....	285
August	2,977	2,231	4	.....	318
September	2,958	2,284	16	.....	299
October	2,736	2,201	4	.....	319
November	2,448	1,942	4	.....	315
December	1,867	1,336	4	.....	260
Average	**2,415**	**1,859**	**6**	.....	**288**

2. SECONDARY PRODUCTION

THE STONE PRODUCTS INDUSTRY

In 1943 there were 151 stone dressing works whose operations were reported separately from the quarries. These plants were engaged chiefly in cutting or polishing Canadian or imported stone to produce finished monuments or cut and dressed stone for construction purposes. Retail establishments engaged only in selling and lettering monuments have not been included. Five producers of rock wool were also included in this industry.

Output from this industry was valued at $4,098,100 in 1943, an increase of 4 per cent over the total of $3,939,764 reported for the previous year. The 60 works in Ontario accounted for 59·2 per cent of the total output and the 41 plants in Quebec for 21·9 per cent. The average number of employees was 857 and $1,256,415 were paid in salaries and wages. Materials used in the cutting and dressing processes, including stone, cost $1,521,308 and expenditures for fuel and electricity amounted to $138,127.

Table 388.—Cost of Materials Used in the Stone Products Industry, 1942 and 1943

—	Cost at Works	
	1942	1943
	$	$
Stone—(a) From Canadian quarries	367,605	344,413
(b) Imported	193,808	178,572
Monuments, cut and polished, for lettering only	102,052	87,106
All other materials	759,922	911,217
Total	**1,423,387**	**1,521,308**

Table 389.—Production from the Stone Products Industry, by Provinces, 1942 and 1943

—	Granite		Marble		Marble chips and dust	Limestone		Finished monuments, lettered only	Other products	Total
	Monuments	For building purposes	Monuments	For building purposes		Monuments and bases	For building purposes			
	$	$	$	$	$	$	$	$	$	$
Prince Edward Island and New Brunswick,										
1942	82,551	....	11,084	....	....	1,500	....	2,440	1,115	**98,690**
1943	96,202	....	20,470	....	....	....	....	2,310	1,015	**119,997**
Nova Scotia—										
1942	38,894	1,770	17,276	....	....	1,334	....	32,034	4,676	**95,984**
1943	48,510	....	21,530	....	....	....	....	31,499	2,148	**103,687**
Quebec—										
1942	401,774	57,548	8,807	54,429	1,880	4,590	1,000	6,106	319,287	**855,421**
1943	451,938	23,473	7,656	39,150	5,264	2,425	420	15,770	353,556	**899,652**
Ontario—										
1942	840,207	37,132	92,301	75,426	7,678	3,400	101,038	78,780	1,211,518	**2,447,489**
1943	751,272	400	102,773	41,966	1,511	15,221	32,805	75,976	1,406,531	**2,428,455**
Manitoba—										
1942	52,475	....	17,386	....	165	5,482	....	31,314	8,599	**115,421**
1943	55,788	14,495	18,699	7,360	23,289	2,075	1,402	7,785	1,850	**132,743**
Saskatchewan—										
1942	47,973	....	37,918	....	1,415	6,629	350	5,875	7,991	**108,151**
1943	66,164	....	44,344	....	1,654	7,215	1,394	8,375	17,381	**146,527**
Albeta—										
1942	61,087	25,000	10,117	5,000	21,230	500	....	4,329	1,329	**128,592**
1943	65,556	27,500	9,607	5,500	23,000	600	....	....	6,592	**138,355**
British Columbia—										
1942	77,893	....	2,300	4,254	....	....	....	1,160	4,409	**90,016**
1943	66,326	....	2,210	2,654	....	....	....	10,950	46,544	**128,684**
Canada—										
1942	**1,602,854**	**121,450**	**197,189**	**139,109**	**32,368**	**23,435**	**102,388**	**162,047**	**1,558,924**	**3,939,764**
1943	**1,601,756**	**65,868**	**227,289**	**96,630**	**51,718**	**27,536**	**36,021**	**152,665**	**1,835,617**	**4,098,106**

Table 390.—Production in Canada and Imports of Rock Wool, 1934-1943

Year	Production $	Imports	
		Pounds	$
1934	1,709	2,987,611	69,267
1935	66,459	1,922,938	57,877
1936	265,472	2,391,504	101,592
1937	346,460	2,030,144	81,050
1938	398,281	1,337,954	45,109
1939	525,998	1,820,763	44,860
1940	935,229	2,082,589	52,238
1941	1,185,324	2,633,544	74,791
1942	1,417,258	1,613,914	54,776
1943	1,707,501	1,839,670	72,780

CONTRACT DRILLING IN THE CANADIAN MINING INDUSTRY, 1944

Section 1

Diamond Drilling of Deposits Other Than Fuels

There were 34 firms engaged in contract diamond drilling of Canadian mineral deposits, other than fuels, during 1944 compared with 27 in 1943. The income received from drilling operations completed by these firms in 1944 totalled $4,970,247 against $3,072,481 in the preceding year. The average number of employees in 1944 was reported at 1,468 and the amount of salaries and wages distributed totalled $2,461,813. The footage drilled by contractors in 1944, in the entire Dominion, aggregated 3,468,797 feet, of which approximately 39 per cent was completed in Ontario, 38 per cent in Quebec and 16 per cent in British Columbia. Contract diamond drilling was also conducted in Nova Scotia, Manitoba, Saskatchewan, Alberta and the Northwest Territories. Firms engaged in this type of drilling purchased in 1944 borts, ballas, carbons, readyset bits, etc., amounting in value to $810,085 compared with $637,070 in 1943.

Not included in this report are general statistics relating to diamond drilling conducted by Canadian mining companies with their own personnel and equipment; employment data relating to such operations are combined with those pertaining to the Canadian mining industry proper.

Drilling Operations Conducted by Contractors Who Employed Diamond Drills Only and Which Were Confined Chiefly to the Testing of Metalliferous Deposits

Table 391.—Contract Diamond Drilling Operations in Canada, 1943 and 1944

Province	Footage drilled	Income from drilling	Average number of employees	Total salaries and wages paid
1943		$		$
Nova Scotia	957	1,795	5	1,664
New Brunswick	...	...	...	...
Quebec	852,801	827,742	231	413,453
Ontario	1,417,935	1,763,124	508	820,591
Manitoba	35,844	43,357	18	23,561
Saskatchewan	34,860	40,951	15	20,140
Alberta	7,078	34,497	14	13,757
British Columbia	286,331	344,064	101	194,439
Yukon	...	...	...	...
Northwest Territories	13,902	16,951	4	6,339
Canada	**2,649,708**	**3,072,481**	**896**	**1,493,944**

Value of stones, readyset and castset bits purchased by contractors, 1943 .... $637,070

Province	Footage drilled	Income from drilling	Average number of employees	Total salaries and wages paid
1944		$		$
Nova Scotia	2,802	4,660	4	2,539
New Brunswick	...	...	...	...
Quebec	1,310,156	1,985,927	634	969,082
Ontario	1,348,813	2,031,096	680	1,042,491
Manitoba	69,006	115,319	38	42,989
Saskatchewan	47,926	55,962	24	26,361
Alberta	32,922	128,329	25	54,408
British Columbia	544,077	302,961	102	220,746
Yukon	...	...	...	...
Northwest Territories	113,095	255,993	61	103,107
Canada	**3,468,797**	**4,970,247**	**1,568**	**2,461,813**

Value of stones, readyset and castset bits purchased by contractors, 1944 .... $810,085

Equipment owned by these contractors in 1944 included 240 air or steam-operated drills, 334 gas-driven drills and 3 electric drills.

Table 392.—Drilling Completed on Auriferous Quartz Deposits (Gold Mines) in Canada, 1943 and 1944

—	Footage Drilled	
	1943	1944
DIAMOND DRILLING FOR EXPLORATION AND TESTING—		
By mining companies with their own personnel and equipment	543,062	510,262
By diamond drilling contractors (*)	1,321,727	1,606,20
OTHER DIAMOND DRILLING—		
Blast hole diamond drilling:		
By mining companies with their own personnel and equipment	97,298	83,672
By diamond drilling contractors (*)	591,598	444,859
Drilling by percussion or other machines (†)	20,014,708	17,830,270

(*) Included in Table 391.
(†) Not complete as records are unavailable at certain mines.

The value of diamonds purchased by gold mining companies in 1944 totalled $128,115.

Table 393.—Drilling Completed on Copper-Gold-Silver and Nickel-Copper Deposits in Canada, 1943 and 1944

—	Footage Drilled	
	1943	1944
DIAMOND DRILLING FOR EXPLORATION AND TESTING—		
By mining companies with their own personnel and equipment	109,703	99,691
By diamond drilling contractors (*)	283,028	285,386
OTHER DIAMOND DRILLING—		
Blast hole diamond drilling:		
By mining companies with their own personnel and equipment	1,197,437	1,088,602
By diamond drilling contractors (*)	32,042	139,552
Drilling by percussion or other machines (†)	16,300,824	12,731,871

(*) Included in Table 391.
(†) Not complete as records are unavailable at certain mines.

Value of diamonds purchased by copper-gold-silver and nickel-copper mining companies in 1944 totalled $180,388.

Table 394.—Drilling Completed on Silver-Lead-Zinc and Silver-Cobalt Deposits in Canada, 1943 and 1944

—	Footage Drilled	
	1943	1944
DIAMOND DRILLING FOR EXPLORATION AND TESTING—		
By mining companies with their own personnel and equipment	7,319	7,353
By diamond drilling contractors (*)	64,425	86,466
OTHER DIAMOND DRILLING—		
Blast hole diamond drilling:		
By mining companies with their own personnel and equipment	.....	.....
By diamond drilling contractors (*)	96,963	280,447
Drilling by percussion or other machines (†)	1,871,957	2,660,574

(*) Included in Table 391.
(†) Not complete as records are unavailable at certain mines.

Table 395.—Drilling Completed on Other Metal-Bearing Deposits, 1943 and 1944

—	Footage Drilled (b)	
	1943	1944
DIAMOND DRILLING FOR EXPLORATION AND TESTING—		
By mining companies with their own personnel and equipment	32,694	30,864
By diamond drilling contractors (*)	280,645	41,976
OTHER DIAMOND DRILLING—		
Blast hole diamond drilling:		
By mining companies with their own personnel and equipment	(a)	(a)
By diamond drilling contractors (*)	(a)	(a)
Drilling by percussion or other machines	(a)	(a) 356,697

(*) Included in Table 391.
(a) Not reported, or not complete as records are unavailable at certain mines.
(b) Includes drilling on iron, chromite, molybdenite and mercury deposits; exclusive of drilling on pitchblende deposits.

Diamonds purchased in 1944 by companies mining these minerals were valued at $268.

Table 396.—Drilling Completed on Asbestos Deposits, 1944

—	Footage Drilled
Diamond Drilling for Exploration and Testing—	
By mining companies with their own personnel and equipment	37,111
By diamond drilling contractors (*)	22,019
Other Diamond Drilling—	
Blast hole diamond drilling:	
By mining companies with their own personnel and equipment	.....
By diamond drilling contractors	.....
Drilling by percussion or other machines	(†) 3,414,969

(*) Included in Table 391.
(†) Not complete as data are not reported by some firms.

Diamonds purchased by asbestos mining companies in 1944 cost $5,756.

Note.—The total footage of contract drilling recorded in Tables 392, 393, 394, 395 and 396 does not necessarily agree with the corresponding totals shown in Table 391 as drilling data are incomplete or unobtainable from some mining firms.

DIRECTORY 1944

The data shown in Table 391 were compiled from returns made by the following firms:

Name of Firm	Head Office Address
Allard Bros	Val d'Or, Que.
Anderson, Anton	20 Patricia Blvd., Timmins, Ont.
Arno Diamond Drilling Co. Ltd	16½ Pine St. N., Timmins, Ont.
Baderski, Frank and Son	Schumacher Road, Timmins, Ont.
Boyles Bros. Drilling Co. Ltd	1291 Parker St., Vancouver, B.C.
Boyles Bros. Drilling (Eastern) Ltd	1291 Parker St., Vancouver, B.C.
Continental Diamond Drilling Co. Ltd	Rouyn, Que.
Connors, T. Diamond Drilling Co. Ltd	744 W. Hastings St., Vancouver, B.C.
Consolidated Diamond Drilling Corp	Room 21 — 33 Melinda St., Toronto, Ont.
Demorest Drilling Limited	Noranda, Que.
Developers of Canada Reg. (A. Barton)	Box 200, Senneterre, Que.
Dependence Diamond Drilling Co	13 Gov't. Road W., Kirkland Lake, Ont.
Globe Drilling and Exploration Co	204 — 4th St. N., Kenora, Ont.
Hawkins, H. (*)	18 Vimy Ave., Timmins, Ont.
Heath and Sherwood	6 Duncan Ave., Kirkland Lake, Ont.
Inspiration Mining & Development Co. Ltd	619—12 Richmond St. E., Toronto, Ont.
Jones and Bradley Limited	Suite 6, David Bldg., Kirkland Lake, Ont.
Kuntz, Harry J	Malartic, Que.
La Rocque, T. E	Box 287, Val d'Or, Que.
Labine Bros	McKenzie Island, Ont.
McDonald, H. C	New Denver, B.C.
McIsaac, R. M	Flin Flon, Man.
Morissette, N. Diamond Drilling Ltd	Box 440, Haileybury, Ont.
Marks, J. M. (*)	Quyon, Que.
Matheson Drilling & Exploration	Matheson, Ont.
National Diamond Drilling Co. Ltd	Box 508, Rossland, B.C.
Northern Diamond Drilling Co	707 McArthur Bldg., Winnipeg, Man.
Ontario Diamond Drilling Co. Ltd	203 MacKey Bldg., Sudbury, Ont.
Pacific Drilling & Exploration Co. Ltd	356 Alexander St., Vancouver, B.C.
Roy Bros	Malartic, Que.
Robinson Contracting Co. Ltd	804-850 Hastings St. W., Vancouver, B.C.
Smith and Travers Comapny Ltd	208 Walnut St., Sudbury, Ont.
Sprague and Henwood Ltd	188 Douglas St., Sudbury, Ont.
Sudbury Diamond Drilling Co. Ltd	619—12 Richmond St. E., Toronto, Ont.
Thompson Drilling & Mining Development Co. Ltd	Cranberry Portage, Man.

(*) Idle in 1944.

Section II.

Contract Drilling for Fuels

In 1944, there were 46 contractors who reported drilling for petroleum, natural gas or for other purposes. The footage drilled totalled 583,155 and the income from operations amounted to $5,353,845; of the footage drilled 230,519 feet were completed by cable drill, 3,000 feet by diamond drill and 349,636 feet by rotary. Employees engaged on this work totalled 533 and salaries and wages paid amounted to $1,086,878. Drilling done by oil companies with their own equipment are not included in this report. The industry in 1944 purchased diamonds, including readyset bits, etc., aggregating $500 in value.

Table 397.—Drilling Conducted During 1944 by Contractors for Petroleum, Natural Gas, and for Other Purposes Not Included in Section 1 of This Report

Province	Footage drilled for petroleum — Type of drill: cable	diamond	rotary	Footage drilled for gas — Type of drill: cable	diamond	rotary	Footage drilled for other purposes — Type of drill: cable	diamond	rotary	Gross income from drilling	Average number of employees	Total salaries and wages paid
	(feet)			(feet)			(feet)			$	No.	$
Prince Edward Island	Drilling done in this province was done by an oil company using its own equipment.											
Nova Scotia	3,393	...	...	1,228	...	...	9,136	...	...	86,922	22	28,273
New Brunswick	...	...	...	...	...	...	...	...	...	...	...	...
Quebec (a)	...	...	...	...	...	...	...	...	...	...	...	...
Ontario	4,289	...	...	182,896	...	...	21,849	...	...	397,395	93	123,906
Manitoba (a)	...	...	...	...	...	...	...	...	...	...	...	...
Saskatchewan	205	...	10,100	...	...	12,306	3,000	...	...	125,381	22	22,298
Alberta	4,523	2,000	305,901	...	1,000	21,329	...	...	...	4,744,147	396	912,401
British Columbia	...	...	...	...	...	...	...	...	...	...	...	...
Northwest Territories	...	...	...	...	...	...	...	...	...	...	...	...
Yukon	...	...	...	...	...	...	...	...	...	...	...	...
Canada	**12,410**	**2,000**	**316,001**	**184,124**	**1,000**	**33,635**	**33,985**	...	...	**5,353,845**	**533**	**1,086,878**

(a) Included with Nova Scotia.
(b) Subject to revision.

The value of stones, readyset or castset diamond bits purchased by contractors in 1944 amounted to $500.

DIRECTORY 1944

The data shown in Table 397 were compiled from returns made by the following firms:

Name of firm	Head office address
Nova Scotia—	
Kennedy, O. V.	Bridgetown
Quebec—	
McMaster, W. R.	Box 455, Caledonia, Ont.
Ontario—	
Ashton, J. L.	550 King St. W., Chatham
Culver, Marvin & Son	R.R. 2, Selkirk
Davidson, F. L., & Son	Box 137, Wingham
Demaray, Clarence	Kerwood
Dennis, G.	R.R. 2, Selkirk
Elk Development Syndicate	South Cayuga
Emerson, H. L.	R.R. 1, Dunnville
Evans, H.	Box 743, Tillsonburg
Heal, Andrew A.	Box 264, Watford
Holmes, E. B.	Bothwell
House, C. C.	Stevensville
Hussey, W. J.	Petrolia
Jackson, P. L., & Co.	Dunnville
Kiser Bros.	5 Sixth St., Chatham
Lymburner Bros. & Webber	Dunnville
McCrie & Stanley	18 Toronto St., Toronto
McCutcheon, T. J.	225 Broad St. E., Dunnville
McKillop, Wm.	Box 102, Hamilton
McLister, J. J.	Dunnville
McMaster, W. R.	Box 455, Caledonia
Patterson & Culver	Dunnville
Patterson, W. C.	Jamestown, N.Y., U.S.A.
Perkins, J. E.	Dunnville
Renwick, S.	Bright
Roth, F. & H.	R.R. 9, Dunville
Shank Bros.	Rainham Centre
Smith & Ehde	R.R. 1, Lowbanks
Stubble, H. H.	225 Grand Ave. E., Chatham
Swent, Wm.	Rainham Centre
Manitoba—	
Coyle, D. J.	796 McDermott Ave., Winnipeg
Saskatchewan—	
Creelman, R. E.	821 Ave. "C" North, Saskatoon
Northern Development Co. Ltd. (N.P.L.)	Lloydminster
Withers, C. H. Drilling Co. Ltd.	Lloydminster
Alberta—	
Alberta Drilling & Development Co.	1 Central Bldg., Calgary
Bush, O. D.	15 Board of Trade Bldg., Calgary
Can-Tex Drilling Co. Ltd.	815 Lancaster Bldg., Calgary
Drilling Contractors Ltd.	902 Lancaster Bldg., Calgary
General Petroleums Ltd.	204 Lancaster Bldg., Calgary
K d'K Drilling Co.	Vermilion
Machinery Depot Ltd.	1029—10th Ave. W., Calgary
Newell & Chandler Ltd.	337—8th Ave. W., Calgary
Regent Drilling Co. Ltd.	Vermilion
Snyder, Head & Associates	258 Scarboro Ave., Calgary
Union Drilling & Development Co.	403 Lancaster Bldg., Calgary
Williamson, M. J.	Vermilion

EXPLANATORY NOTES

Method of Computing Quantities and Values of the Mineral Production of Canada in 1943.

Arsenic.—White arsenic (AS_2O_3) produced at Canadian plants at its sales value.

Bismuth.—(a) Recoverable metal in silver-lead-bismuth bullion shipped to foreign smelters for refining at an arbitrary price; (b) Bismuth metal produced at Canadian smelters valued at the average New York price for the year.

Cadmium.—Canadian refinery production valued at the average London price for the year.

Cobalt.—Cobalt content of the various cobalt products sold by the Ontario smelter producing these products added to the cobalt content of ores and residues exported for treatment in foreign smelters; the value given is the gross amount received by the shippers.

Copper.—(a) Recoverable copper in ores and concentrates exported valued at the average London price for the year, in Canadian funds; (b) Copper in blister copper made at Manitoba; Ontario and Quebec smelters valued at the average London price for the year in Canadian funds; (c) Copper in copper-nickel matte exported from Canadian smelters valued at an arbitrary price agreed upon between the Dominion Bureau of Statistics and the Ontario Department of Mines.

The price per pound used throughout 1943 to evaluate Canadian production was that agreed upon by the Canadian Producers and the British Government, with necessary adjustments.

Gold.—Gold in bullion produced and the recoverable gold in all other Canadian mine products is valued at the standard rate of $20·671834 per fine ounce until the end of 1930. For succeeding years, unless otherwise specified, gold is valued at the average price on world markets transposed to Canadian funds.

Lead.—Recoverable lead in ores exported from Canada added to lead contained in base bullion made at Trail, B.C., valued at the average London quotations for the year in Canadian funds. The average price used for 1943 was that agreed upon by contract between Canadian producers and the British Government, with necessary adjustments.

Nickel.—(a) Refined and electrolytic nickel produced at Canadian refineries valued in Canadian funds at the average price obtained for such products sold during the year; (b) Nickel in oxides and salts sold from Canadian smelters and refineries at its total selling value in Canadian funds in the form in which it was sold; (c) Nickel in matte exported from Canada valued at an arbitrary figure agreed upon by the Ontario Department of Mines and the Dominion Bureau of Statistics (representative of the value of the nickel in matte form).

Platinum Group Metals.—Recoverable metals in smelter products and placer platinum at the average London price and transposed to Canadian funds.

Silver.—Silver bullion produced and the recoverable silver in other primary plant products, and the recoverable silver in Canadian ores exported, at the average New York price for foreign ores in Canadian funds for the refined metal.

Tellurium and Selenium.—Refinery production valued at the average London price for the year.

Zinc.—Refined zinc produced by the Consolidated Mining and Smelting Co., Ltd., at Trail, B.C., and by the Hudson Bay Mining and Smelting Co., Ltd., Flin Flon, Manitoba, and the recoverable zinc in concentrates exported, valued at the average monthly price quoted in London, in Canadian funds.

The average price used for 1943 was that agreed upon by contract between Canadian producers and the British Government, with necessary adjustments.

Coal.—Output tonnage evaluated pro rata according to income from sales.

Other Non-Metallic Minerals, Clay Products and Structural Materials.—Shipments during the year at their respective sales values.

Imports.—Statements and quantities and values are based on the declarations of importers, as subsequently checked by government officials.

The value of imported merchandise is the fair market value or the price thereof when sold for home consumption in the principal markets of the country whence and at the time when the same were exported directly to Canada. The price and value of the goods in every case are stated as in condition packed ready for shipment, the fair value being shown in the currency of the country of export, and the selling price to the purchaser in Canada shown in the actual currency in which the goods were purchased. In the case of goods that are the manufacture or produce of a foreign country, the currency of which is substantially depreciated, the value stated is the value that would be placed on similar goods manufactured or purchased in the United Kingdom and imported from that country, if such similar goods are made or produced there. If similar goods are not made or produced in the United Kingdom, the value stated is the value of similar goods made or produced in any European country, the currency of which is not substantially depreciated.

Exports.—Statements of quantities and values are based on the declaration of exporters as subsequently checked by government officials.

The value of exports of Canadian merchandise is the actual cost or the value at the time of exportation at the points in Canada whence originally shipped.

Weight.—Weight, where shown in imports and exports is the net weight of the goods, excluding the weight of the covers or receptacles, except in the cases of certain goods, as provided in the tariff.

The expression "ton" means 2,000 pounds, and cwt. 100 pounds, avoirdupois. Where other units of quantity are used, imperial standards apply.

Unless otherwise arranged, the data relating to the operations of less than three firms producing the same commodity or mineral are not published separately.

DIRECTORY OF FIRMS

In the following pages the names and addresses of all the principal operators in the Canadian mining industry are given and the location of the properties worked in 1943 is also shown.

METAL MINING INDUSTRIES

The Alluvial Gold Mining Industry

NOTE.—(x) Active but not producing.

