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DOMINION BUREAU OF STATISTICS
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ANNUAL REPORT

ON THE

MINERAL PRODUCTION OF CANADA

DURING THE CALENDAR YEAR

1944

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In preparing the manuscript for the above-mentioned report, the chapter on the Stone Industry was inadvertently omitted. This supplement should be inserted after page 287 in order to complete your copy.

THE STONE INDUSTRY IN CANADA, 1944

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.

Production by these industries during the year totalled $9,698,164, 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 1944 numbered 3,018 and their combined earnings amounted to $4,580,951.

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 new stone produced in Canada during 1944 totalled $7,159,177 compared with $7,964,179 in 1943. The tonnage shipped in 1944 included 5,565,286 tons of limestone valued at $5,528,459; 269,964 tons of granite (igneous rocks) valued at $1,303,790; 146,766 tons of sandstone valued at $223,453; 11,829 tons of marble valued at $85,374 and 1,147 tons of slate worth $18,101. Of the total value of domestic stone produced in 1944, quarries in the province of Quebec contributed 46·6 per cent, Ontario 40·6 per cent, and Nova Scotia 3·1 per cent.

The number of firms in the stone quarrying industry in 1944 totalled 405; employees numbered 2,164; salaries and wages paid aggregated $3,154,689 and the cost of fuel, electricity and process supplies used amounted to $1,497,880.

Table 1.—Production (Sales) of Stone from Canadian Quarries, by Kinds and by Provinces, 1943 and 1944

Province		Granite (a)	Limestone (b)	Marble	Sandstone	Slate	Total
1943							
Nova Scotia	tons	703	174,933	.....	72,232	.....	247,868
	$	28,407	234,197	.....	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**	**250,663**	**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 1,865,597 tons of limestone consumed in the cement industry in 1944 and 1,918,742 tons in 1943. Limestone used in the Canadian lime industry is also not included; it is estimated that approximately 1,571,451 tons of limestone were burned in the manufacture of lime in 1944 and 1,514,481 tons in 1943.

Table 1.—Production (Sales) of Stone From Canadian Quarries, by Kinds and by Provinces, 1943 and 1944—Concluded

Province		Granite (a)	Limestone (b)	Marble	Sandstone	Slate	Total
1944							
Nova Scotia	tons	1,886	50,734	....	45,813	....	**98,433**
	$	37,532	123,613	....	63,968	....	**225,113**
New Brunswick	tons	1,857	66,731	....	1,400	....	**69,988**
	$	47,504	165,258	....	31,425	....	**244,187**
Quebec	tons	127,544	2,370,141	6,489	89,470	198	**2,593,842**
	$	830,238	2,349,177	50,569	104,629	198	**3,334,811**
Ontario	tons	125,604	2,852,241	5,215	5,223	....	**2,988,283**
	$	307,497	2,549,402	32,650	20,431	....	**2,909,980**
Manitoba	tons	357	31,572	....	....	....	**31,929**
	$	4,967	48,587	....	....	....	**53,554**
Alberta	tons	....	12,726	....	....	....	**12,726**
	$	....	43,049	....	....	....	**43,049**
British Columbia	tons	12,716	181,141	125	4,860	949	**199,791**
	$	76,052	249,373	2,155	3,000	17,903	**348,483**
Canada	tons	**269,984**	**5,565,286**	**11,829**	**146,766**	**1,147**	**5,994,992**
	$	**1,303,790**	**5,528,459**	**85,374**	**223,453**	**18,101**	**7,159,177**

Table 2.—Production (Sales) of Stone(*) from Canadian Quarries, by Provinces, Showing Purposes for Which Used, 1944

For use as follows:		Nova Scotia	New Bruns-wick	Quebec	Ontario	Mani-toba	Alberta	British Columbia	Canada
1944									
Building stone—Rough	tons	372	80	7,275	3,414	245	....	1,436	**12,822**
	$	4,719	962	23,391	11,096	2,003	....	3,624	**45,795**
Dressed	tons	....	620	6,136	3,337	227	....	....	**10,320**
	$	....	31,890	261,228	47,325	9,964	....	....	**350,407**
Monumental and ornamental stone—Rough	tons	37	1,488	6,777	....	....	....	1,305	**9,607**
	$	552	11,625	96,552	....	....	....	13,800	**122,529**
Monumental and ornamental stone—Dressed	tons	349	188	5,200	174	120	....	304	**6,335**
	$	33,980	33,074	491,894	918	4,575	....	50,594	**615,035**
Flagstone	tons	....	....	....	1,315	27	....	....	**1,342**
	$	....	....	....	4,748	180	....	....	**4,928**
Curbstone	tons	....	....	200	....	....	....	....	**200**
	$	....	....	1,298	....	....	....	....	**1,298**
Paving blocks	tons	....	....	1,250	300	....	....	....	**1,550**
	$	....	....	7,874	600	....	....	....	**8,474**
Lining open-hearth furnaces	tons	8,930	....	....	....	....	....	....	**8,930**
	$	16,967	....	....	....	....	....	....	**16,967**
Chemical—									
Flux in iron and steel furnaces	tons	....	57	1,005	414,625	4,457	1,000	589	**421,733**
	$	....	110	854	373,334	7,480	2,500	976	**385,254**
Flux in non-ferrous smelters	tons	....	....	49,729	117,099	....	....	37,491	**204,319**
	$	....	....	26,706	87,188	....	....	24,406	**138,300**
Glass factories	tons	....	....	391	....	....	3,742	....	**1,133**
	$	....	....	1,466	....	....	5,613	....	**7,079**
Pulp and paper mills	tons	....	4,188	129,642	25,375	1,741	....	47,719	**208,665**
	$	....	7,748	179,815	82,986	1,913	....	101,675	**374,137**
Sugar refineries	tons	....	....	....	4,978	....	....	....	**4,978**
	$	....	....	....	4,231	....	....	....	**4,231**
Other chemical uses	tons	....	....	....	244,592	....	....	20,942	**265,534**
	$	....	....	....	240,107	....	....	21,264	**261,371**
Pulverized Stone—									
Whiting (substitute)	tons	....	....	....	2,732	....	....	233	**2,965**
	$	....	....	....	16,611	....	....	2,996	**19,607**
Asphalt filler	tons	277	....	9,031	4,153	....	....	966	**14,427**
	$	2,493	....	32,910	14,853	....	....	4,830	**55,086**
Dusting coal mines	tons	....	....	....	....	....	3,030	473	**3,503**
	$	....	....	....	....	....	12,120	3,193	**15,313**
Agricultural purposes and fertilizer plants	tons	41,454	62,467	171,637	32,074	1,833	1,514	5,966	**316,945**
	$	103,367	157,353	239,521	74,337	4,923	6,056	15,485	**601,042**
Other uses	tons	....	....	80	10,547	2,282	....	23	**12,932**
	$	....	....	465	35,090	2,028	....	207	**37,790**
Crushed stone for manufacture of artificial stone	tons	....	....	172	82	....	....	....	**251**
	$	....	....	786	255	....	....	....	**1,041**
Roofing granules	tons	....	....	....	35,031	....	....	952	**35,983**
	$	....	....	....	126,135	....	....	17,975	**141,110**
Poultry grit	tons	73	....	1,910	8,318	....	3,440	1,466	**15,207**
	$	786	....	10,628	49,752	....	16,760	7,317	**85,243**
Stucco dash	tons	....	....	531	97	....	....	522	**1,150**
	$	....	....	3,439	582	....	....	5,314	**9,335**
Terrazzo chips	tons	....	....	1,327	1,465	....	....	....	**2,792**
	$	....	....	7,283	10,850	....	....	....	**18,133**
Rock wool	tons	....	....	....	7,130	....	....	....	**7,130**
	$	....	....	....	6,890	....	....	....	**6,890**
Rubble and riprap	tons	6,441	900	101,598	84,207	1,600	....	6,855	**201,601**
	$	10,949	1,425	88,722	80,683	1,810	....	4,234	**187,823**
Crushed stone—									
Concrete aggregate	tons	30,000	....	1,293,101	514,841	14,393	....	....	**1,852,335**
	$	33,300	....	1,152,845	400,144	14,403	....	....	**1,600,692**
Road metal	tons	10,500	....	382,773	1,030,303	4,443	....	70,239	**1,498,258**
	$	18,000	....	351,067	911,685	3,761	....	68,283	**1,352 796**
Railroad ballast	tons	....	....	424,077	442,094	561	....	2,310	**869,042**
	$	....	....	356,067	329,580	514	....	2,310	**688,471**
Total Canada	tons	**98,433**	**69,988**	**2,593,842**	**2,988,283**	**31,929**	**12,726**	**199,791**	**5,994,992**
	$	**225,113**	**241,187**	**3,334,811**	**2,909,980**	**53,554**	**43,049**	**348,483**	**7,159,177**
Per cent of total	Quantity	1·64	1·17	43·27	49·85	0·53	0·21	3·33	**100·00**
	Value	3·14	3·41	46·58	40·65	0·75	0·60	4·87	**100·00**

(*) Includes the production of slate and marl.

Table 3.—Production (Sales) of Stone From Canadian Quarries, by Kinds, Showing Purposes for Which Used, 1943 and 1944

For use as follows:		Granite (a)	Limestone (b)	Marble	Sandstone	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
	$	398,828	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	...	...	...	177,431
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	208,341	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**	**161,163**	**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.

Table 3.—Production (Sales) of Stone from Canadian Quarries, by Kinds, Showing Purposes for Which Used, 1943 and 1944—Concluded

For use as follows:		Granite (a)	Lime-stone (b)	Marble	Sand-stone	Slate	Total
1944							
Building stone—Rough	tons	4,260	4,770	142	3,650	....	12,822
	$	10,033	11,149	9,268	15,345	....	45,795
Dressed	tons	1,592	7,458	120	1,150	....	10,320
	$	83,485	214,037	18,135	34,750	....	350,407
Monumental and ornamental stone—Rough	tons	9,607	....	....	....	....	9,607
	$	122,529	....	....	....	....	122,529
Dressed	tons	6,041	120	....	174	....	6,335
	$	609,542	4,575	....	918	....	615,035
Flagstone	tons	....	907	....	435	....	1,342
	$	....	1,336	....	3,592	....	4,928
Curbstone	tons	200	....	....	....	....	200
	$	1,298	....	....	....	....	1,298
Paving blocks	tons	1,235	....	....	315	....	1,550
	$	7,770	....	....	704	....	8,474
Lining open-hearth furnaces	tons	....	8,930	....	....	....	8,930
	$	....	16,967	....	....	....	16,967
Chemical—							
Flux in iron and steel furnaces	tons	....	421,713	20	....	....	421,733
	$	....	384,924	330	....	....	385,254
Flux in non-ferrous smelters	tons	....	204,319	....	....	....	204,319
	$	....	138,300	....	....	....	138,300
Glass factories	tons	....	4,133	....	....	....	4,133
	$	....	7,079	....	....	....	7,079
Pulp and paper mills	tons	....	208,665	....	....	....	208,665
	$	....	374,137	....	....	....	374,137
Sugar refineries	tons	....	4,978	....	....	....	4,978
	$	....	4,231	....	....	....	4,231
Other chemical uses	tons	....	265,534	....	....	....	265,534
	$	....	261,371	....	....	....	261,371
Pulverized stone—							
Whiting (substitute)	tons	....	2,915	50	....	....	2,965
	$	....	18,807	800	....	....	19,607
Asphalt filler	tons	....	14,427	....	....	....	14,427
	$	....	55,086	....	....	....	55,086
Dusting coal mines	tons	....	3,503	....	....	....	3,503
	$	....	15,313	....	....	....	15,313
Agricultural purposes and fertilizer plants	tons	400	316,545	....	....	....	316,945
	$	2,825	598,217	....	....	....	601,042
Other uses	tons	....	12,502	430	....	....	12,932
	$	....	35,925	1,865	....	....	37,790
Crushed stone for manufacture of artificial stone	tons	....	82	172	....	....	254
	$	....	255	786	....	....	1,041
Roofing granules	tons	33,039	1,995	....	....	949	35,983
	$	123,732	2,475	....	....	17,903	144,110
Poultry grit	tons	279	10,251	4,677	....	....	15,207
	$	2,800	53,930	28,513	....	....	85,243
Stucco dash	tons	4	565	581	....	....	1,150
	$	70	4,826	4,439	....	....	9,335
Terrazzo chips	tons	....	270	2,522	....	....	2,792
	$	....	810	17,323	....	....	18,133
Rock wool	tons	....	7,130	....	....	....	7,130
	$	....	6,890	....	....	....	6,890
Rubble and riprap	tons	29,265	153,892	3,115	15,131	198	201,601
	$	24,021	136,294	3,915	23,395	198	187,823
Crushed stone—							
Concrete aggregate	tons	54,476	1,751,849	....	46,010	....	1,852,335
	$	83,951	1,455,549	....	61,192	....	1,600,692
Road metal	tons	129,566	1,350,374	....	18,318	....	1,498,258
	$	231,734	1,090,968	....	30,094	....	1,352,796
Railroad ballast	tons	....	807,459	....	61,583	....	869,042
	$	....	635,008	....	53,463	....	688,471
Total Canada(b)	tons	**269,964**	**5,565,286**	**11,829**	**146,766**	**1,147**	**5,994,992**
	$	**1,303,790**	**5,528,159**	**85,374**	**223,453**	**18,101**	**7,159,177**

Table 4.—Production of Stone for Building Purposes, Chemical Use, Cement Manufacture, Concrete Aggregate, Road Metal and Railroad Ballast, 1935-1944

Year		Building stone (a)	For chemical purposes(b)	For concrete aggregate	For road metal	For railroad ballast	For cement manufacture(c)
1935	tons	200,899	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	1,465,108
	$	746,370	626,297	1,214,181	2,522,080	570,606	....
1938	tons	40,666	551,737	981,739	2,721,922	80,019	1,358,689
	$	725,402	468,000	791,971	2,347,910	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	743,772	....
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	1,983,222	2,108,428	852,928	1,994,202
	$	314,428	1,330,127	1,727,889	1,989,509	704,389	....
1944	tons	23,142	1,108,362	1,852,335	1,498,258	869,042	1,930,900
	$	396,202	1,170,372	1,600,692	1,352,786	688,471	....

(a) Does not include monumental or ornamental stone.
(b) Does not include limestone used in Canadian lime industry which totalled 1,571,451 tons in 1944.
(c) Includes shale in 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; 75,460 tons in 1943 and 74,303 tons in 1944.

GRANITE

Table 5.—Production of Granite(*) in Canada, 1935-1944

Year	Short tons	$	Year	Short tons	$
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
1939	1,102,395	2,119,501	1944	269,964	1,303,790

(*) 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 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. Prior to the war 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 break-waters; 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. 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 should give careful study to the market possibilities of a monumental stone, especially of 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 the industry is likely to prosper."

LIMESTONE

Table 6.—Production of Limestone(*) in Canada, 1935-1944

Year	Short tons	$	Year	Short tons	$
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	3,864,610	1943	6,265,181	6,105,749
1939	4,149,589	3,817,551	1944	5,565,286	5,528,450

(*) Includes dolomite and marl; production of marl totalled 23,026 tons in 1942; 22,913 tons in 1943, and 19,848 tons in 1944.

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 present production of limestone for all purposes, including the manufacture of lime and cement, constitutes 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. In chemical composition the deposits range from pure high-calcium limestone through magnesian limestone to dolomite. Large deposits of brucite limestone and magnesitic dolomite are being worked.

"Of significance in connection with future production of pure limestone is the progress being made in beneficiation whereby siliceous material is in part removed from impure limestone by flotation. This method of purifying limestone is now in use at several Portland cement plants in various parts of the world, and it is likely to be more widely used in the future as it permits utilization of certain deposits which, though advantageously situated, contain impurities that hitherto spoiled the usefulness of the deposit.

"Limestone is widely distributed and is quarried on a large scale in all industrial countries. Rarely is there much international trade in it, but limestone for use in certain large consuming centres in Canada can be obtained more cheaply from abroad and considerable quantities are imported for use as blast furnace flux, for road metal, and for use in some pulp mills in Ontario near the International boundary. Comparatively small tonnages are exported to the United States for use in agriculture and in sugar refineries. No separate record is maintained of the trade in limestone.

"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. For certain uses (in the wood pulp industry, for example) the limestone as quarried requires little or no processing, but most 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. Most of the 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. The value of rock wool and slag wool produced in 1944 by five Canadian plants in Ontario and Quebec was $1,617,420 compared with $1,721,141 in 1943. The decreased production was caused mostly by shortages in labour and materials. Two new plants, one in Saskatchewan and one in New Brunswick, were built during 1944 but did not come into production until 1945.

"Pure dolomite is now an important source of magnesia and magnesium metal. The metal is recovered directly from calcined dolomite by reduction with ferrosilicon, and indirectly by reacting calcined dolomite with sea-water or with magnesium chloride brine, thereby forming magnesium hydroxide that is converted into the chloride, from which after dehydration, magnesium is recovered by electrolysis. High-calcium lime can be used in place of dolomitic lime for precipitating magnesium hydroxide from sea-water and brine, but where the dolomitic lime is used the yield of magnesia is increased by the magnesia content of the latter. Dolomite is the raw matter from which basic magnesium carbonate and magnesia are made by the Pattinson process. Dead-burned dolomite is widely used as a refractory material in the steel industry.