Name	Head office address	Location
BRITISH COLUMBIA—		
Anderson, M. A.	Wells	Cariboo M.D.
Anderson, Hardale and Vik	Atlin	Atlin M.D.
Bindschadler, Carl	Wells	Cariboo M.D.
B. and K. Placers	c/o Eric North, Wells	Cariboo M.D.
Bride, Maurice	Atlin	Atlin M.D.
Buckland, John	Atlin	Atlin M.D.
Barkerville Gold Mines	Box 1, Barkerville	Cariboo M.D.
Brister, J. V. Company	Atlin	Atlin M.D.
Columbia Development Co. Ltd.	410 King St. W., Kitchener, Ont.	Atlin M.D.
Cons. Mining & Smelting Co. of Canada Ltd.	Trail	Omineca M.D.
Doodif, James	Barkerville	Cariboo M.D.
Ennerdale Placers	Van Winkle	Cariboo M.D.
Falker, I. I.	Van Winkle	Cariboo M.D.
Fleury, J. and Chapman, W.	Wells	Cariboo M.D.
Goodheart, Fred	Tranquille	Kamloops M.D.
Grange, Chas. C.	Manson Creek	Omineca M.D.
Halverson, Gunnar	Barkerville	Cariboo M.D.
Holm, Arvid	Barkerville	Cariboo M.D.
Hasbrouck, W. C.	Keithley Creek	Quesnel M.D.
Huffman, J. A.	Ft. St. James	Omineca M.D.
Huffman, G. C.	Atlin	Atlin M.D.
Ivanic & Co.	Atlin	Atlin M.D.
Kywati Synd. (x)	1609 Royal Bank Bldg., Vancouver	Kamloops M.D.
Lindgrin, Gunnar	Atlin	Atlin M.D.
Lowhee Mining Co. Ltd.	917 Rust Bldg., Tacoma, Wash., U.S.A.	Cariboo M.D.
McKinnon, Chas. E.	Atlin	Atlin M.D.
McCrae, Alex	Revelstoke	Revelstoke M.D.
Miller, James W.	Marysville	Ft. Steele M.D.
Melline, Fred	Jesmond	Clinton M.D.
Murphy, Nathan	Atlin	Atlin M.D.
Noland, John W.	Atlin	Atlin M.D.
Obman, F., Co.	Atlin	Atlin M.D.
Prpich, T.	Atlin	Atlin M.D.
Risberg, Carl A.	Van Winkle	Cariboo M.D.
Savery, W. H.	c/o W. E. North, Wells	Cariboo M.D.
Spruce Creek Mining Co. Ltd.	Box 23, Atlin	Atlin M.D.
Spruce Creek Placers Ltd. (x)	College Centre Bldg., Seattle, Wash.	Atlin M.D.
Suran, John	Cranbrook	Ft. Steele M.D.
Taburt, I.	Dome Creek	Cariboo M.D.
Trehouse Hydraulic Gold Mining Co.	Barkerville	Cariboo M.D.
YUKON—		
Clear Creek Placers Ltd.	4556 University Way, Seattle, Wash.	Clear Creek
Holbrook Dredging Co. (x)	Dawson	Sixtymile
Lunde, V.	Mayo Landing	Mayo District
Middlecoff, E.	Mayo	Hiatt Creek
Yukon Cons. Gold Corp. Ltd.	1919 Marine Bldg., Vancouver, B.C.	various operations.

Principal Operators in the Canadian Auriferous Quartz Mining Industry

NOVA SCOTIA—		
Avon Gold Mines Ltd.	411 Confederation Bldg., Montreal, Que.	Oldham
Cons. Mining & Smelting Co. of Canada Ltd.	215 St. James St. W., Montreal, Que.	Caribou Mines
Queens Mines Ltd.	Box 667, Halifax	Malaga District
QUEBEC—		
Beattie Gold Mines (Quebec) Ltd.	25 King St. W., Toronto, Ont.	Duparquet
Belleterre Quebec Mines Ltd.	Belleterre	Belleterre
Blais, G. R.	Box 575, Amos	various.
Camp Bird Mines Ltd. (x)	465 St. John St., Montreal	Varsan Tp.
Canadian Malartic Gold Mines Ltd.	25 King St. W., Toronto, Ont.	Malartic
Central Cadillac Mines Ltd.	132 St. James St. W., Montreal	Cadillac Tp.
Ceré, Léo	Box 220, Val d'Or	Villebon Tp.
Ceré, Gustave	Val d'Or	Villebon Tp.
Columbière Mines Ltd. (x)	Room 505, 67 Yonge St., Toronto, Ont.	Piedmont Tp. Bourlamaque Tp.

DIRECTORY OF FIRMS—Continued

The Canadian Auriferous Quartz Mining Industry—Continued

NOTE.—(x) Active but not producing.

Name	Head office address	Location
QUEBEC—Concluded		
Cons. Mining & Smelting Co. of Canada Ltd. (x)	215 St. James St. W., Montreal	Various.
Dome Exploration Co. (Quebec) Ltd. (x)	Bourlamaque	Various.
East Malartic Mines Ltd	355 St. James St. W., Montreal	Fournière Tp.
Eureka Mining Reg	Box 674, Val d'Or	Bourlamaque Tp.
Francœur Gold Mines Ltd	941 Dominion Square Bldg., Montreal	Arntfield.
Hosking-Cockeram Prospecting Synd. (x)	McWatters P.O.	Joannes Tp.
Lamaque Mining Co. Ltd	Bourlamaque	Bourlamaque
Lapa Cadillac Gold Mines Ltd	Suite 1010, 100 Adelaide St. W., Toronto, Ont	Cadillac Tp.
Marbenor Malartic Mines Ltd. (x)	710 Excelsior Life Bldg., Toronto, Ont	Dubuisson Tp. Fournière Tp.
Malartic Gold Fields Ltd	355 St. James St. W., Montreal	Dubuisson Tp. Fournière Tp.
McWatters Gold Mines Ltd	Drawer 988, Haileybury, Ont	Rouyn Tp.
Mic-Mac Mines Ltd	c/o Royal Trust Co., Montreal	Bousquet Tp.
Montmagny Gold Mines Ltd. (x)	c/o A. V. Corlett, Arntfield	Beauchastel Tp.
O'Brien Gold Mines Ltd	Kewagama	Cadillac Tp.
Pershing Manitou Gold Mining Co. Ltd. (x)	132 St. James St. W., Montreal	Courville Tp.
Perron Gold Mines Ltd	Perron	Pascalis Tp. Senneville Tp.
Powell-Rouyn Gold Mines Ltd	Box 200, Noranda	Rouyn Tp.
Reade, Douglas	Val d'Or	Tiblemont Tp.
Senator-Rouyn Ltd	45 A. Main St., Hull	Rouyn Tp.
Sigma Mines (Quebec) Ltd	Bourlamaque	Bourlamaque Tp.
Siscoe Gold Mines Ltd	907 Dominion Square Bldg., Montreal	Dubuisson Tp. Varsan Tp.
Sladen-Malartic Mines Ltd	56 Sparks St., Ottawa, Ont	Fourniere Tp.
Stadacona Rouyn Mines Ltd	10 St. James St. E., Montreal	Rouyn Tp.
Sullivan Cons. Mines Ltd	1604 Aldred Bldg., Montreal	Dubuisson Tp.
Thurbois Mines Ltd. (x)	201 Park Bldg., Windsor, Ont	Destor Tp.
Toburn Gold Mines Ltd. (x)	1809 Royal Bank Bldg., Toronto, Ont	Desserat Tp. Bourlamaque Tp.
West Malartic Mines Ltd	7000 Jeanne Mance St., Montreal	Cadillac Tp.
ONTARIO—		
Porcupine Area—		
Aunor Gold Mines Ltd	1600 Royal Bank Bldg., Toronto	Delore Tp.
Bonetal Gold Mines Ltd	1705 Sterling Tower Bldg., Toronto	Whitney Tp.
Broulan Porcupine Mines Ltd	1705 Sterling Tower Bldg., Toronto	Whitney Tp.
Buffalo Ankerite Gold Mines Ltd	Box 533, South Porcupine	Deloro Tp.
Coniaurum Mines Ltd	25 King St. W., Toronto	Tisdale Tp.
Delnite Mines Ltd	Box 590, Timmins	Deloro Tp.
Dome Mines Ltd	36 Toronto St., Toronto	Tisdale Tp.
Hallnor Mines Ltd	1600 Royal Bank Bldg., Toronto	Whitney Tp.
Hollinger Cons. Gold Mines Ltd	Timmins	Timmins Tp. Hislop Tp.
Hoyle Gold Mines Ltd	25 King St. W., Toronto	Whitney Tp. Cody Tp.
McIntyre Porcupine Mines Ltd	Schumacher	Whitney Tp. Tisdale Tp.
Moneta Porcupine Mines Ltd	67 Younge St., Toronto	Timmins
Naybob Mines Ltd	c/o J. Montgomery, Federal Bldg., Toronto	Ogden Tp.
Pamour Porcupine Mines Ltd	Pamour	Whitney Tp.
Paymaster Cons. Mines Ltd	Box 508, South Porcupine	Deloro Tp. Tisdale Tp.
Preston East Dome Mines Ltd	South Porcupine	Tisdale Tp.
Kirkland Lake Area—		
Bidgood Kirkland Gold Mines Ltd	Box 850, Kirkland Lake	Lebel Tp.
Continental Kirkland Gold Mines Ltd. (x)	1809 Royal Bank Bldg., Toronto	Kirkland Lake
Kirkland Lake Gold Mining Co. Ltd	314 Metropolitan Bldg., Toronto	Teck Tp.
Lake Shore Mines Ltd	Kirkland Lake	Teck Tp.
Leta Explorations Ltd. (x)	67 Yonge St., Toronto	Various.
Macassa Mines Ltd	1001 Federal Bldg., Toronto	Teck Tp.
Sylvanite Gold Mine Ltd	Box 670, Kirkland Lake	Teck Tp.
Teck-Hughes Gold Mines Ltd	14 Finkle St., Woodstock	Teck Tp.
Toburn Gold Mines Ltd	1809 Royal Bank Bldg., Toronto	Teck Tp. Lebel Tp.
Upper Canada Mines Ltd	1101 Federal Bldg., Toronto	Gauthier Tp.
Wright-Hargreaves Mines Ltd	1203 Liberty Bank Bldg., Buffalo, N.Y.	Teck Tp.
Larder Lake Area—		
Chesterville Larder Lake Gold Mining Co. Ltd	330 Bay St., Toronto	McGarry Tp.
Kerr-Addison Gold Mines Ltd	80 King St. W., Toronto	McGarry Tp.
Omega Gold Mines Ltd	Larder Lake	McVittie Tp.
Pelangio-Larder Mines Ltd. (x)	Drawer 967, Kirkland Lake	McGarry Tp.
Tovarich-Larder Gold Mines Ltd. (x)	372 Bay St., Toronto	Hearst, McElroy and McVittie Tps.
Yama Gold Mines Ltd	171 Yonge St., Toronto	Catherine Tp.

DIRECTORY OF FIRMS—Continued

The Canadian Auriferous Quartz Mining Industry—Continued

NOTE.—(x) Active but not producing.

Name	Head office address	Location
ONTARIO—Continued		
Matachewan Area—		
Hollinger Cons. Gold Mines Ltd	Timmins	Powell Tp.
Matachewan Cons. Mines Ltd	25 King St. W., Toronto	Powell and Cairo Tps.
Sudbury Area—		
Jerome Gold Mines Ltd	350 Bay St., Toronto	Osway and Huffman Tps.
Algoma Area —		
Deep Lake Gold Mines Ltd	109 N. Union St., Akron, Ohio, U.S.A.	Michipicoten.
Regenery Metals	c/o E. W. Munro, Siderite	Michipicoten.
Thunder Bay Area—		
Hard Rock Gold Mines Ltd	Geraldton	Ashmore Tp.
Leitch Gold Mines Ltd	Beardmore	Eva and Summers Tps.
Little Long Lac Gold Mines Ltd	25 King St. W., Toronto	Errington and Ashmore Tps.
Magnet Cons. Mines Ltd	Geraldton	Errington Tp.
MacLeod-Cockshutt Gold Mines Ltd	357 Bay St., Toronto	Ashmore Tp.
Kenora Area—		
Goldwood Gold Mine Ltd	36 Toronto St., Toronto	Kenora District.
Kenwest Gold Mines Ltd	10 Adelaide St. E., Toronto	Upper Manitou Lake
Wendigo Gold Mines Ltd	Kenora	Witch Bay.
Patricia District—		
Berens River Mines Ltd	Favourable Lake	Favourable Lake
Central Patricia Gold Mines Ltd	Federal Bldg., Toronto	Crow River
Cochenour Willans Gold Mines Ltd	68 Yonge St., Toronto	Dome Tp.
Hasaga Gold Mines Ltd	Red Lake	Red Lake.
Madsen Red Lake Gold Mines Ltd	67 Yonge St., Toronto	Baird and Heyson Tps.
McKenzie Red Lake Gold Mines Ltd	Premier Trust Bldg., Toronto	Dome Tp.
McMarmac Red Lake Gold Mines Ltd	66 King St. W., Toronto	Dome Tp.
Pickle Crow Gold Mines Ltd	25 King St. W., Toronto	Pickle Lake.
Uchi Gold Mines Ltd	25 King St. W., Toronto	Uchi Lake.
MANITOBA—		
Goldbeam Mines Ltd. (x)	75 Summit Ave., Toronto	West Hawk Lake
God's Lake Gold Mines Ltd	395 Main St., Winnipeg	God's Lake.
San Antonio Gold Mines Ltd	237 Curry Bldg., Winnipeg	Rice Lake.
Webb, T. R	Cranberry Portage	Elbow Lake.
SASKATCHEWAN—		
Studer, Adolph	Sulphite Lake	Lac La Ronge.
BRITISH COLUMBIA—		
Bayonne Cons. Mines Ltd. (x)	308 Pacific Bldg., Vancouver	Nelson M.D.
Bralorne Mines Ltd	555 Burrard St., Vancouver	Lillooet M.D.
Cariboo Gold Quartz Mining Co. Ltd	Royal Bank Bldg., Vancouver	Cariboo M.D.
Dentonia-Gold Finch	Box 629, Greenwood	Greenwood M.D.
Gold Belt Mining Co. Ltd	475 Howe St., Vancouver	Nelson M.D.
Hedley Mascot Gold Mines Ltd	Royal Bank Bldg., Vancouver	Osoyoos M.D.
Island Mountain Mines Co. Ltd	Wells	Cariboo M.D.
Kelowna Exploration Co. Ltd	Hedley	Osoyoos M.D.
Kootenay Belle Gold Mines Ltd	Stock Exchange Bldg., Vancouver	Nelson M.D.
Livingstone Mining Co	Blewett	Blewett.
Nelson Slocan Cons. Mines Ltd	490 Baker St., Nelson	Nelson M.D.
Pioneer Gold Mines of B.C. Ltd	607 Rogers Bldg., Vancouver	Lillooet M.D.
Privateer Mine Ltd. and Prident Gold Mines Ltd	Room 602, 475 Howe St., Vancouver	Alberni M.D.
Sheep Creek Gold Mines Ltd	616 Stock Exchange Bldg., Vancouver	Nelson M.D.
Silbak Premier Mines Ltd	626 Pender St. W., Vancouver	Portland Canal M.D.
NORTHWEST TERRITORIES—		
Cons. Mining & Smelting Co. of Canada Ltd	Trail, B.C	Yellowknife M.D.
Negus Mines Ltd	410 Royal Bank Bldg., Toronto, Ont	Yellowknife M.D.
Rycon Mines Ltd	c/o Cons. Mining & Smelting Co. of Canada, Trail, B.C	Yellowknife M.D.
Thompson-Lundmark Gold Mines Ltd	c/o Cons. Mining & Smelting Co. of Canada, Trail, B.C	Yellowknife M.D.

Operators in Canadian Copper-Gold-Silver Mining Industry

QUEBEC—		
Aldermac Copper Corp. Ltd	Dominion Square Bldg., Montreal	Beauchastel Tp. Ascot Tp.
Bagamac Mines Ltd. (x)	Oak Ridges, Ont	Rouyn Tp.
Donalda Mines Ltd. (x)	132 St. James St. W., Montreal	Rouyn Tp.
Létourneau, Joseph (x)	Disraeli	Stratford Tp.

DIRECTORY OF FIRMS—Continued

The Auriferous Quartz Mining Industry—Concluded

NOTE.—(x) Active but not producing.

Name	Head office address	Location
QUEBEC—Concluded		
Macdonald Mines Ltd. (x)	132 St. James St. W., Montreal	Dufresnoy Tp.
Metalore Mining Corp. Ltd. (x)	156 Yonge St., Toronto, Ont.	Perron Tp. Desmeloizes Tp.
Noranda Mines Ltd.	Royal Bank Bldg., Toronto, Ont.	Rouyn Tp.
Normetal Mining Corp. Ltd.	350 Bay St., Toronto, Ont.	Desmeloizes Tp.
Naus, Roy D. (x)	R.R. 2, Compton	Compton Tp. Weedon Tp.
Sullivan Cons. Mines Ltd. (x)	1604 Aldred Bldg., Montreal	Bourlamaque Tp.
Touton Mining & Exploration Co. (x)	500 Place d'Armes, Montreal	Fabre Tp.
Waite Amulet Mines Ltd.	Noranda	Dufresnoy Tp. Duprat Tp.
ONTARIO—		
Algoma Copper Mines Ltd.	199 Bay St., Toronto	Tp. 1A, Algoma.
Kam-Kotia Porcupine Mines Ltd.	Timmins	Robb Tp.
MANITOBA—		
Emergency Metals Ltd.	Royal Bank Bldg., Winnipeg	The Pas M.D.
Hudson Bay Mining & Smelting Co. Ltd.	Royal Bank Bldg., Winnipeg	The Pas M.D.
Sherritt Gordon Mines Ltd.	25 King St. W., Toronto, Ont.	The Pas M.D.
SASKATCHEWAN—		
Hudson Bay Mining & Smelting Co. Ltd.	Royal Bank Bldg., Winnipeg	Flin Flon area.
BRITISH COLUMBIA—		
Britannia Mining & Smelting Co. Ltd.	Britannia Beach	Vancouver M.D.
Granby Cons. Mining, Smelting & Power Co. Ltd.	675 West Hastings St., Vancouver	Similkameen M.D.
Industrial Metals Mining Co. Ltd. (x)	101 Royal Trust Bldg., Vancouver	Nanaimo M.D.
Twin "J" Mines Ltd.	Box 398, Duncan	Victoria M.S.
Austin Mining Synd. (Nerlip)	Box 643, Cobalt, Ont.	Coleman Tp.
Ankarlo & Bell (Silver Bar)	3033 N. Humboldt Ave., Milwaukee 12, Wis.	Cobalt.
Bellayse Mineral Interests Ltd.	Room 710, 36 Toronto St., Toronto, Ont.	South Lorraine
Cobalt Products Ltd. (Provincial) (†)	67 Yonge St., Toronto, Ont.	Bucke Tp.
(Agaunico) (x)		Gillies Limit
Comet Leasing Co. (Kerr Lake)	Box 274, Cobalt, Ont.	Coleman Tp.
Cross Lake Lease (O'Brien)	Box 390, Cobalt, Ont.	Houltain Tp.
(Miller Lake O'Brien)		Coleman Tp.
Davis, Norman B. (x)	512 Victoria Bldg., Ottawa, Ont.	Werner Lake
McCready, W. E. (Nipissing)	Cobalt, Ont.	Cobalt
Mercier, Raoul (Trethewey)	Box 547, Cobalt, Ont.	Coleman Tp.
(Foster)		
Murphy and Landry (Coniagas)	Cobalt, Ont.	Cobalt
(Trethewey)		
Nipissing Mining Co. Ltd.	1007 Excelsior Life Bldg., Toronto	Cobalt
Presse, A. (Nipissing)	Cobalt, Ont.	Cobalt
O'Shaughnessy, C. V. J. (x)	Box 319, Cobalt, Ont.	Custom mill—Cobalt
Peterson Lease (Hudson Bay)	52 Nickel St., Cobalt, Ont.	Cobalt
Rowe, Stuckey & Parsons (Frontier)	Box 755, Cobalt, Ont.	Silver Centre
Sanymac Milling & Development Co. Ltd. (x) (Congiaas and Red Jacket)	501 Central Building, Toronto, Ont.	Coleman Tp.
Sutherland, J. H. (Lawson)	Cobalt, Ont.	Coleman
Silanco Mining & Smelting Corp. Ltd. (x)	45 Richmond St. W., Toronto, Ont.	Bucke Tp. Gillies Limit
Smith, Chas. (Cobalt Lake)	Cobalt, Ont.	Cobalt.
Sycee Cobalt Silver Mines Ltd.	Fasken & Co., 36 Toronto St., Toronto, Ont.	Coleman Tp.
Taylor, W. D. (Lorrain Trout Lake)	Cobalt	South Lorraine
Waldag Prospecting Synd. (Waldman)	Room 304, 21 King St. E., Toronto, Ont.	Gillies Limit
Windsor Cobalt Silvers Ltd. (Cobnor) (x)	Room 15, 9 Toronto St., Toronto, Ont.	Bucke Tp.

(†) Now operated by Silanco Mining & Smelting Corp. Ltd.
(x) Conducted milling operations.
NOTE.—In addition to the names listed, there were several small shippers from whom official reports were unobtainable. Mine names shown in brackets.

The Canadian Silver-Lead-Zinc Mining Industry

QUEBEC—		
Federal Zinc & Lead Co. Ltd. (x)	708 Drummond Bldg., Montreal	Lemieux Tp.
Golden Manitou Mines Ltd.	Room 1104, 330 Bay St., Toronto, Ont.	Bourlamaque Tp.
Lyall and Beidelman (x)	708 Drummond Bldg., Montreal	Lemieux Tp.
New Calumet Mines Ltd.	25 King St. W., Toronto, Ont.	Calumet Island.
Siscoe Metals Ltd. (Tetreault mine)	907 Dominion Square Bldg., Montreal	Portneuf Co.
ONTARIO—		
Beausoleil, Geo. & Co. (x)	221 Notre Dame St. W., Montreal, Que.	Enterprise.
Lake Geneva Mining Co. Ltd.	941 Dominion Square Bldg., Montreal, Que.	Hess Tp.
Ozone War Metals Mining Synd. Ltd. (x)	30 La Belle Bldg., Windsor, Ont.	Prospecting.

DIRECTORY OF FIRMS—Continued

The Canadian Silver-Lead-Zinc Mining Industry—Concluded

(x) Active but not producing.

Name of operator	Head office address	Location of mine
YUKON—		
Bjonnes, Ellef	Mayo	Mayo M.D.
Settlemier & Bermingham	Mayo	Mayo M.D.
Treadwell Yukon Corp. Ltd. (a)	1022 Crocker Bldg., San Francisco, Cal.	Mayo M.D.
BRITISH COLUMBIA—(†)		
Ainsmore Cons. Mines Ltd	121 Yonge St., Toronto, Ont.	Ainsworth.
Base Metals Mining Corp. Ltd	Suite 602, 350 Bay St., Toronto, Ont.	Field.
Campbell, Colin J. (Bosun)	4675 West 5th Ave., Vancouver	New Denver.
Cons. Mining & Smelting Co. of Canada Ltd.	Trail	Kimberley.
Doney, E. and Vandergriff, E. (Victor)	Sandon	Sandon.
Highland-Bell Ltd	Creston	Beaverdell.
Kootenay Belle Gold Mines Ltd. (Whitewater)	916 Stock Exchange Bldg., Vancouver	Retallock
Kootenay Florence Project	c/o Wartime Metals Corp., 637 Craig St. W., Montreal, Que.	Ainsworth M.D.
McCready, G. E. (Caledonia)	Retallock	Ainsworth M.D.
Omineca Base Metals Ltd. (x) (Silver Standard)	475 Howe St., Vancouver	New Hazelton.
Petersen, Eugene H., (New Spring field)	Box 182, Sandon	Sandon.
Providence Mine Synd.	Box 629, Greenwood	Greenwood M.D.
Reco Mountain Base Metals Mines Ltd.	c/o Hamilton and Wragge, Nelson	Sandon.
Sheep Creek Gold Mines Ltd. (Zincton)	616 Stock Exchange Bldg., Vancouver	Zincton.
Wanke, Ed. A. (Cariboo)	Greenwood	Rock Creek.
Western Exploration Co. Ltd.	Silverton	Slocan Lake.

(a) Now in liquidation.
(†) Exclusive of several small shippers who are usually lessees.

The Nickel-Copper Mining, Smelting and Refining Industry

ONTARIO—		
Falconbridge Nickel Mines, Ltd.	25 King St. W., Toronto	Falconbridge Tp.
International Nickel Company of Canada, Limited	Copper Cliff	Mines: Tps. of Levack, Snider, McKim and Garson. Smelters: Copper Cliff and Coniston. Nickel refinery: Port Colborne. Copper refinery: Copper Cliff.
Nickel Offsets Ltd.	Room 1701, 372 Bay St., Toronto	Foy Tp.
Ontario Nickel Mines Ltd.	Room 304, 350 Bay St., Toronto	MacLennan Tp.
Dominion Nickel Mining Corp. Ltd. (x)	Room 28, 24 King St. W., Toronto	Norman Tp.
Harlin Nickel Mines Ltd.	Room 503, 357 Bay St., Toronto	Porquis Jct.

THE MISCELLANEOUS METAL MINING INDUSTRY

(x) Active but not producing.

Name of firm and product	Head office address	Location of mine or plant
Aluminum—		
Aluminum Company of Canada Limited	1700 Sun Life Bldg., Montreal, Que.	Arvida Que. Shawinigan Falls, Que. La Tuque, Que. Isle Maligne, Que. Beauharnois, Que.
Antimony—		
Consolidated Mining & Smelting Company of Canada Ltd.	215 St. James St., Montreal, Que.	Trail, B.C.
Beryl—		
Canadian Beryllium Mines & Alloys Ltd. (x)	Room 401, 100 Adelaide St. W., Toronto, Ont.	Renfrew Co., Ont.
Universal Light Metals Co. (x)	28 James St. S., Hamilton, Ont.	Renfrew Co., Ont.
Bismuth—		
Deloro Smelting & Refining Co. Ltd. (x)	900 Victoria Bldg., Ottawa, Ont.	Deloro, Ont.
Consolidated Mining & Smelting Company of Canada Ltd.	215 St. James St., Montreal, Que.	Trail, B.C.

DIRECTORY OF FIRMS—Continued

THE MISCELLANEOUS METAL MINING INDUSTRY—Continued

(x) Active but not producing.

Name of firm and product	Head office address	Location of mine or plant
Cadmium—		
Consolidated Mining & Smelting Company of Canada Ltd.	215 St. James St., Montreal, Que.	Trail, B.C.
Hudson Bay Mining & Smelting Co. Ltd.	500 Royal Bank Bldg., Winnipeg, Man.	Flin Flon, Man.
Chromite—		
Alchrome Prospecting Synd. (x)	11 King St. W., Toronto, Ont.	Matapedia Co., Que.
Asbestos Corporation Ltd.	Thetford Mines, Que.	Thetford Mines, Que.
Chrome Association	c/o Simeon Bergeron, 142 Notre Dame St., Black Lake, Que.	Black Lake, Que.
Chromite Limited	404 Notre Dame St. W., Montreal, Que.	St. Cyr, Que.
Chromore Ltd.	Manoir Hebert, Thetford Mines, Que.	Thetford Mines, Que.
Corriveau, Alexandre (x)	Disraeli, Que.	Garthey Tp., Que.
Labbe, Ward & Lambert	Thetford Mines, Que.	Coleraine Tp., Que.
Labonte and Motiver	7 rue Notre Dame, Thetford Mines, Que.	Coleraine Tp., Que.
Mount Albert Mining Co. Ltd. (x)	1010 Canada Cement Bldg., Montreal, Que.	Gaspé District, Que.
Morisset, R. and Co.	Black Lake, Que.	Coleraine Tp., Que.
Paro, Orel	Black Lake, Que.	Coleraine Tp., Que.
Roberge, J. W.	Thetford Mines, Que.	Thetford District, Que.
Thetford Ferro Chrome Reg.	Thetford Mines, Que.	Coleraine Tp., Que.
Wartime Metals Corp. (Chromeraine Project)	637 Craig St. W., Montreal, Que.	Coleraine Tp., Que.
Iron Ore—		
Dominion Steel & Coal Corp. Ltd.	Sydney, N.S.	Bathurst, N.B.
Goyette, A. E. (x)	4295 St. Hubert St., Montreal, Que.	Arthabaska Co., Que.
Hollinger North Shore Exploration Co. Ltd. (x)	721 Royal Bank Bldg., Montreal, Que.	New Quebec.
Algoma Ore Properties Ltd.	Cornwall Bldg., Sault Ste. Marie, Ont.	Algoma District, Que.
Great Lakes Iron Mines Lts. (x)	Room 505, 67 Yonge St., Toronto, Ont.	Atikokan, Ont.
Gunflint Iron Mines Ltd. (x)	Room 412, 11 King St. W., Toronto, Ont.	Round Lake, Ont. Shebandowan, Ont.
Hollinger Cons. Gold Mines Ltd. (x)	Timmins, Ont.	Halton Co., Ont.
Michipicoten Iron Mines Ltd. (x)	Room 2810, 25 King St. W., Toronto, Ont.	Algoma District, Ont.
Midwest Iron Corp. Ltd. (x)	36 Toronto St., Toronto, Ont.	Arikokan, Ont.
Rebair Gold Mines Ltd. (x)	9 Adelaide St. E., Toronto, Ont.	Atikokan, Ont.
Steep Rock Iron Mines Ltd. (x)	25 King St. W., Toronto, Ont.	Atikokan, Ont.
Tomahawk Iron Mines Ltd. (x)	Suite 405, 67 Yonge St., Toronto, Ont.	Hastings Co., Ont.
Indium—		
Consolidated Mining & Smelting Company of Canada Ltd.	215 St. James St., Montreal, Que.	Trail, B.C.
Lithium Ore—		
Hudson Bay Mining & Smelting Co. Ltd. (x)	500 Royal Bank Bldg., Winnipeg, Man.	Cat Lake, Man.
Lithium Corporation of Canada Ltd. (x)	403 Avenue Bldg., Winnipeg, Man.	Bernic and Cat Lakes, Man.
Sherritt Gordon Mines Ltd. (x)	25 King St. W., Toronto, Ont.	Crowduck Bay, Man. East Braintree, Man.
Magnesium—		
Consolidated Mining & Smelting Company of Canada Ltd. (x)	215 St. James St., Montreal, Que.	Trail, B.C.
Dominion Magnesium Ltd.	Room 1107, 67 Yonge St., Toronto, Ont.	Haley, Ont.
Manganese Ore—		
British Manganese Mines Ltd.	Room 1102, 45 Richmond St. W., Toronto, Ont.	Sussex, N.B.
Mercury—		
Bralorne Mines Ltd.	555 Burrard St., Vancouver, B.C.	Omineca District, B.C.
Consolidated Mining & Smelting Company of Canada Ltd.	215 St. James St., Montreal, Que.	Pinchi Lake, B.C.
Molybdenite—		
Consolidated Mining & Smelting Company of Canada Ltd.	215 St. James St., Montreal, Que.	Salmo, B.C.
Creamar Moly Mines Ltd.	410 Royal Bank Bldg., Toronto, Ont.	Searchmont, Ont.
Farley Mining Co.	195½ Main St., Hull, Que.	Gatineau Dist., Que.
Gayhurst Prospecting Synd. (x)	Room 428, 67 Yonge St., Toronto, Ont.	Prospecting, Que.
Indian Molybdenum Ltd.	Bourlamaque, Que.	Preissac, Que.
Norseman Mines Ltd. (x)	80 Richmond St. W., Toronto, Ont.	LaCorne Tp., Que.
Norwin Molybdenite Mines Ltd. (x)	Room 405, 26 Queen St. E., Toronto, Ont.	Eardley Tp. Que.
Molyca Mines Ltd.	3778 Batrel St., Montreal, Que.	Oldfield Tp., Que.
Quyon Molybdenite Co. Ltd.	Quyon, Que.	Quyon, Que.
Steeloy Mining Corp. Ltd. (x)	80 King St. W., Toronto, Ont.	Preissac Tp., Que.
Sullivan Cons. Mines Ltd. (x)	1604 Aldred Bldg., Montreal, Que.	LaCorne Tp., Que.
Wartime Metals Corp.	637 Craig St. W., Montreal, Que.	LaCorne Tp., Que. Bagot Tp., Ont.
Pitchblende—		
Eldorado Mining & Refining	80 King St. W., Toronto, Ont.	Great Bear Lake, N.W.T
Selenium-Tellurium—		
International Nickel Co. of Canada Ltd.	Copper Cliff, Ont.	Copper Cliff, Ont.
Canadian Copper Refiners Ltd.	1600 Royal Bank Bldg., Toronto, Ont.	Montreal East, Que.

DIRECTORY OF FIRMS—Continued

THE MISCELLANEOUS METAL MINING INDUSTRY—Concluded

(x) Active but not producing.

Name of firm and product	Head office address	Location of mine or plant
Tin—		
Consolidated Mining & Smelting Company of Canada Ltd	215 St. James St., Montreal, Que	Trail, B.C.
Titanium Ore—		
Baie St. Paul Titanic Iron Ore Co	Baie St. Paul, Que	St. Urbain, Que.
Brossard, Hercule (x)	La Malbaie, Que	La Malbaie, Que.
Coulombe, J	71 Ave. Royal Monument, Quebec, Que	St. Urbain, Que.
Tungsten Concentrates—		
B.C. War Metals Research Board (†)	University of British Columbia, Vancouver, B.C	Vancouver, B.C.
Bralorne Mines Ltd	555 Burrard St., Vancouver, B.C	Bralorne, B.C.
Bureau of Mines (Federal) (†)	Booth St., Ottawa, Ont	Ottawa, Ont.
Consolidated Mining & Smelting Company of Canada Ltd	215 St. James St., Montreal, Que	Nelson M.D., B.C. (x) Omineca M.D., B.C. Greenwood M.D., B.C. (x)
Eldridge, G. S. (x)	567 Hornby St., Vancouver, B.C	Albert Canyon, B.C.
Hollinger Cons. Gold Mines Ltd. (†)	Timmins, Ont	Timmins, Ont.
Little Long Lac Gold Mines Ltd. (†)	Geraldton, Ont	Geraldton, Ont.
Phillips, Edwin	Gold Bridge, B.C	Lillooet Dist., B.C.
Quebec Department of Mines (†)	Quebec, Que	Val d'Or, Que..
Wartime Metals Corp. (Emerald)	637 Craig St. W., Montreal, Que	Salmo, B.C.

(†) Treated ores from various Canadian mines.

The Canadian Non-Ferrous Smelting and Refining Industry

Quebec—		
Aluminum Company of Canada Ltd	1700 Sun Life Bldg., Montreal, Que	Arvida, Shawinigan Falls, La Tuque, Isle Maligne, Beauharnois.
Canadian Copper Refiners Ltd	1600 Royal Bank Bldg., Toronto, Ontatio	Montreal East.
Noranda Mines Limited	1600 Royal Bank Bldg., Toronto, Ontario	Noranda.
Ontario—		
Deloro Smelting Refining Co. Limited	Deloro, Ontario	Deloro.
Dominion Magnesium Ltd	67 Yonge St., Toronto, Ont	Haley.
Eldorado Mining nnd Refining	80 King Street, W., Toronto, Ontario	Port Hope.
Falconbridge Nickel Mines Ltd	25 King Street W., Toronto, Ontario	Falconbridge.
International Nickel Co. of Canada Limited	Copper Cliff, Ontario	Copper Cliff, Coniston, Port Colborne.
Manitoba—		
Hudson Bay Mining and Smelting Co. Limited	500 Royal Bank Bldg., Winnipeg, Manitoba	Flin Flon.
British Columbia—		
Consolidated Mining and Smelting Co. of Canada Limited	Trail, B.C	Trail.

NON-METAL MINING INDUSTRIES, INCLUDING FUELS

FUELS

DIRECTORY OF FIRMS—Continued

Coal Mining Industry

Name	Address	Location
NOVA SCOTIA—		District—
Acadia Coal Co., Ltd	Trenton	Pictou.
Beech Hill Coal Co	River Hebert	Cumberland.
Bras d'Or Coal Co. Ltd	Bras d'Or	Cape Breton.
Cumberland Ry. & Coal Co	Sydney	Cumberland.
Dominion Coal Co. Ltd	Sydney	Cape Breton.
Doucet, S. J	Inverness	Inverness.
Evans, G. V	St. Rose	Inverness.
Gordon, Hugh	Joggins	Cumberland.
Greenwood Coal Co. Ltd	New Glasgow	Pictou.
Hillcrest Mining Co. Ltd	River Hebert	Cumberland.
Indian Cove Coal Co., Ltd	Sydney Mines	Cape Breton.
Intercolonial Coal Co., Ltd	Westville	Pictou.
Inverness Coal Mine	Inverness	Inverness.
Joggins Coal Co., Ltd	Amherst	Cumberland.
Kemptown Coal Mine	Kemptown	Cumberland.
McLellan & Sons, J.A	Inverness	Inverness.
Margaree Steamship Co	Inverness	Inverness.
Maritime Coal Ry. & Pr. Co. Ltd	Amherst	Cumberland.
Old Sydney Collieries Ltd	Trenton	Cape Breton.
Standard Coal Co. Ltd	Amherst	Cumberland.
Sullivan Coal Co. Ltd	Sydney Mines	Cape Breton.
NEW BRUNSWICK—		County—
Avon Coal Co., Ltd	Minto	Queens.
Banks, H. F. Coal Co	Minto	Queens.
Butler, Stanley	Newcastle Bridge	Queens.
Crawford, E. S	Newcastle Bridge	Queens.
Evans, W. B	Minto	Queens.
Flower, H. L	Newcastle Creek	Queens.
Fearn, William	Coal Creek	Queens.
Fearon, Bertrum	Beersville	Kent.
Girvan, H. H	Jailletville	Kent.
Grant, A	Minto	Queens.
Horgan, F. J	Chipman	Queens.
King, G. H	Chipman	Queens.
McDonald, J. F	Minto	Queens.
McMann, Hugh	Newcastle Creek	Queens.
Minto Coal Co. Ltd	Minto	Queens.
Miramichi Lumber Co. Ltd	Minto	Queens.
Myles, Geo. H	Minto	Queens.
Newcastle Coal Co	Minto	Queens.
Rothwell Coal Co. Ltd	Minto	Queens.
Welton Harvey Ltd	Minto	Queens.
Welton & Henderson Ltd	Minto	Queens.
Wisely, W. B	Chipman	Queens.
Woodcock, A. G	Fredericton	Queens.
Yeamans, C. S	Newcastle Bridge	Queens.
MANITOBA—		
Goodlands Mine Co	Goodlands.	

SASKATCHEWAN—

NOTE.—SOURIS AREA—Comprises mines at or near Bienfait, Taylorton, Pinto, Estevan and Roche Percee.
WOOD MOUNTAIN AREA.—Comprises mines at or near Assiniboia, Bengough, Willow Bunch and Wood Mountain.
SHAUNAVON AREA.—Comprises mines at or near Shaunavon, Dollard, South Fork and East End.

Name	Address	Location
		Area—
Anderson, Peter	Maxstone	Wood Mountain.
Anderson, Niel	Estevan	Souris.
Assels, Glen	Shaunavon	Shaunavon.
Banks, H	Bienfait	Souris.
Banks, H	Pinto	Souris.
Baniulis Bros. Ltd	Bienfait	Souris.
Beahm, George	Roan Mine	Wood Mountain.
Beauchesne, O	St. Victor	Wood Mountain.
Bednarik, John	Shaunavon	Shaunavon.
Belz, Werner	Buffalo Gap	Wood Mountain.
Bembridge, J	Bienfait	Souris.
Berge, Telford	Buffalo Gap	Wood Mountain.
Berg, J	Dollard	Shaunavon.
Bjarne, L	Minton	Wood Mountain.
Blondeau, A	Roche Percee	Souris.
Bouffard, Emile	Willow Bunch	Wood Mountain.
Bourguin & Sons, L. E	Estevan	Souris.
Boyer, T. & Sons	Estevan	Souris.
Brandieze, Jos	Coronach	Wood Mountain.
Brown, H	Big Beaver	Wood Mountain.

DIRECTORY OF FIRMS—Continued

Coal Mining Industry—Continued

Name	Address	Location
SASKATCHEWAN—Continued		Area—
Brown, Alton G.	Wideview	Wood Mountain.
Coats & Kingdon	Bienfait	Souris.
Culbert, Wesley	Minton	Wood Mountain.
Dovell, A. C.	Eastend	Shaunavon.
Eastern Collieries of Bienfait	Estevan	Souris.
Eikemo & Peterson	Gladmar	Wood Mountain.
Emery, E. G.	Readlyn	Wood Mountain.
Estevan Coal Co.	Estevan	Souris.
Fair, J. A.	Harptree	Wood Mountain.
Finnberg, N.	Fir Mountain	Wood Mountain.
Fister, J. J.	Big Beaver	Wood Mountain.
Flower Bros.	Estevan	Souris.
Freaman, Bruce	Southfork	Shaunavon.
Furniskieg, A.	Minton	Wood Mountain.
Gill, William	Estevan	Souris.
Glombowski, Rudolph	Ardill	Wood Mountain.
Gosselin, Raymond	Willow Bunch	Wood Mountain.
Gosselin, C.	Dollard	Shaunavon.
Guse, L.	Bengough	Wood Mountain.
Higgins, James	Willow Bunch	Wood Mountain.
High Test Lignite Coal Co. Ltd.	Bienfait	Souris.
Jacques, Jos.	Southfork	Shaunavon.
Jenish Bros.	Estevan	Souris.
Jones, Wm.	Viceroy	Wood Mountain.
Karlson, Ernest	Glentworth	Wood Mountain.
Kirkpatrick, H.	Shaunavon	Shaunavon.
Kissner, A.	Assiniboia	Wood Mountain.
Klyne & Son, T.	Roche Percee	Souris.
Knoblauch, Ed.	Shaunavon	Shaunavon.
Krzeminski, Z.	Estevan	Souris.
Laboccetta, John	Wood Mountain	Wood Mountain.
Lapointe, Louis	Buffalo Gap	Wood Mountain.
Larsen, Peter	Eastend	Shaunavon.
Lebeck, A.	Buffalo Gap	Wood Mountain.
Lee, Austin M.	Big Beaver	Wood Mountain.
Livingston, Kelly	Rockglen	Wood Mountain.
Matheson & Ulrich	Pinto	Souris.
McCuaig, M.	Fife Lake	Wood Mountain.
McGillis, J. M.	Willow Bunch	Wood Mountain.
Man. & Sask. Coal Co. Ltd.	503 Ave. Bldg., Winnipeg, Manitoba	Souris.
Morrison, Ray	Big Beaver	Wood Mountain.
Nordstrom, C.	Estevan	Souris.
North West Coal Co.	Bienfait	Souris.
Olshanoski, J.	Estevan	Souris.
Osjust, Steve	Estevan	Souris.
Parkinson, Geo.	Estevan	Souris.
Paulhus, J. A.	Willow Bunch	Wood Mountain.
Pilsner, J.	Scout Lake	Wood Mountain.
Pohl, Henry	Buffalo Gap	Wood Mountain.
Raketti, J. B.	Shaunavon	Shaunavon.
Riedel Bros.	Bienfait	Souris.
Roche Percee Coal Mining Co. Ltd.	Roche Percee	Souris.
Rock Spring Coal Co.	Pinto	Souris.
Salaba, G. J.	Willow Bunch	Wood Mountain.
Sanftleben, Geo.	Readlyn	Wood Mountain.
Scott, Ervin	Viceroy	Wood Mountain.
Slater, Dan	Bengough	Wood Mountain.
South Cambrian Ltd.	Pinto	Souris.
Southernwood, E.	Estevan	Souris.
Spirka & Novak	Shaunavon	Shaunavon.
Stirling, A.	Readlyn	Wood Mountain.
Taje & Co., Ed.	Estevan	Souris.
Tarita, Paul	Stonehenge	Wood Mountain.
Tessier & Insko	Estevan	Souris.
Tipple, J.	Lonesome Butte	Wood Mountain.
Tisdale, A. E.	Estevan	Souris.
Treleaven, Wm.	Bengough	Wood Mountain.
Treleaven, J.	Bengough	Wood Mountain.
Wagner & Mattson	Bengough	Wood Mountain.
Western Dom. Coal Mines Ltd.	Taylorton	Souris.
Wilhelm, John	Verwood	Wood Mountain.
Wilkins, H. W.	Shaunavon	Shaunavon.
Wilkins, L. F.	Shaunavon	Shaunavon.
Youngberg Bros., H. McBurney & C. H. Ulrich	Willow Bunch	Wood Mountain.
ALBERTA—		District—
Bituminous—		
Brazeau Collieries Ltd.	25 King St. W., Toronto, Ontario	Nordegg.
Cadomin Coal Co. Ltd.	418 McLeod Bldg., Edmonton	Mountain Park.
Canmore Mines Ltd.	Canmore	Cascade.
Hillcrest Mohawk Collieries Ltd.	Bellevue	Crowsnest.
Holmes, F.	Pincher Creek	Crowsnest.

DIRECTORY OF FIRMS—Continued

Coal Mining Industry—Continued

Name	Address	Location
ALBERTA—Continued		
Bituminous—*Continued*		District—
International Coal & Coke Co. Ltd.	Coleman	Crowsnest.
K. D. Collieries Ltd.	103 Pinder Bldg., Saskatoon, Sask.	Mountain Park.
Luscar Coals Ltd.	410 Tegler Bldg., Edmonton	Mountain Park.
McGillivray Creek Coal & Coke Co., Ltd.	Coleman	Crowsnest.
Mountain Park Coals Ltd.	410 Tegler Bldg., Edmonton	Mountain Park.
West Canadian Collieries Ltd.	Blairmore	Crowsnest.
Wheatley, F. & Sons	Banff	Cascade.
Wilson, B. A.	Pincher Creek	Crowsnest.
Sub-bituminous—		
Alexo Coal Co. Ltd.	Alexo	Saunders.
Bighorn & Saunders Creek Collieries Ltd.	Saunders	Saunders.
Coal Valley Mining Co. Ltd.	Coal Valley	Coalspur.
Davies, G. C.	Priddis	Pekisko.
Foothills Collieries Ltd.	Foothills	Coalspur.
Jasper Coals Ltd.	Edmonton	Prairie Creek.
Keith Albert	Lundbreck	Pincher.
Lakeside Coals Ltd.	Edmonton	Coalspur.
McLeod River Hard Coal Co. (1941) Ltd.	Nanaimo, B.C.	Coalspur.
Sterling Collieries Co. Ltd.	Edmonton	Coalspur.
Swan, H. & Son	Priddis	Pekisko.
Thirty-Two Collieries Ltd.	Edmonton	Coalspur.
Lignite—		
Aetna Coal Co.	East Coulee	Drumheller.
Ajax Coal Co.	Medicine Hat	Redcliff.
Arcadia Coal Mines Ltd.	Willow Creek	Drumheller.
Atlas Coal Mine (Regal Coal Co. Ltd.)	East Coulee	Drumheller.
Baldwin, J. N. & L. A.	Grand Prairie	Halcourt.
Balogh, Aaron	Carbon	Carbon.
Bailey Bros. & Jackson	Gadsby	Castor.
Banner Coals Ltd.	Edmonton	Edmonton.
Beverly Coal Co. Ltd.	Beverly	Edmonton.
Big Valley Coal Co.	Big Valley	Big Valley.
Birnwell Coal Ltd.	Calgary	Brooks.
Bish Bros.	Forestburg	Castor.
Blackfoot Indian Agency	Gleichen	Gleichen.
Blades, James	Delburne	Ardley.
Boice & Ginther	Elnora	Big Valley.
Bordula, A. J.	Hanna	Sheerness.
Bradshaw, Richard	Trochu	Carbon.
Bradley, James	Foreman	Castor.
Bright Service Coal Mine	Edmonton	Edmonton.
Brilliant Coal Co.	Drumheller	Drumheller.
Burn Brite Coal Co.	Drumheller	Drumheller.
Bush Mines Ltd.	Edmonton	Edmonton.
Buxton, Arthur	Lonira	Whitecourt.
Campbell, C. C.	Trochu	Carbon.
Campbell & O'Reilly	Dimsdale	Halcourt.
Campkin, R. & Sons	Lousana	Big Valley.
Camrose Collieries Ltd.	Camrose	Camrose.
Camarta, John	Cardiff	Edmonton.
Canadian Dinant Coal Co.	Three Hills	Carbon.
Castor Creek Collieries Ltd.	Castor	Castor.
Chester Mine	Lethbridge	Lethbridge.
Chiarello, Frank	Legal	Edmonton.
Chinook Coal Co.	Sheerness	Sheerness.
Chiswick, J.	Gadsby	Castor.
Commander Coal Mine	Drumheller	Drumheller.
Continental Coal Corp.	Grassy Lake	Taber.
Cordel, J. F.	Halkirk	Castor.
Cotek, William	R.R. 3, S. Edmonton	Edmonton.
Dahl & Cage	Halcourt	Halcourt.
Dawson Coal Ltd.	Edmonton	Edmonton.
Denio, Ernest	Drumheller	Drumheller.
Dickinson, Knight and Dickinson	R.R. 2, St. Albert	Edmonton.
Dickinson & Knight	Carbondale	Edmonton.
Dodds Coal Mine	Dodds	Tofield.
Dunbar, J. & Partners	Hinton Trail	Halcourt.
Easton, James	Castor	Castor.
East Carbon Coal Co.	Carbon	Carbon.
East Trochu Coal Mine	Trochu	Carbon.
Edmonton Collieries Ltd.	Edmonton	Edmonton.
Egg Lake Coal Co.	Morinville	Edmonton.
Empire Collieries Ltd.	East Coulee	Drumheller.
Falvo, D.	Dodds	Tofield.
Forsyth & Arnold	Lethbridge	Lethbridge.
Foye, E. B.	Drumheller	Drumheller.
Fraser, Alec	Carmangay	Champion.
Geddes, Wm.	Little Plume	Pakowki.
Gill, Peter	Thorsby	Wetaskiwin.
Great West Coal Co.	10117—100A St. Edmonton	Edmonton.