"Magnesitic dolomite is used in Quebec for the production of refractory products; brucitic limestone is processed for the production of magnesia and hydrated lime.

"The use of limestone in agriculture is capable of extensive development. Though the necessity of applying limestone or lime to agricultural land to maintain or increase soil fertility has been emphasized for many years, the quantity so used in Canada is small.

"Limestone in blocks or large dimensions for sawing into budding stone is quarried in Quebec, Ontario, and Manitoba. The quarry centres in Quebec for this heavily bedded limestone are at St. Marc des Carrières in Portneuf county, and in the vicinity of Montreal. At both localities a grey limestone is obtained. In Ontario, silver-grey limestone and smaller quantities of buff, and of variegated buff and grey limestone, are quarried near Queenston in the Niagara Peninsula. At Longford Mills, near Orillia, buff, silver-grey, and brown limestone suitable for building stone and marble 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. They have been inactive for the past several years.

"In addition to the large quarries, the products of which normally have a wide shipping range, small quarries producing building stone for local use are worked near Quebec City, Montreal, and Hull in the province of 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.

"The small production in 1944 reflects the wartime curtailment in construction of buildings of the type requiring cut stone. Most of the quarries were inactive during 1944 and a part of the shipments made were from stock. The rise in imports was occasioned in part by the difficulty of securing labour for the short periods of quarry operation necessary to supply the small demand for stone not already in stock. As a result, many of the quarries remained closed and the small demand was supplied by imported stone.

"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.

"There is likely to be a good demand for structural limestone when construction for civilian requirements gets under way, because the construction of a great many necessary buildings for which Canada limestone is specified has been deferred until after the war."

MARBLE

Table 7.—Production of Marble in Canada, 1935-1944

Year	Short tons	$	Year	Short tons	$
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	68,622
1939	14,124	200,054	1944	11,829	85,374

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 broken marble for use as rubble and for making artificial stone, terrazzo chips, stucco dash, poultry grit, marble flour, and whiting substitute. Waste from some of the quarries is sold for chemical and metallurgical uses and for road metal.

"In Quebec, several varieties of clouded grey marble and also a black marble are available in the quarries of Missisquoi Stone and Marble Company, Limited at Philipsburg. 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. White dolomite is quarried and crushed by Canadian Dolomite Company, Limited at Portage du Fort, Pontiac county, for making artificial stone, terrazzo chips, stucco dash, and various minor products.

"In Ontario, black marble in beds up to 40 inches thick is quarried at St. Albert, near Ottawa, by Silvertone Black Marble Quarries, Limited, Ottawa. 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 of red and buff marble by Winnitoba Marble Quarries, Winnipeg, from its quarry at Fisher Branch to supply building rubble and terrazzo chips.

"In British Columbia there are many deposits of marble, but there, is at present only a small production of white marble, and Associated Products, Victoria, from a quarry at Malahat, and by Beale Quarries Limited, Van Anda, Texada Island.

"Many deposits of beautifully coloured marble are known, but have never been fully investigated, chiefly because in the past the demand in Canada for marble of any one colour, other than for a staple variety, such as white, was comparatively small.

"There is a wide range in the price of marble depending on the quality and rareness of colouring.

"The war has adversely affected the marble industry because most of the wartime buildings have been of the industrial type in which little or no standing marble has been used. Few of the quarries were in active operation in 1944 and such shipments of block or slab marble as were made were from stock. There has, however, been an increase in the demand for terrazzo material, most of which previously originated in Europe. Several of the Canadian quarry operators have added equipment for the production of both terrazzo chips and poultry grit from waste marble, and a good range of colours is now available in domestic terrazzo chips. In view of the large accumulation of building construction to be proceeded with after the war it is expected that a good demand for Canadian marble will materialize in the near future".

SANDSTONE

Table 8.—Production of Sandstone in Canada, 1935-1944

Year	Short tons	$	Year	Short tons	$
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	250,003
1939	176,205	331,830	1944	146,766	223,453

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 1944 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 1944 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 manufactures. Crude, crushed or ground quartzite sold for fluxing purposes or as silica sand is included under quartz as production.

SLATE

Table 9.—Production of Slate in Canada, 1935-1944

Year	Short tons	$	Year	Short tons	$
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	1,336	17,733
1939	1,149	6,760	1944	1,147	18,101

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.

WHITING SUBSTITUTE

"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 from 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. The marbles at present used contain very little magnesium carbonate, though in the past a whiting substitute made from white dolomite was produced in Eastern Canada for making putty, and there seems to be no good reason why a dolomitic whiting substitute would not be equally as suitable as calcite for numerous purposes.

"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, and both were in operation in 1944. The output of one 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 made in Canada.

"Producers of whiting substitute are: Pulverized Products, Limited, Montreal; Claxton Manufacturing Company, Toronto; White Valley Chemicals, Limited, Bobcaygeon, Ontario (operated by Chem-Ore Mines, 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 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, though there are some uses for which chalk whiting is necessary and other materials cannot be substituted.

"There is little or no whiting substitute exported from Canada. Imports of whiting, crude chalk, and prepared chalk were valued at $334,744 in 1944 compared with $303,190 in 1943.

"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 ceramic glaze, and for a number of other purposes.

"Prices per ton, bagged and in carload lots, range from $8 to $15 f.o.b. plants." (Bureau of Mines, Ottawa).

Table 10.—Consumption of Whiting (and Chalk), by Uses, as Reported to the Annual Census of Industry, 1943 and 1944

Industry	1943		1944	
	Tons	Cost at Works	Tons	Cost at Works
Paints and pigments	7,773	239,832	8,887	263,998
Rubber	3,202	58,215	2,208	46,925
Miscellaneous textiles *	4,147	45,342	4,938	56,713
Explosives (a)	271	4,472	316	7,489
Toilet preparations (a)	238	18,985	911	50,540

* Includes oilcloth and linoleum.
(a) Chalk, ground and precipitated.

Table 11.—Imports into Canada and Exports of Stone, by Kinds, 1943 and 1944

—		1943		1944	
		Quantity	Value	Quantity	Value
			$		$
Imports					
Building stone, n.o.p.	cwt.	854	5,651	36,972	15,120
Curling stones and handles therefor	pair	392	8,784	396	10,667
Granite, rough, not hammered or chiselled			47,291		53,707
Granite, sawn only			16,450		15,783
Granite, monuments					
Granite, manufactures of, n.o.p.			5,828		9,430
Marble, rough, not hammered or chiselled			5,462		8,844
Marble, sawn or sand rubbed, not polished			10,282		22,653
Marble, not further manufactured than sawn for tombstones			25,971		38,036
Marble, manufactures of, n.o.p.			8,915		7,869
Refuse stone	ton	807,561	447,850	734,141	398,378
Slate roofing	square	460	5,229	720	7,986
Slate mantels and manufactures of slate, n.o.p.			37,509		28,075
Chalk, china, cornwall or cliff stone and mica schist			33,404		26,107
Mineral wool	ton		72,780	1,310	147,862
Whiting, gilders' whiting and Paris white	ton	11,198	257,496	13,432	279,112
Manufactures of stone, n.o.p.			18,813		25,067
Chalk, prepared			12,290		19,525
Pumice and pumice stone and lava tufa			19,479		27,880
Grindstones, not mounted and not less than 36 inches in diameter	no.	612	64,731	578	59,211
Grindstones, n.o.p.	no.	1,068	2,266	672	2,098
Burrstones, rough, in blocks	no.	36	452	62	1,062
Ganister	ton	484	3,970	347	2,463
Total			**1,110,903**		**1,206,935**
Exports					
Crushed stone	ton	1,173	999	507	[illegible]
Granite and marble, unwrought	ton	3,762	47,258	3,871	42,[illegible]
Dressed stone of all kinds			7,819		[illegible]
Grindstones, manufactured			5,032		[illegible]
Total			**61,108**		**19,226**

2.—Secondary production—The Stone Products Industry, 1944

In 1944 there were 142 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 $4,370,430 in 1944, an increase of 6·6 per cent over the total of $4,098,100 reported for the previous year. The 59 works in Ontario accounted for

56·6 per cent of the total output and the 39 plants in Quebec for 23·4 per cent. The average number of employees was 854 and $1,426,262 were paid in salaries and wages. Materials used in the cutting and dressing processes, including stone, cost $1,670,718 and expenditures for fuel and electricity amounted to $160,725.

Table 12.—Cost of Materials used in the Stone Products Industry, 1943 and 1944

—	Cost at Works 1943	Cost at Works 1944
	$	$
Stone—(a) From Canadian quarries	344,413	409,677
(b) Imported	178,572	218,367
Monuments, cut and polished, for lettering only	87,106	124,383
All other materials	911,217	918,291
Total	**1,521,308**	**1,670,718**

Table 13.—Production from the Stone Products Industry, by Provinces 1943, and 1944

—	Granite: Monuments	Granite: For building purposes	Marble: Monuments	Marble: For building purposes	Marble chips and dust	Limestone: Monuments and bases	Limestone: For building purposes	Finished monuments, lettered only	Other products	Total
	$	$	$	$	$	$	$	$	$	$
Prince Edward Island and New Brunswick—										
1943	96,202	....	20,470	....	....	....	....	2,310	1,015	119,997
1944	108,662	....	23,612	450	....	....	....	2,275	1,173	136,172
Nova Scotia—										
1943	48,510	....	21,530	....	....	....	....	31,499	2,148	103,687
1944	41,442	4,000	25,000	....	....	....	....	35,840	2,711	108,993
Quebec—										
1943	451,938	23,473	7,656	39,150	5,264	2,425	420	15,770	353,556	899,652
1944	557,591	15,471	7,506	26,668	4,679	3,007	650	15,241	389,958	1,020,771
Ontario—										
1943	751,272	400	102,773	41,966	1,511	15,221	32,805	75,976	1,406,531	2,428,455
1944	795,525	7,073	147,677	35,497	411	33,763	97,459	80,468	1,276,003	2,473,876
Manitoba—										
1943	55,788	14,495	18,699	7,360	23,289	2,075	1,402	7,285	1,850	132,743
1944	79,045	....	13,733	5,870	100	2,078	....	33,785	179	134,790
Saskatchewan—										
1943	66,164	....	44,344	....	1,654	7,215	1,394	8,375	17,381	146,527
1944	92,260	4,650	50,855	3,342	585	7,422	757	9,415	13,782	183,068
Alberta—										
1943	65,556	27,500	9,607	5,500	23,000	....	600	....	6,592	138,355
1944	96,737	....	21,810	....	18,040	2,600	....	41,988	6,926	188,101
British Columbia—										
1943	66,326	....	2,210	2,654	....	....	....	10,950	46,544	128,684
1944	99,895	236	445	8,976	....	....	....	9,157	5,950	124,659
Canada—										
1943	**1,601,756**	**65,868**	**227,289**	**96,630**	**54,718**	**27,536**	**36,021**	**152,665**	**1,835,617**	**4,098,100**
1944	**1,871,157**	**31,430**	**290,638**	**80,803**	**23,815**	**48,870**	**98,866**	**228,169**	**1,696,682**	**4,370,430**

Table 14.—Production in Canada and Imports of Rock Wool, 1934-1944

Year	Production $	Imports Pounds	Imports $
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	396,261	1,337,954	45,109
1939	525,998	1,820,763	44,860
1940	935,229	2,082,589	52,233
1941	1,185,324	2,633,544	74,791
1942	1,417,258	1,643,944	54,776
1943	1,707,501	1,839,670	72,780
1944	1,617,420	2,619,513	147,862

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SUPPLEMENT TO ANNUAL REPORT

ON THE

MINERAL PRODUCTION OF CANADA

1944

In preparing the manuscript for the above-mentioned report, the chapter on the Stone Industry was inadvertently omitted. This supplement should be inserted after page 287 in order to complete your copy.

THE STONE INDUSTRY IN CANADA, 1944

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.

Production by these industries during the year totalled $9,698,164, 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 1944 numbered 3,018 and their combined earnings amounted to $4,580,951.

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 new stone produced in Canada during 1944 totalled $7,159,177 compared with $7,964,179 in 1943. The tonnage shipped in 1944 included 5,565,286 tons of limestone valued at $5,528,459; 269,964 tons of granite (igneous rocks) valued at $1,303,790; 146,766 tons of sandstone valued at $223,453; 11,829 tons of marble valued at $85,374 and 1,147 tons of slate worth $18,101. Of the total value of domestic stone produced in 1944, quarries in the province of Quebec contributed 46·6 per cent, Ontario 40·6 per cent, and Nova Scotia 3·1 per cent.

The number of firms in the stone quarrying industry in 1944 totalled 405; employees numbered 2,164; salaries and wages paid aggregated $3,154,689 and the cost of fuel, electricity and process supplies used amounted to $1,497,880.

Table 1.—Production (Sales) of Stone from Canadian Quarries, by Kinds and by Provinces, 1943 and 1944

Province		Granite (a)	Limestone (b)	Marble	Sandstone	Slate	Total
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	7,848	....	3,206,027
	$	212,136	2,704,205	24,852	17,195	....	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	8,169	1,145	236,212
	$	103,218	213,544	1,450	8,190	17,542	311,906
Canada	tons	**780,122**	**6,265,181**	**11,848**	**154,163**	**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 1,865,597 tons of limestone consumed in the cement industry in 1944 and 1,918,742 tons in 1943. Limestone used in the Canadian lime industry is also not included; it is estimated that approximately 1,571,451 tons of limestone were burned in the manufacture of lime in 1944 and 1,614,481 tons in 1943.

Table 1.—Production (Sales) of Stone From Canadian Quarries, by Kinds and by Provinces, 1943 and 1944—Concluded

Province		Granite (a)	Limestone (b)	Marble	Sandstone	Slate	Total
1944							
Nova Scotia	tons	1,886	50,734	....	45,813	....	**98,433**
	$	37,532	123,613	....	63,968	....	**225,113**
New Brunswick	tons	1,857	66,731	....	1,400	....	**69,988**
	$	47,504	165,258	....	31,425	....	**244,187**
Quebec	tons	127,544	2,370,141	6,489	89,470	198	**2,593,842**
	$	830,238	2,349,177	50,569	104,629	198	**3,334,811**
Ontario	tons	125,604	2,852,241	5,215	5,223	....	**2,988,283**
	$	307,497	2,549,402	32,650	20,431	....	**2,909,980**
Manitoba	tons	357	31,572	....	....	....	**31,929**
	$	4,967	48,587	....	....	....	**53,554**
Alberta	tons	....	12,726	....	....	....	**12,726**
	$	....	43,049	....	....	....	**43,049**
British Columbia	tons	12,716	181,141	125	4,860	949	**199,791**
	$	76,052	249,373	2,155	3,000	17,903	**348,483**
Canada	tons	**269,954**	**5,565,286**	**11,829**	**146,766**	**1,147**	**5,994,992**
	$	**1,303,790**	**5,528,459**	**85,374**	**223,453**	**18,101**	**7,159,177**

Table 2.—Production (Sales) of Stone(*) from Canadian Quarries, by Provinces, Showing Purposes for Which Used, 1944