DIRECTORY OF FIRMS—Continued

Coal Mining Industry—Continued

Name	Address	Location
ALBERTA—Continued		
Lignite—*Continued*		District—
Gunderson Brick & Coal Co. Ltd.	Redcliff	Redcliff.
Guiney, C. J.	Rosebud	Gleichen.
Gwilliam, D. J.	Namao	Edmonton.
Haden, J.	Castor	Castor.
Hamilton Coal Co., J. J.	Lethbridge	Lethbridge.
Hamilton, John	Delia	Drumheller.
Hanson, C. H.	Rosalind	Castor.
Herbaut, A.	Champion	Champion.
Howorth & Fraser	Halcourt	Halcourt.
Hronek, Ben	Halkirk	Castor.
Hy-Grade Coal Mining Co. Ltd.	Drumheller	Drumheller.
Johnson, Alex	Ardley	Ardley.
Ideal Coal Co. Ltd.	Wayne	Drumheller.
Ironside Bros.	Scapa, R.R. 2	Sheerness.
Jones & Son	Forestburg	Castor.
Kehl & McGladrie	Nevis	Ardley.
Kent Coal Co. Ltd.	Edmonton	Edmonton.
Kerralta Coal Co.	Lethbridge	Lethbridge.
Kleenbirn Collieries Ltd.	Eyzemore	Brooks.
K. M. Coal Mine	Forestburg	Castor.
Kurp, Carl	Delbourne	Ardley.
Lakeside Coals Ltd.	Edmonton	Pembina.
Lavenne, C.	Bow Island	Taber.
Le Gear, Max	Forestburg	Castor.
Lethbridge Collieries Ltd.	Lethbridge	Lethbridge.
Lien, E.	Edberg	Castor.
Litke Bros.	Hanna	Sheerness.
Long Coal Co.	Namao	Edmonton.
Lynass, John	Delburne	Ardley.
Majestic Mines Ltd.	Taber	Taber.
Maggs, G.	Barnwell	Taber.
Maple Leaf Minerals Ltd.	Drumheller	Drumheller.
Marshall & Heisz Coal Co.	Donalda	Castor.
Masciangelo, John	Delia	Sheerness.
May, John	S. Edmonton	Edmonton.
McGaw, A. M. S.	Champion	Champion.
McKinlay & Son, James	Huxley	Big Valley.
McMillan, Alex	Rosebud	Gleichen.
Meek, F. G.	Heisler	Castor.
Midland Coal Mining Co. Ltd.	Drumheller	Drumheller.
Mills & Sons, J. J.	Heisler	Castor.
Minute Coal Co.	Drumheller	Drumheller.
Mitchinson, Thomas	Donalda	Castor.
Molzan, Henry	S. Edmonton	Edmonton.
Monarch Coal Mining Co. Ltd.	Drumheller	Drumheller.
Mueller, J. J.	Masinasin	Milk River.
Muncy, H. C.	Foreman	Castor.
Newcastle Collieries Ltd.	Drumheller	Drumheller.
Nimko, K.	S. Edmonton	Edmonton.
North Point Coal Co.	Thorhild	Rochester.
Nottal & Davidson	Three Hills	Carbon.
O'Brien, A.	Halkirk	Castor.
Oliver, E.	Taber	Taber.
Opalinski & Sinoski	S. Edmonton	Edmonton.
Ottwell Coal Co.	Clover Bar	Edmonton.
Pahl, Fred M.	Hanna	Sheerness.
Pastorchik & Partners	Three Hills	Carbon.
Peerless Coal Co.	Carbon	Carbon.
Pembina Collieries Ltd.	Entwistle	Pembina.
Phillips, W. T.	Castor	Castor.
Pickering, B.	Beynon	Drumheller.
Popovitch, M.	Champion	Champion.
Proskow, Jos.	Dinant	Camrose.
Red Deer Valley Coal Co. Ltd.	Drumheller	Drumheller.
Red Flame Coal Co. Ltd.	Round Hill	Camrose.
Red Hot Coal Co. Ltd.	Edmonton	Edmonton.
Raeder, W.	Elkwater	Pakowki.
Remillard, O. V.	Castor	Castor.
Riddock & Horkulak	S. Edmonton	Edmonton.
Riverdale Coal Co. Ltd.	Edmonton	Edmonton.
Robinson, W.	Entwistle	Pembina.
Rollingson, George	Lethbridge	Lethbridge.
Rosedale Collieries Ltd.	Aerial	Drumheller.
Rosedale Collieries Ltd.	Rosedale	Drumheller.
Rozzolini & Bridarolli	Magrath	Lethbridge.
Russell, Chas. O.	Alix	Ardley.
Ryley Coal Mine	Ryley	Tofield.
Ryning, Jas. W.	Rowley	Carbon.
Samis, K. E.	Namao	Edmonton.
Sank, John	Heisler	Castor.
Schlender, Otto	Trochu	Carbon.
Schnepf, Karl	Rosebud	Gleichen.

DIRECTORY OF FIRMS—Continued

Coal Mining Industry—Continued

Name	Address	Location
ALBERTA—Continued		
Lignite—*Concluded*		District—
Shaw, Mrs. Dan	Castor	Castor.
Sheerness Coal Co. Ltd.	Sheerness	Sheerness.
Shute & Partners	Dinant	Camrose.
Sinoski, Mike	S. Edmonton	Edmonton.
Sissons, J. W.	Alix	Ardley.
Smith, Howard	Edmonton	Edmonton.
Sovereign Coal Co. Ltd.	Wayne	Drumheller.
Spencer & Dolphin	Carbon	Carbon.
Standard Coal Mine	Standard	Gleichen.
Stoney Creek Collieries Ltd.	Camrose	Camrose.
Strader, Chas.	Halkirk	Castor.
Straub, F. A.	Alix	Ardley.
Strilchuk, Leo	R.R. 2, Ohaton	Camrose.
Strickland & Tennant	Lethbridge	Lethbridge.
Stubbs, T. E.	Hanna	Sheerness.
Taylor, Thomas	Groton	Milk River.
Thorhild Coal Co.	Thorhild	Rochester.
Tofield Coal Co. Ltd.	Tofield	Tofield.
Tollestrup, G. F.	Lethbridge	Lethbridge.
Tyrlik, John	Heisler	Castor.
Watson, Alex	Blue Ridge	Whitecourt.
Western Gem & Jewel Collieries Ltd.	Rosedale	Drumheller.
Whittaker, O. W.	Beynon	Drumheller.
Wilkinson, Frank	Donalda	Castor.
Wilma Coal Co.	Edmonton	Pembina.
Wiltse, F. N.	Halkirk	Castor.
Wood & Larson	High Prairie	No Area.
Wright, H. H.	Gensee	Pembina.
BRITISH COLUMBIA—		
Bulkley Valley Collieries Ltd.	Telkwa	Inland.
Canadian Collieries (Dunsmuir) Ltd.	Nanaimo	Island.
Cassidy Mines	Nanaimo	Island.
Chambers, R. H.	Nanaimo	Island.
Consolidated Mg. & Smelting Co. Ltd.	Trail	Crows' Nest Pass.
Crow's Nest Pass Coal Co. Ltd.	Fernie	" " "
Deer Home Mine	Extension	Island.
Gething Coal Mine	Hudson Hope	Inland.
Granby Cons. M.S. & P. Co. Ltd.	Princeton	Inland.
Hat Creek Coal Mines	Ashcroft	Inland.
Inland Collieries Ltd.	Princeton	Inland.
Johnston, Carl Emil	Cottonwood	Inland.
Frater, George	Nanaimo	Island.
Lewis Mine	Nanaimo	Island.
Loudon, W. D.	Wellington	Island.
Merritt Coal Mines Ltd.	Merritt	Inland.
Middlesboro Collieries Ltd.	Merritt	Inland.
Packwood Mine	Fort St. John	Inland.
Pacific Coal Mine	Nanaimo	Island.
Princeton Tulameen Coal Co. Ltd.	Princeton	Inland.
Stronach Mine	Wellington	Island.
Telkoal Co. Ltd.	Telkwa	Inland.
Tulameen Collieries Ltd.	Vancouver	Inland.
Wellington No. 9 Coal Mine	Nanaimo	Island.

The Natural Gas Industry

NOTE.—(a) Drilling only.
(b) Distributing only.
(c) Producing wells drilled in 1943—no output reported.
(d) Dry wells drilled in 1943.
(e) Drilling and producing.
(f) Pipe line company.
(g) Using or selling gas from absorption plant.

Name	Address	Location—Field
NEW BRUNSWICK—		
(b) Moncton Electricity & Gas Co.	700 Main St., Moncton	
New Brunswick Gas & Oilfields Ltd.	Box 194, Moncton	Stoney Creek.
ONTARIO—		
Achilles Oil & Gas Syndicate	67 Yonge St., Toronto	Senaca, Woodhouse. and S. Cayuga.
(e) Ajax Oil & Gas Co. Ltd.	371 Bay St., Toronto	Dover, Tuscarora, and Middleton.
Aloka Oil Co. Ltd.	57 Queen St. W., Toronto	Dereham and Malahide.
Amer-Can. Oil & Gas Co.	Chatham	Dover, Walpole, Tilbury, and Windham.

DIRECTORY OF FIRMS—Continued

The Natural Gas Industry—Continued

Name	Address	Location—Field
ONTARIO—Continued		
(a) Ashton, J. L.	550 King St. W., Chatham	
Barnhart, Mrs. E.	Stevensville	Bertie.
Bates, Norman	Humberstone	Humberstone.
Beacon Natural Gas Syndicate	112 Locust St. Kitchener	Walpole.
Beaver Oil & Gas Syndicate	67 Yonge St., Toronto	Walpole.
(b) Beaver Utilities	70 Richmond St. W., Toronto	Walpole
Beer, George	Binbrook	Binbrook.
(b) Belmont Gas Co.	978 Church St., Windsor	Binbrook
Benn, A. S.	Hagersville	Walpole.
Benner, K. W.	Fisherville	Rainham.
Bertie Tp. Gas & Oil Syndicate	Fisherville	Bertie and Willoughby.
Binbrook Gas Co.	Binbrook	Binbrook.
Bliss, Douglas E.	1312 Maxine St., Flint, Mich., U.S.A.	Middleton.
Brindley & Harper	Bradford, Pa., U.S.A.	Brantford.
Broadway Gas Syndicate	Cayuga	Walpole.
Buck, C.S.	Port Rowan	South Walsingham.
Burchell Natural Gas & Oil Syndicate	R.R. 2 Listowel	Woodhouse and Raleigh.
Canada Cement Co. Ltd.	Box 290, Station B., Montral, Quebec	Wainfleet.
Canadian Natural Gas Syndicate	Simcoe	Moulton and Bayham.
Canby, B. F.	Wainfleet	Wainfleet.
Canfield Gas Syndicate	703 Capitol Park Bldg., Detroit, Mich., U.S.A.	Cayuga North.
Canfield Natural Gas Co. Ltd.	Canfield	Cayuga North.
Cartwright, S. E.	1972 Penobscot Bldg., Detroit, Mich., U.S.A.	Walpole.
Central Pipe Line Co. Ltd.	Chatham	Bayham, Houghton, Middleton, Dereham and Malahide.
Central Senaca Gas Syndicate	Cayuga	Senaca.
(b) City Gas Company of London	215 Dundas St., London	
Colbert, Chas. T.	26 Sun Life Bldg., Hamilton	Walpole.
Coleman, J. A.	Wellandport	Gainsboro.
Columbia Natural Gas Co. Ltd.	515 Pigott Bldg., Hamilton	Dunn.
Comins, H. M.	Flint, Mich., U.S.A.	Rainham.
Connor & McKechnie	Dunnville	Bayham.
Coronation Gas Syndicate	Stevensville	Bertie.
Dain City Gas Syndicate	208 Burgar St., Welland	Humberstone and Bertie.
Dawson, Ralph	Merlin	Tilbury East.
Dean Gas Syndicate	Fisherville	Middleton and Bayham.
Delhi Gas Syndicate	Cayuga	Windham.
Dereham Gas & Oil Co. Ltd.	67 Yonge St., Toronto	Oneida, Walpole, Rainham and Walsingham South.
Diamond Gas Syndicate	Dunnville	Moulton.
Domestic Gas & Oil Co. Ltd.	Blyth	Senaca, Oneida and Moulton.
Dominion Natural Gas Co. Ltd.	518 Jackson Bldg., Buffalo, N.Y., U.S.A.	Binbrook, Caistor, Canbora, Charlotteville, Dereham, Delhi Village, Dunn, Glanford, Humberstone, Mersea, Middleton, Moulton, North Cayuga, North Walsingham, Oneida, Onondaga, Port Dover Village, Port Rowan, Rainham, Raleigh, Romney, Senaca, Sherbrooke, South Cayuga, South Walsingham, Tilbury East, Townsend, Wainfleet, Walpole, Winham, and Woodhouse.
Dorset Oil & Gas Syndicate	67 Yonge St., Toronto	Cayuga South.
Dunn Natural Gas Co. Ltd.	81 St. Paul St., St. Catharines	Dunn and Sherbrooke.
Dunnville-Detroit Gas Syndicate	703 Capitol Park Bldg., Detroit, Mich., U.S.A.	Cayuga North.
Economy Natural Gas Syndicate	Stratford	Woodhouse.
Elgin Prospecting Syndicate	Ridgeway	Humberstone.
Elk Development Syndicate	Cayuga	Humberstone.
Emerald Gas Syndicate	67 Yonge St., Toronto	Oneida.
(e) Emerson, Harry L.	Dunnville	Moulton, Canboro, and Wainfleet.
(a) Evans, H. L.	Tillsonburg	
Featherstone, Roy	Caledonia	Oneida.
Fisherville Gas Co.	Fisherville	Rainham.
Fleet Aircraft Ltd.	Fort Erie	Bertie.
(b) Fonthill-Ridgeville Gas Co. Ltd.	Box 511, Portland, Ind., U.S.A.	
Frontier Gas Syndicate	Fisherville	Bertie.
Gas Producers Co.	703 Capitol Park Bldg., Detroit, Mich., U.S.A.	Raleigh.
Gifford, Arthur & Son	Cayuga	Cayuga South.

DIRECTORY OF FIRMS—Continued

The Natural Gas Industry—Continued

Name	Address	Location—Field
ONTARIO—Continued		
Glenney, C. A.	Dunnville	Canboro.
Grand River Gas & Oil Syndicate	Canfield	Cayuga North.
Grimsby Natural Gas Co. Ltd.	Grimsby	Caistor, Gainsboro, and Canboro.
Haldimand Gas Syndicate	Cayuga	Rainham.
Haldimand Natural Gas Syndicate	Stevensville	Bertie.
Highbank Oil Ltd.	Chatham	Raleigh.
Houk Syndicate	Dunnville	Moulton.
House, C. C.	Stevensville	Bertie.
Ideal Gas Syndicate	Fisherville	Rainham.
(e) Jackson, Percy L.	Dunnville, Moulton and Walpole	Canboro, Cayuga North.
Jackson & Graff Syndicate	Dunnville	Crowland.
(e) Jasperson, Bon	Kingsville	Gosfield South, and Romney.
Jenkins, Stanley S.	282 W. North St., Buffalo, N.Y., U.S.A.	Townsend and Bertie.
Kelly Gas & Oil Syndicate	15 Drayton Ave., Toronto	Rainham, and Walpole.
Kent Gas Syndicate	922 Millwood Rd., Toronto	Walpole.
(a) Kiser Bros	Chatham	
Lake Erie Gas Syndicate	54 Hambly Ave., Toronto	Rainham.
Lake Shore Gas & Oil Syndicate	Stevensville	Bertie.
(b) Leamington, Town of	Leamington	
Lincoln National Gas Ltd.	Fort Erie	Canboro, Gainsboro, Caistor, Wainfleet, and Moulton.
Lindsay, W. B. Estate	10126-100th St., Edmonton, Alta.	Walpole.
Little, R. W.	222 Humbercrest Blvd., Toronto	Walpole, Rainham, Onondaga, and Barnt.
Locators Oils Ltd.	22 King St. W., Toronto 1	Middleton, and Cayuga South
Lomac Gas & Oil Co. Ltd.	Port Stanley	Bayham.
(e) Lymburner Bros. & Webber	Dunnville	Rainham, Walpole and Cayuga North.
(a) McCutcheon, T.	225 Broad St., Dunnville	
(e) McKechnie, S.	Dunnville	Senaca, Bayham, and Walpole.
(a) McLister, G. G.	Dunnville	
Mehlenbacher, L. B.	Cayuga	Senaca, Walpole and Cayuga North.
Midfield Gas Corp. Ltd.	68 Yonge St., Toronto	Cayuga North and Oneida.
Minor, Irene C.	Cheltenham	Sherbrooke.
Mohawk Gas & Oil Co. Ltd.	421 Main St., Hamilton	Canboro, Oneida, and Walpole.
Monarch Gas & Oil Syndicate	Fisherville	Walpole.
Morningstar, Roy	Stevensville	Bertie.
New Eden Natural Gas Co. Ltd.	Tillsonburg	Bayham.
New Tillsonburg Oil & Gas Co. Ltd.	26 Adelaide St. W., Toronto	Middleton.
Niagara Gas Syndicate	Fisherville	Bertie.
Niagara Natural Gas Co. Ltd.	Fort Erie	Moulton.
Neice, Elmond	Lowbanks	Sherbrooke.
(b) Norotto Gas Co. Ltd.	Norwich	
North Cayuga Gas Syndicate	231 Rawson Rd., Brookline, Mass., U.S.A.	Cayuga North.
North Shore Gas Co.	Selkirk	Rainham.
Noyes, L. A.	Stevensville	Willoughby.
(b) Oil Springs Oil & Gas Co. Ltd.	Oil Springs	
(b) (f) Oxford Pipe Line Co. Ltd.	100 Adelaide St. W., Toronto	
Palmer, Jas.	Wainfleet	Wainfleet.
(e) Patterson, W. C. Gas Co. Ltd.	Jamestown, N.Y., U.S.A.	Dunn, Walpole, Willoughby, Rainham, Cayuga North Crowland, Humberstone, Bayham, Dereham and Wainfleet.
(a) Patterson & Culver	Dunnville	
Peacock Point, Gas & Oil Syndicate	Fisherville	Walpole.
Petrol Oil & Gas Co. Ltd.	414 Bay St., Toronto	Dover, Oneida, Onondaga and Tuscarora.
Pine Ridge Gas Co. Ltd.	Port Stanley	Bayham.
(e) Port Colborne-Welland Gas Co.	Port Colborne	Onondaga Senaca, Oneida, and Cayuga North.
Povec Gas Syndicate	Tillsonburg	Cansboro and Mersea.
Prairie Gas & Oil Co. Ltd.	350 Bay St., Toronto	Dover and Raleigh.
Provincial Gas Co. Ltd.	Fort Erie N.	Humberstone, Willoughby, Bertie and Crowland.
Rainham Gas Syndicate	Cayuga	Rainham.
Reicheld, F. W.	Jarvis	Walpole.
Ricker, Arthur	Canboro	Canboro.
Riley, J. V.	162 Talbot St., Simcoe	Moulton.
Romney Oil & Gas Co.	18 Toronto St., Toronto	Tilbury E., Romney and Wainfleet.
Rossmore Exploration Ltd.	80 Richmond St. W., Toronto	Oneida and Cayuga N.
(e) Roth, F. & H.	R.R. 9, Dunnville	Bertie and Dunn.

DIRECTORY OF FIRMS—Continued

The Natural Gas Industry—Continued

Name	Address	Location—Field
ONTARIO—Continued		
Rowe, E. P., Estate of	350 Bay St., Toronto	Dover, Bayham, and Middleton.
Royal Gas Syndicate	Stevensville	Bertie.
Salina Gas Co. Ltd.	Chatham	Tilbury East.
Sandusk Gas Syndicate	Fisherville	Walpole.
Sarnia Oil & Gas Co. Ltd.	350 Bay St., Toronto	Enniskillen and Sarnia.
(a) Shank Bros.	R.R. 2, Selkirk	
Sherk & Carruthers	Sherkston	Humberstone.
Sherk & Learn	Sherkston	Humberstone.
Sherk, Perry M.	Sherkston	Humberstone.
Sherk, Bert & Nagel	Stevensville	Bertie.
Shurr & Shank	R.R. 1, Jarvis	Oneida and Rainham.
Sider, Andrew & Jesse	Stevensville	Bertie.
Sider, Norman	Sherkston	Bertie and Humberstone.
(e) Smith & Ehde	Lowbanks	Moulton.
South Norwich Gas & Oil Syndicate	Norwich	Norwich South.
Springvale Gas & Oil Co. Ltd.	Hagersville	Walpole.
(e) Standard Gas & Oil Syndicate	Fisherville	Rainham and Walpole.
Stanley Gas Syndicate	922 Millwood Rd., Toronto	Walpole, Rainham and Sherbrooke.
Star Gas Syndicate	Ridgeway	Bertie.
Sterling Gas Co.	5 Quebec St., Guelph	Walpole.
Stevensville Natural Gas & Fuel Co.	Stevensville	Bertie.
Stewart & Stewart	R.R. 3, Jarvis	Walpole.
Storm & Stewart	R.R. 1, Sherkston	Humberstone.
(e) Stover & Rawlings	19 Beatty St., Chatham	Dover and Raleigh.
Stromwell Syndicate	Tillsonburg	Moulton.
(a) Stubble, H. H.	Chatham	
Sundy Gas Wells	Dunnville	Canboro.
Superior Gas Syndicate	Fisherville	Rainham.
Sweets Corners Gas Syndicate	Fisherville	Rainham.
(a) Swent, Wm. Norman	Selkirk	
Tanner, J. O.	General Motors Bldg., Detroit, Mich., U.S.A.	Cayuga North and Oneida.
Till Gas Syndicate	Tillsonburg	Walpole.
Union Gas Co. of Canada Ltd.	Chatham	Romney, Tilbury East, Raleigh, Dover, Dawn, (d) Sombra, Camden Gore, (d) Zone, Canboro, Dunn, Cayuga North, Rainham, Seneca, Cayuga South, Walpole, Woodhouse, Oneida, Chatham, Malahide, (d) Delaware and (d) Westminster.
(b) United Gas & Fuel Co. of Hamilton Ltd.	82-84 King St. E., Hamilton	
Victoria Gas Co.	Dunnville	Rainham and Walpole
Victory Oil & Gas Co.	510 Huron & Erie Bldg., London	Windham.
Wainfleet Gas Co. Ltd.	Box 914, Jamestown, N.Y., U.S.A.	Wainfleet.
Walpole Gas Syndicate	Cayuga	Walpole, Port Rowan and Walsingham South.
(e) Walter Gas Syndicate Ltd.	Simcoe	Townsend, Woodhouse, Walsingham South, Walpole and Middleton.
Welland County Gas Syndicate	Stevensville	Bertie.
(b) Wentworth Gas Co. Ltd.	82-84 King St. E., Hamilton	
West Petroleum Ltd.	372 Bay St., Toronto	Romney.
Western Ontario Natural Gas Co. Ltd.	81 St. Paul St., St. Catharines	Canboro, Cayuga North Dunn, Bayham, and Dereham.
(a) Willits, Geo. E.	Bothwell	
Willoughby Gas Syndicate	R.R. 1, Chippawa	Humberstone.
SASKATCHEWAN—		
Lloydminster Gas Co. Ltd.	Lloydminster	Lloydminster.
Northern Utilities Ltd.	Lloydminster	Lloydminster.
ALBERTA—		
Ace Royalties Ltd.	4 Clarence Block, 122, 8th Ave. W., Calgary	Turner Valley
Advance Oil Co. Ltd.	232 Lougheed Bldg., Calgary	Turner Valley.
Alberta Clay Products Co. Ltd.	Medicine Hat	Medicine Hat.
Alberta Oil Incomes Ltd.	301 Lancaster Bldg., Calgary	Turner Valley.
Alberta Pacific Royalties Ltd.	201 Lancaster Bldg., Calgary	Turner Valley.
Allied Royalties Ltd.	201 Lancaster Bldg., Calgary	Turner Valley.
Amalgamated Oils Ltd.	Lancaster Bldg., Calgary	Turner Valley.
Anglo Canadian Oil Co. Ltd.	Lancaster Bldg., Calgary	Turner Valley.
Argus Royalties Ltd.	Lancaster Bldg., Calgary	Turner Valley.
Arrow Oil Royalties Ltd.	804 Southam Bldg., Calgary	Turner Valley.
Associated Oil & Gas Co. Ltd.	200 Leeson-Lineham Block, Calgary	Turner Valley.
B. & B. Royalties Ltd.	232 Lougheed Bldg., Calgary	Turner Valley.
Baltac Oils Ltd.	200 Leeson-Lineham Block, Calgary	Turner Valley.
Barsac Royalties Ltd.	303 Toronto General Trusts Bldg., Calgary	Turner Valley.

DIRECTORY OF FIRMS—Continued

The Natural Gas Industry—Continued

Name	Address	Location—Field
ALBERTA—Continued		
(b) Bow Island, Town of	Bow Island	
(g) British American Oil Co. Ltd	Royal Bank Bldg., King and Yonge Sts., Toronto	
British Colonial Oils Ltd	1010 Lancaster Bldg., Calgary	Turner Valley.
British Dominion Oil & Development Corp. Ltd	213-216 Dominion Bank Bldg., Calgary	Turner Valley.
Brown Oil Corp Ltd	232 Lougheed Bldg., Calgary	Turner Valley.
Calgary Power Co. Ltd	244 St. James St., Montreal, Que	Bassano.
Calmont Oils Ltd	303 Toronto General Trusts Bldg., Calgary	Turner Valley.
Canadian Pacific Railway Co	Medicine Hat	Medicine Hat.
Canadian Western Natural Gas, Light, Heat & Power Co. Ltd	215 6th Ave. W., Calgary	Brooks.
Canadian Western Power & Fuel Co. Ltd	Third St., Redcliff	Redcliff.
Chinook Oils Ltd	232 Lougheed Bldg., Calgary	Turner Valley.
Crude Oils Ltd	No. 1 Imperial Bank Chambers, Calgary	Turner Valley.
D. & D. Royalties Ltd	303 Toronto General Trusts Bldg., Calgary	Turner Valley.
Davies Petroleums Ltd	409 Lancaster Bldg., Calgary	Turner Valley.
Deep Oils Ltd	1 Imperial Bank Chambers, Calgary	Turner Valley.
Department of National Defence	Traders Bldg., Calgary	Suffield.
Dominion Glass Co. Ltd	1111 Beaver Hall Hill, Montreal, Que	Redcliff.
Drillers & Producers Ltd	304 Toronto General Trusts Bldg., Calgary	Turner Valley.
East Crest Oil Co. Ltd	212 Grain Exchange Bldg., Calgary	Turner Valley.
Extension Oil Royalties Ltd	Lancaster Bldg., Calgary	Turner Valley.
Federated Petroleums Ltd	232 Lougheed Bldg., Calgary	Turner Valley.
Foothills Oil & Gas Co. Ltd	606 Second St. W., Calgary	Turner Valley.
Four Star Petroleums Ltd	232 Lougheed Bldg., Calgary	Turner Valley.
Franco Oils Ltd	Vermilion	Vermilion.
(g) Gas & Oil Refineries Ltd	301 Lancaster Bldg., Calgary	
Gunderson Brick & Coal Co. Ltd	Redcliff	Redcliff.
Harris Wells Ltd	201 Lancaster Bldg., Calgary	Turner Valley.
Highwood-Sarcee Oils Ltd	614 Lancaster Bldg., Calgary	Turner Valley.
Home Oil Co. Ltd	226 Lougheed Bldg., Calgary	Turner Valley.
Hudson's Bay Oil & Gas Co. Ltd	79 Main St., Winnipeg, Man	Viking.
Kamalta, Well Operators Ltd	201 Lancaster Bldg., Calgary	Turner Valley.
Major Oil Investments Ltd	407 Lancaster Bldg., Calgary	Turner Valley.
Maple Leaf Oil Co. Ltd	608 Stock Exchange Bldg., Vancouver, B.C.	Wainwright.
Medicine Hat Brick & Tile Co. Ltd	Medicine Hat	Medicine Hat.
Medicine Hat, City of	Medicine Hat	Medicine Hat.
Model Oils Ltd	201 Lancaster Bldg., Calgary	Turner Valley.
National Petroleum Corp.	401 Leeson-Lineham Bldg., Calgary	Turner Valley.
Northwestern Utilities Ltd	10124-104 St., Edmonton	Viking.
Ogilvie Flour Mills Co. Ltd	Medicine Hat	Medicine Hat
Oil Ventures Ltd	No. 1 Imperial Bank Chambers, Calgary	Turner Valley.
Pacific Petroleums Ltd	1 Imperial Bank Chambers, Calgary	Turner Valley.
Renown Royalties Ltd	201 Lancaster Bldg., Calgary	Turner Valley.
Reward Spooner Model	717 Lancaster Bldg., Calgary	Turner Valley.
Royal Crest Petroleums Ltd	232 Lougheed Bldg., Calgary	Turner Valley.
Royalite Oil Co. Ltd	606-2nd St. W., Calgary	Turner Valley.
Royalite-Model No. 1 Well	201 Lancaster Bldg., Calgary	Turner Valley.
Share Royalties Ltd	61 Canada Life Bldg., Calgary	Turner Valley.
Shaw, R. L.	Lloydminster, Sask	Lloydminster.
Southwest Petroleum Co. Ltd	606-2nd St. W., Calgary	Turner Valley.
Sunset Oils Ltd	302 Toronto General Trusts Bldg., Calgary	Turner Valley.
Three Point Petroleum Ltd	232 Lougheed Bldg., Calgary	Turner Valley.
Trail Oils Ltd	1 Imperial Bank Chambers, Calgary	Turner Valley.
Turner Valley Royalties Ltd	232 Lougheed Bldg., Calgary	Turner Valley.
Twin Valley Oil Royalties Ltd	804 Southam Bldg., Calgary	Turner Valley.
United Assets Ltd	232 Lougheed Bldg., Calgary	Turner Valley.
Vanalta Ltd	Granville Island, Vancouver, B.C.	Red Coulee.
Vulcan-Brown Petroleums Ltd	232 Lougheed Bldg., Calgary	Turner Valley.
(b) Wainwright Gas Co. Ltd	36 Dominion Bank Bldg., Edmonton	
Welch, Miss Nora	Suffield	Medicine Hat.
Westside Royalties Ltd	232 Lougheed Bldg., Calgary	Turner Valley.
Wetaskiwin, City of	Wetaskiwin	Wetaskiwin.
York Oils Ltd	501 Leeson-Lineham Block, Calgary	Turner Valley.
NORTHWEST TERRITORIES—		
Imperial Oil Ltd. (Canol Project)	10152-101st St., Edmonton, Alta	Fort Norman.
Imperial Oil Ltd	56 Church St., Toronto, Ont	Fort Norman.

DIRECTORY OF FIRMS—Continued

The Crude Petroleum Industry

(x) Producers of 300 barrels or more during the year.
(a) Drillers only.
(b) Producer and driller.
(c) Drilling only.
(d) Operates an absorption plant.
(e) In addition to operating and drilling wells in the Turner Valley field, this company operates two absorption plants.

Name	Address	Location—Field
NEW BRUNSWICK—		
New Brunswick Gas & Oilfields Ltd.	Moncton	Stoney Creek.
ONTARIO (x)—		
Barnes, Amos G.	Petrolia	Petrolia and Enniskillen.
Barnes, Henry	Oil Springs	Petrolia and Enniskillen.
Beattie Bros.	Glencoe	Metcalfe.
Brock, Thomas A.	Petrolia	Petrolia and Enniskillen.
Campbell, John L., Estate of	19 Hume St., London	Petrolia and Enniskillen.
Canadian Oil Companies Ltd.	Terminal Bldg., Toronto	Petrolia and Enniskillen.
Cole, W. J.	Petrolia	Petrolia and Enniskillen.
Collins, Matthew	Petrolia	Petrolia and Enniskillen.
Corey, Harrison	Petrolia	Petrolia and Enniskillen.
Dennies, Charles, Estate of	Oil Springs	Oil Springs.
Domestic Gas & Oil Co. Ltd.	Blyth	Bothwell.
Dominion Petroleum Co. Ltd.	Bank of Montreal Bldg., London	Mosa.
Donald, George	Oil Springs	Petrolia and Enniskillen.
Edward, F. H.	Petrolia	Petrolia and Enniskillen.
Empire Royalties	c/o Eastern Trust Co., Toronto	Dunwich.
Fairbank, J. H., Estate of	Petrolia	Petrolia and Enniskillen.
Fitzpatrick, P. H.	2230 Park Ave., Detroit, Mich., U.S.A.	Orford.
Garinger, Arthur D.	Oil Springs	Petrolia and Enniskillen.
Graff, G. I.	25 Market Place, Stratford	Bothwell.
(a) Gregory, G. F. & Sons	Petrolia	
Hamlin, Frederick George	Petrolia	Petrolia and Enniskillen.
Heal, Andrew A.	Watford	Warwick.
High Grade Natural Gas Co.	215 King St. W.	Dover.
Hillis Bros.	Oil Springs	Petrolia and Enniskillen.
Holmes, E. B.	Bothwell	Bothwell.
Houston, M. B.	853 Hellmuth Ave., London	Petrolia and Enniskillen.
Howlett, Fred & Sons	Petrolia	Petrolia and Enniskillen.
(a) Hussey, W. J.	Petrolia	
Jackson & Morningstar	Oil Springs	Petrolia and Enniskillen.
Kelly, Mrs. E.	Petrolia	Petrolia and Enniskillen.
Kells, E. E.	Petrolia	Petrolia and Enniskillen.
Kerr, John, Estate of	Petrolia	Petrolia and Enniskillen.
Lathur, Arthur	Bothwell	Orford.
Lennan, Lloyd A.	Petrolia	Petrolia and Enniskillen.
Leverton, Wm. & R. H. Buckenham	Bothwell	Bothwell.
Lewis, Laura & Wm.	Oil Springs	Petrolia and Enniskillen.
Lidster, Geo. H. & Harold	Wallacetown	Dunwich.
Lotan, Percy	Bothwell	Bothwell.
MacGillivray, Margaret	Oil Springs	Petrolia and Enniskillen.
Marcus, Andrew	Bothwell	Bothwell.
McCutcheon, A. P.	Oil Springs	Petrolia and Enniskillen.
McGill, Joseph	Bothwell	Bothwell.
McMillan & Marvin	Bothwell	Bothwell.
McMillan & Warwick	Bothwell	Bothwell.
Mitchell, Charles	Oil Springs	Petrolia and Enniskillen.
Mitchell, Robt. W.	Oil Springs	Petrolia and Enniskillen.
Morningstar, George E.	Oil Springs	Petrolia and Enniskillen.
Morningstar, H. M.	Oil Springs	Petrolia and Enniskillen.
Ontario Lands & Oil Co. Ltd.	Petrolia	Petrolia and Enniskillen.
Petrol Oil & Gas Co. Ltd.	414 Bay St., Toronto	Dover.
Pope, H. O.	Bothwell	Bothwell.
Pope, Wm. Jr.	Bothwell	Thamesville.
Prairie Gas & Oil Co. Ltd.	350 Bay St., Toronto	Dover and Raleigh.
Rawson, W. J.	Petrolia	Petrolia and Enniskillen.
Rowe, E. P., Estate of	350 Bay St., Toronto	Dover East and Raleigh.
Saroline Oil Co. Ltd.	Petrolia	Petrolia and Enniskillen.
Shain, Viola M.	Petrolia	Petrolia and Enniskillen.
Slack, C. M.	Petrolia	Petrolia and Enniskillen.
Sutherland, B. M.	Petrolia	Petrolia and Enniskillen.
Thompson, Arnold	Petrolia	Petrolia and Enniskillen.
Tunks, James	Bothwell	Bothwell.
Union Gas Co. of Canada Ltd.	Chatham	Dawn.
Warwick, Joseph	Oil Springs	Petrolia and Enniskillen.
(b) Wilson-Sullivan Development Co.	Sarnia	Warwick.
Winnett, J. W. G.	418 Talbot St., London	Bothwell and Warwick.
Woodward, Wm.	Oil Springs	Petrolia and Enniskillen.
Yerks, Frank	Petrolia	Petrolia and Enniskillen, and Warwick.
ALBERTA—		
Ace Royalties Ltd.	4 Clarence Block, 122-8th Ave. W., Calgary	Turner Valley.
Advance Oil Co. Ltd.	232 Lougheed Bldg., Calgary	Turner Valley.
Alberta Oil Incomes Ltd.	301 Lancaster Bldg., Calgary	Turner Valley.
Alberta Pacific Royalties Ltd.	201 Lancaster Bldg., Calgary	Turner Valley.

DIRECTORY OF FIRMS—Continued

The Crude Petroleum Industry—Continued

Name	Address	Location—Field
ALBERTA—Continued		
Allied Royalties Ltd.	201 Lancaster Bldg., Calgary	Turner Valley.
Amalgamated Oils Ltd.	Lancaster Bldg., Calgary	Turner Valley.
Anglo-Canadian Oil Co. Ltd.	Lancaster Bldg., Calgary	Turner Valley.
Argus Royalties Ltd.	Lancaster Bldg., Calgary	Turner Valley.
Arrow Oil Roylaties Ltd.	804 Southam Bldg., Calgary	Turner Valley.
Associated Oil & Gas Co. Ltd.	200 Leeson-Lineham Block, Calgary	Turner Valley.
B. & B. Royalties Ltd.	232 Lougheed Bldg., Calgary	Turner Valley.
Baltac Oils Ltd.	200 Leeson-Lineham Block, Calgary	Turner Valley.
Barsac Royalties Ltd.	303 Toronto General Trusts Bldg., Calgary	Turner Valley.
Bethwain Oils Ltd.	73 Adelaide St., W. Toronto, Ont.	Wainwright.
Borradaile Oils Ltd.	330 Bay St., Toronto, Ont.	Vermilion.
(d) British American Oil Co. Ltd.	Royal Bank Bldg., King and Yonge Sts., Toronto	
British Colonial Oils Ltd.	1010 Lancaster Bldg., Calgary	Turner Valley.
British Dominion Oil and Development Corp. Ltd.	213-216 Dominion Bank Bldg., Calgary	Turner Valley
Brown Oil Corp Ltd.	232 Lougheed Bldg., Calgary	Turner Valley.
Calmont Oils Ltd.	303 Toronto General Trusts Bldg., Calgary	Turner Valley.
Calwin Royalties Ltd.	301 Lancaster Bldg., Calgary	Turner Valley.
Cannar Oils Ltd.	355 McGill St., Montreal, Que.	Vermilion.
Chinook Oils Ltd.	232 Lougheed Bldg., Calgary	Turner Valley.
Command Oils Ltd.	4 Clarence Blk. 122-8th Ave. W., Calgary	Turner Valley.
Commoil Ltd.	4 Clarence Blk., 122-8th Ave. W., Calgary	Turner Valley.
(c) Commonwealth Drilling Co. Ltd.	4 Clarence Blk., 122-8th Ave. W., Calgary	
Conestoga Resources Ltd.	710 Excelsior Life Bldg., Toronto, Ont.	Vermilion.
Crude Oils Ltd.	1 Imperial Bank Chambers, Calgary	Turner Valley
D. & D. Royalties Ltd.	303 Toronto General Trusts Bldg., Calgary	Turner Valley.
Dalhousie Oil Co. Ltd.	606 Second St. W., Calgary	Turner Valley.
Davies Petroleums Ltd. (N.P.L.)	409 Lancaster Bldg., Calgary	Turner Valley.
De Koch, Wm. G.	Vermilion	Vermilion.
Deep Oils Ltd.	1 Imperial Bank Chambers, Calgary	Turner Valley.
Dina Oil & Refining Co. Ltd.	Lloydminster	Dina.
Director Royalties Ltd.	600 Lancaster Bldg., Calgary	Turner Valley.
Dominion Oil Co. Ltd.	906 Marine Bldg., Vancouver, B.C.	Taber.
Drillers & Producers Ltd.	304 Toronto General Trusts Bldg., Calgary	Turner Valley.
East Crest Oil Co. Ltd.	212 Grain Exchange Bldg., Calgary	Turner Valley.
Edmonton Wainwright Oils Ltd.	8 McDougal Court, Edmonton	Wainwright.
Extension Oil Royalties Ltd.	Lancaster Bldg., Calgary	Turner Valley.
Federated Petroleums Ltd.	232 Lougheed Bldg., Calgary	Turner Valley.
Foothills Oil & Gas Co. Ltd.	606 Second St. W., Calgary	Turner Valley.
Four Star Petroleums Ltd.	232 Lougheed Bldg., Calgary	Turner Valley.
Franco Oils Ltd.	Vermilion	Vermilion.
(d) Gas & Oil Refineries Ltd.	301 Lancaster Bldg., Calgary	
Gem Royalties Ltd.	403 Lancaster Bldg., Calgary	Turner Valley.
Globe Royalties Ltd.	401 Leeson-Lineham Bldg., Calgary	Turner Valley.
Granville Oils Ltd.	4 Clarence Block, 122-8th Ave. W., Calgary	Turner Valley.
Harris Syndicate	201 Lancaster Bldg., Calgary	Turner Valley.
Highwood-Sarcee Oils Ltd.	614 Lancaster Bldg., Calgary	Turner Valley.
Hollingsworth Oils Ltd.	210 Toole Peet Bldg., Calgary	Vermilion.
Home Oil Co. Ltd.	226 Lougheed Bldg., Calgary	Turner Valley.
Imperial Oil Ltd.	56 Church St., Toronto, Ont.	Turner Valley.
Independent Royalties Ltd.	403 Lancaster Bldg., Calgary	Turner Valley.
Well Operators for Kamalta	201 Lancaster Bldg., Calgary	Turner Valley.
Majestic Mines Ltd.	Taber	Taber.
Major Oil Investments Ltd.	407 Lancaster Bldg., Calgary	Turner Valley.
McDougall-Segur Exploration Co. of Canada Ltd.	405-8th Ave. W., Calgary	Turner Valley.
Mercury Oils Ltd.	301 Lancaster Bldg., Calgary	Turner Valley.
Miracle Oils Ltd.	301 Lancaster Bldg., Calgary	Turner Valley.
Miracle Royalties Ltd.	301 Lancaster Bldg., Calgary	Turner Valley.
Model Oils Ltd.	201 Lancaster Bldg., Calgary	Turner Valley.
Model Spooner Syndicate	717 Lancaster Bldg., Calgary	Turner Valley.
Moose Oils Ltd.	714 Lancaster Bldg., Calgary	Moose Dome.
(c) National Drilling Co. Ltd.	401 Leeson-Lineham Bldg., Calgary	
National Petroleum Corp. Ltd.	401 Leeson-Lineham Bldg., Calgary	Turner Valley.
National Vulcan Royalties Ltd.	401 Leeson-Lineham Bldg., Calgary	Turner Valley.
(c) Newell & Chandler Ltd.	304 Toronto General Trusts Bldg., Calgary	
Oil Ventures Ltd.	1 Imperial Bank Chambers, Calgary	Turner Valley.
Okalta Oils Ltd.	Renfrew Bldg., Calgary	Turner Valley.
Pacific Oil & Refinery of Alberta Ltd.	Lethbridge	Del Bonita.
Pacific Petroleums Ltd.	1 Imperial Bank Chambers, Calgary	Turner Valley.
Princeville Petroleums Ltd.	475 Howe St., Vancouver, B.C.	Vermilion.
Regal Royalties Ltd.	401 Leeson-Lineham Bldg., Calgary	Turner Valley.
Renown Royalties Ltd.	201 Lancaster Bldg., Calgary	Turner Valley.
Reward Spooner Model	717 Lancaster Bldg., Calgary	Turner Valley.
Royal Canadian Oils Ltd.	403 Lancaster Bldg., Calgary	Turner Valley.
Royal Crest Petroleums Ltd.	232 Lougheed Bldg., Calgary	Turner Valley.
(e) Royalite Oil Co. Ltd.	606-2nd St. W., Calgary	Turner Valley.
Royalite Model No. 1 Well	201 Lancaster Bldg., Calgary	Turner Valley.
Sasko-Wainwright Oil & Gas Ltd.	103 Bowerman Bldg., Saskatoon, Sask.	Wainwright.
Share Royalties Ltd.	61 Canada Life Bldg., Calgary	Turner Valley.
Shaw, R. L.	Lloydminster, Sask.	Lloydminster.
Southwest Petroleum Co. Ltd.	606-2nd St. W., Calgary	Turner Valley.