For use as follows:		Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Alberta	British Columbia	Canada
1944									
Building stone—Rough	tons	372	80	7,275	3,414	245	...	1,436	**12,822**
	$	4,719	962	23,391	11,096	2,003	...	3,624	**45,795**
Dressed	tons	...	620	6,136	3,337	227	...	...	**10,320**
	$	...	31,890	261,228	47,325	9,864	...	...	**350,407**
Monumental and ornamental stone—Rough	tons	37	1,488	6,777	...	...	...	1,305	**9,607**
	$	552	11,625	96,552	...	...	...	13,800	**122,529**
Monumental and ornamental stone—Dressed	tons	349	188	5,200	174	120	...	304	**6,335**
	$	33,980	33,074	491,894	918	4,575	...	50,594	**615,035**
Flagstone	tons	...	...	...	1,315	27	...	...	**1,342**
	$	...	...	...	4,748	180	...	...	**4,928**
Curbstone	tons	...	...	200	...	...	...	...	**200**
	$	...	...	1,298	...	...	...	...	**1,298**
Paving blocks	tons	...	...	1,250	300	...	...	...	**1,550**
	$	...	...	7,874	600	...	...	...	**8,474**
Lining open-hearth furnaces	tons	8,930	...	...	...	...	...	...	**8,930**
	$	16,967	...	...	...	...	...	...	**16,967**
Chemical—									
Flux in iron and steel furnaces	tons	...	57	1,005	414,625	4,457	1,000	589	**421,733**
	$	...	110	854	373,334	7,480	2,500	976	**385,254**
Flux in non-ferrous smelters	tons	...	...	49,729	117,099	...	...	37,491	**204,319**
	$	...	...	26,706	87,188	...	...	24,406	**138,300**
Glass factories	tons	...	...	391	...	...	3,742	...	**4,133**
	$	...	...	1,466	...	...	5,613	...	**7,079**
Pulp and paper mills	tons	...	4,188	129,642	25,375	1,741	...	47,719	**208,665**
	$	...	7,749	179,815	82,986	1,913	...	101,675	**374,137**
Sugar refineries	tons	...	...	...	4,978	...	...	...	**4,978**
	$	...	...	...	4,231	...	...	...	**4,231**
Other chemical uses	tons	...	...	...	244,592	...	...	20,942	**265,534**
	$	...	...	...	240,107	...	...	21,264	**261,371**
Pulverized Stone—									
Whiting (substitute)	tons	...	...	...	2,732	...	...	233	**2,965**
	$	...	...	...	16,611	...	...	2,996	**19,607**
Asphalt filler	tons	277	...	9,031	4,153	...	...	966	**14,427**
	$	2,493	...	32,910	14,853	...	...	4,830	**55,086**
Dusting coal mines	tons	...	...	...	...	...	3,030	473	**3,503**
	$	...	...	...	...	...	12,120	3,193	**15,313**
Agricultural purposes and fertilizer plants	tons	41,454	62,467	171,637	32,074	1,833	1,514	5,966	**316,945**
	$	103,367	157,353	239,521	74,337	4,923	6,056	15,485	**601,042**
Other uses	tons	...	...	80	10,547	2,282	...	23	**12,932**
	$	...	...	465	35,090	2,028	...	207	**37,790**
Crushed stone for manufacture of artificial stone	tons	...	...	172	82	...	...	...	**254**
	$	...	...	786	255	...	...	...	**1,041**
Roofing granules	tons	...	...	...	35,031	...	...	952	**35,983**
	$	...	...	...	126,135	...	...	17,975	**144,110**
Poultry grit	tons	73	...	1,910	8,318	...	3,440	1,466	**15,207**
	$	780	...	10,628	49,752	...	16,760	7,317	**85,243**
Stucco dash	tons	...	...	531	97	...	...	522	**1,150**
	$	...	...	3,439	582	...	...	5,314	**9,335**
Terrazzo chips	tons	...	...	1,327	1,465	...	...	...	**2,792**
	$	...	...	7,283	10,850	...	...	...	**18,133**
Rock wool	tons	...	...	...	7,130	...	...	...	**7,130**
	$	...	...	...	6,890	...	...	...	**6,890**
Rubble and riprap	tons	6,441	900	101,598	84,207	1,600	...	6,855	**201,601**
	$	10,949	1,425	88,722	80,683	1,810	...	4,234	**187,823**
Crushed stone—									
Concrete aggregate	tons	30,000	...	1,293,101	514,841	14,393	...	...	**1,852,335**
	$	33,300	...	1,152,845	400,144	14,403	...	...	**1,600,692**
Road metal	tons	10,500	...	382,773	1,030,303	4,443	...	70,239	**1,498,258**
	$	18,000	...	351,067	911,685	3,761	...	68,283	**1,352 796**
Railroad ballast	tons	...	...	424,077	442,094	561	...	2,310	**869,042**
	$	...	...	356,067	329,580	514	...	2,310	**688,471**
Total Canada	tons	**98,433**	**69,988**	**2,593,812**	**2,988,283**	**31,929**	**12,726**	**199,791**	**5,994,992**
	$	**225,113**	**214,187**	**3,334,811**	**2,909,980**	**53,554**	**43,049**	**348,483**	**7,159,177**
Per cent of total	Quantity	1·64	1·17	43·27	49·85	0·53	0·21	3·33	**100·00**
	Value	3·14	3·41	46·58	40·65	0·75	0·60	4·87	**100·00**

(*) Includes the production of slate and marl.

Table 3.—Production (Sales) of Stone From Canadian Quarries, by Kinds, Showing Purposes for Which Used, 1943 and 1944

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	....	26,491
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
	$	398,828	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	208,341	1,604,224	....	68,657	....	1,881,222
	$	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.

Table 3.—Production (Sales) of Stone from Canadian Quarries, by Kinds, Showing Purposes for Which Used, 1943 and 1944—Concluded

For use as follows:		Granite (a)	Lime-stone (b)	Marble	Sand-stone	Slate	Total
1944							
Building stone—Rough	tons	4,260	4,770	142	3,650	....	12,822
	$	10,033	11,149	9,268	15,345	....	45,795
Dressed	tons	1,592	7,458	120	1,150	....	10,320
	$	83,485	214,037	18,135	34,750	....	350,407
Monumental and ornamental stone—Rough	tons	9,607	....	....	....	....	9,607
	$	122,529	....	....	....	....	122,529
Dressed	tons	6,041	120	....	174	....	6,335
	$	609,542	4,575	....	918	....	615,035
Flagstone	tons	....	907	....	435	....	1,342
	$	....	1,336	....	3,592	....	4,928
Curbstone	tons	200	....	....	....	....	200
	$	1,298	....	....	....	....	1,298
Paving blocks	tons	1,235	....	....	315	....	1,550
	$	7,770	....	....	704	....	8,474
Lining open-hearth furnaces	tons	....	8,930	....	....	....	8,930
	$	....	16,967	....	....	....	16,967
Chemical—							
Flux in iron and steel furnaces	tons	....	421,713	20	....	....	421,733
	$	....	384,924	330	....	....	385,254
Flux in non-ferrous smelters	tons	....	204,319	....	....	....	204,319
	$	....	138,300	....	....	....	138,300
Glass factories	tons	....	4,133	....	....	....	4,133
	$	....	7,079	....	....	....	7,079
Pulp and paper mills	tons	....	208,665	....	....	....	208,665
	$	....	374,137	....	....	....	374,137
Sugar refineries	tons	....	4,978	....	....	....	4,978
	$	....	4,231	....	....	....	4,231
Other chemical uses	tons	....	265,534	....	....	....	265,534
	$	....	261,371	....	....	....	261,371
Pulverized stone—							
Whiting (substitute)	tons	....	2,915	50	....	....	2,965
	$	....	18,807	800	....	....	19,607
Asphalt filler	tons	....	14,427	....	....	....	14,427
	$	....	55,086	....	....	....	55,086
Dusting coal mines	tons	....	3,503	....	....	....	3,503
	$	....	15,313	....	....	....	15,313
Agricultural purposes and fertilizer plants	tons	400	316,545	....	....	....	316,945
	$	2,825	598,217	....	....	....	601,042
Other uses	tons	....	12,502	430	....	....	12,932
	$	....	35,925	1,865	....	....	37,790
Crushed stone for manufacture of artificial stone	tons	....	82	172	....	....	254
	$	....	255	786	....	....	1,041
Roofing granules	tons	33,039	1,995	....	....	949	35,983
	$	123,732	2,475	....	....	17,903	144,110
Poultry grit	tons	279	10,251	4,677	....	....	15,207
	$	2,800	53,930	28,513	....	....	85,243
Stucco dash	tons	4	565	581	....	....	1,150
	$	70	4,826	4,439	....	....	9,335
Terrazzo chips	tons	....	270	2,522	....	....	2,792
	$	....	810	17,323	....	....	18,133
Rock wool	tons	....	7,130	....	....	....	7,130
	$	....	6,890	....	....	....	6,890
Rubble and riprap	tons	29,205	153,892	3,115	15,131	198	201,601
	$	24,021	136,294	3,915	23,395	198	187,823
Crushed stone—							
Concrete aggregate	tons	54,476	1,751,849	....	46,010	....	1,852,335
	$	83,951	1,455,549	....	61,192	....	1,600,692
Road metal	tons	129,566	1,350,374	....	18,318	....	1,198,258
	$	231,734	1,090,968	....	30,094	..	1,352,796
Railroad ballast	tons	....	807,459	....	61,583	....	869,042
	$	....	635,008	....	53,463	....	688,471
Total Canada(b)	tons	**269,964**	**5,565,286**	**11,829**	**146,766**	**1,147**	**5,991,992**
	$	**1,303,790**	**5,528,159**	**85,374**	**223,453**	**18,101**	**7,159,177**

Table 4.—Production of Stone for Building Purposes, Chemical Use, Cement Manufacture, Concrete Aggregate, Road Metal and Railroad Ballast, 1935-1944

Year		Building stone (a)	For chemical purposes (b)	For concrete aggregate	For road metal	For railroad ballast	For cement manufacture (c)
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	1,989,509	704,389	....
1944	tons	23,142	1,109,362	1,852,335	1,498,258	869,042	1,939,900
	$	396,202	1,170,372	1,600,692	1,352,796	688,471	....

(a) Does not include monumental or ornamental stone.
(b) Does not include limestone used in Canadian lime industry which totalled 1,571,451 tons in 1944.
(c) Includes shale in 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; 75,460 tons in 1943 and 74,303 tons in 1944.

GRANITE

Table 5.—Production of Granite(*) in Canada, 1935-1944

Year	Short tons	$	Year	Short tons	$
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	1,135,090	1,827,433	1942	1,366,425	1,946,249
1938	705,307	1,379,417	1943	780,422	1,522,072
1939	1,102,395	2,119,501	1944	269,964	1,303,790

(*) 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 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. Prior to the war 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 break-waters; 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. 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 should give careful study to the market possibilities of a monumental stone, especially of 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 the industry is likely to prosper."

LIMESTONE

Table 6.—Production of Limestone(*) in Canada, 1935-1944

Year	Short tons	$	Year	Short tons	$
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
1939	4,149,589	3,817,551	1944	5,565,286	5,528,459

(*) Includes dolomite and marl; production of marl totalled 23,026 tons in 1942; 22,913 tons in 1943, and 19,848 tons in 1944.

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 present production of limestone for all purposes, including the manufacture of lime and cement, constitutes 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. In chemical composition the deposits range from pure high-calcium limestone through magnesian limestone to dolomite. Large deposits of brucite limestone and magnesitic dolomite are being worked.

"Of significance in connection with future production of pure limestone is the progress being made in beneficiation whereby siliceous material is in part removed from impure limestone by flotation. This method of purifying limestone is now in use at several Portland cement plants in various parts of the world, and it is likely to be more widely used in the future as it permits utilization of certain deposits which, though advantageously situated, contain impurities that hitherto spoiled the usefulness of the deposit.

"Limestone is widely distributed and is quarried on a large scale in all industrial countries. Rarely is there much international trade in it, but limestone for use in certain large consuming centres in Canada can be obtained more cheaply from abroad and considerable quantities are imported for use as blast furnace flux, for road metal, and for use in some pulp mills in Ontario near the International boundary. Comparatively small tonnages are exported to the United States for use in agriculture and in sugar refineries. No separate record is maintained of the trade in limestone.

"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. For certain uses (in the wood pulp industry, for example) the limestone as quarried requires little or no processing, but most 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. Most of the 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. The value of rock wool and slag wool produced in 1944 by five Canadian plants in Ontario and Quebec was $1,617,420 compared with $1,721,141 in 1943. The decreased production was caused mostly by shortages in labour and materials. Two new plants, one in Saskatchewan and one in New Brunswick, were built during 1944 but did not come into production until 1945.

"Pure dolomite is now an important source of magnesia and magnesium metal. The metal is recovered directly from calcined dolomite by reduction with ferrosilicon, and indirectly by reacting calcined dolomite with sea-water or with magnesium chloride brine, thereby forming magnesium hydroxide that is converted into the chloride, from which after dehydration, magnesium is recovered by electrolysis. High-calcium lime can be used in place of dolomitic lime for precipitating magnesium hydroxide from sea-water and brine, but where the dolomitic lime is used the yield of magnesia is increased by the magnesia content of the latter. Dolomite is the raw matter from which basic magnesium carbonate and magnesia are made by the Pattinson process. Dead-burned dolomite is widely used as a refractory material in the steel industry.

"Magnesitic dolomite is used in Quebec for the production of refractory products; brucitic limestone is processed for the production of magnesia and hydrated lime.

"The use of limestone in agriculture is capable of extensive development. Though the necessity of applying limestone or lime to agricultural land to maintain or increase soil fertility has been emphasized for many years, the quantity so used in Canada is small.

"Limestone in blocks or large dimensions for sawing into building stone is quarried in Quebec, Ontario, and Manitoba. The quarry centres in Quebec for this heavily bedded limestone are at St. Marc des Carrières in Portneuf county, and in the vicinity of Montreal. At both localities a grey limestone is obtained. In Ontario, silver-grey limestone and smaller quantities of buff, and of variegated buff and grey limestone, are quarried near Queenston in the Niagara Peninsula. At Longford Mills, near Orillia, buff, silver-grey, and brown limestone suitable for building stone and marble 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. They have been inactive for the past several years.

"In addition to the large quarries, the products of which normally have a wide shipping range, small quarries producing building stone for local use are worked near Quebec City, Montreal, and Hull in the province of 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.

"The small production in 1944 reflects the wartime curtailment in construction of buildings of the type requiring cut stone. Most of the quarries were inactive during 1944 and a part of the shipments made were from stock. The rise in imports was occasioned in part by the difficulty of securing labour for the short periods of quarry operation necessary to supply the small demand for stone not already in stock. As a result, many of the quarries remained closed and the small demand was supplied by imported stone.

"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.

"There is likely to be a good demand for structural limestone when construction for civilian requirements gets under way, because the construction of a great many necessary buildings for which Canada limestone is specified has been deferred until after the war."

MARBLE

Table 7.—Production of Marble in Canada, 1935-1944

Year	Short tons	$	Year	Short tons	$
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
1939	14,124	200,054	1944	11,829	85,374

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 broken marble for use as rubble and for making artificial stone, terrazzo chips, stucco dash, poultry grit, marble flour, and whiting substitute. Waste from some of the quarries is sold for chemical and metallurgical uses and for road metal.

"In Quebec, several varieties of clouded grey marble and also a black marble are available in the quarries of Missisquoi Stone and Marble Company, Limited at Philipsburg. 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. White dolomite is quarried and crushed by Canadian Dolomite Company, Limited at Portage du Fort, Pontiac county, for making artificial stone, terrazzo chips, stucco dash, and various minor products.

"In Ontario, black marble in beds up to 40 inches thick is quarried at St. Albert, near Ottawa, by Silvertone Black Marble Quarries, Limited, Ottawa. 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 of red and buff marble by Winnitoba Marble Quarries, Winnipeg, from its quarry at Fisher Branch to supply building rubble and terrazzo chips.

"In British Columbia there are many deposits of marble, but there, is at present only a small production of white marble, and Associated Products, Victoria, from a quarry at Malahat, and by Beale Quarries Limited, Van Anda, Texada Island.

"Many deposits of beautifully coloured marble are known, but have never been fully investigated, chiefly because in the past the demand in Canada for marble of any one colour, other than for a staple variety, such as white, was comparatively small.

"There is a wide range in the price of marble depending on the quality and rareness of colouring.

"The war has adversely affected the marble industry because most of the wartime buildings have been of the industrial type in which little or no standing marble has been used. Few of the quarries were in active operation in 1944 and such shipments of block or slab marble as were made were from stock. There has, however, been an increase in the demand for terrazzo material, most of which previously originated in Europe. Several of the Canadian quarry operators have added equipment for the production of both terrazzo chips and poultry grit from waste marble, and a good range of colours is now available in domestic terrazzo chips. In view of the large accumulation of building construction to be proceeded with after the war it is expected that a good demand for Canadian marble will materialize in the near future".

SANDSTONE

Table 8.—Production of Sandstone in Canada, 1935-1944

Year	Short tons	$	Year	Short tons	$
1935	342,824	838,005	1940	176,475	305,543
1936	285,508	495,856	1941	159,885	305,528
1937	235,165	343,871	1942	153,865	236,810
1938	101,854	218,405	1943	164,163	250,003
1939	176,265	331,830	1944	146,766	223,453

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 1944 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 1944 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 manufactures. Crude, crushed or ground quartzite sold for fluxing purposes or as silica sand is included under quartz as production.

SLATE

Table 9.—Production of Slate in Canada, 1935-1944

Year	Short tons	$	Year	Short tons	$
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	1,336	17,733
1939	1,149	6,760	1944	1,147	18,101

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.

WHITING SUBSTITUTE

"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 from 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. The marbles at present used contain very little magnesium carbonate, though in the past a whiting substitute made from white dolomite was produced in Eastern Canada for making putty, and there seems to be no good reason why a dolomitic whiting substitute would not be equally as suitable as calcite for numerous purposes.

"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, and both were in operation in 1944. The output of one 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 made in Canada.

"Producers of whiting substitute are: Pulverized Products, Limited, Montreal; Claxton Manufacturing Company, Toronto; White Valley Chemicals, Limited, Bobcaygeon, Ontario (operated by Chem-Ore Mines, 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 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, though there are some uses for which chalk whiting is necessary and other materials cannot be substituted.

"There is little or no whiting substitute exported from Canada. Imports of whiting, crude chalk, and prepared chalk were valued at $334,744 in 1944 compared with $303,190 in 1943.

"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 ceramic glaze, and for a number of other purposes.

"Prices per ton, bagged and in carload lots, range from $8 to $15 f.o.b. plants." (Bureau of Mines, Ottawa).

Table 10.—Consumption of Whiting (and Chalk), by Uses, as Reported to the Annual Census of Industry, 1943 and 1944

Industry	1943		1944	
	Tons	Cost at Works	Tons	Cost at Works
Paints and pigments	7,773	239,832	8,887	263,998
Rubber	3,202	58,215	2,208	40,925
Miscellaneous textiles *	4,147	45,342	4,938	56,713
Explosives (a)	271	4,472	316	7,489
Toilet preparations (a)	238	18,985	911	50,540

* Includes oilcloth and linoleum.
(a) Chalk, ground and precipitated.