DIRECTORY OF FIRMS—Continued

The Crude Petroleum Industry—Concluded

Name	Address	Location—Field
ALBERTA—Continued		
Sovereign Royalties Ltd.	317 Alberta Corner, Calgary	Turner Valley.
Standard Oil Co. of B.C. Ltd.	906 Marine Bldg., Vancouver, B.C.	Princess and Taber.
Sunburst Oil Co. Ltd.	c/o Prudential Trust, 800 Lancaster Bldg., Calgary	Turner Valley.
Sunset Oils Ltd.	302 Toronto General Trusts Bldg., Calgary	Turner Valley.
Three Point Petroleums Ltd.	232 Lougheed Bldg., Calgary	Turner Valley.
Trail Oils Ltd.	1 Imperial Bank Chambers, Calgary	Turner Valley.
Turner Valley Royalties Ltd.	232 Lougheed Bldg., Calgary	Turner Valley.
Twin Valley Oil Royalties Ltd.	804 Southam Bldg., Calgary	Turner Valley.
United Assets Ltd.	Lougheed Bldg., Calgary	Turner Valley.
Vanaltu Ltd.	Granville Island, Vancouver, B.C.	Red Coulee.
Vanpeg Royalties Ltd.	301 Lancaster Bldg., Calgary	Turner Valley.
Vermilata-Frankview Gross Royalty Trust	710 Excelsior Bldg., Toronto, Ont.	Vermilion.
Vulcan Brown Petroleums Ltd.	232 Lougheed Bldg., Calgary	Turner Valley.
Wain-Con Oils Ltd.	431 Tegler Bldg., Edmonton	Wainwright.
Wainwright Petroleums Ltd.	Bank of Toronto Bldg., Edmonton	Wainwright.
Westside Royalties Ltd.	232 Lougheed Bldg., Calgary	Turner Valley.
Winalta Royalties Ltd.	301 Lancaster Bldg., Calgary	Turner Valley.
York Oils Ltd.	501 Leeson-Lineham Blk., Calgary	Turner Valley.
NORTHWEST TERRITORIES—		
Imperial Oil Ltd. (Canol Project)	10152-101st St., Edmonton, Alta.	Fort Norman.
Imperial Oil Ltd.	56 Church St., Toronto, Ont.	Fort Norman.

OTHER NON-METAL MINING INDUSTRIES

DIRECTORY OF FIRMS—Continued

Asbestos Mining Industry

Name of firm	Head or general office address	Location
QUEBEC—		
Asbestos Corporation Ltd.	Thetford Mines	Thetford Mines, Black Lake, Coleraine.
Bell Asbestos Mines Ltd.	Thetford Mines	Thetford Tp.
Canadian Johns-Manville Co. Ltd.	Sun Life Bldg., Montreal	Asbestos.
International Asbestos Co. Ltd. (x)	66 Wellington St. N., Sherbrooke	St. Adrien de Ham.
Johnson's Company	Thetford Mines	Thetford Mines, Coleraine.
Nicolet Asbestos Mines Ltd.	820 Transportation Bldg., Montreal	Norbestos.
Quebec Asbestos Corp. Ltd.	East Broughton Station	East Broughton Sta.

(x) Carried on exploration or development work only.

The Feldspar and Quartz Mining Industry

(a) Produces silica.
(b) Produces feldspar.
(c) Operates a mill.
(d) Also produces kaolin.
(e) Produces nepheline syenite.

Name of firm	Head or general office address	Location
NOVA SCOTIA—		
Nairn, J. (a)	24 Whitney Ave., Sydney	Leitches Creek.
QUEBEC—		
Bigelow, Gordon (Derry mine) (a) (b)	Glen Almond	Derry Tp.
Bonhomme, J. R. (a) (c)	8661 Drolet, Montreal	Kilkenny Tp.
Cameron, U. P. (b)	Buckingham	Buckingham district.
Canadian Carborundum Co. Ltd. (a) (c)	Box 57, Niagara Falls, Ont.	St. Canut.
Canada China Clay & Silica Ltd. (a) (c) (d)	1600 Royal Bank Bldg., Toronto, Ont.	D'Amherst Tp.
Canadian Flint & Spar Co. Ltd. (a) (b) (c)	Room 512 Victoria Bldg., Ottawa, Ont.	Buckingham; Derry Tp.; Templeton Tp.
Gatineau Mining & Contracting Co. Ltd. (b)	27 Dalhousie St., Montreal	Wakefield Tp.
Hill, Wm., Jr. (a)	Glen Almond	Buckingham Tp.
Lafrance, Ovila (a)	Angers	Buckingham Tp.
Micaspar Industries Ltd. (b)	16 James St. S., Hamilton, Ont.	Portland W. Tp.
Morin, Henri A. (a) (b)	Box 3, Buckingham	Buckingham Tp.
Montpetit, Euclyde (a)	Melochville	Melochville.
Perkins Mining Co. (b)	Gatineau Pointe	Buckingham Tp.
Parcher, A. (a)	Buckingham	Buckingham district.
Range Prospecting Synd.	Suite 28, 14 Toronto St., Toronto, Ont.	Buckingham district.
United Mining Industries Ltd. (a) (b)	1451 Notre Dame St. W., Montreal	Buckingham district.
Wallingford, W. M. (b)	Gatineau Pointe	Derry Tp.
Warwick, Wm. (b)	Glen Almond	Buckingham Tp.
ONTARIO—		
American Nepheline Corp. (c) (e)	Lakefield	Methuen Tp.
Bathurst Feldspar Mines Ltd. (a) (b)	21 King St. E., Toronto	Bathurst Tp.
Frontenac Floor & Wall Tile Co. Ltd. (b)	Box 178, Kingston	Bathurst Tp.
Dominion Mines & Quarries Ltd. (a) (c)	Canada Life Bldg., Toronto	Kilarney.
Hamilton, Thos. J. (b)	Box 86, Madawaska	Murchison Tp.
Keystone Contractors Ltd. (b)	732 Langlois Ave., Windsor	Murchison Tp.
Kingston Silica Mines Ltd. (a) (c)	R.R. 1, Kingston	Pittsburg Tp.
Madawaska Feldspar Co. (a) (b)	275 St. James St. W., Montreal, Que.	Murchison Tp.
Magnetawan Feldspar Mining Synd. (b)	64 Kent Road, Toronto	Burton Tp.
Purdy Mica Mines Ltd. (b)	Oak St. E. North Bay	Eau Claire.
Rare Minerals Prospecting Synd. (a)	Wilson Bldg., Toronto	Gananoque.
Symington, J. B. (a)	557 Queen St. E., Sault Ste. Marie	Bar River.
Verona Rock Products Ltd. (a) (b) (c)	330 Bay St., Toronto	Frontenac Co.
Wright & Co. (a)	960 Queen St., Sault Ste. Marie	Algoma District.
BRITISH COLUMBIA—		
Cons. Mining & Smelting Co. Ltd. (a)	Trail	Greenwood M.D.; Osoyoos M.D.

Firms in Gypsum Mining Industry, 1943

Name of firm	Head or general office address	Location
NOVA SCOTIA—		
Canadian Gypsum Co. Ltd.	170 Bloor St. W., Toronto, Ont.	Wentworth.
Conn. Adamant Plaster Co.	10 River St., New Haven, Conn.	Cheverie.
Gypsum, Lime & Alabastine, Canada, Ltd. (x)	Paris, Ont.	Baddeck Bay.
National Gypsum (Canada) Ltd.	325 Delaware Ave., Buffalo, N.Y.	Walton, Dingwall, Cheticamp.
Victoria Gypsum Co. Ltd. (x)	Little Narrows	Little Narrows.
Windsor Plaster Co. Ltd.	Windsor	Brooklyn, Hants Co.

DIRECTORY OF FIRMS—Continued

Firms in Gypsum Mining Industry, 1943—Concluded

Name of firm	Head office address	Location
NEW BRUNSWICK—		
Canadian Gypsum Co. Ltd.	170 Bloor St. W., Toronto, Ont.	Hillsborough
ONTARIO—		
Canadian Gypsum Co. Ltd.	170 Bloor St. W., Toronto	Hagersville.
Gypsum, Lime & Alabastine, Canada, Ltd.	Paris	Caledonia.
MANITOBA—		
Gypsum, Lime & Alabastine, Canada, Ltd.	Paris, Ont.	Gypsumville.
Western Gypsum Products Ltd.	503 McArthur Bldg., Winnipeg	Amaranth.
BRITISH COLUMBIA—		
Gypsum, Lime & Alabastine, Canada, Ltd.	Paris, Ont.	Falkland.

The Iron Oxide Mining Industry

QUEBEC—		
Argall, Thomas H.	Pointe du Lac	Pointe du Lac.
Girardin, Chas. D.	Yamachiche	Almaville.
Mauricy Oxide Co.	259-6th Ave., Grand'Mère	St. Adelphe.
The Sherwin-Williams Co. of Canada Ltd. (x)	2875 Centre St., Montreal	Red Mill.
BRITISH COLUMBIA—		
Davidson, J. G.	346 Surfton Place, La Jolla, California, U.S.A.	Alta. Lake.

(x) Produce refined grades.

The Canadian Mica Mining Industry

(x) Active but no shipments made.
(a) Markets dressed mica.
(b) Operates a grinding mill.
(c) Not recorded.
(d) Mines muscovite mica.

QUEBEC—		
Ahearn, W. (a)	538 MacLaren St., Ottawa, Ont.	Hull Tp.
Banca Mining & Exploration Co. Ltd. (x)	11 King St. W., Toronto, Ont.	Portland Tp.
Beauchemin, J. (a) (d)	5841 Côte des Neiges, Montreal	(c).
Bélanger, Arthur	Perkins, Que.	(c).
Bigras, E.	Notre-Dame-du-Laus	(c).
Bigelow, John (a)	Calumet	(c).
Blackburn Bros. (a) (b)	85 Sparks St., Ottawa, Ont.	Cantley. Perkins Mills. Ottawa.
Blood, A. P. (a)	c/o A. O. Schoonmaker, 161 Sixth Ave., New York, N.Y.	Denholm Tp.
Charbonneau, Ronaldo	Perkins	(c).
Chénier, Z. E. (a)	Rockland, Ont.	Grenville Tp.
Clément, A.	Buckingham	Derry Tp.
Cross, L. E.	Cascades	Cascades.
Cross, Walter C. (a)	209 Bridge St., Hull	Hull Tp.
Charbonneau, N.	Perkins	(c).
Côté, W. R.	115 Filiatreault St., Ville St. Laurent	Laurel.
Charron, A.	37 Sacré-Cœur, Hull	(c).
Delisle, Jos.	Mistassini	Lac St. Jean.
de Rainville, J. Paul	Perkins	Perkins.
Déziel, Alex	Wilsons Corners	Wakefield E. Tp.
Dominion Mica (a)	14 St. Valier St., Quebec	(c).
Dwyer, C. J. (a) (d)	1006 St. Zotique St., Montreal	Chibougamau area.
Gauthier, J. B.	Buckingham	Portland W. Tp.
Gillies, W.	Smithville, Ont.	Papineau Co.
Industrial Mica Co. Ltd. (a)	6998 Jeanne Mance St., Montreal	Wilson's Corners.
Lafontaine, R.	Perkins	Perkins.
Lefebvre, N. (a)	Notre-Dame-du-Laus	(c).
Larabie, A.	Perkins Mills	(c).
Linmac Mica Ltd.	Room 1413, Royal Bank Bldg., Montreal	Cantley.
McGarry, Ed.	Wilson's Corners	(c).
McGlashan, R. J. (a)	190 Montcalm St. Hull	(c).
Mica Company of Canada Ltd. (a)	Hull	Hull.
Mica Laurentian Ltd. (d)	Victory Bldg., Toronto, Ont.	Bergeronnes Tp.
Peterson, S. M. (a)	1851 Henderson Ave., Ottawa, Ont.	St. Pierre de Wakefield.
Prud'homme, Oscar (a)	Perkins	(c).
Rainville, A.	Perkins Mills	(c).
Robson, Bruce C. (x)	125 Holland Ave. Ottawa Ont.	Low Tp.
Renaud, A.	Perkins	(c).
Saguenay, La Corp. Les Minéraux du (a) (d)	St. Joseph d'Alma	Saguenay Dist.
Seguin, E. R. (d)	Buckingham	(c).
Simard, E. (d) (a)	Bergeronnes	Bergeronnes.

DIRECTORY OF FIRMS—Continued

The Canadian Mica Mining Industry—Concluded

Name of operator	Head office address	Location
QUEBEC—Concluded		
Sparks, W. M. E.	Woodroffe, Ont.	Whitefish Lake.
St. Lawrence Mining Corp. Ltd. (a)	132 St. James St. W., Montreal	(c).
Sylvanite Gold Mines Ltd. (a)	Box 670, Kirkland Lake, Ont.	Portland Tp. W.
TeeGee Ltd. (a)	Royal Bank Bldg., Montreal	(c).
Valley, P. (a)	Buckingham	Portland E. Tp.
Villeneuve, E. (d)	3484 Côte des Neiges, Montreal	Portbriand Tp.
Wallingford, E. Ltd. (a)	Perkins	Templeton Tp.
Wallingford, A. (a)	Gatineau Pointe	(c).
Wallingford, Jos. N. (a)	Glen Almond	Glen Almond.
Wallingford, W. M. (a)	Gatineau Pointe	(c).
White, A. W. Mica Ltd. (a)	Suite 407-67 Yonge St., Toronto, Ont.	Wells Tp.
Wilson, Wm. S. (a)	Cascades	Thorne Tp.
ONTARIO—		
Amber Ridge Mica Co. (a)	Westport	(c).
Amic Mica Mines Ltd. (d) (a)	80 Richmond St. W., Toronto	Eau Claire.
Biram Mines Ltd. (a)	Room 508, 11 King St. W., Toronto	Burgess N. Tp.
Bonfield Mica Prospecting Synd. (d)	Suite 504, 112 Yonge St., Toronto	Dickens Tp.
Canadian Flint & Spar Co. Ltd. (d)	512 Victoria Bldg., Ottawa	Dickens Tp.
Fillion, S. O. (a)	432 Kensington Ave., Ottawa	(c).
Kingston Mica Mining Co. Ltd.	Godfrey	Bedford Tp.
Lee, W. W. (a) (d)	Perth Road	(c).
Laughrin Prospecting Synd. (x)	371 Bay St., Toronto	Laughrin Tp.
Loughborough Mining Co. Ltd. (a)	Sydenham	Various.
Mattarig Mica Mining Synd. Ltd. (x)	c/o W. R. Binch, 38 King St. W., Toronto	Mattawan and Olrig Tps.
Micaspar Industries Ltd. (a)	16 James St. S. Hamilton	Loughborough Tp.
Major Mica Mines Ltd. (a)	See Micaspar Industries Ltd.	
O'Connor, W. J. (a)	Lombardy	Leeds Co.
Orser, S. H.	Verona	Bancroft.
Perth Mica Ltd. (a)	See Biram Mines Ltd.	
Purdy Mica Mines Ltd. (a) (d)	Oak St., North Bay	Mattawan and Olrig Tps.
Watts, R. W. (a)	Perth	(c).
BRITISH COLUMBIA—		
Fairey & Co. (b)	661 Taylor St., Vancouver, B.C.	Vancouver.
McKay, R. C.	Oliver	Oliver.
Richmond, Geo. W. & Co. (b)	4190 Blenheim St., Vancouver	

The Canadian Peat Industry

(x) Active but no shipments made.
(a) Produces moss.
(b) Produces peat fuel.
(c) Produces humus.

NEW BRUNSWICK—		
Fofard Peat Moss Co. (a)	Shippegan	Shippegan.
Western Peat Co. Ltd. (x)	Box 699, New Westminster, B.C.	Shippegan.
QUEBEC—		
Belleau, Eugène (b)	103 Catherine St. S., Hamilton, Ont.	Bellechasse Tp.
Bourque, Clovis (a) (b)	St. Marc des Carrières	St. Marc des Carrières, St. Alban.
Canada Peat Ltd. (a)	Rivière du Loup	Withworth Tp.
Excel Peat Ltd. (a) (b)	Rivière du Loup	Isle-aux-Coudres.
Faucher, Arthur (b)	Grondines	Grondines.
Maple Leaf Peat Co. (a)	Rivière du Loup	Withworth Tp.
Murphy, Patrick (a) (b)	St. Romual	St. Lambert.
Produits de Tourbe Beaucejour (b)	St. Romual	Beauséjour Tp.
Perfect Peat Products Co. (a)	Rivière du Loup	Withworth Tp.
Premier Peat Moss Ltd. (a)	Isle Verte	Isle Verte.
Proulx, Georges (b) (x)	187 Cartier St., Chicoutimi	Bagot Tp.
Produits Tourbe de Garthby (b)	Garthby	Garthby.
Quebec Peat Moss Co. (a) (b)	St. Guillaume d'Upton	St. Bonaventure.
Roy, Louis (a)	Rivière Blanche	Rivière Blanche.
Roy, Roméo (a)	St. Ulric	St. Ulric.
Tourbière de Pointe-au-Père (a) (b)	Mont Joli	Pointe-au-Père.
Tourbière Rivière Ouelle (a)	c/o F. X. Lambert, 2 Côte d'Abraham	Rivière Ouelle.
Waterville Moss & Peat Mine (a)	Waterville	Waterville.
ONTARIO—		
Arctic Peat Moss Corp. Ltd. (a)	200 Sterling Securities Bldg., Winnipeg, Man.	Crozier.
Canadian Industries Limited (c)	1135 Beaver Hall Hill, Montreal, Que.	Harwick Tp.
Canadian Humus Products Reg. (c)	Suite 1010, 100 Adelaide St. W., Toronto	Beverly Tp.
Erie Peat Ltd. (a)	105 E. Main St., Welland	Welland.
Leasu Peat Works (b)	R.R. 2, Gads Hill	Ellice Tp.
Pringle, J. A. (a)	Arden	Arden.
Polar Bear Peat Moss Products Reg. (a)	Fort Frances	Pinewood.
Stuart, Walter J. (b)	Morewood	Morewood.
Wallace, D. A. (b)	Osgoode	Osgoode Tp.

DIRECTORY OF FIRMS—Continued

The Peat Industry—Concluded

Name of firm	Head office address	Location
MANITOBA—		
McMillan, N. (a)	Lac du Bonnet	Lac du Bonnet.
Winnipeg Supply & Fuel Co. Ltd. (a)	812 Boyd Bldg., Winnipeg	Moss Spur.
ALBERTA—		
Moss Tex Ltd. (a)	10250-107th St., Edmonton	Winterburn.
BRITISH COLUMBIA—		
Alouette Peat Products Ltd. (a)	Pitt Meadows	McTavish Road.
Byrnerood Peat Farm (a)	2707 McKay Ave., New Westminster	Byrne Rood.
B.C. Peat Co. Ltd. (a)	304 Royal Bank Bldg., Vancouver	New Westminster.
Coast Peat Co. Ltd. (a)	736 Granville St., Vancouver	Burnaby.
Columbia Products Ltd. (a)	Box 699, New Westminster	Richmond Tp. Lulu Isoand.
Excelsior Peat Ltd. (a)	6633 Yew St., Vancouver	Burnaby.
Industrial Peat Co. (a)	Box 329, New Westminster	Delta Municipality.
Lulu Island Peat Co. Ltd. (a)	R.R. 2, Eburne	Richmond Tp.
Northern Peat Moss Co. Ltd. (a)	R.R. 2. Eburne	Richmond Tp.
Pacific Peat Products Ltd. (a)	814 Hall Bldg., Vancouver	New Westminster.
Western Peat Co. Ltd. (a)	Box 699, New Westminster	Westminster Highway.

The Salt Industry

NOVA SCOTIA—		
Malagash Salt Co. Limited	196 Provost St., New Glasgow	Cumberland Co.
ONTARIO—		
Brunner, Mond Canada, Ltd.	Canndian Bank of Commerce Bldg., Toronto	Essex Co.
Canadian Industries Limited	Box 10, Montreal, Que.	Essex Co.
Goderich Salt Co. Ltd.	Box 577, Goderich	Goderich.
Sifto Salt Co. Ltd.	2240 Sun Life Bldg., Montreal, Que.	Sarnia.
Warwick Pure Salt Co. Ltd.	R.R. 5, Watford	Lambton Co.
Western Canada Flour Mills Co. Ltd.	287 MacPherson Ave., Toronto	Goderich.
MANITOBA—		
Neepawa Salt Ltd.	Box 10, Montreal, Que.	Neepawa.
ALBERTA—		
Industrial Minerals Ltd.	2240 Sun Life Bldg., Montreal, Que.	Waterways.

The Talc and Soapstone Industry

(x) Active but not producing.

QUEBEC—		
Baker Mining & Milling Co. Ltd.	4010 St. Catherine St. W., Montreal	Highwater.
Broughton Soapstone & Quarry Co. Ltd.	Broughton Station	Broughton Station.
Fortin, Charles	Robertsonville	Thetford Tp.
Pharo, L. C.	187 St. Maurice St., Thetford Mines	Leeds Tp.
Maple Leaf Soapstone (x)	West Broughton	W. Broughton.
ONTARIO—		
Canada Talc Limited	Madoc	Huntingdon Tp.
Spry, W. C.	Madoc	Ompah.
BRITISH COLUMBIA—		
Wartime Metals Corp. (x)	637 Craig St. W., Montreal, Que.	Kootenay National Park.

THE MISCELLANEOUS NON-METAL MINING INDUSTRIES

Asphalt

* Active but not producing.

Name of operator, province and product	Head office address	Plant location
ALBERTA—		
Oil Sands Ltd. (*)	455 St. John St., Montreal, Que.	Bitumount.

Barite

NOVA SCOTIA—		
Canadian Industrial Minerals Ltd.	Walton, N.S.	Walton.
BRITISH COLUMBIA—		
Summit Lime Works Ltd.	Box 273, Lethbridge, Alta.	Golden M.D.

Brucite

QUEBEC—		
Aluminum Company of Canada Ltd.	Sun Life Building, Montreal	Wakefield.

Diatomite

NOVA SCOTIA—		
G. W. Wightman (Mrs.)	Smith's Cove, N.S.	Digby Co.
BRITISH COLUMBIA—		
Fairey and Co.	661 Taylor Sgt., Vancouver	Cariboo M.D. Vancouver.

Fluorspar

NOVA SCOTIA—		
Papke, William	Trout River, N.S.	Inverness Co.
QUEBEC—		
Allevato, T. (*)	Rouyn, Que.	Huddersfield Tp.
ONTARIO—		
Bassett Fluorspar Mining Synd. Ltd.	Room 908, 36 Toronto St., Toronto	Madoc Tp.
Gilman, R. T.	Madoc	Huntingdon Tp.
Millwood Fluorspar Mines Ltd.	204 McKinnon Bldg., Toronto	Hastings Co.
Montgomery, F. K.	Havelock	Cardiff Tp.
Reliance Fluorspar Mining Synd. Ltd.	c/o W. J. Symon, Madoc	Huntingdon Tp.
Stocklosar, Chas. A.	Box 198, Madoc	Huntingdon Tp.
Tops Mining Synd. Ltd.	c/o W. E. Clark, Harcourt	Harcourt.
Trent Mining Synd. Ltd.	213 Dundas St. E., Trenton	Madoc.
Wood Land Mineral Company	19 John St. S., Hamilton	Huntingdon Tp.

Garnets

ONTARIO—		
Niagara Garnet Co. (*)	Box 835, Niagara Falls, N.Y.	River Valley.

Graphite

ONTARIO—		
Black Donald Graphite Ltd.	Calabogie	Brougham Tp.

THE MISCELLANEOUS NON-METAL MINING INDUSTRIES—Continued

Grindstones

NOTE.—(*) Active but not producing.

Name of operator, province and product	Head office address	Plant location
NEW BRUNSWICK—		
Read, H. C.	Bathurst	Stonehaven.

Lithium Minerals

MANITOBA—		
Lithium Corp. of Canada Ltd. (*)	403 Avenue Bldg., Winnipeg	Bernic and Cat Lakes.
Sherritt Gordon Mines Ltd. (*)	25 King St. W., Toronto	Herb Lake.

Magnesitic Dolomite

QUEBEC—		
Canadian Refractories Ltd	1050 Canada Cement Bldg., Montreal	Kilmar, Harrington.

Mineral Waters

QUEBEC—		
Biron and Courville	St. François du Lac	St. François du Lac.
Cie d'Eau Minérale de St. Hyacinthe	632 Concord St., St. Hyacinthe	St. Hyacinthe.
Gurd, Chas. & Co. Ltd	1016 Bleury St., Montreal	Varennes.
Eau Minérale Etoile	Ste. Genevieve de Batiscan	Batiscan.
Eau Naturelle Purgative de Chambord Ltd. (*)	Desbiens	Chambord.
Lemay, Lucien	St. François du Lac	Nicolet Tp.
Levesque, Ernest (*)	Rivière du Loup Station	St. Germainde Kamouraska.
Minard, Edouard	Maskinongé	Maskinongé.
Mont-Clair Richelieu Spring Water Co. Ltd.	c/o J. G. Gravelle, 3711 Basset St., Montreal	Chambly.
Pellerin, Albert & Sons	St. Barnabé N., Quebec	St. Barnabé N.
Source d'Eau Minérale Radnor	St. Maurice	Radnor Tp.
Source Coulombia	L'Epiphanie	L'Epiphanie.
Usine d'Embouteillage Maski	St. Justin	St. Justin.
ONTARIO—		
Belleville Aqua Vital Co. Ltd	201 McDonald Ave., Belleville	Thurlow Tp.
Carlsbad Springs	Carlsbad	Carlsbad.
Deneault, J. F.	Bourget	Bourget.
Gurd, Chas. & Co. Ltd	1016 Bleury St., Montreal, Que.	Caledonia Springs.
Renaud, Victor	Blackburn	Blackburn.

Phosphate

QUEBEC—		
Bigelow, Robert	Buckingham	Papineau Co.
Crang, J. K. Corp.	24 Adelaide St. E., Toronto, Ont.	Buckingham Dist.
High Rock Phosphates Ltd. (*)	11 des Ramparts	Buckingham Dist.
ONTARIO—		
Cordick, Hilliard V.	6 Church St., Perth	Burridge.
Ontario Phosphate Co.	Westport	Westport.
Riley, C.	1110 Concourse Bldg., Toronto	Burridge.
Robson, Bruce C.	125 Holland Ave., Ottawa	Burridge.

Silica Brick

NOVA SCOTIA—		
Dominion Steel & Coal Corp. Ltd	Sydney, N.S.	Sydney.
ONTARIO—		
Algoma Steel Corp. Ltd	Sault Ste. Marie	Sault Ste. Marie.

THE MISCELLANEOUS NON-METAL MINING INDUSTRIES—Concluded

Sodium Carbonate

NOTE.—(*) Active but not producing.

Name of operator, province and product	Head office address	Plant location
BRITISH COLUMBIA—		
Bishop, Viola C. (Mrs.)	c/o Boyds Garage, Clinton	Clinton area.
Davison, E. C.	2043 W. 42nd Ave., Vancouver	Clinton area.

Sodium Sulphate

SASKATCHEWAN—		
Horseshoe Lake Mining Co. Ltd.	Ormiston	Ormiston.
Midwest Chemicals Ltd.	Palo	Whiteshore Lake.
Mellor, J. F.	Alsask	Alsask.
Natural Sodium Products	Bishopric	Alsask, Frederick Lake.
Sybouts Sodium Sulphate Co. Ltd.	46 Goodwin Terrace, Westwood, N.J., U.S.A.	Surprise Valley.

Sulphur (Pyrites)

QUEBEC—		
Aldermac Copper Corp. Ltd.	Dominion Square Bldg., Montreal	Arntfield.
Noranda Mines Ltd.	Royal Bank Bldg., Toronto, Ont.	Noranda.
ONTARIO—		
International Nickel Co. of Canada Ltd. (†)	Copper Cliff	Copper Cliff.
BRITISH COLUMBIA—		
Consolidated Mining & Smelting Company of Canada Ltd. (†)	Trail	Trail.
Britannia Mining & Smelting Co. Ltd.	Britannia Beach	Britannia Beach.

Volcanic Dust

SASKATCHEWAN—		
Spagrud, Thor	Rockglen	Rockglen.

(†) Recover sulphur from smelter gases.

CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS

CANADIAN PORTLAND CEMENT PRODUCERS

Name of firm	Head office address	Location of plant
QUEBEC—		
Canada Cement Company Ltd.	Box 290, Station B, Montreal	Hull, Montreal East.
ONTARIO—		
Canada Cement Company Ltd.	Box 290, Station B, Montreal, Que.	Belleville, Port Colborne
St. Mary's Cement Company Ltd.	357 Bay St., Toronto	St. Mary's.
MANITOBA—		
Canada Cement Company Ltd.	Box 290, Station B, Montreal, Que.	Fort Whyte.
ALBERTA—		
Canada Cement Company Ltd.	Box 290, Station B, Montreal, Que.	Exshaw.
BRITISH COLUMBIA—		
British Columbia Cement Co. Ltd.	500 Fort St., Victoria, B.C.	Bamberton.

THE DOMESTIC CLAY PRODUCTS INDUSTRY

NOVA SCOTIA—		
Brooks, Stephen and Son	Box 159, New Glasgow	New Glasgow.
Harriss Bros.	5 Byng Ave., Sydney	Sydney.
McCurdy, Henry	Middle Musquodoboit	Middle Musquodoboit.
Shaw, L. E., Ltd.	8 Prince St., Halifax	Lantz.
Standard Clay Products Ltd.	St. Johns	New Glasgow.
NEW BRUNSWICK—		
Ryan, M. and Son, Ltd.	Fredericton	Fredericton.
Shaw, L. E. Ltd.	8 Prince St., Halifax, N.S.	Chipman.
QUEBEC—		
Ascot Tile and Brick Co. Ltd.	Ascot Corner	Ascot Corner.
Canada China Clay & Silica Ltd.	Kasil	Kasil.
Castonguay, Hubert	Deschaillons	Deschaillons.
Champlain Brique Ltée, La	c/o H. Boulet, 15 St. Peter St., Quebec	In liquidation.
Citadelle Brique Ltée	14 rue St. Joseph, Quebec	Boischatel.
Crite, Freddy	rue du Moulin, St. Tite	St. Tite.
LaPrairie Company Inc., The	906 University Tower Bldg., Montreal	LaPrairie, Delson.
Lotbinière Brique Reg., La	Deschaillons	Deschaillons.
Montreal Terra Cotta Limited	911 Dominion Square Bldg., Montreal	Lakeside.
Roy, O. and P.	St. George West	St. George West.
St. Lawrence Brick Co. Ltd.	1010 St. Catherine St. W., Montreal	LaPrairie.
Scott Brique Reg., La	Scott Junction	Scott Junction.
Standard Clay Products Ltd.	Box 189, St. Johns	St. Johns.
ONTARIO—		
Barnes, Wm. R. Co. Ltd.	243 Cumberland Ave., Hamilton	Waterdown.
Broadwell, B. and Son	Kingsville	Gosford S. Tp.
Canadian Pressed Brick Co. Ltd.	Kenilworth Ave. S., Hamilton	Hamilton.
Central Tile Bricks Corp. Ltd.	Tilbury	Tilbury.
Chapman Bros.	145 Dawes Rd., Toronto	East York Tp.
Construction Materials Ltd.	Drawer 70, New Toronto	Etobicoke Tp.
Cooksville Company Ltd.	46 Bloor St. W., Toronto	Cooksville.
Cornhill, James & Sons Ltd.	Box 36, Chatham	Harwich Tp.
Coultis, George & Son	Thetford	Bosanquet.
Curtis Bros.	Box 809, Peterborough	Otonabee Tp.
Dellor, Albert & Son	Brownsville	Brownsville.
Dochart Brick, Tile & Terra Cotta Works	Arnprior	Arnprior.
Douglas, John R.	Wilkesport	Lambton Co.
Elliott, James, Jr.	519 Wellington St. W., Sault Ste. Marie	Korah Tp.
Elliott, Wm.	R.R. 1, Glenannan	Bruce Co.
Fletcher Brick & Tile	Fletcher	Tilbury E. Tp.
Frid Bros. Ltd.	Main and Macklin Sts., Hamilton	Hamilton.
Gammage, C. R.	R.R. 2, Dresden	Camden Tp.
Hamilton Pressed Brick Co. Ltd.	211 Kensington Ave. S., Hamilton	Wentworth Co.
Hill, A. W. & Sons	Coatsworth	Tilbury E. Tp.
Huntsville Brick Works	Box 308, Huntsville	Chaffey Tp.
Interprovincial Brick Co. Ltd.	46 Bloor St. W., Toronto	Cheltenham, Milton.
Jamieson Lime Co.	Renfrew	Renfrew.
Janes, D. A.	Mt. Brydges	Caradoc Tp.
Jasperson Brick & Tile Co.	Kingsville	Coatsworth Tp.
Koebel Bros.	St. Clements	St. Clements.
Lindsay, Earl & Sons	R.R. 2, Wallaceburg	Kent Co.
Martin, Amos C.	R.R. 3, Wallenstein	Peel Tp.
McFarlane, W. J.	Forest	Forest.
McFarren, F. B., Ltd.	120 Wellington St. W., Toronto	Streetsville.
Milton Brick Co. Ltd.	170 Bloor St. W., Toronto	Esquesing Tp.
Missinaibi Clays & Mining Ltd.	56½ Adelaide St. E., Toronto	Missinaibi Dist.

THE DOMESTIC CLAY PRODUCTS INDUSTRY—Concluded

Name of firm	Head office address	Location of plant
Ontario—Concluded		
Moscow Brick & Tile Works	R.R. 1, Greenock	Culross Tp.
Napanee Brick & Tile Works	R.R. 3, Napanee	Lennox Co.
National Fireproofing Co. of Canada Ltd.	57 Bloor St. W., Toronto 5	Aldershot.
National Sewer Pipe Co. Ltd.	Aldershot	E. Flamboro Tp., Hamilton. Swansea.
Northern Brick & Clay Products	New Liskeard	Temiskaming.
Norwich Brick & Tile Works	R.R. 2, Norwich	Oxford Co.
Ottawa Brick & Terra Cotta Co. Ltd.	Billings Bridge	Billings Bridge.
Paxton, Fred R.	70 Herrick Ave., St. Catharines	St. Catharines.
Phinn Brick Co.	1042 Adelaide St., London	London.
Phippen & Son	390 Dawes Rd., East York	East York.
Seegmiller, E. & E., Ltd.	525 Wendell Ave., Kitchener	Kitchener.
Snelgrove, A., Estate	Beaverton	Beaverton.
Sproat and Sproat	R.R. 4, Seaforth	Tuckersmith Tp.
Standard Brick Co.	500 Greenwood Ave., Toronto	Toronto.
Superior Brick & Tile Co. Ltd.	426 Victoria Ave., Fort William	Paipoonge Tp.
Toronto Brick Co. Ltd.	897 Bay St., Toronto	Toronto, York Tp.
Wallace, R., & Son	92 First Ave., North Bay	Widdifield Tp.
Wright, F. M.	Comber	Tilbury W. Tp.
Manitoba—		
Alsip Brick, Tile & Lumber Co. Ltd.	537 Portage Ave., Winnipeg	Winnipeg.
Pembina Mt. Clays Ltd. (*)	915 Paris Bldg., Winnipeg	Morden.
Wardrop, D. M.	Whitemouth	Whitemouth.
Saskatchewan—		
Alberta Clay Products Co. Ltd.	Medicine Hat, Alta.	Ravenscrag. Eastend. Willows.
Bruno Clay Works Ltd.	411 Albert Ave., Saskatoon	Bruno.
Dominion Fire Brick & Clay Products Ltd.	Box 90, Moose Jaw	Claybank.
International Clay Products Ltd.	Box 399, Estevan	Estevan.
Medalta Potteries Ltd.	620-3rd St. W., Calgary, Alta.	Willows, Eastend.
Alberta—		
Acme Brick Co. Ltd.	125 Alberta Block, Edmonton	Cannell.
Aetna Coal Co.	East Coulee	Rosedale Ferry.
Alberta Clay Products Co. Ltd.	Medicine Hat	Dunmore. Medicine Hat.
Grande Prairie Brick Yard	Grande Prairie	Grande Prairie.
Gunderson Brick & Coal Co. Ltd.	Redcliffe	Redcliffe.
Kidd, Gordon L. (*)	Box 230, Drumheller	Sec. 14-29-20 W. 4.
Medicine Hat Brick & Tile Co. Ltd.	Box 100, Medicine Hat	Medicine Hat.
Redcliffe Pressed Brick Co. Ltd.	Redcliffe	Redcliffe.
British Columbia—		
Baker Brick & Tile Co. Ltd.	3191 Douglas St., Victoria	Victoria.
Champion & White Ltd.	1075 Main St., Vancouver	Bazan Bay.
Clayburn Co. Ltd.	850 W. Hastings St., Vancouver	Kilgard.
Fairey & Co.	661 Taylor St., Vancouver	Vancouver.
Gypsum, Lime & Alabastine Canada, Ltd. (*)	Paris, Ont.	New Westminster.
Glover, F. (*)	Princeton	Princeton.
Haug, Wm. & Son	Box 220, Kelowna	Kelowna.
Port Haney Brick Co. Ltd.	846 Howe St., Vancouver	Haney.

(*) Produces Bentonite.

PRODUCERS OF STONEWARE AND POTTERY FROM DOMESTIC CLAY

Name of firm	Head office address	Location of plant
New Brunswick—		
Canuck Pottery	198 Union St., Saint John	Saint John.
Deichmann, K. and E.	Moss Glen	Moss Glen. Musquodoboit.
Foley Pottery Ltd.	Saint John	Saint John.
Quebec—		
Poterie du Saguenay, La	Chicoutimi	Chicoutimi.
Laurentian Art Pottery Inc.	St. Jérôme	St. Jérôme.
Ontario—		
Foster Pottery Co.	Main St. W., Hamilton	Hamilton.
Alberta—		
Medalta Potteries Ltd.	620-3rd St. W., Calgary	Medicine Hat.
Medicine Hat Potteries	Medicine Hat	Medicine Hat.

THE IMPORTED CLAY PRODUCTS INDUSTRY

Name of firm	Address
QUEBEC—	
Canada Firebrick Company Ltd.	4741 St. Ambroise St., Montreal.
Canadian Potteries Ltd.	5 Mackenzie King St., St. Johns.
Standard Clay Products Ltd.	St. Johns.
Walker-Hind-Sutherland Refractories Ltd.	309 St. Ferdinand St., Montreal.
ONTARIO—	
Armaco Ltd.	24 Wellington St. W., Toronto.
Canadian Ohio Brass Company Ltd.	Thorold Rd., Niagara Falls.
Canadian Porcelain Company Ltd.	Paradise Rd., Hamilton.
Canada Vitrified Products Ltd.	Talbot St. E., St. Thomas.
Dominion Potteries Ltd.	Dundas St. W., Oakville.
Donvale Pottery Co.	27 Davies Ave., Toronto 8.
Ecanada Art Pottery Ltd.	2 Paradise Rd., Hamilton.
Frontenac Floor & Wall Tile Co. Ltd.	Kingston.
Green, A. P., Fire Brick Co. Ltd.	Commercial St. (Leaside), Toronto 12.
Hamilton Potteries Ltd.	100 Locke St., Hamilton.
McMaster Pottery	Main St., Dundas.
National Refractories Ltd.	Port Robinson.
Ontario Refractories Ltd.	Port Robinson.
Plibrico Jointless Firebrick Ltd.	Horner Ave., Toronto 14.
Robinson Clay Product Co. of Canada Ltd.	119 Shaftesbury Ave., Toronto.
Smith Potteries	353 King St. W., Oshawa.
Sovereign Potteries Ltd.	282 Sherman Ave. N., Hamilton.
Turner's Plastic Fire Brick Co. Ltd.	Audley St., Mimico.
Georgetown Clay Products Ltd.	King St., Georgetown.
BRITISH COLUMBIA—	
Allen Refractories	69E-1st Ave., Vancouver.

THE LIME INDUSTRY

(x) Inactive.
(a) Use calcium or high calcium limestone.
(b) Use dolomitic limestone.
(c) Purchase lime.
(d) Kind of limestone not reported.

Name of firm	Head office address	Location of plant
NOVA SCOTIA—		
Dominion Steel & Coal Corp. Ltd. (b)	Sydney	Sydney.
Eastern Lime Co. Ltd. (a)	Windsor	Windsor.
NEW BRUNSWICK—		
Bathurst Power & Paper Co. Ltd. (a)	Bathurst	Bathurst.
Purdy and Green Ltd. (a)	204 Metcalfe St., Saint John	Saint John.
Snowflake Lime Ltd. (a) (b)	Saint John	Saint John.
Saint John Lime Co. (x) (a) (b)	Brookville	Brookville.
QUEBEC—		
Aluminum Company of Canada Ltd. (b)	1700 Sun Life Bldg., Montreal	Wakefield.
Arnaud, Edwilda (d)	Joliette	Joliette.
Canadian Refractories Ltd. (b)	1050 Canada Cement Bldg., Montreal	(c).
Carrière St. Maurice Ltd. (d)	1293 rue Hart, Trois Rivières	St. Louis de France.
Carrière Trois-Rivières Ltd. (a)	St. Louis de France	St. Louis de France.
Côté, Joseph (a)	Metabetchouan	Metabetchouan.
Dandelin, Z. (d)	St. Dominique	St. Dominique.
Deschambault Quarry Corp. (d)	St. Marc-des-Carrières	St. Marc des Carrières.
Dominion Lime Ltd. (a)	Lime Ridge	Lime Ridge.
Dontigny, Raymond (d)	Ste. Thècle	Ste. Thècle.
Filion, Narcisse (d)	St. Joachim	St. Joachim.
Lalumière, Joseph (d)	St. Dominique	St. Dominique.
Laurentian Stone Co. Ltd. (a)	195 Nicholas St., Ottawa, Ont.	Hull.
Limoges, Henri (a)	552 Pouport St., Montreal	St. Michel.
Mercure, Camille (a)	555-16th Ave., St. Hyacinthe	St. Dominique.
Shawinigan Chemicals Ltd. (a)	Craig St. W., Montreal	Shawinigan Falls.
Standard Lime Co. Ltd. (a)	St. Paul de Joliette	St. Paul de Joliette. St. Marc des Carrières.
Trottier, David (d)	St. Marc des Carrières	St. Marc des Carrières.
ONTARIO—		
Bell, Cecil (d)	R.R. 4, Chesley	Sullivan Tp.
Brunner, Mond Canada, Ltd. (a)	Canadian Bank of Commerce Bldg., Toronto	Anderdon Tp.
Canada & Dominion Sugar Co. Ltd. (a)	Chatham	Wallaceburg.
Canada Lime Co. (a)	180 Duke St., Toronto	Coboconk.
Canadian Gypsum Co. Ltd. (b)	170 Bloor St. W., Toronto	Guelph.
Chemical Lime Co. Ltd. (a)	Beachville	Oxford Co.
Gypsum, Lime & Alabastine, Canada, Ltd. (a) (b).	Paris	Beachville. Glen Christie. Halton.

THE LIME INDUSTRY—(Concluded)

Name of firm	Head office address	Location of plant
ONTARIO—Concluded		
Jamieson Lime Co. (a)	Renfrew	Horton Tp.
North American Cyanamid Ltd. (a)	Niagara Falls	Niagara Falls.
Rockwood Lime Co. (b)	Box 46, Rockwood	Rockwood.
Shane Lime & Charcoal Co. Ltd. (a)	Eganville	Grattan Tp.
MANITOBA—		
Building Products & Coal Co. Ltd. (b)	111 Christie St., Winnipeg	Inwood.
Gillis Quarries Ltd. (x) (a)	Richard and Spruce Sts., Winnipeg, Man.	Garson.
Gypsum, Lime & Alabastine, Canada, Ltd.	Paris, Ont.	(c).
Manitoba Sugar Co. Ltd. (a)	Fort Garry	Fort Garry.
Winnipeg Supply & Fuel Co. Ltd. (a)	812 Boyd Bldg., Winnipeg	Moosehorn. Stonewall.
ALBERTA—		
Canadian Sugar Factories Ltd. (a)	Raymond	Raymond. Picture Butte.
Errico, M. (d)	Cadomin	Cadomin.
Loder's Lime Co. Ltd. (a)	Exshaw	Kananaskis.
Summit Lime Works Ltd. (a)	Box 273, Lethbridge	Crow's Nest Dist.
BRITISH COLUMBIA—		
Pacific Lime Co. Ltd. (a)	744 W. Hastings St., Vancouver	Texada Island.
Pacific Mills Ltd. (a)	Campbell Ave., Vancouver	Ocean Falls.

THE SAND AND GRAVEL INDUSTRY

In addition to the names listed below, production has been reported by the railway companies for ballast, and also a considerable amount by counties and townships in Ontario for road use.

(w) Markets washed or screened material.

NOVA SCOTIA—		
Crockett, V. B.	71 King St., Truro	Colchester Co.
Nova Scotia Department of Highways	Halifax	Various.
Warren Bituminous Paving Co. (w)	1454 Bloor St. W., Toronto 9, Ont.	Yarmouth.
NEW BRUNSWICK—		
Likely, Jos. A. Ltd. (w)	Saint John	East Saint John.
New Brunswick Department of Highways	Fredericton	Various.
QUEBEC—		
Beaudry, Antoine	1706 Plessier, Montreal	St. Henri.
Bélanger & Peltier	St. Aimé	St. Germain and St. Dominique.
Bigras, Omer	Ste. Rose Ouest	Ste. Rose Ouest.
Bonner Sand & Ballast Ltd. (w)	1434 St. Catherine St. W., Montreal	South Durham.
Brosseur, S.	McWatters	McWatters.
Breen, Thos.	Kearns, Ont.	Guigues.
Brouillet Sand & Gravel Co.	Rawdon	Ste. Julienne.
Canadian Johns-Manville Co. Ltd.	Sun Life Bldg., Montreal	Asbestos.
Coaticook, Ville de (w)	Coaticook	Coaticook.
Compagnie de Sable Ltée (w)	10-3eme Ave., Quebec	St. Charles River.
Consolidated Oka Sand & Gravel Co. Ltd. (w)	248 McCord St., Montreal	Lake of Two Mountains.
Gagnon, Arthur	Grand'Mère	Guineau Jct.
Gagnon, L. P.	St. David de Lévis	St. Charles River.
General Crushing Co.	43 Pint Ave., Quebec	Rosaire.
Goyer, Edouard & Frère	St. Bruno	St. Bruno.
Granby, City of	Granby	Granby.
Hains, Alexandre	Beauport	Beauport.
Laberge, Evariste	Ste. Foy	Ste. Foy.
La Corporation de Ville de Magog	Magog	Magog.
Latulippe, Philippe (w)	290 rue de la Ronde, Quebec	St. Charles River.
Marchand, Euclide	Almaville	Mont Carmel.
Mercure, Camille	St. Hyacinthe	St. Dominique.
Quebec, City of	Quebec	Ste. Thérèse de Beauport
Riverin, Jean Joseph	Arvida	Various.
Robert & Dufour	Ste. Anne de Beaupré	Beauport West.
St. Francis River Dredging Co. (w)	St. François du Lac	St. Francis River.
Sherbrooke, City of	Sherbrooke	Orford Tp.
Standard Lime Co. Ltd. (w)	Joliette	Ste. Emelie.
Standard Sand & Gravel Ltd. (w)	St. Félix de Valois	St. Félix de Valois.
Two Mountains Sand Co.	Canada Cement Bldg., Montreal	Pt. Calumet.
Venne, Oscar	Lachenaie	Lachenaie.
ONTARIO—		
Adair, Dolson	Caledon East	Caledon East.
Barnes, Wm., Co. Ltd. (w)	243 Cumberland Ave., Hamilton	Waterdown.
Benson & Patterson	Stamford	Stamford.
Boyd Bros.	Osgoode	Osgoode.
Burrows, John	North Bay	Widdifield Tp..
Conlin, Herbert L. (w)	Highland Creek	Scarboro Tp.
Consolidated Sand & Gravel Ltd. (w)	[illegible] Bldg., Toronto [illegible]	[illegible], Paris and Waterford.
[illegible] Construction Co. Ltd. (w)	[illegible] Albert St., Ottawa	[illegible] Road