Table 11.—Imports into Canada and Exports of Stone, by Kinds, 1943 and 1944

—		1943		1944	
		Quantity	Value	Quantity	Value
Imports			$		$
Building stone, n.o.p	cwt.	854	5,651	36,972	15,120
Curling stones and handles therefor	pair	392	8,784	396	10,667
Granite, rough, not hammered or chiselled		....	47,291	....	53,707
Granite, sawn only		....	16,450	....	15,783
Granite, monuments		....	....	....	....
Granite, manufactures of, n.o.p		....	5,828	....	9,430
Marble, rough, not hammered or chiselled		....	5,462	....	8,844
Marble, sawn or sand rubbed, not polished		....	10,282	....	22,653
Marble, not further manufactured than sawn for tombstones		....	25,071	....	38,036
Marble, manufactures of, n.o.p		....	8,915	....	7,869
Refuse stone	ton	807,561	447,850	734,141	398,378
Slate roofing	square	460	5,229	720	7,986
Slate mantels and manufactures of slate, n.o.p		....	37,509	....	28,075
Chalk, china, cornwall or cliff stone and mica schist		....	33,404	....	26,107
Mineral wool	ton	....	72,780	1,310	147,862
Whiting, gilders' whiting and Paris white	ton	11,198	257,496	13,432	279,112
Manufactures of stone, n.o.p		....	18,813	....	25,067
Chalk, prepared		....	12,290	....	19,525
Pumice and pumice stone and lava tufa		....	19,479	....	27,880
Grindstones, not mounted and not less than 36 inches in diameter	no.	612	64,731	578	59,211
Grindstones, n.o.p	no.	1,068	2,366	672	2,098
Burrstones, rough, in blocks	no.	36	452	62	1,062
Ganister	ton	484	3,970	347	2,463
Total		....	**1,110,903**	....	**1,206,935**
Exports					
Crushed stone	ton	1,173	999	597	735
Granite and marble, unwrought	ton	3,762	47,258	3,871	42,567
Dressed stone of all kinds		....	7,819	....	5,713
Grindstones, manufactured		....	5,032	....	211
Total		....	**61,108**	....	**49,226**

2.—Secondary production—The Stone Products Industry, 1944

In 1944 there were 142 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 $4,370,430 in 1944, an increase of 6·6 per cent over the total of $4,098,100 reported for the previous year. The 59 works in Ontario accounted for

56·6 per cent of the total output and the 39 plants in Quebec for 23·4 per cent. The average number of employees was 854 and $1,426,262 were paid in salaries and wages. Materials used in the cutting and dressing processes, including stone, cost $1,670,718 and expenditures for fuel and electricity amounted to $160,725.

Table 12.—Cost of Materials used in the Stone Products Industry, 1943 and 1944

—	Cost at Works	
	1943	1944
	$	$
Stone—(a) From Canadian quarries	344,413	409,677
(b) Imported	178,572	218,367
Monuments, cut and polished, for lettering only	87,106	124,383
All other materials	911,217	918,291
Total	**1,521,308**	**1,670,718**

Table 13.—Production from the Stone Products Industry, by Provinces 1943, and 1944

—	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—										
1943	96,202	....	20,470	....	....	....	....	2,310	1,015	119,907
1944	108,662	....	23,612	450	....	....	....	2,275	1,173	136,172
Nova Scotia—										
1943	48,510	....	21,530	....	....	....	....	31,499	2,148	103,687
1944	41,442	4,000	25,000	....	....	....	....	35,840	2,711	108,993
Quebec—										
1943	451,938	23,473	7,656	39,150	5,264	2,425	420	15,770	353,556	899,652
1944	557,591	15,471	7,506	26,068	4,679	3,007	650	15,241	389,958	1,020,771
Ontario—										
1943	751,272	400	102,773	41,966	1,511	15,221	32,805	75,976	1,406,531	2,428,455
1944	795,525	7,073	147,677	35,497	411	33,763	97,459	80,468	1,276,003	2,473,876
Manitoba—										
1943	55,788	14,495	18,609	7,360	23,289	2,075	1,402	7,285	1,850	132,743
1944	79,045	....	13,733	5,870	100	2,078	....	33,785	179	134,790
Saskatchewan—										
1943	66,164	....	44,344	....	1,654	7,215	1,394	8,375	17,381	146,527
1944	92,260	4,650	50,855	3,342	585	7,422	757	9,415	13,782	183,068
Alberta—										
1943	65,556	27,500	9,607	5,500	23,000	....	600	....	6,592	138,355
1944	96,737	....	21,810	....	18,040	2,600	....	41,988	6,926	188,101
British Columbia—										
1943	66,320	....	2,210	2,654	....	....	....	10,950	46,544	128,684
1944	99,895	236	445	8,976	....	....	....	9,157	5,950	124,659
Canada—										
1943	**1,601,756**	**65,868**	**227,289**	**96,630**	**54,718**	**27,536**	**36,021**	**152,665**	**1,835,617**	**4,098,100**
1944	**1,871,157**	**31,430**	**290,638**	**80,803**	**23,815**	**18,870**	**98,866**	**228,169**	**1,696,682**	**4,370,430**

Table 14.—Production in Canada and Imports of Rock Wool, 1934-1944

Year	Production	Imports	
	$	Pounds	$
1934	1,709	2,987,611	69,267
1935	66,450	1,922,938	57,877
1936	265,472	2,391,504	101,592
1937	346,460	2,030,144	81,050
1938	396,261	1,337,954	45,109
1939	525,998	1,820,763	44,860
1940	935,229	2,082,589	52,233
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
1944	1,617,420	2,619,513	147,862

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

ANNUAL REPORT

ON THE

MINERAL PRODUCTION OF CANADA

DURING THE CALENDAR YEAR

1944

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

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PREFACE

Annual reports on the Mineral Production of Canada have been published since 1886. The first reports were prepared 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 from Canada's metal and non-metal mines and quarries, oil and gas wells, and plants producing lime, products from Canadian clays, and cement. It contains tables showing the salaries and wages paid, the number of employees, the amounts spent on fuel and power, the power-producing equipment installed, and the process supplies purchased.

The report is divided into nine chapters; the first is a complete summary, and the remaining chapters conform to the eight major groups into which the Canadian mining industry is divided. A list of all mining companies which reported to the Bureau for 1944 is added. This list is divided into (a) producing mines, and (b) those which are preparing for production or which are operating but not producing.

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 confidential.

In pre-war years, this report included world tables of the production of all important minerals by countries. No figures on world production have been published since 1939, but their publication will be resumed as soon as available.

As in previous years, the Bureau co-operated with the Mines Departments of the provinces of Nova Scotia, Quebec, Ontario, Manitoba, 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., Director—Division of Census of Industry and Merchandising, by Mr. R. J. McDowall, B.Sc., Mining Statistician.

HERBERT MARSHALL,
Dominion Statistician.

DOMINION BUREAU OF STATISTICS,
Ottawa, July 30, 1946

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ANNUAL REPORT

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MINERAL PRODUCTION OF CANADA

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CHAPTER ONE

The total gross value of Canadian mineral production during the calendar year 1944 amounted to $485,819,114, a decrease of 8·3 per cent from the corresponding total of $530,053,966 recorded for 1943. The combined values of primary metals produced in Canadian metallurgical plants and metals contained in ores exported decreased to $308,292,161 from a total of $356,812,760 in the preceding year. The quantity of fuels produced in 1944, including coal, natural gas, peat and petroleum, showed relatively little change from 1943; the total value of these minerals produced during the year under review amounted to $97,291,007 compared with $92,514,384 in 1943. The value of asbestos, salt, gypsum and other non-metallic minerals classified as industrial totalled $37,251,009 in 1944, representing a relatively small decline from $38,716,568 recorded for the preceding year. Structural materials, comprising clay products, cement, lime, stone and sand and gravel shipped from producing plants in 1944 were evaluated at $42,984,937 as against $42,010,254 in 1943.

The decrease in total value of Canadian mineral output in 1944 resulted largely from a pronounced curtailment in the production of most metals; this became evident with the dawn of early victory in Europe and the realization that the war was being definitely won by the allied powers. Following the successful invasion of Normandy on June 6, there commenced a distinct and planned retrenchment in the intensive wartime production of certain metals and minerals considered as strategic during the peak years of uncertainty and stress of conflict.

Stock piles of most of these materials, essential in the mass production of munitions of war, reached satisfactory proportions in 1944. Percentage decreases from 1943 in the quantities of the major base metals produced were copper 4·9; lead 31·4; nickel 4·7 and zinc 9·8. The year under review witnessed the closing down of the Wartime Metals Corporation Chromeraine Project in the eastern townships of Quebec, and of the Indian Molybdenum mine in Pressiac township of the same province. Tungsten concentrates were shipped from stock piles, but there was no actual production of tungsten ores in Canada during 1944. The purchase of Canadian cobalt ores by the Metal Reserve Company of the United States was discontinued on February 22, 1944. In British Columbia the Takla mercury mine operated by Bralorne Mines Ltd. was closed down in September, and in July the Consolidated Mining and Smelting Company of Canada ceased the production of mercury at Pinchi Lake. In 1944 there was a very considerable decrease in the recovery of the platinum metals from the nickel-copper ores of the Sudbury district. An interesting and important event to be recorded was the first commercial shipment of high-grade hematite iron ore in 1944 from near Atikokan, Ontario, by Steep Rock Iron Mines Ltd.

Canadian gold production in 1944 totalled 2,922,911 fine ounces valued at $112,532,073 compared with 3,651,301 fine ounces worth $140,575,088 in 1943. This falling off in gold output was the largest single factor contributing to the decrease in the total value of Canadian mineral production in 1944 and represents the third consecutive year in which annual decreases in gold production have been recorded. The principal reasons for this decline in gold output was a shortage of skilled labour, lack of proper equipment and supplies and more recently and to a lesser extent the recovery of the metal from non-ferrous ores.

Labour shortages were also apparent throughout most of the non-metallic mining industries. Coal mine labour continued to be the determining factor in production and the wastage due to age and mortality was not made up by young men entering the industry; though production decreased, the total value of the output was higher. Coal miners received an additional wage of $1.00 per day plus paid holidays as from November 1, 1944. In 1944 there was a record amount of exploration and drilling in Alberta and Saskatchewan for new supplies of petroleum and at Norman Wells in the Northwest Territories the Canol pipe line was operated throughout the year. During 1944 two wells were drilled on Cape Breton, Nova Scotia, and one well continued in Prince Edward Island; operations were also continued on a well located in Gaspé, Quebec.

In Ontario, a relatively small tonnage of corundum was shipped from Craigmont, Renfrew county, by Wartime Metals Corporation; this was the first commerical shipment from this area in many years.

Of the grand total gross value of Canadian mineral production in 1944, the mines of Nova Scotia contributed $33,981,977 (6·99 per cent); New Brunswick $4,133,902 (0·85 per cent); Quebec $90,182,553 (18·56 per cent); Ontario $210,706,307 (43·37 per cent); Manitoba $13,830,406 (2·85 per cent); Saskatchewan $22,291,848 (4·59 per cent); Alberta $51,066,662 (10·51 per cent); British Columbia $57,246,071 (11·78 per cent); Northwest Territories $1,440,069 (0·31 per cent) and Yukon $939,319 (0·19 per cent).

Employees in the entire Canadian mining industry totalled 104,878 in 1944 and salaries and wages distributed amounted to $204,808,314 compared with 112,140 employees and $207,575,955 in 1943, and 112,043 employees and $198,550,260 in 1942.

Table 1.—Quantities and Values of Mineral Products from Canadian Sources, 1943 and 1944

—		1943		1944	
		Quantity	Value	Quantity	Value
			$		$
METALLICS					
Antimony	lb.	1,114,166	189,408	1,937,933	281,000
Arsenic (As_2O_3)	lb.	3,153,538	254,009	2,627,022	180,866
Bismuth	lb.	407,597	562,484	123,875	154,844
Cadmium	lb.	786,611	904,602	526,970	579,667
Chromite	ton	29,595	919,878	27,054	748,494
Cobalt	lb.	175,961	191,407	36,283	34,106
Copper	lb.	575,190,132	67,170,601	547,070,118	65,257,172
Gold	fine oz.	3,651,301	140,575,088	2,922,911	112,532,073
Iron ore	ton	641,294	2,032,240	553,252	1,909,608
Lead	lb.	444,060,769	16,670,041	304,582,198	13,706,199
Magnesium	lb.	7,153,974	2,074,652	10,579,778	2,575,695
Manganese ore	ton	48	985	....	....
Mercury	lb.	1,690,240	4,559,200	735,908	1,210,375
Molybdenite concentrates	lb.	784,715	549,515	2,127,508	1,079,698
Nickel	lb.	288,018,615	71,675,322	274,598,629	69,204,152
Palladium, rhodium, iridium, etc.	fine oz.	126,004	5,233,068	42,929	1,960,085
Platinum	fine oz.	219,713	8,458,951	157,523	6,064,635
Pitchblende products		....	(a)	....	(a)
Selenium	lb.	374,013	654,523	298,592	537,466
Silver	fine oz.	17,344,569	7,849,111	13,627,109	5,859,656
Tellurium	lb.	8,600	15,050	10,661	18,657
Thallium	lb.	....	....	128	1,690
Tin	lb.	776,937	450,623	516,626	299,643
Titanium ore	ton	69,437	308,290	33,973	165,195
Tungsten concentrates	lb.	1,508,621	1,083,538	886,745	245,780
Zinc	lb.	610,754,354	24,430,174	550,823,353	23,685,405
Total Metallics		....	**356,812,760**	....	**308,292,161**

Table 1.—Quantities and Values of Mineral Products from Canadian Sources, 1943 and 1944—Concluded

—		1943		1944	
		Quantity	Value	Quantity	Value
			$		$
Non-Metallics—Fuels					
Coal	ton	17,859,057	62,877,549	17,026,499	70,433,169
Natural gas	M cu. ft.	44,276,216	13,159,418	45,067,158	11,422,541
Peat	ton	782	7,000	644	5,397
Petroleum	bbl.	10,052,302	16,470,417	10,099,404	15,429,900
Total		....	**92,514,384**	....	**97,291,007**
Other Non-Metallics					
Asbestos	ton	467,196	23,169,505	419,265	20,619,516
Barite	ton	24,474	279,253	118,719	1,023,696
Corundum	ton	....	....	173	17,111
Diatomite	ton	98	3,331	13	437
Feldspar	ton	23,858	237,771	23,509	227,632
Fluorspar	ton	11,210	318,424	6,924	217,701
Garnet rock	ton	....	....	3	90
Graphite	ton	1,903	197,431	1,582	171,166
Grindstones	ton	164	6,225	225	12,000
Gypsum	ton	446,848	1,381,468	596,164	1,511,978
Iron oxides	ton	8,401	135,893	8,599	150,250
Magnesitic dolomite and brucite		....	1,260,056	....	1,139,281
Mica	lb.	8,050,692	553,856	6,684,846	841,026
Mineral waters	gal.	139,611	67,541	156,150	79,031
Nepheline syenite	ton	49,901	292,010	47,625	217,989
Peat moss	ton	64,360	1,461,422	(b) 80,446	1,869,553
Phosphate	ton	1,451	18,385	482	6,716
Quartz	ton	1,776,749	1,608,448	1,740,262	1,658,409
Salt	ton	687,686	4,379,378	695,217	4,074,021
Silica brick	M	4,165	295,505	3,997	312,092
Soapstone (including some talc)	ton	14,204	135,469	19,013	204,127
Sodium carbonate	ton	468	5,148	44	484
Sodium sulphate	ton	107,121	1,025,151	102,421	987,842
Sulphur	ton	257,515	1,753,425	248,088	1,755,739
Talc	ton	11,959	131,216	13,584	153,122
Volcanic dust	ton	50	257	....	....
Total		....	**38,716,568**	....	**37,251,009**
Clay Products and Other Structural Materials					
Clay products (brick, tile, etc.)		....	6,608,193	....	6,997,425
Cement	bbl.	7,302,289	11,599,033	7,190,851	11,621,372
Lime	ton	907,768	6,832,992	885,142	6,926,844
Sand and gravel	ton	25,744,469	9,005,857	28,399,986	10,280,119
Stone	ton	7,222,950	7,964,179	5,994,992	7,159,177
Total		....	**42,010,254**	....	**42,981,937**
Grand Total		....	**530,053,966**	....	**485,819,114**

(a) Not available for publication.
(b) Includes some duplication resulting from the resale of moss purchased from other producers.