THE SAND AND GRAVEL INDUSTRY—Continued

Name of firm	Head office address	Location
ONTARIO—Concluded		
Dominion Concrete Co. Ltd. (w)	Kemptville	Kemptville.
Ellins Bros. (w)	304 Scarlett Rd., Toronto 9	Etobicoke Tp.
Gauthier, John (w)	Porcupine	Whitney Tp.
Goodreau, Charles, Estate of (w)	Northwood	Harwich Tp.
Grandmaitre, Donat	71 Montreal Rd., Eastview	Rockliffe Village.
Hollinger Cons. Gold Mines Ltd.	Timmins	Tisdale Tp.
Howard Sand & Gravel Co. Ltd. (w)	Aldershot	E. Flamboro Tp.
Jones, John D.	Wilton Grove	Wilton Grove.
Kingston Sand & Gravel Ltd.	235 Wellington St., Kingston	Kingston Tp.
McAuley, P. L.	Trenton	Trenton.
McLean, A. B. & Sons (w)	Sault Ste. Marie	Sault Ste. Marie.
National Sand & Material Co. Ltd. (w)	402 Harbour Bldg., Toronto	Point Pelee, Niagara River.
Nicholson Transit Co. (w)	River Rouge, Mich., U.S.A.	Eastern Cap.
Quigley's Foundry Sands (w)	Bartonville	Waterdown.
Rayner Construction Ltd. (w)	Leaside	Fergus and Geraldton.
Scott, T. J. (w)	489 Bay St., Sault Ste. Marie	Lake Superior.
Spratt, G. H. (w)	Billings Bridge	Billings Bridge.
Tees Transit Co. (w)	58 Whitton Rd., Hamilton	Niagara Bar.
Towland Construction Co. Ltd. (w)	294 Dundas St. N., London	Dorchester Tp.
United Towing & Salvage Co. (w)	635 Common St., Montreal, Que.	Lake Superior.
Warren Bituminous Paving Co. Ltd. (w)	1454 Bloor St. W., Toronto 9	Huntsville.
White, Bertha M. (w)	209 N. Vidal St., Sarnia	Sarnia.
Woollatt Fuel & Supply Co. Ltd. (w)	Walkerville	Leamington.
MANITOBA—		
Alsip Brick Tile & Lumber Co. Ltd.	537 Portage Ave., Winnipeg	Beausejour.
Brandon, City of	Brandon	Brandon.
Building Products & Coal Co. Ltd.	111 Christie St., Winnipeg	Birds Hill.
Greater Winnipeg Water District	185 King St., Winnipeg	Mile 31 and Mile 80, G.W.W.D. Ry.
Manitoba Department of Highways	Winnipeg	Various.
McCurdy Supply Co. Ltd. (w)	1034 Arlington St., Winnipeg	
Winnipeg, City of	223 James Ave., Winnipeg	Birds Hill.
SASKATCHEWAN—		
Betteridge, Stanley	Pilot Butte	Pilot Butte.
Eamon, H. G. & Co.	Biggar	Biggar.
Hudson Bay Mining & Smelting Co. Ltd.	500 Royal Bank Bldg., Winnipeg, Man.	Flin Flon.
North Battleford, City of	1201 King St., North Battleford	North Battleford.
Prince Albert, City of	Prince Albert	Prince Albert.
Saskatchewan Department of Highways	Regina	Various.
Tobiassen, Martin	Sceptre	Sceptre.
Wamsley, R.	Snipe Lake	Snipe Lake.
ALBERTA—		
Alberta Department of Highways	Edmonton	Various.
Cristall Sand	10165–104th St., Edmonton	Perryvale.
Jefferies & Sons Ltd. (w)	Calgary	Calgary.
BRITISH COLUMBIA—		
Armstrong, City of	Armstrong	Vernon.
British Columbia Department of Highways	Victoria	Various.
Chilliwack, City of	Chilliwack	Chilliwack Tp.
Consolidated Mining & Smelting Co. Ltd. (w)	Trail	Fort Steele and Tadanac.
Decks Sand & Gravel Co. Ltd. (w)	101 West First Ave., Vancouver	Seymour Creek, North Vancouver and Coquitlam.
Fernie, City of	Fernie	Fernie.
Gilley Bros. Ltd. (w)	902 Columbia St., New Westminster	Port Coquitlam.
Gravel Contractors Ltd.	Dawson Creek	Pouce Coupe River.
Highland Sand & Gravel Co. Ltd. (w)	Lynmour	Lynmour.
Hillside Sand & Gravel Co. Ltd. (w)	1075 Main St., Vancouver	Hillside and Howe Sound.
McIntyre & Harbing (w)	Royal Oak P.O., Saanich	Victoria.
Nelson, City of (w)	501 Front St., Nelson	Nelson.
Pitkethly Bros. (w)	8699 Angus Drive, Vancouver	Vancouver.
Port Alberni, City of	Port Alberni	Alberni District.
Port Coquitlam, City of	Port Coquitlam	Port Coquitlam.
Producers Sand & Gravel Co. (1929) Ltd. (w)	1902 Store St., Victoria	Esquimalt.
Road Materials Ltd. (w)	8699 Hudson St., Vancouver	North Vancouver.
Saanich, District of	Royal Oak P.O., Vancouver Island	Saanich Municipality.

THE STONE QUARRYING INDUSTRY

(x) Firms operating dressing works in conjunction with quarry.
(†) Did not ship in 1943.

Granite

NOVA SCOTIA—		
Bower, A. R.	Box 255, Shelburne	Shelburne.
Dauphinee, W. T. (x)	Shelburne	Shelburne.
N.S. Department of Highways	Halifax	Various.
Rice Bros.	Lawrencetown	Nictaux West.
Shaw, Wm. (for W. H. Nixon) (x)	Williamstown	Nictaux West.
Shelburne Granite Works (x) (†)	Shelburne	Birchtown.

THE STONE QUARRYING INDUSTRY—Continued

Granite—Concluded

Name	Head office address	Location
New Brunswick—		
Granite Street Pavement & Construction Co. Ltd. (x).	Box 1137, Saint John	Hampstead.
Mooney, B., & Sons (x)	49 Canterbury St., Saint John	Hampstead.
Spinney, Stephen, Estate of	St. George	St. George.
Quebec—		
Anderson, Jas.	Box 125, Beebe	Beebe.
Bérubé, Lucien (x)	Brownsburg	Chatham Tp.
Bolduc, Antonio	St. Sébastien	Beauce.
Bourbonnais, J. P.	Dorion-Vaudreuil	Rigaud.
Brodies Ltd. (x)	1070 Bleury St., Montreal	Graniteville, Guenette, and Mount Johnson.
Bullock, W. W.	Graniteville	Stanstead Co.
Cie de Marbre & Tuile de Quebec	181 rue St. Jean, Quebec	Ste. Cécile de Frontenac.
Cloutier, R. L. (x)	Beebe	Beebe.
Delwaide & Goffin (x)	1365 rue St. Valier, Quebec	Chicoutimi.
Désy, Lorenzo	Almaville	Almaville.
Didier, Jos. Belley	330 St. Dominique, Jonquière	Jonquière.
Dubois, Honoré	Rivière à Pierre	Rivière à Pierre.
Dumas & Voyer (x)	Rivière à Pierre	Bois Tp.
Foundation Co. of Canada Ltd. (x)	Guy and Sherbrooke Sts., Montreal	Chicoutimi.
Frenette, P. E.	Rimouski	Rimouski.
Gaboriault & Niven	Box 65, Grenville	Argenteuil Co.
Gagnon, Arthur	1740-4ème rue, Grand'Mère	Grand'Mère.
Granit National Ltée (x)	St. Joseph d'Alma	St. Joseph d'Alma.
Grenier, Elie	Glenada	Glenada.
Lacasse & Boulais	Box 23, Beebe	Beebe.
Lambert, Alcide	Shawinigan Falls	Ste. Flore.
Maltais, Chas.	98 rue St. Joseph, St. Joseph d'Alma	St. Joseph d'Alma.
Massicotte, Lucien	504 Notre Dame, Cap de la Madeleine	La Tuque.
McNamara Construction Co. (x)	42 Industrial St., Leaside, Ont.	Long Point of Mingan.
Perron, Arthur	Rivière à Pierre	Rivière à Pierre.
Quebec North Shore Paper Co.	680 Sherbrooke St. W., Montreal	Baie Comeau.
St. Bruno Quarry & Paving Co. Ltd.	636 Ave. Querbes, Outremont	Chambly Co.
Scotstown Granite Co. Ltd. (x)	660 St. Catherine St., Montreal	Lingwick Tp.
Silver Granite Co. Ltd. (x)	2331 Provençal, Montreal	St. Samuel Station.
Société d'Entreprises Générales Ltée	Amos	Amos.
Wilkinson, Frank L.	Beebe	Stanstead Co.
Ontario—		
Building Products Ltd. (x)	Box 6063, Montreal, Que.	Madoc.
Curran & Briggs Ltd.	61 Haverson Blvd., Toronto	Bancroft.
Fort William, City of	City Hall, Fort William	Mt. McKay.
Horne, Wm., Granite Quarries (x)	Butler, via Ignace	Butler.
Ontario Rock Co. Ltd.	2 College St., Toronto 2	Belmont Tp.
Manitoba—		
Winnitoba Marble Co. (x) (†)	1180 Wall St., Winnipeg	Hawk Lake.
British Columbia—		
B.C. Monumental Works Ltd. (x)	27 Kingsway, Vancouver	Granite Island.
Canadian National Railways	Montreal, Que.	Various.
Canadian Pacific Railways	Montreal, Que.	Ashcroft.
Gilley Bros. Ltd.	902 Columbia St., New Westminster	Granite Island.
Nelson, City of	City Hall, 501 Front St., Nelson	Kootenay District.
Nelson Granite & Monumental Co.	505 Front St., Nelson	Nelson.
Trail, City of	1394 Pine Ave., Trail	West Kootenay.
Vancouver Granite Co. Ltd.	308 Pacific Bldg., Vancouver	Nelson Island.
Wilson, Jas. G. (x)	Sirdar	Sirdar.

Limestone

Nova Scotia—		
Dillman, Thos. (x)	Admiral Rock	Admiral Rock.
Dominion Steel & Coal Corp.	Sydney	Point Edward.
Eastern Lime Co. (x)	Windsor	Windsor.
Kirkpatrick, Robie	Kirkhill	Kirkhill.
McVicar & McDonald (†)	Bailey's Brook	Doctors Brook.
Mersey Paper Co. Ltd.	Liverpool	East River.
Mosher, O. P. & Sons	Upper Musquodoboit	Musquodoboit.
Nairn, J. S. (Dolomite)	24 Whitney Ave., Sydney	Scotch Lake.
North Inverness Lime Crushing Association (†)	Grand Etang	North Inverness District.
Nova Scotia Department of Agriculture	Truro	Various.
Nova Scotia Department of Highways	Halifax	Various.
Smiley, Howard (†)	Newport	Upper Newport.
Windsor Foundry (x)	O'Brien St., Windsor	Manner Point.

THE STONE QUARRYING INDUSTRY—Continued

Limestone—Concluded

Name	Head office address	Location
New Brunswick—		
Alward, R. M.	Havelock	Havelock.
Brookville Manufacturing Co.	Brookville	Brookville.
Saint John Lime Co. (†)	Brookville	Brookville.
Snowflake Lime Ltd.	3 Pokiok Rd., Saint John	Saint John.
Quebec—		
Aluminum Company of Canada Ltd.	1700 Sun Life Bldg., Montreal	Chicoutimi.
Andorno, Jean (x)	Cap St. Martin	Cap St. Martin.
Assels, J. G.	Port Daniel Centre	Clemville.
Beaudry, J. P.	41 rue Taché, Joliette	Joliette.
Bédard, Jean, Ltd.	St. Martin	St. Martin.
Boucher, Louis	Gaspé Percé	Gaspé Percé.
Boucher, Télesphore	Notre Dame de la Salette	Notre Dame de la Salette.
Bourget, John D.	Deforceville	Deforceville.
Canada Cement Co. Ltd.	Box 290, Station B, Montreal	Hull.
Canadian Quarries Co.	10 Ouest, St. Jacques, Montreal	Ville St. Michel.
Carrière de Cap St. Martin	636 Ave. Querbes, Outremont	Cap St. Martin.
Carrière Chateau Enrg.	Château Richer	Château Richer.
Carrière Gravel Ltée	Château Richer	Château Richer.
Carrière Pointe Claire	Dorion-Vaudreuil	Beaconsfield.
Carrière St. Barthélémi	St. Barthélémi	St. Barthélémi.
Carrière St. Dominique Ltée (x)	555-16ème Ave., St. Hyacinthe	St. Dominique.
Carrière St. Maurice Ltée	1293 rue Hart, Trois Rivières	St. Louis de Fance.
Carrière Trois Rivières Ltée (x)	St. Louis de France	St. Louis de France.
Charbonneau, L., & Cie	St. François de Sales	Laval Co.
Cie de Construction de Roberval Ltée	Roberval	Roberval.
Couture, L. P.	Ste. Anne des Monts	Ste. Anne des Monts.
Department of Justice	Ottawa	St. Vincent de Paul.
Deschambault Quarry Corp. (x)	56 rue St. Pierre, Que.	St. Marc.
Dominion Lime Ltd. (x)	Lime Ridge	Lime Ridge.
Drouin, Belonaie	Ste. Justine	Ste. Justine.
Dufresne Engineering Co.	1832 Blvd. Pie IX, Montreal	Rivière des Prairies.
Durocher, Cyrille	11021 Notre Dame E., Montreal	Montreal East.
Eucher, Willie Tremblay	Ste. Anne de Chicoutimi	Chicoutimi.
Filion, Aldège	Lachute	Lachute.
Fortin, Camille	Chambord, Lac St. Jean	St. Jean.
Gagné, Octave	St. Ulric	St. Ulric.
Gagnon & Leclerc	St. Joachim	St. Joachim.
Gaspesian Fertilizer Co.	Port Daniel E.	Port Daniel E.
Gauthier, Jos. O. (x)	St. Marc des Carrières	St. Marc des Carrières.
Gauthier, René	7657 Henri Julien, Montreal	Bélanger Tp.
Gingras & Frère Ltée	St. Marc des Carrières	St. Marc des Carrières.
Gosselin, A.	St. Laurent	St. Laurent.
Gouin, J. A.	Box 240, Trois Rivières	St. Marc des Carrières.
Highway Paving Co.	6301 Park Ave., Montreal	Chicoutimi.
Kennedy Construction Co. Ltd.	407 McGill St., Montreal	Actonvale.
Lagace Quarry	130 Labelle Blvd., Quebec	St. Martin.
Lakeshore Construction Co.	136 Cartier Ave., Pointe Claire	Pointe Claire.
Landry, J. B. A.	St. André-Matapédia	St. André.
Lapan, Frank Ltd.	2805 Lacordaire St., Montreal	Montreal.
Larouche, J. B. (x)	Baie St. Paul	Baie St. Paul.
La Salle Products Ltd.	159 Jean-Talon W., Montreal	Ville St. Michel.
Laurentian Stone Co. Ltd.	195 Nicholas St., Ottawa, Ont.	Wrightville.
Leclerc, J. J.	Drapeau	Drapeau.
Les Amendements Calcaires de Rivière Bleue (x)	Rivière Bleue	Témiscouata Co.
Martineau Fils Ltée (x)	517 Marie Anne E., Montreal	Pont Viau, Montreal.
Mercure, Camille	555-16ème Ave., St. Hyacinthe	St. Dominique.
Miner, R. H. Co. Ltd.	Room 719, Sun Life Bldg., Montreal	St. Laurent and Bélanger Village.
Montreal Quarry & Cut Stone Co.	2020 Union Ave., Montreal	Côte St. Michel.
National Quarries Ltd.	6301 Park Ave., Montreal	Côte St. Michel.
Naud, Eugene	Hamelin	St. Marc des Carrières.
Ouimet, Eugène	St. Jean	St. Jean.
Paquette, Lévis	Cap St. Martin	Cap St. Martin.
Pelletier, Jos. E.	Ste. Anne des Monts	Ste. Anne des Monts.
Pierre à Chaud Ltée	St. Marc des Carrières	St. Marc des Carrières.
Poirier, Edgar	St. Siméon	St. Siméon.
Quebec Department of Highways	Quebec	Various.
Rioux, Louis	Cowansville	Cowansville.
Rousseau, T. E.	105 Côte de la Montagne, Quebec	Val Brilliant, New Carlisle.
St. Francis Rock Products & Equipment Ltd.	St. Laurent	St. Laurent.
St. Laurent Stone Products & Supplies Ltd.	St. Laurent	Laval Co.
Shawinigan Chemicals Ltd.	Power Bldg., Montreal	Bedford.
Société Co-Opérative Agricole	St. Godefroi	St. Godefroi.
Standard Clay Products Ltd.	Box 189, St. Johns	St. Johns.
Standard Lime Co. Ltd.	Joliette	St. Paul de Joliette.
Syndicat Co-Opérative Carrière Ferme Neuve	Ferme Neuve	Ferme Neuve.
Syndicat de Broyage de Lévis	St. Joseph de Lévis	St. Joseph de Lévis.
Trappist Fathers	Village des Pères	Village des Pères.
Tremblay, Louis P.	Matane	Matane.
Tremblay, Nap.	31 rue Joffre, Hull	Hull.

THE STONE QUARRYING INDUSTRY—Continued

Limestone—Concluded

Name	Head office address	Location
QUEBEC—Continued		
Turcotte & Asselin	370 Dorchester, Quebec	Château Richer.
Union des Carrières & Pavages Ltée	42-21ème Ave., Quebec	Charlesbourg.
Varin, Jos.	3275 St. Michel, Montreal	St. Michel.
Verreault, Elz.	194 Dupont, Quebec	Giffard.
Viau, Paul	340 Blvd. du Havre, Valleyfield	Valleyfield.
ONTARIO—		
Bonter Marble & Calcium Co. Ltd.	Box 61, Marmora	Marmora.
Bonter, W. F.	Malone	Malone.
Brunner, Mond Canada, Ltd.	Bank of Commerce Bldg., Toronto	Anderdon Tp.
Canada Cement Co. Ltd.	Box 290, Station B, Montreal, Que.	Thurlow Tp.
Canadian Crushed Stone Ltd.	72 Sun Life Bldg., Hamilton	Dundas and Hagersville.
Chemical Lime Co. Ltd.	Beachville	Oxford Co.
Cook, J. S.	Wiarton	Amabel Tp.
Gypsum, Lime & Alabastine Canada, Ltd.	Paris	Beachville, Hespeler and Milton.
Hagersville Quarries Ltd.	Hagersville	Hagersville.
Haldimand Quarries & Construction Ltd.	137 Wellington St. W., Toronto	Hagersville.
Innerkip Quarries Ltd.	2700 Dufferin St., Toronto	Innerkip.
Jamieson Lime Co.	Renfrew	Horton Tp.
Johnson Bros. Co. Ltd.	37 Market St., Brantford	Walpole Tp.
Kingston Penitentiary (x)	Box 22, Kingston	Portsmouth.
Kirby, S.	215 Sussex St., Ottawa	Gloucester Tp.
Kirkfield Crushed Stone Ltd.	2700 Dufferin St., Toronto	Kirkfield.
Lapierre, M. C.	1949-8th Ave., Owen Sound	Owen Sound.
Law, R. E., Stone Ltd.	Port Colborne	Port Colborne.
Limestone Products Ltd.	1109 Millwood Rd., Toronto	N. Orillia Tp.
Marlhill Mines Ltd. (x)	Allanburg Rd., Thorold	Thorold.
McDonald, A. G.	Bronte	Bronte.
McGinnis & O'Connor	394 King St. E., Kingston	Barriefield.
Noranda Mines Ltd.	1600 Royal Bank Bldg., Toronto 1	Haileybury.
North American Cyanamid Ltd.	Niagara Falls	Ingersoll.
Ontario Department of Highways	Parliament Bldgs., Toronto	Various.
Ontario Rock Co. Ltd.	2 College St., Toronto 2	Belmont and Methuen Tps.
Pembroke, Corp. of	Pembroke	Pembroke.
Peterborough, City of	Peterborough	Peterborough.
Queenston Quarries Ltd. (x)	72 Sun Life Bldg., Hamilton	St. Davids.
Walker Bros.	Thorold	Stamford Tp.
Webman, John	578 Division St., Kingston	Kingston Tp.
Welland Crushed Stone & Building Co. Ltd.	Niagara Falls	Stamford Tp.
MANITOBA—		
Building Products & Coal Co. Ltd.	111 Christie St., Winnipeg	Inwood.
Gillies Quarries Ltd. (†)	Richards & Spruce Sts., Winnipeg	Garson and Stonewall.
McArdle, L. A. K.	Mafeking	Mafeking.
Tyndall Quarry Co. Ltd. (x)	1591 Erin St., Winnipeg	Garson.
Winnipeg, City of	223 James Ave., Winnipeg	Stoney Mountain.
Winnipeg Supply & Fuel Co. Ltd.	812 Boyd Bldg., Winnipeg	Moosehorn and Stonewall.
ALBERTA—		
Loders Lime Co. Ltd.	Kananaskis, Exshaw P.O.	Kananaskis.
Summit Lime Works Ltd.	Box 273, Lethbridge	Lethbridge.
BRITISH COLUMBIA—		
Agostinelli & Vannuchi	957 Rossland Ave., Trail	Fife.
Beale Quarries Ltd.	744 W. Hastings St., Vancouver	Van Anda.
British Columbia Department of Highways	Victoria	Various.
British Columbia Pulp & Paper Co. Ltd.	Bank of Nova Scotia Bldg., Vancouver	Nanaimo.
Canadian Pacific Railways	Montreal, Que.	Golden.
Christensen, P. (Koeye Lime Quarries)	Namu	Namu.
Fernie, City of	Fernie	Fernie.
Pacific Lime Co. Ltd.	744 W. Hastings St., Vancouver	Texada Island.

Marble

QUEBEC—		
Mah Ltd.	98 Dupont, Que.	St. Joseph de Beauce.
Missisquoi Stone & Marble Co. Ltd. (x)	Phillipsburg	Phillipsburg.
White Grit Co.	120 Strathcona Ave., Ottawa, Ont.	Portage du Fort.
ONTARIO—		
Connolly Marble, Mosaic & Tile Co. Ltd. (†)	316 Dupont St., Toronto	Madoc Tp.
Silverstone Black Marble Quarries Ltd.	328 Waverley St., Ottawa	St. Albert.
Stockloser, Karl	Box 13, Madoc	Eldorado.
White Star Mine (Bolender Bros.)	Haliburton	Haliburton.
BRITISH COLUMBIA—		
Marble & Associated Products	507 Ellice St., Victoria	Malahat.

THE STONE QUARRYING INDUSTRY—Concluded

Sandstone

Name	Head office address	Location
NOVA SCOTIA—		
Fairview Crushed Stone	637A Gottingen St., Halifax	Halifax.
Nova Scotia Department of Highways	Halifax	Various.
Wallace Quarries Ltd	Wallace	Wallace.
NEW BRUNSWICK—		
Read Stone Co. (x) (†)	Sackville	Stonehaven.
Smith, E. A. (x)	Shediac	Shediac.
QUEBEC—		
Blais, Jos	32 Mont Marie Ave., Lévis	St. Romuald.
Gagnon, L. P	St. David de Lévis	St. David de Lévis.
Rousseau, T. E	105 Côte de la Montagne, Quebec	Val Brilliant.
Ste. Marie, U	Beauport	Beauport.
Sherbrooke, City of	Sherbrooke	Sherbrooke.
Simard, Adjutor	Pointe au Pic	Pointe au Pic.
ONTARIO—		
Campbell Sandstone Quarries Ltd	Box c19, Westboro	Bells Corners.
Norton, A. W	Limehouse	Limehouse.
Sinfield, E. W	Terra Cotta	Terra Cotta.
Sykes Quarries	Church St., Georgetown	Glen Williams.
BRITISH COLUMBIA—		
Consolidated Mining & Smelting Co	Trail	Fort Steele.

Slate

QUEBEC—		
Williamson & Crombie	Kingsbury	Kingsbury
BRITISH COLUMBIA—		
Brown, O. M	1903 Lansdowne Rd., Victoria	Kapoor.
Richmond, George W	4190 Blenheim St., Vancouver	Howe Sound.

PRODUCERS OF ROCK WOOL

Name	Address
Canadian Gypsum Company Ltd	Weston, Ontario.
Canadian Johns Manville Co. Ltd	Asbestos, Quebec.
Gypsum, Lime & Alabastine, Canada, Ltd	Caledonia, Ontario.
Insulation Products Ltd	Todmorden, Toronto, Ontario.
Spun Rock Wools Ltd	Thorold, Ontario.
Vacuum Wool Limited	Ladysmith, British Columbia.