Table 2.—Finally Revised Statistics on the Mineral Production of Canada, by Provinces, 1944

—		Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Northwest Territories	Yukon	Canada
METALS												
Antimony	lb.								1,937,933			1,937,933
	$								281,000			281,000
Arsenic	lb.			2,268,067	358,955							2,627,022
	$			153,944	26,922							180,866
Bismuth	lb.								123,875			123,875
	$								154,844			154,844
Cadmium	lb.					20,921	119,639		386,410			526,970
	$					23,013	131,603		425,051			579,667
Chromite	ton			27,054								27,054
	$			748,494								748,494
Cobalt	lb.				(b) 36,283							36,283
	$				34,106							34,106
Copper	lb.			108,055,172	285,307,278	43,878,639	73,514,499		36,302,628	11,902		547,070,118
	$			12,966,620	33,845,632	5,265,437	8,821,740		4,356,315	1,428		65,257,172
Gold	oz.	5,840		746,784	1,731,836	74,168	122,782	51	196,857	20,775	23,818	2,922,911
	$	224,840		28,751,184	66,675,686	2,855,468	4,727,107	1,963	7,578,994	799,838	916,993	112,532,073
Iron ore	ton				553,252							553,252
	$				1,909,608							1,909,608
Lead	lb.			10,487,842	1,065,741				292,922,888		105,727	304,582,198
	$			471,953	47,958				13,181,530		4,758	13,706,199
Magnesium	lb.				10,579,778							10,579,778
	$				2,575,695							2,575,695
Mercury	lb.								735,908			735,908
	$								1,210,375			1,210,375
Molybdenite (concentrates)	lb.			2,124,693	2,815							2,127,508
	$			1,078,616	1,082							1,079,698
Nickel	lb.				274,598,629							274,598,629
	$				69,204,152							69,204,152
Palladium, rhodium, etc	oz.				42,929							42,929
	$				1,960,085							1,960,085
Platinum	oz.				157,523							157,523
	$				6,064,635							6,064,635
Pitchblende products	$									(a)		(a)
Selenium	lb.			146,352	65,000	12,957	74,283					298,592
	$			263,434	117,000	23,323	133,709					537,466
Silver	oz.	188		2,500,681	3,143,275	569,873	1,735,773	4	5,631,572	13,677	32,066	13,627,109
	$	81		1,075,293	1,351,608	245,045	746,382	2	2,421,576	5,881	13,788	5,859,656
Tellurium	lb.				9,900	113	648					10,661
	$				17,325	198	1,134					18,657
Thallium	lb.					128						128
	$					1,690						1,690
Tin	lb.								516,626			516,626
	$								299,643			299,643

Titanium ore	ton			33,973								33,973
	$			165,195								165,195
Tungsten (concentrates)	lb.				63,152				818,000		5,593	886,745
	$				5,212				236,788		3,780	245,780
Zinc	lb.			137,378,439	2,429,176	45,822,278	87,130,087		278,063,373			550,823,353
	$			5,907,273	104,455	1,970,358	3,746,594		11,956,725			23,685,405
Total	$	**224,921**		**51,582,006**	**183,941,161**	**10,384,532**	**18,308,269**	**1,965**	**42,102,841**	**807,147**	**939,319**	**308,292,161**
NON-METALS												
FUELS												
Coal	ton	5,745,671	345,123				1,372,766	7,428,708	2,134,231			17,026,499
	$	30,728,535	1,845,277				2,034,914	26,814,937	9,009,506			70,433,169
Natural gas	M cu. ft.		702,464		7,082,508		119,116	37,161,570		1,500		45,067,158
	$		341,636		4,694,097		46,656	6,339,817		335		11,122,541
Peat	ton			444	200							644
	$			3,597	1,800							5,397
Petroleum, crude	bbl.		23,296		125,067			8,727,366		1,223,675		10,099,104
	$		32,832		296,420			14,468,061		632,587		15,429,900
Total	$	**30,728,535**	**2,219,745**	**3,597**	**4,992,317**		**2,081,570**	**47,622,815**	**9,009,506**	**632,922**		**97,291,007**
OTHER NON-METALLIC AND INDUSTRIAL MINERALS												
Asbestos	ton			419,265								419,265
	$			20,619,516								20,619,516
Barite	ton	106,106							12,613			118,719
	$	970,774							52,922			1,023,696
Corundum	ton				173							173
	$				17,111							17,111
Diatomite	ton	5							8			13
	$	175							262			137
Feldspar	ton			17,842	5,667							23,509
	$			177,271	50,361							227,632
Fluorspar	ton			18	6,906							6,924
	$			670	217,031							217,701
Garnet rock	ton				3							3
	$				90							90
Graphite	ton				1,582							1,582
	$				171,166							171,166
Grindstone	ton		225									225
	$		12,000									12,000
Gypsum	ton	401,284	42,040		90,288	38,330			24,222			596,164
	$	489,932	200,748		348,873	368,498			103,927			1,511,978
Iron oxides	ton			8,117					482			8,599
	$			142,050					8,200			150,250
Magnesitic dolomite and brucite	$			1,139,281								1,139,281
Mica	lb.			2,274,634	3,486,212				924,000			6,684,846
	$			178,899	646,745				15,382			841,026
Mineral waters	gal.			148,965	7,185							156,150
	$			78,226	805							79,031
Nepheline syenite	ton				47,625							47,625
	$				217,989							217,989
Peat moss	lb.		4,000,000	38,065,580	24,981,760	2,256,580			91,588,468			160,892,388
	$		64,000	359,724	144,820	41,878			1,259,131			1,869,553

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Table 2.—Finally Revised Statistics on the Mineral Production of Canada, by Provinces, 1944—Continued

—		Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Northwest Territories	Yukon	Canada
Other Non-Metallic and Industrial Minerals—Concluded												
Phosphate	ton	.....	.....	482	.....	.....	.....	.....	.....	.....	.....	482
	$	.....	.....	6,716	.....	.....	.....	.....	.....	.....	.....	6,716
Quartz	ton	10,100	.....	236,091	(x) 1,326,288	.....	(x) 143,101	.....	24,682	.....	.....	1,740,262
	$	27,350	.....	639,429	868,389	.....	50,085	.....	73,156	.....	.....	1,658,409
Salt	ton	38,809	.....	.....	603,806	27,267	.....	25,335	.....	.....	.....	695,217
	$	281,482	.....	.....	2,906,117	488,776	.....	397,646	.....	.....	.....	4,074,021
Silica brick	M	2,931	.....	.....	1,066	.....	.....	.....	.....	.....	.....	3,997
	$	177,003	.....	.....	135,089	.....	.....	.....	.....	.....	.....	312,092
Soapstone (including some talc)	ton	.....	.....	19,013	.....	.....	.....	.....	.....	.....	.....	19,013
	$	.....	.....	204,127	.....	.....	.....	.....	.....	.....	.....	204,127
Sodium carbonate	ton	.....	.....	.....	.....	.....	.....	.....	44	.....	.....	44
	$	.....	.....	.....	.....	.....	.....	.....	484	.....	.....	484
Sodium sulphate	ton	.....	.....	.....	.....	.....	102,421	.....	.....	.....	.....	102,421
	$	.....	.....	.....	.....	.....	987,842	.....	.....	.....	.....	987,842
Sulphur	ton	.....	.....	116,887	17,876	.....	.....	.....	113,325	.....	.....	248,088
	$	.....	.....	453,501	178,760	.....	.....	.....	1,123,478	.....	.....	1,755,739
Talc	ton	.....	.....	.....	13,584	.....	.....	.....	.....	.....	.....	13,584
	$	.....	.....	.....	153,122	.....	.....	.....	.....	.....	.....	153,122
Total	$	**1,946,716**	**276,748**	**23,999,410**	**6,056,468**	**899,152**	**1,037,927**	**397,646**	**2,636,942**	.....	.....	**37,251,009**
Clay Products and Other Structural Materials												
CLAY PRODUCTS												
Clay—Bentonite	$	.....	.....	.....	.....	160,268	.....	2,076	1,504	.....	.....	163,848
Fireclay	ton	2,919	.....	.....	.....	.....	948	.....	3,763	.....	.....	7,630
	$	10,711	.....	.....	.....	.....	9,133	.....	18,589	.....	.....	38,433
Kaolin	ton	.....	.....	424	.....	.....	.....	.....	.....	.....	.....	424
	$	.....	.....	5,758	.....	.....	.....	.....	.....	.....	.....	5,758
Other clay	ton	.....	.....	.....	486	.....	18,315	.....	.....	.....	.....	18,801
	$	.....	.....	.....	1,785	.....	90,817	.....	.....	.....	.....	92,602
Fireclay blocks and shapes	$	270	.....	.....	.....	.....	194,824	.....	26,157	.....	.....	221,251
Firebrick	M	3	.....	.....	.....	.....	.....	.....	3,177	.....	.....	3,180
	$	147	.....	.....	.....	.....	.....	.....	164,690	.....	.....	164,837
Brick, soft mud process—Face	M	.....	.....	.....	7,489	.....	.....	.....	428	.....	.....	7,917
	$	.....	.....	.....	166,738	.....	.....	.....	10,921	.....	.....	177,659
Common	M	6	1,703	1,350	3,862	516	180	4,827	1,738	.....	.....	14,182
	$	96	29,267	18,836	67,166	8,115	2,060	53,232	35,564	.....	.....	214,336
Stiff mud process—Face (wire cut)	M	.....	1,411	21,724	29,930	800	138	880	292	.....	.....	55,175
	$	.....	42,337	518,375	743,375	24,000	4,179	17,407	10,410	.....	.....	1,360,083
Common	M	5,981	3,293	31,009	2,999	250	214	683	22	.....	.....	41,451
	$	96,315	38,379	538,624	48,256	5,000	2,853	12,685	325	.....	.....	742,437

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Dry press—Face......M			2,241	8,182		4	3,100	463			13,990
$			63,947	204,747		138	48,719	20,164			337,715
Common......M			8,779	3,930			6,100				18,809
$			163,884	88,112			65,897				317,893
Fancy or ornamental brick (including special shapes, embossed and enamelled brick)......M				28							28
$				866							866
Sewer brick......M				233							233
$				4,391							4,391
Paving brick......M				321							321
$				18,793							18,793
Structural tile—Hollow blocks (including fire-proofing and load-bearing tile)......ton	13,139	1,668	31,288	28,344		2,829	8,157	2,395			87,820
$	119,595	14,071	283,329	271,977		23,503	72,556	26,527			811,558
Roofing tile......$											
Floor tile (quarries)......$				43,817							43,817
Drain tile......M	158	54	618	10,785		85	251	1,733			13,681
$	5,733	1,909	28,005	309,245		3,400	10,434	66,999			425,725
Sewer pipe (including copings, flue linings, etc.) $	159,373	3,360	178,333	312,081			243,245	68,340			964,732
Pottery, glazed or unglazed (including coarse earthenware, stoneware, flower pots and all other pottery)......$		75,288	82,000	60,000			617,326	3,930			838,544
Other products......$	10,454	2,440	700	6,047				32,506			52,147
Total Clay Products......$	**402,694**	**207,051**	**1,881,791**	**2,347,396**	**197,383**	**330,907**	**1,143,577**	**486,626**			**6,997,125**
OTHER STRUCTURAL MATERIALS											
Cement......bbl.			3,249,302	1,863,210	865,750		699,989	512,594			7,190,851
$			4,736,094	2,730,381	1,698,567		1,370,502	1,085,918			11,621,372
Lime (x)—Quicklime......ton	3,362	17,218	250,616	391,678	20,428		18,102	36,798			738,202
$	42,957	195,545	2,167,913	2,886,778	178,876		151,457	324,553			5,948,079
Hydrated lime......ton		2,580	88,466	37,607	9,466		750	8,071			146,940
$		32,102	336,165	424,399	122,256		7,500	56,343			978,765
Total lime......ton	3,362	19,798	339,082	429,285	29,894		18,852	44,869			885,142
$	42,957	227,647	2,504,078	3,311,177	301,132		158,957	380,896			6,926,844
Sand and gravel......ton	911,970	1,960,382	8,541,400	9,529,803	1,102,448	1,163,097	833,524	4,357,362			28,399,986
$	411,041	958,524	2,140,856	4,417,427	296,080	533,175	328,151	1,194,859			10,280,119
Stone—Granite......ton	1,886	1,857	127,544	125,604	357			12,716			269,964
$	37,532	47,504	830,238	307,497	4,967			76,052			1,303,790
Limestone (x)......ton	50,734	66,731	2,370,141	2,852,241	31,572		12,726	181,141			5,565,286
$	123,613	165,258	2,349,177	2,549,402	48,587		43,049	249,373			5,528,459
Marble......ton			6,489	5,215				125			11,829
$			50,569	32,650				2,155			85,374
Sandstone......ton	45,813	1,400	89,470	5,223				4,860			146,766
$	63,968	31,425	104,629	20,431				3,000			223,453
Slate......ton			108					949			1,147
$			198					17,903			18,101
Total stone......ton	98,433	69,988	2,593,842	2,988,283	31,929		12,726	199,791			5,994,992
$	225,113	244,187	3,334,811	2,909,980	53,554		43,049	348,483			7,159,177
Total Other Structural Materials $	**679,111**	**1,430,358**	**12,715,749**	**13,368,965**	**2,349,339**	**533,175**	**1,900,659**	**3,010,156**			**35,987,512**
Total Clay Products and other Structural Materials......$	**1,081,805**	**1,637,409**	**14,597,540**	**15,716,361**	**2,546,722**	**864,082**	**3,044,236**	**3,496,782**			**42,984,937**
Grand Total......$	**33,981,977**	**4,133,902**	**90,182,553**	**210,706,307**	**13,830,406**	**22,231,818**	**51,066,662**	**57,246,071**	**1,410,069**	**939,319**	**485,819,114**

Table 2.—Finally Revised Statistics on the Mineral Production of Canada, by Provinces, 1944—Concluded

—	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Northwest Territories	Yukon	Canada
Metallics..........$	224,921	....	51,582,006	183,941,161	10,384,532	18,308,289	1,965	42,102,841	807,147	939,319	308,292,161
Fuels..........$	30,728,535	2,219,745	3,597	4,992,317	....	2,081,570	47,622,815	9,009,506	632,922	....	97,291,097
Other non-metallics..........$	1,946,716	276,748	23,999,410	6,056,468	899,152	1,037,927	307,646	2,636,942	....	....	37,251,099
Clay products..........$	402,694	207,051	1,881,791	2,347,396	197,383	330,907	1,143,577	486,626	....	....	6,997,425
Other structural materials..........$	679,111	1,430,358	12,715,749	13,308,965	2,349,339	533,175	1,900,659	3,010,156	....	....	35,987,512
Grand Total—1944..........$	33,981,977	4,133,902	90,182,553	210,706,307	13,830,406	22,291,848	51,066,662	57,246,071	1,440,069	939,319	**485,819,114**
Per cent of total..........	6·99	0·85	18·56	43·37	2·85	4·59	10·51	11·78	0·31	0·19	**100·00**
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**
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**	**16,689,887**	**15,020,555**	**41,364,385**	**76,841,180**	**3,860,298**	**3,117,992**	**560,241,290**

(a) Data not available.

(b) Includes cobalt in crude ores exported; cobalt in ores shipped from Government stock pile, and any cobalt recovered from Canadian ores at the Deloro smelter.

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

Table 3.—Production of Leading Mineral Products, by Months, 1943 and 1944

1943	Asbestos	Cement	Clay Products	Coal	Copper
	tons	barrels	$	tons	pounds
January	32,541	294,518	367,605	1,559,304	45,916,074
February	36,161	278,128	389,235	1,578,404	47,372,427
March	40,275	437,903	430,216	1,688,463	52,897,339
April	33,358	460,174	468,325	1,387,020	52,915,538
May	48,867	706,464	544,910	1,318,099	49,601,198
June	43,487	827,085	620,376	1,365,993	46,263,193
July	43,767	936,684	655,550	1,387,654	47,354,190
August	40,059	953,742	684,649	1,441,577	46,222,900
September	39,252	878,483	709,227	1,463,498	42,540,896
October	33,911	813,867	681,042	1,569,411	48,860,883
November	38,989	497,577	623,167	1,472,424	47,505,267
December	36,529	217,664	433,291	1,627,210	47,740,227
Total	**467,196**	**7,302,289**	**6,608,193**	**17,859,057**	**575,190,132**

1943	Feldspar	Gold	Gypsum	Lead	Lime
	tons	fine oz.	tons	pounds	tons
January	1,209	334,422	28,131	38,604,106	67,255
February	1,448	327,318	24,110	38,807,636	68,827
March	1,780	347,591	35,429	46,936,627	79,712
April	1,307	323,041	25,063	36,773,575	82,173
May	1,441	313,489	22,839	40,601,268	73,504
June	3,123	326,839	23,314	39,579,471	66,755
July	1,959	292,663	36,759	36,100,126	71,781
August	2,772	293,281	50,623	32,113,307	76,055
September	2,548	282,130	51,825	32,884,233	80,181
October	2,093	279,988	61,143	35,272,574	80,862
November	2,079	267,726	46,666	34,635,657	85,868
December	2.099	262,813	40,946	31,752,789	72,087
Total	**23,858**	**3,651,301**	**446,848**	**444,060,769**	**905,060**

1943	Natural Gas	Nickel	Petroleum	Salt (x)	Silver	Zinc
	M cu. ft.	pounds	barrels	tons	fine oz.	pounds
January	5,511,483	25,338,479	856,361	23,871	1,620,707	52,578,751
February	4,518,318	23,156,794	775,985	23,778	1,637,526	48,105,936
March	5,052,566	26,106,700	856,649	24,690	1,787,385	54,101,689
April	3,683,571	25,612,003	832,765	26,249	1,688,247	50,706,472
May	3,135,347	24,517,190	868,321	29,748	1,475,903	53,667,946
June	2,520,662	25,739,223	821,869	30,569	1,392,477	53,335,891
July	2,307,864	23,585,993	843,127	32,839	1,348,784	52,585,837
August	2,328,237	21,334,008	853,531	30,513	1,298,765	52,053,564
September	2,729,297	22,524,474	823,054	31,007	1,172,710	48,129,596
October	3,423,322	22,924,363	855,009	30,419	1,291,502	46,836,744
November	4,180,824	23,175,838	829,559	31,180	1,367,624	46,989,693
December	4,875,725	24,003,550	836,072	26,678	1,262,939	51,662,235
Total	**44,276,216**	**288,018,615**	**10,052,302**	**341,541**	**17,344,569**	**610,754,354**

1944	Asbestos	Cement	Clay Products	Coal	Copper
	tons	barrels	$	tons	pounds
January	31,987	176,123	375,256	1,626,068	48,877,850
February	32,663	201,622	333,525	1,454,614	45,536,837
March	36,675	272,971	393,411	1,546,446	48,203,812
April	33,839	393,811	411,040	1,236,200	44,989,445
May	35,644	738,585	621,655	1,290,481	47,578,287
June	35,495	994,410	681,358	1,233,251	47,082,930
July	31,259	982,191	740,908	1,168,859	44,975,986
August	37,036	943,459	759,123	1,379,044	44,743,580
September	38,137	860,024	743,672	1,391,475	43,106,124
October	37,752	878,238	766,808	1,528,291	42,039,927
November	36,076	559,448	721,703	1,638,628	43,811,150
December	32.702	189,969	446,366	1,533,142	45,824,190
Total	**419,265**	**7,190,851**	**6,997,425**	**17,026,499**	**547,070,118**

(x) Commercial salt only.

Table 3.—Production of Leading Mineral Products, by Months, 1943 and 1944 —Concluded

1944	Feldspar	Gold	Gypsum	Lead	Lime
	tons	fine oz.	tons	pounds	tons
January	1,580	258,607	44,157	32,857,666	74,063
February	2,766	257,613	44,704	29,887,544	75,295
March	2,316	267,485	49,168	24,373,016	78,485
April	1,279	245,577	38,839	25,383,726	74,658
May	1,131	257,647	41,547	20,583,341	76,482
June	2,259	240,673	47,177	19,832,745	73,859
July	1,806	236,362	66,660	24,633,240	67,957
August	1,832	237,617	80,437	18,401,675	70,867
September	2,177	237,151	57,804	18,993,630	71,269
October	2,355	230,749	50,047	18,452,002	79,981
November	1,849	223,806	39,965	35,836,191	75,336
December	2,159	229,624	35,659	35,347,422	66,980
Total	**23,509**	**2,922,911**	**596,164**	**304,582,198**	**885,142**

1944	Natural Gas	Nickel	Petroleum	Salt (x)	Silver	Zinc
	M cu. ft.	pounds	barrels	tons	fine oz.	pounds
January	5,155,411	23,546,809	831,512	25,163	1,212,349	49,438,642
February	5,052,082	22,383,335	788,257	23,761	1,280,962	46,551,662
March	4,981,513	25,290,263	871,446	27,701	1,375,351	47,918,693
April	4,043,182	23,161,864	838,010	26,853	1,237,170	45,119,487
May	3,104,618	24,024,759	852,335	31,004	1,035,847	47,499,582
June	2,677,868	20,374,755	818,678	27,801	1,167,200	41,373,262
July	2,424,789	23,411,947	806,342	27,693	1,077,974	42,536,604
August	2,393,762	23,848,093	827,603	27,690	835,166	44,843,903
September	2,634,712	22,710,286	852,263	29,290	910,838	46,955,939
October	3,053,695	21,819,119	878,082	24,691	1,060,784	43,098,175
November	4,398,092	22,259,195	855,752	30,401	1,199,153	44,718,272
December	5,147,434	21,768,204	879,124	22,970	1,234,315	50,769,132
Total	**45,067,158**	**274,598,629**	**10,099,404**	**325,018**	**13,627,109**	**550,823,353**

(x) Commercial salt only.

Table 4.—Summary, by Nine Main Branches, of the Net Value of Commodity Production in Canada, 1939-1943*

—	1939	1940	1941	1942	1943
	$	$	$	$	$
Agriculture	(*) 722,263,000	774,023,000	803,185,000	1,351,606,000	1,245,843,000
Forestry	271,723,416	370,121,275	421,419,139	429,079,260	462,815,227
Fisheries	34,378,681	38,106,690	51,769,638	64,821,702	74,655,678
Trapping	7,919,412	11,207,930	15,138,040	23,801,213	21,579,615
Mining (Total)	393,232,044	448,089,729	497,904,632	514,109,951	475,529,364
Auriferous quartz	129,633,245	146,713,744	145,978,833	131,938,062	95,597,710
Other mining	263,598,799	301,366,985	351,925,799	382,171,889	379,931,654
Electric power	149,863,892	163,780,757	183,146,426	200,345,240	200,833,297
Construction	183,706,338	206,893,992	269,561,885	310,917,100	293,538,167
Custom and repair	108,821,000	111,608,000	130,778,000	141,395,000	144,952,000
Manufactures, n.e.s. (*)	1,277,265,130	1,591,625,600	2,194,821,273	2,884,501,057	3,405,712,025
Grand Total	**3,149,172,913**	**3,715,447,973**	**4,567,724,033**	**5,920,576,613**	**6,325,458,373**
Manufactures, Total†	**1,531,051,901**	**1,942,471,238**	**2,605,119,788**	**3,309,973,758**	**3,816,413,541**

* Business Statistics Branch, Dominion Bureau of Statistics (1943 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 5.—Provincial Distribution of the Net Value of Commodity Production in Canada, 1939-1943

Province	1939	1940	1941	1942	1943
	$	$	$	$	$
Prince Edward Island	10,095,108	11,246,797	11,902,619	15,369,746	19,955,547
Nova Scotia	103,580,011	125,850,203	133,581,788	161,603,076	187,595,481
New Brunswick	71,771,425	85,076,573	102,048,957	116,820,880	133,799,469
Quebec	826,352,765	991,849,049	1,278,326,692	1,610,227,431	1,848,391,341
Ontario	1,324,654,503	1,588,120,149	2,049,178,610	2,440,514,058	2,622,176,339
Manitoba	145,272,803	170,695,828	195,328,675	268,265,285	285,852,815
Saskatchewan	218,239,483	215,014,542	183,233,045	426,555,113	333,445,471
Alberta	199,701,118	233,532,134	231,709,186	385,214,709	321,341,525
British Columbia	242,364,518	287,653,018	374,168,179	486,376,020	565,082,092
Yukon and Northwest Territories	7,141,179	6,409,680	8,246,282	9,630,295	7,818,293
Canada	**3,149,172,913**	**3,715,447,973**	**4,567,724,033**	**5,920,576,613**	**6,325,458,373**

Table 6.—Proportion Contributed by Mining to Total Net Value of Production in each Province, 1939-1943

Province	1939	1940	1941	1942	1943		
						Percentage of Net Value Provincial Production	
	Mining Net	Mining Net	Mining Net	Mining Net	Mining Net	All Mines	Auriferous quartz mines only
	$	$	$	$	$	%	%
Prince Edward Island	.....	.....	.....	.....	.....	.....	.....
Nova Scotia	23,504,419	26,189,233	24,535,707	25,174,960	21,979,202	11·72	0·62
New Brunswick	3,600,454	3,024,317	3,231,658	3,176,007	3,249,933	2·43	.....
Quebec	81,600,118	100,134,979	127,649,905	138,100,940	134,500,359	7·28	0·98
Ontario	188,867,969	209,277,055	219,459,986	212,351,819	183,488,086	7·06	2·54
Manitoba	12,401,404	14,005,270	11,898,109	9,508,569	8,973,959	3·14	0·72
Saskatchewan	6,391,404	8,652,006	9,336,756	14,487,408	23,507,079	7·05	.....
Alberta	26,049,861	29,593,293	36,167,469	40,604,704	41,767,222	13·00	.....
British Columbia	45,419,651	53,513,427	60,323,299	64,378,171	54,105,996	9·57	1·18
Yukon and Northwest Territories	5,396,764	4,631,149	5,301,743	6,327,373	3,957,528	50·02	24·94
Canada	**393,232,041**	**448,080,729**	**497,904,632**	**514,109,951**	**475,529,364**	**7·52**	**1·51**

Table 7.—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	1916	177,201,534	22·05
1887	10,321,331	2·23	1917	189,646,821	23·18
1888	12,518,894	2·67	1918	211,301,897	25·37
1889	14,013,113	2·96	1919	176,686,390	20·84
1890	16,763,353	3·50	1920	227,859,665	26·40
1891	18,976,616	3·92	1921	171,923,342	19·56
1892	16,623,415	3·39	1922	184,297,242	20·55
1893	20,035,082	4·04	1923	214,079,331	23·41
1894	19,931,158	3·98	1924	209,583,406	22·71
1895	20,505,917	4·05	1925	226,583,333	24·19
1896	22,474,256	4·38	1926	240,437,123	25·61
1897	28,485,023	5·49	1927	247,356,695	25·67
1898	38,412,431	7·32	1928	274,989,487	27·96
1899	49,234,005	9·27	1929	310,850,246	31·00
1900	64,420,877	12·04	1930	279,873,578	27·42
1901	65,797,911	12·16	1931	230,434,726	22·21
1902	63,231,836	11·36	1932	191,228,225	18·20
1903	61,740,513	10·83	1933	221,495,253	20·74
1904	60,082,771	10·27	1934	278,161,590	25·67
1905	69,078,999	11·49	1935	312,344,457	28·56
1906	79,286,697	12·81	1936	361,919,372	32·82
1907	86,865,202	13·75	1937	457,359,092	41·13
1908	85,557,101	13·16	1938	441,823,237	39·42
1909	91,831,441	13·70	1939	474,602,059	41·94
1910	106,823,623	14·93	1940	529,825,035	46·39
1911	103,220,994	14·32	1941	560,241,290	49·06
1912	135,048,296	18·33	1942	566,768,672	48·63
1913	145,634,812	19·35	1943	530,053,966	44·87
1914	128,863,075	16·75	1944	485,819,114	*40·57
1915	137,109,171	17·44			
			Grand Total	**10,767,855,346**	

*Based on an estimated population of 11,975,000 in 1944.

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

Table 8.—Annual Values of the Mineral Production of Canada, by Classes, since 1929

Year	Metallics	Non-metallics		Total
		Fuels and other non-metallics	Structural materials and clay products	
	$	$	$	$
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**
1944	*308,292,161	134,542,016	42,984,937	**485,819,114**

*Exclusive of the values of pitchblende products.

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

Table 9.—Total (Cumulative) Recorded Production in Canada of Specified Metals and Minerals to December 31, 1944

—	—	Quantity	Value
			$
Gold	(a) fine ounces	92,297,754	2,684,387,981
Silver	(b) fine ounces	880,919,928	494,565,826
Copper	(c) pounds	9,722,381,043	1,137,180,949
Nickel	(d) pounds	4,182,022,892	1,136,791,884
Lead	(b) pounds	8,566,923,587	368,433,325
Zinc	(f)	....	280,533,781
Cobalt	(e) pounds	34,417,386	33,726,917
Platinum metals	(g) fine ounces	3,357,717	....
Coal	(h) tons	686,348,556	2,101,717,301
Asbestos	(i) tons	9,078,939	358,558,518

NOTE.—The total value of production by the entire Canadian mining industry from 1886 to the end of 1944 totalled $10,767,855,346.

(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 10.—Values of the entire 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	99,651,044	267,435,727	16,689,867
1942	32,783,165	3,690,158	104,300,010	259,114,946	14,345,046
1943	29,979,837	3,676,834	101,610,678	232,948,959	13,412,266
1944	33,981,977	4,133,902	90,182,553	210,706,307	13,830,406

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	48,941,216	68,442,386	1,625,819	2,679,993
1944	22,291,848	51,066,962	57,246,071	939,319	1,440,069

* Values of pitchblende products not included in 1942, 1943 or 1944.

Table 11.—Average Annual Metal Prices, in Canadian Dollars, 1929-1944

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
1944	38·50	0·430	0·120	0·450	0·430

*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 12.—(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 (c)
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	4·080	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	1944	11·775	6·500	8·250	44·750

(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. (c) 1932-1944—for other than newly mined domestic.

Statement of Minister of Finance in 1944 Budget Speech Respecting Mining Taxation

In his 1944 Budget Speech, delivered in the House of Commons on June 26, the Minister of Finance, Hon. J. L. Ilsley, made the following statement in respect of mining taxation:

"During recent months we have been urged to introduce a number of drastic changes in the tax structure as it affects the mining and oil producing industries. These industries are very properly considering their post-war position and the contribution which they can make to the solution of post-war problems. Needless to say, the government has very much in mind the need of a comprehensive and many-sided program to encourage the efficient development of our natural resources and to assure that these industries will make the maximum contribution to the expansion of employment, national income and national wealth after the war. Natural resources, of course, are for the most part in the hands of the provinces, but the dominion, it is believed, can do much to promote full development and wise conservation. Tax policy may be one of the devices which it may appropriately use to these ends but it will be by no means the only one. The dominion's program should be part of an integrated program worked out in co-operation with the provinces. At the forthcoming dominion-provincial conference, this program, it is proposed, should be discussed with Provincial Governments and agreement reached as to the contribution to be made by the respective levels of government.

"For these reasons I believe that any radical changes in tax policy of special application only to the mining and oil companies would be premature at this time. The Excess Profits Tax Act already includes a special formula for the taxation of oil wells and gold mines. New companies in the metalliferous mining field enjoy a three-year exemption from excess profits tax. In last year's budget we made a number of important concessions to encourage exploration and drilling for oil and also made it possible for mining companies to write off exploration and prospecting expenses incurred in prospecting anywhere in Canada for base metals or strategic minerals. With this measure of encouragement the oil and mineral industries have been able to make a very important contribution to the country's war effort. They have also been willing to bear their full share of the burden of financing the war and they well recognize, I believe, that the need for war revenue continues at least as great and as urgent as ever. The changes I have announced in respect of income and excess profits taxation and the indications I have given in regard to future tax policy will apply to these industries as well as to other industrial enterprises and I hope that it may be possible to announce at the next session of parliament the comprehensive and integrated program for the development and conservation of natural resources to which I have already referred."

Canadian Metals Controller's Order 19

In June 1942 the Metals Controller issued Order M.C. 19 which restricted the production, development and new installations in non-essential mines. This order was issued for the following reasons:

1. To conserve labour and materials which were urgently required for more essential purposes.

2. To maintain the operating gold mines and to aid them in securing components for machinery and equipment for maintenance and repair, safety appliances and pumping machinery from the United States. Arrangements to this effect were made with the War Production Board.

By restricting gold mining operations this order restricted the employment of underground men in these mines and new gold properties and, therefore, made available more underground men for essential base metal mine production. Despite these curtailments of actual mining operations there never were any restrictions on prospecting and surface development of new properties.

Following the victory in Europe in 1945 there was some easing in the regulations governing the procurement of component parts and equipment from the United States. The Labour Department gave the Metals Control Office assurance that they through National Selective Service were able, and would continue, to direct men to the base metal mines in order to maintain necessary production and, therefore, on June 7, 1945, this order was rescinded and the only restrictions remaining on gold mining operations were the availability of materials and labour. The availability of sufficient component parts, etc., from the United States for the maintenance of operating gold mines presents no difficulty but some difficulty may be encountered in obtaining equipment for new mines. While the base metal mines are still in need of approximately 3,000 men, the majority of which are underground men, the Labour Department feels that there are certain areas in which there is a small surplus of underground workers and these are being allowed to seek employment in existing gold mines or on new properties.

Activities of Wartime Metals Corporation

(Metals Controller—Department of Munitions and Supply)

Wartime Metals Corporation, a wholly owned Crown Company operating under the Department of Munitions and Supply was incorporated without share capital on March 27, 1942. The Corporation was created to assume the responsibility of administering, directing, operating and supervising such mining and metallurgical projects as the Minister of Munitions and Supply found necessary, in order to meet serious shortages of certain metals and minerals.

Where it was considered advisable for the Government to provide capital assistance in order that a specified metal or mineral be produced, definite recommendations were made by the Metals Controller to the Minister of Munitions and Supply, and upon approval by the Minister, Wartime Metals Corporation was directed to proceed with the work involved.

The Corporation also performed similar duties in connection with all mining projects operated in Canada by His Majesty for the account of various United States governmental agencies.

During its life of approximately three and one half years, Wartime Metals Corporation undertook 19 projects, 8 of which were conducted on behalf of the United States government, including all the production of copper, lead, zinc and corundum noted below:

1. Tetreault Zinc Lead
2. Granby Copper No. 2
3. Kam Kotia Copper
4. Twin "J" Copper Zinc
5. Britannia Copper
6. Kootenay Florence Zinc Lead
7. Lake Geneva Zinc Lead
8. Craigmont Corundum

For the first seven projects listed above, Metals Reserve was fully reimbursed by Canada on July 15, 1944, and the agreement between Metals Reserve and War Supplies Ltd. was cancelled. The reimbursement included capital expenditures and the difference between cost and the U.S. ceiling price of metals delivered in cases where cost exceeded the U.S. ceiling price. Craigmont Corundum is still in operation under the supervision of the Metals Control.

The remainder of the projects was undertaken to meet the threatened shortages, mainly in Canada but partly in Great Britain. Of these the five listed below proved to be impractical and were discontinued after short initial periods:

1. Lava Talc
2. Granby Copper No. 1.
3. High Lake Molybdenite
4. Zenith Molybdenite
5. Vanadium

The six remaining projects are listed below together with their approximate production during their period of operation.

1. Dominion Magnesium	22,300,000	lbs.	magnesium
2. Chromeraine (Chrome Ore)	12,353,000	"	chromium content
3. La Corne Molybdenum	1,430,000	"	molybdenum content
4. Emerald Tungsten	272,000	"	WO_3
5. Ingot Brass	1,050,000	"	Brass Ingots
6. Molybdenite Roasting	1,357,713	"	molybdenum oxide
	225,103	"	ferromolybdenum
	201,325	"	molybdenum in stock at Climax

Strategic Minerals

The annual report of the Department of Mines and Resources, Ottawa, for the fiscal year ended March 31, 1944 contained the following information:

"The Special Minerals Projects Division (Mines and Geology Branch) administered funds provided by the Branch out of the war appropriation for exploration and development work in connection with the supply of strategic minerals; for investigation of petroliferous deposits and potential petroliferous areas; for the remodelling and expansion of the plant of Abasand Oils Limited, near Fort McMurray, Alberta; for assistance to provincial governments in providing transportation facilities into strategic mineral properties; and for assistance to provincial governments in winter maintenance of roads into strategic mineral properties. Funds recoverable from other departments were also administered by the division in connection with the production of fluorspar and tungsten.

"An Allotment of $500,000 from war appropriation was provided for continuation of exploration and development work in connection with the supply of strategic minerals, including the administration of projects involving loans to producers of chromite at St. Cyr, Quebec, of fluorspar in the Madoc area, Ontario, and of tungsten in Yukon. Exploratory drilling of potential areas in Manitoba was carried out by contractors under the supervision of the Branch. Development of muscovite mica and fluorspar properties in Ontario was assisted through the leasing of Government-owned mining equipment at low rentals. The projects were carried out on the recommendation of the Metals Controller . . . . ."

Table 13.—Mineral Production of Nova Scotia, 1942-1944

Product	1942		1943		1944	
	Quantity	Value	Quantity	Value	Quantity	Value
		$		$		$
METALLICS—						
Antimony ... pound	...	...	...	...	...	...
Copper ... pound	...	...	...	...	...	...
Gold ... fine oz.	12,989	500,076	4,129	158,967	5,840	224,840
Lead ... pound	...	...	...	...	...	...
Manganese ore ... tons	61	91	...	...	...	...
Manganese metal ... pound	...	...	...	...	...	...
Silver ... fine oz.	446	188	144	65	188	81
Tungsten concentrates ... pound	4,300	3,967	19,374	18,564	...	...
Zinc ... pound	...	...	...	...	...	...
NON-METALLICS—						
Barytes ... tons	17,750	172,060	22,550	263,419	106,106	970,774
Coal ... tons	7,204,852	29,116,118	6,103,085	27,121,861	5,745,671	30,728,535
Diatomite ... tons	218	6,541	82	2,465	5	175
Fluorspar ... tons	300	6,584	825	17,000	...	...
Grindstones ... tons	...	...	...	...	...	...
Gypsum ... tons	394,216	512,762	255,736	368,639	401,284	489,932
Quartz ... tons	10,708	23,557	9,486	16,126	10,100	27,350
Salt ... tons	50,199	317,798	47,775	245,157	38,809	281,482
Silica brick ... M	3,090	142,511	3,113	169,783	2,931	177,003
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Clay products ...	...	618,441	...	478,571	...	402,694
Lime—						
Quicklime ... tons	21,540	222,304	9,611	111,758	3,362	42,957
Hydrated lime ... tons	310	4,030	122	1,586	...	...
Sand and gravel ... tons	775,795	371,970	917,376	585,007	911,970	411,041
Stone ... tons	229,517	764,167	247,868	420,869	98,433	225,113
Total ...	...	**32,783,165**	...	**29,979,837**	...	**33,981,977**

Table 14.—Mineral Production of New Brunswick, 1942-1944

Product	1942		1943		1944	
	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	435,203	1,826,403	372,873	1,641,069	345,123	1,845,277
Grindstones ... tons	216	10,000	164	6,225	225	12,000
Gypsum ... tons	36,623	111,316	36,263	148,315	42,040	200,748
Natural gas ... M cu. ft.	619,380	299,688	675,029	327,787	702,464	341,636
Petroleum ... brls.	28,089	39,467	24,530	34,342	23,296	32,832
Peat Moss ... tons	295	8,100	990	27,000	2,000	64,000
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Clay products ...	...	246,041	...	216,446	...	207,051
Lime—						
Quicklime ... tons	16,217	146,357	13,634	132,901	17,218	195,545
Hydrated lime ... tons	6,210	51,124	3,748	41,407	2,580	32,102
Sand and gravel ... tons	923,020	540,541	719,531	372,936	1,960,382	958,524
Stone ... tons	87,937	321,280	53,583	147,371	69,988	244,187
Total ...	...	**3,609,158**	...	**3,676,834**	...	**4,133,902**

Table 15.—Mineral Production of Quebec*, 1942-1944

Product	1942		1943		1944	
	Quantity	Value	Quantity	Value	Quantity	Value
		$		$		$
Metallics—						
Arsenic (As_2O_3)...lb.	6,349,074	428,562	2,744,921	221,085	2,268,067	153,944
Chromite...tons	11,456	343,568	29,595	919,878	27,054	748,494
Copper...lb.	140,911,876	14,212,372	131,163,776	15,411,744	108,055,172	12,966,620
Gold...fine oz.	1,092,388	42,056,938	922,533	35,517,521	746,784	28,751,184
Iron ore...tons	187	935	...	...	...	...
Lead...lb.	437,634	14,713	2,435,523	91,430	10,487,842	471,953
Magnesium metal (a)...lb.	141,081	62,076	...	...		
Molybdenite concentrates...lb.	222,276	131,906	784,715	549,515	2,124,693	1,078,616
Selenium...lb.	326,208	626,319	216,498	378,872	146,352	263,434
Silver...fine oz.	1,655,042	697,865	2,212,115	1,001,071	2,500,681	1,075,293
Tellerium...lb.	...	...	...	...	...	...
Titanium ore, sold for export...tons	10,031	50,906	69,437	308,290	33,973	165,195
Tungsten concentrates...lb.	2,981	2,612	5,401	5,369	...	...
Zinc...lb.	73,940,811	2,522,121	128,169,810	5,126,792	137,378,439	5,907,273
Non-Metallics—						
Asbestos...tons	439,459	22,663,283	467,196	23,169,505	419,265	20,619,516
Barite...tons	...	...	...	...	...	...
Feldspar...tons	16,802	164,588	17,199	176,222	17,842	177,271
Fluorspar...tons	...	...	...	...	18	670
Iron oxides (ochre)...tons	8,866	147,049	7,998	131,057	8,117	142,050
Magnesitic dolomite and brucite...	...	1,059,374	...	1,260,056	...	1,139,281
Mica...tons	1,328	285,263	1,543	245,846	1,137	178,899
Natural mineral waters...Imp. gal.	129,062	60,316	125,605	61,703	148,965	78,226
Peat fuel...tons	...	...	522	4,440	444	3,597
Peat moss...tons	12,982	197,560	14,398	298,307	19,033	359,724
Phosphate...tons	930	12,973	1,050	14,272	482	6,716
Quartz...tons	203,219	543,817	214,959	605,916	236,091	639,429
Soapstone†...tons	14,369	136,529	14,204	135,469	19,013	204,127
Sulphur...tons	168,832	673,965	136,007	545,229	116,887	453,501
Clay Products and Other Structural Materials—						
Cement...brls.	4,446,416	6,487,078	3,394,895	4,899,578	3,249,302	4,736,004
Clay products...	...	1,741,297	...	1,504,428	...	1,881,791
Lime—						
Quicklime...tons	263,321	1,981,535	2,857,94	2,331,293	250,616	2,167,913
Hydrated lime...tons	85,255	342,172	96,638	336,098	88,466	336,165
Sand and gravel...tons	11,026,249	2,485,853	10,601,376	2,362,635	8,541,400	2,140,856
Stone...tons	4,188,210	4,166,465	3,427,325	3,996,967	2,593,842	3,334,811
Total...	...	**104,300,010**	...	**101,610,678**	...	**90,182,553**

(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 16.—Mineral Production of Ontario, 1942-1944

Product	1942		1943		1944	
	Quantity	Value	Quantity	Value	Quantity	Value
		$		$		$
METALLICS—						
Arsenic (As_2O_3)...lb.	1,504,049	152,331	408,617	32,924	358,955	26,922
Bismuth...lb.	2,333	3,219	...	...	...	...
Chromite...tons	...	...	...	...	...	...
Cobalt...lb.	(a) 83,871	88,444	(a) 175,961	191,407	(a) 36,283	34,106
Copper...lb.	308,282,414	30,625,404	277,840,560	32,232,027	285,307,278	33,845,632
Gold...fine oz.	2,763,819	106,407,032	2,117,215	81,512,777	1,731,836	66,675,686
Iron ore...short tons	545,119	1,516,142	498,232	1,452,250	553,252	1,909,608
Lead...lb.	3,183,159	107,018	2,273,896	85,362	1,065,741	47,958
Magnesium metal...lb.	473,910	208,520	7,153,974	2,074,652	10,579,878	2,575,695
Molybdenite (concentrates)...lb.	423	150	...	...	2,815	1,082
Nickel...lb.	285,211,803	69,998,427	288,018,615	71,675,322	274,598,629	69,204,152
Palladium, rhodium, etc...fine oz.	222,573	8,279,221	126,004	5,233,068	42,929	1,960,085
Platinum...fine oz.	285,188	10,897,033	219,706	8,458,681	157,523	6,064,635
Selenium...lb.	76,000	145,920	82,000	143,500	65,000	117,000
Silver...fine oz.	4,452,787	1,877,562	2,671,320	1,208,879	3,143,275	1,351,608
Tellurium...lb.	9,500	15,200	8,600	15,050	9,900	17,325
Tungsten concentrates...lb.	162,185	145,241	494,405	356,478	63,152	5,212
Zinc...lb.	4,710,394	160,671	3,299,812	131,993	2,429,176	104,455
NON-METALLICS—						
Asbestos...tons	...	...	...	...	...	...
Barite...tons	...	...	...	...	...	...
Corundum...tons	...	...	...	...	173	17,111
Feldspar...tons	5,468	49,353	6,659	61,549	5,667	50,361
Fluorspar...tons	4,340	113,957	10,385	301,424	6,906	217,031
Garnet (schist)...tons	17	176	...	...	3	90
Graphite...tons	...	117,904	1,903	197,431	1,582	171,166
Gypsum...tons	82,796	304,170	92,448	335,637	90,288	348,873
Mica...tons	1,400	89,243	2,127	296,189	1,743	646,745
Natural mineral waters...Imp. gal.	28,023	14,189	14,006	5,748	7,185	805
Natural gas...M cu. ft.	10,476,770	6,809,901	7,914,408	6,543,913	7,082,508	4,694,097
Nepheline syenite...tons	...	246,893	...	292,010	47,625	217,989
Peat (fuel)...tons	172	1,204	260	2,560	200	1,800
Peat (moss)...tons	9,427	147,729	11,120	136,595	12,490	144,820
Petroleum...brls.	143,845	306,242	132,492	311,356	125,067	296,420
Phosphate...tons	334	4,458	401	4,113	...	...
Quartz (b)...tons	1,367,733	914,256	1,350,640	852,196	1,326,288	868,389
Salt...tons	558,407	2,793,328	594,889	3,356,870	603,806	2,906,117
Silica brick...M	1,183	120,495	1,052	125,722	1,066	135,089
Sulphur†...tons	18,634	186,340	16,907	169,070	17,876	178,760
Talc...tons	15,499	174,295	11,959	131,216	13,584	153,122
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Cement...brls.	2,784,782	3,998,294	1,972,009	2,872,732	1,863,210	2,730,381
Clay Products...	...	2,549,486	...	2,453,829	...	2,347,396
Lime—						
Quicklime...tons	382,667	2,761,643	382,950	2,794,071	391,678	2,886,778
Hydrated lime...tons	33,031	363,931	28,971	321,123	37,607	424,399
Sand and gravel...tons	8,420,358	3,433,986	8,285,309	3,620,852	9,529,803	4,417,427
Stone...tons	3,106,545	2,985,938	3,206,027	2,958,383	2,988,283	2,909,980
Total...	...	**259,114,946**	...	**232,948,959**	...	**210,706,307**

† 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, but includes any metal reshipped from stock pile.
(b) Includes low grade silica sand for fluxing purposes.

Table 17.—Mineral Production of Manitoba, 1942-1944

Product	1942		1943		1944	
	Quantity	Value	Quantity	Value	Quantity	Value
		$		$		$
METALLICS—						
Cadmium....lb.	29,236	34,498	20,983	24,130	20,921	23,013
Copper....lb.	47,595,586	4,800,491	38,014,872	4,466,747	43,878,639	5,265,437
Gold....fine oz.	136,226	5,244,701	91,775	3,533,337	74,168	2,855,468
Selenium....lb.	21,209	40,721	5,239	9,168	12,957	23,323
Silver....fine oz.	821,824	346,530	587,270	265,767	569,873	245,045
Tellurium....lb.	361	578	†	†	113	198
Thallium....lb.	....	....	....	....	128	1,690
Tungsten concentrates....lb.	1,309	1,300	16	16	....	....
Zinc....lb.	29,908,179	1,020,168	46,783,873	1,871,355	45,822,278	1,970,358
NON-METALLICS—						
Coal....tons	1,265	3,763	999	2,064	....	....
Feldspar....tons	....	....	....	....	....	....
Gypsum....tons	29,218	179,780	37,989	380,529	38,330	368,498
Lithium minerals....$	....	....	....	....	....	....
Natural gas....cu. ft.	(b)	(b)	(b)	(b)	(b)	(b)
Peat moss....tons	2,224	55,832	2,042	72,687	1,128	41,878
Salt....tons	22,706	397,101	27,523	497,227	27,267	488,776
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Cement....brls.	654,855	1,374,498	793,913	1,503,416	865,756	1,698,567
Clay products....	....	80,890	....	132,382	....	197,383
Lime—						
Quicklime....tons	21,443	181,052	24,962	216,414	20,428	178,876
Hydrated lime....tons	4,981	84,027	5,076	91,405	9,466	122,256
Sand and gravel....tons	1,443,001	427,150	1,048,673	293,938	1,102,448	296,086
Stone....tons	43,488	71,966	37,974	50,784	31,929	53,554
Total....	....	**14,345,046**	....	**13,412,266**	....	**13,830,406**

† 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 18.—Mineral Production of Saskatchewan, 1942-1944

Product	1942		1943		1944	
	Quantity	Value	Quantity	Value	Quantity	Value
		$		$		$
METALLICS—						
Cadmium....lb.	147,314	173,831	166,955	191,998	119,639	131,603
Copper....lb.	56,781,466	5,726,979	85,948,719	10,098,974	73,514,490	8,821,740
Gold....fine oz.	178,871	6,886,533	174,090	6,702,465	122,782	4,727,107
Selenium....lb.	71,952	138,148	70,276	122,983	74,283	133,709
Silver....fine oz.	2,664,132	1,123,358	2,812,624	1,272,825	1,735,773	746,382
Tellurium....lb.	1,223	1,957	†	†	648	1,134
Zinc....lb.	84,461,520	2,880,983	96,350,404	3,854,016	87,130,087	3,746,594
NON-METALLICS—						
Coal....tons	1,301,116	1,760,065	1,665,972	2,432,249	1,372,766	2,034,914
Quartz (a)....tons	155,699	54,495	163,102	57,086	143,101	50,085
Salt....tons	....	....	....	....	....	....
Sodium sulphate....tons	131,258	1,079,692	107,121	1,025,151	102,421	987,842
Natural gas....M cu. ft.	117,124	45,585	116,201	45,568	119,116	46,656
Petroleum crude....brls.	....	....	....	....	....	....
Volcanic dust....tons	....	....	50	257	....	....
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Clay products....	....	271,325	....	348,725	....	330,907
Sand and gravel....tons	679,979	435,798	1,288,263	583,687	1,163,097	533,175
Total....	....	**20,578,749**	....	**26,735,984**	....	**22,291,848**

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

Table 19.—Mineral Production of Alberta, 1942-1944

Product	1942		1943		1944	
	Quantity	Value	Quantity	Value	Quantity	Value
		$		$		$
METALLICS—						
Gold.....fine oz.	34	1,309	21	808	51	1,963
Silver.....fine oz.	2	1	1	....	4	2
NON-METALLICS—						
Bituminous sands.....tons	(a)	(a)	(a)	(a)	(a)	(a)
Coal.....tons	7,754,053	22,624,410	7,676,726	24,030,688	7,428,708	26,814,937
Natural gas.....M cu. ft.	34,482,585	6,146,146	35,569,078	6,241,815	37,161,570	6,339,817
Peat moss.....tons	58	1,380	55	1,425	....	....
Petroleum.....brls.	10,117,073	15,514,665	9,601,530	15,724,518	8,727,366	14,468,061
Salt.....tons	22,360	335,960	17,499	280,124	25,335	397,646
Sodium sulphate.....tons	....	....	....	....	....	....
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Cement.....brls.	668,043	1,307,353	606,703	1,176,442	699,989	1,370,502
Clay products.....	....	1,013,497	....	978,049	....	1,143,577
Lime—						
Quicklime.....tons	18,117	148,720	17,482	142,125	18,102	151,457
Hydrated lime.....tons	704	7,040	733	7,330	750	7,500
Sand and gravel.....tons	481,644	218,914	626,157	309,389	833,524	328,151
Stone.....tons	12,028	40,436	13,961	47,899	12,726	43,049
Total.....	....	**47,359,831**	....	**48,911,210**	....	**51,066,662**

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

Table 20.—Mineral Production of British Columbia, 1942-1944

Product	1942		1943		1944	
	Quantity	Value	Quantity	Value	Quantity	Value
		$		$		$
METALLICS—						
Antimony.....lb.	3,041,030	516,975	1,114,166	189,408	1,937,933	281,000
Arsenic (As_2O_3).....lb.	7,114,751 (b)	71,148	(a)	(a)	(a)	(a)
Bismuth.....lb.	345,223	476,408	407,597	562,484	123,875	151,844
Cadmium.....lb.	972,413	1,147,447	598,673	688,474	386,410	425,051
Copper.....lb.	50,015,521	5,044,565	42,222,205	4,961,109	36,302,628	4,356,315
Gold.....fine oz.	474,338	18,262,052	241,346	9,291,821	196,857	7,578,994
Indium.....fine oz.	471	4,710	....	....	....	....
Lead.....lb.	507,199,704	17,052,054	439,155,635	16,485,902	292,922,888	13,181,530
Magnesium.....lb.	193,727	85,240	....	....	....	....
Mercury.....lb.	1,035,914	2,943,807	1,690,240	4,559,200	735,908	1,210,375
Molybdenite.....lb.	4,887	2,007	....	....	....	....
Platinum.....fine oz.	40	1,528	7	270	....	....
Silver.....fine oz.	10,596,204	4,467,996	8,995,488	4,070,818	5,631,572	2,421,576
Tin.....lb.	1,237,863	643,689	776,937	450,623	516,626	299,643
Tungsten concentrates.....lb.	250,930	228,590	976,622	692,260	818,000	236,788
Zinc.....lb.	387,236,469	13,208,636	336,150,455	13,446,018	278,063,373	11,956,725
NON-METALLICS—						
Barite.....tons	1,917	16,084	1,924	15,834	12,613	52,922
Coal.....tons	2,168,541	7,566,822	2,039,402	7,648,720	2,134,231	9,009,506
Diatomite.....tons	147	2,547	16	866	8	262
Fluorspar.....tons	1,559	25,498	....	....	....	....
Gypsum.....tons	23,313	146,154	24,412	148,348	24,222	103,927
Iron oxides (ochre).....tons	438	4,604	403	4,836	482	8,200
Magnesium sulphate.....tons	1,140	38,760	....	....	....	....
Mica (schist).....tons	281	9,061	355	11,821	462	15,382
Peat moss.....tons	28,520	658,771	35,755	925,408	45,794	1,259,131
Quartz.....tons	815	2,037	38,562	77,124	24,682	73,156
Sodium carbonate.....tons	256	2,048	468	5,148	44	484
Sulphur*.....tons	116,248	1,134,586	104,601	1,039,126	113,325	1,123,478
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Cement.....brls.	571,945	1,198,014	534,769	1,146,865	512,594	1,085,918
Clay Products.....	....	560,746	....	495,163	....	486,626
Lime—						
Quicklime.....tons	25,977	204,438	31,714	261,526	36,798	324,553
Hydrated lime.....tons	5,057	32,466	6,333	43,895	8,071	56,343
Sand and gravel.....tons	2,599,861	1,091,202	2,257,784	877,413	4,357,362	1,194,859
Stone.....tons	310,341	396,342	236,212	341,906	199,791	348,483
Total.....	....	**77,247,932**	....	**68,442,386**	....	**57,246,071**

* 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 21.—Mineral Production of Yukon and the North West Territories, 1942-1944

Product	1942		1943		1944	
	Quantity	Value	Quantity	Value	Quantity	Value
		$		$		$
METALLICS—						
Antimony ... lb.	78	13	...	...	...	...
Gold ... fine oz.	83,246	3,204,971	41,160	1,584,660	23,818	916,993
Lead ... lb.	1,322,065	44,448	195,715	7,347	105,727	4,758
Silver ... fine oz.	482,133	203,296	52,348	23,690	32,066	13,788
Tungsten concentrates ... lb.	968	840	12,083	10,122	5,593	3,780
NON-METALLIC—						
Coal ... tons	...	...	...	...	...	...
Total ...	...	**3,453,568**	...	**1,625,819**	...	**939,319**
Copper ... lb.	74,963	7,561	...	...	11,902	1,428
Gold ... fine oz.	99,394	3,826,669	59,032	2,272,732	20,775	799,838
Pitchblende products ...	(a)	(a)	(a)	(a)	(a)	(a)
Natural gas ... M cu. ft.	1,500	335	1,500	335	1,500	335
Silver ... fine oz.	22,531	9,500	13,250	5,996	13,677	5,881
Petroleum, crude ... brls.	75,789	108,477	293,750	400,201	1,223,675	632,587
Tungsten concentrates ... lb.	98,218	23,725	720	729	...	...
Total ...	...	**3,976,267**	...	**2,679,993**	...	**1,440,069**

(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, 1942, 1943 and 1944

—	1942	1943	1944
Gold quartz ores ...	17,722,866	12,853,610	10,790,495
Copper-gold-silver ores ...	8,575,626	8,251,579	7,395,608
Nickel-copper ores ...	12,081,545	12,925,590	12,954,201
Silver-cobalt ores ...	25,550	39,184	27,184
Silver-lead-zinc ores ...	2,951,480	3,252,657	2,911,824
Miscellaneous metals (iron ore etc.) ...	1,120,478	1,359,008	1,250,800
Asbestos ...	8,233,516	7,929,471	7,778,805
Feldspar and nepheline syenite ...	77,049	90,416	84,089
Quartz, exclusive of sand (shipments) ...	487,664	947,195	988,758
Gypsum and anhydrite ...	794,886	430,822	536,356
Talc and soapstone ...	30,376	22,128	30,553
Iron oxides ...	15,629	12,648	15,519
Other non-metals ...	457,251	529,326†	536,957†
Stone, all kinds, quarries (exclusive of stone used for cement and lime) ...	7,978,066	7,222,950	5,994,992
Stone used for the manufacture of cement ...	2,155,750	1,994,202	1,939,900
Estimate rock for the manufacture of lime ...	1,574,508	1,614,481	1,571,451
Total (other than coal) ...	**64,282,240**	**59,475,267**	**54,807,492**
Total coal ...	**18,865,030**	**17,859,057**	**17,026,499**

For years 1922 to 1941, 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, 1940-1944

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 (c) $	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							
1940	125	126	9,933,894	840	1,680,779	208,680	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
1944	47	47	(f)	211	598,556	84,104	1,197,021
AURIFEROUS QUARTZ MINES							
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
1944	257	262	(f)	17,226	37,023,505	19,029,032	75,234,384
COPPER-GOLD-SILVER MINES							
1940	25	26	60,446,948	6,115	10,777,827	25,370,357	**27,804,419
1941	21	[illegible]	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	29,695,643	43,840,679
1944	23	26	(f)	5,175	10,710,071	24,191,776	38,198,039
SILVER-COBALT MINES							
1940(d)	48	44	337,080	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
1944	10	11	(f)	165	260,575	99,600	323,260
SILVER-LEAD-ZINC MINES*							
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
1944	20	20	(f)	2,769	5,810,290	4,489,198	16,802,759
NICKEL-COPPER MINES							
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	8,186,777	50,801,633
1943	6	10	52,250,437	7,270	15,863,646	8,896,063	54,324,097
1944	5	9	(f)	7,628	14,678,695	9,048,726	54,621,089
MISCELLANEOUS METAL MINES							
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	3,996,555
1943	54	59	15,603,307	1,964	4,295,153	2,540,873	6,521,495
1944	27	27	(f)	1,385	2,809,013	2,057,850	3,303,143
NON-FERROUS METAL SMELTING AND REFINING							
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)399,356,356	†111,857,020
1944	9	[illegible]	(f)	23,927	44,536,991	(b)359,903,763	†123,303,038
Total Metal Mining Industries							
1940	**756**	**772**	**615,918,818**	**60,351**	**105,525,343**	**276,988,746**	****329,196,007**
1941	**612**	**633**	**708,199,019**	**61,291**	**120,787,221**	**339,972,576**	**361,619,855**
1942	(a)**468**	**483**	**768,245,462**	**61,185**	**126,886,402**	**400,152,674**	**371,526,623**
1943	(d)**334**	**359**	**890,060,117**	**64,324**	**128,483,302**	**467,165,380**	**336,511,720**
1944	(e)**398**	**418**	(f)	**58,486**	**116,427,696**	**409,901,019**	**312,982,733**

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

(b) Includes fuel and electricity used for metallurgical purposes and cost of ores, etc., treated which were $174,274,655 in 1940, $213,542,005 in 1941, $258,903,818 in 1942, $317,917,186 in 1943 and $281,266,002 in 1944.

(c) See end of table.

(a) 371 producing. ** Revised data. (d) 285 producing. (e) 213 producing. (f) not reported.

Table 23.—Principal Statistics of the Mineral Industry in Canada, by Industries, 1940-1944—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) (a) $	5 Number of employees	6 Salaries and wages $	7 Cost of process supplies, purchased electricity and fuel also freight and smelter charges (c) $	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							
1940	491	527	103,634,890	26,434	34,043,162	8,996,231	43,55[illegible],679
1941	417	469	106,498,356	26,330	38,149,602	9,680,614	45,780,856
1942	380	419	108,766,697	26,2[illegible]5	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
1944	341	394	....	25,596	55,020,537	12,712,820	54,344,700
NATURAL GAS							
1940	236	3,438	80,487,766	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
1944	211	3,621	....	1,810	2,885,654	201,152	9,571,205
PETROLEUM							
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	1,972	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
1944	224	2,264	....	2,547	5,814,676	1,242,795	14,575,563
TOTAL FUELS							
1940	*1,027*	*6,325*	*237,339,509*	*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*
1944	*776*	*6,279*	....	*29,953*	*63,720,867*	*14,156,767*	*78,491,468*
OTHER NON-METAL MINING INDUSTRIES							
ASBESTOS							
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
1944	9	10	....	4,050	6,401,185	4,016,059	17,820,317
FELDSPAR, QUARTZ AND NEPHELINE SYENITE							
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
1944	41	42	....	529	772,385	467,937	1,836,093

* Production of peat since 1929 included with the other non-metallics.
(c) See footnote at end of table. (a) not reported in 1944.

Table 23.—Principal Statistics of the Mineral Industry in Canada, by Industries, 1940-1944—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) (a) $	5 Number of employees	6 Salaries and wages $	7 Cost of process supplies, purchased electricity and fuel also freight and smelter charges (c) $	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							
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	214,139	1,010,043
1943	6	12	5,147,424	438	617,780	248,043	1,133,425
1944	8	14	....	328	490,872	387,941	1,124,037
IRON OXIDES (OCHRE)							
1940	7	7	195,263	46	38,842	18,033	93,841
1941	4	4	189,877	44	42,152	21,394	129,675
1942	5	5	194,541	47	44,288	26,615	125,038
1943	5	5	254,891	47	46,554	27,028	108,865
1944	6	6	....	55	49,876	37,485	112,765
MICA							
1940	65	65	259,108	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	37,313	346,254
1943	78	78	458,402	430	357,992	54,395	499,461
1944	70	70	....	400	359,797	56,624	784,402
PEAT (d)							
1940	(b)	(b)	(b)	(b)	(b)	(b)	(b)
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
1944	39	39	....	1,183	1,154,009	383,376	1,780,000
SALT							
1940	9	9	4,993,914	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
1944	8	9	....	710	1,302,143	1,498,424	3,287,660
TALC AND SOAPSTONE							
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
1944	6	6	....	113	133,883	68,165	289,054
MISCELLANEOUS							
1940	46	46	2,491,527	547	703,501	608,028	1,508,729
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	2,268,237
1944	50	52	....	865	1,500,250	1,188,860	2,797,719

(a) Not reported in 1944.
(b) In 1940 peat moss and peat humus included with the manufacturing industry and peat fuel included with miscellaneous non-metals.
(c) See footnote at end of this table.
(d) Includes data on peat fuel, peat moss and peat humus.

Table 23.—Principal Statistics of the Mineral Industry in Canada, by Industries, 1940-1944—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) (a) $	5 Number of employees	6 Salaries and wages $	7 Cost of process supplies, purchased electricity and fuel also freight and smelter charges (c) $	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							
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	7,056,363	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
1944	237	248	....	8,233	12,164,400	8,104,871	29,632,077
Total Non-Metal Mining Industries, Including Fuels							
1940	1,223	6,531	272,220,979	36,835	47,245,267	16,481,192	83,991,151
1941	1,160	6,455	285,900,688	37,705	53,333,052	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	21,963,737	106,520,011
1944	1,013	6,527	....	38,186	75,885,267	22,261,638	108,123,545
Clay Products and Other Structural Materials							
CLAY PRODUCTS							
Brick, Tile and Sewer Pipe							
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
1944	98	102	....	1,889	2,819,912	1,451,686	4,711,125
STONEWARE AND POTTERY							
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
1944	8	8	....	358	356,892	66,816	767,798
TOTAL CLAY PRODUCTS[*]							
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
1944	106	110	....	2,247	3,176,804	1,518,502	5,478,923
OTHER STRUCTURAL MATERIALS†							
CEMENT							
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
1944	3	8	....	1,207	2,254,775	5,764,387	6,882,354

(*) Includes kaolin and other clays. (a) not reported in 1944.
(†) A considerable proportion of the values shown for lime and stone sales represents shipments for chemical purposes —see chapter 9.
(c) See footnote at end of this table.

Table 23.—Principal Statistics of the Mineral Industry in Canada, by Industries, 1940-1944—Concluded

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) (a) $	5 Number of employees	6 Salaries and wages $	7 Cost of process supplies, purchased electricity and fuel also freight and smelter charges (c) $	8 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							
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
1944	38	42	....	815	1,414,426	2,046,550	5,005,235
SAND AND GRAVEL							
1940	1,458	5,596	3,456,502	4,243	3,744,585	291,008	11,468,237
1941	1,399	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
1944	1,541	5,381	....	1,773	2,494,657	391,738	9,888,381
STONE							
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	3,451,265	1,517,169	7,229,425
1943	407	453	10,954,939	2,473	3,529,755	1,533,627	6,430,552
1944	405	466	....	2,164	3,154,689	1,497,880	5,661,297
TOTAL OTHER STRUCTURAL MATERIALS							
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*	*5,765*	*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*
1944	*1,987*	*5,897*	....	*5,359*	*9,318,547*	*9,700,555*	*27,[illegible],267*
Total Clay Products and Other Structural Materials							
1940	**2,132**	**6,362**	**88,208,231**	**11,700**	**11,718,976**	**8,810,378**	**34,893,571**
1941	**2,041**	**6,146**	**88,569,618**	**11,231**	**12,301,913**	**10,767,140**	**35,865,916**
1942	**1,997**	**5,886**	**89,123,449**	**9,621**	**12,303,686**	**11,658,601**	**35,334,369**
1943	**1,939**	**5,665**	**86,838,770**	**9,073**	**12,685,461**	**10,656,440**	**32,464,633**
1944	**2,093**	**6,007**	....	**8,206**	**12,495,351**	**11,219,057**	**32,916,190**
GRAND TOTAL OF ALL INDUSTRIES							
1940	**4,111**	**13,665**	**976,348,028**	**108,886**	**164,489,686**	**302,261,316**	***448,080,729**
1941	**3,813**	**13,234**	**1,082,669,355**	**113,227**	**186,423,186**	**368,388,709**	**497,901,632**
1942	**3,576**	**12,897**	**1,115,345,913**	**112,013**	**198,550,260**	**431,911,446**	**511,109,951**
1943	**3,292**	**12,449**	**1,183,442,427**	**112,140**	**207,575,935**	**498,885,557**	**475,529,364**
1944	**3,501**	**12,952**	....	**101,878**	**204,808,314**	**413,384,744**	**451,022,168**

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. (a) Not reported in 1944.

* Revised data.

(c) See note above.

Table 24.—Principal Statistics of the Mineral Industry in Canada, by Provinces, 1940-1944

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) (a) $	4 Number of employees	5 Salaries and wages $	6 Cost of process supplies, purchased electricity and fuel also freight and smelter charges (b) (c) $	7 Net value of bullion, ore, concentrates, residues and other minerals shipped from the mines, smelters, brick and cement plants and quarries (*) $
Nova Scotia						
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	49,486,020	14,394	22,169,053	6,594,557	25,174,960
1943	712	51,261,925	13,852	25,348,097	6,737,166	21,979,202
1944	509	....	13,538	30,815,335	7,664,988	25,208,621
New Brunswick						
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
1944	429	....	1,631	2,240,478	463,355	3,631,871
Quebec						
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	34,098,021	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
1944	3,747	....	27,973	49,498,836	191,719,356	145,964,861
Ontario						
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
1944	6,242	....	33,194	64,706,975	176,635,812	161,819,719
Manitoba						
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	12,476,881	9,508,569
1943	150	29,033,717	1,777	3,497,951	9,429,404	8,973,959
1944	145	....	1,732	3,369,320	9,697,444	10,288,654
Saskatchewan						
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
1944	195	....	2,652	5,328,535	21,184,997	18,362,133

Plants io 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.

(a) Not reported in 1944.

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

(c) See footnote, preceding table.

⊕ Revised data.

Table 24.—Principal Statistics of the Mineral Industry in Canada, by Provinces, 1940-1944—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) (c)	Net value of bullion, ore, concentrates, residues and other minerals shipped from the mines, smelters, brick and cement plants and quarries (*)
		$		$	$	$
Alberta						
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	4,982,748	41,767,222
1944	882	....	11,582	23,389,050	5,674,431	42,672,706
British Columbia						
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	27,166,996	45,101,414	64,378,171
1943	654	107,674,852	13,399	25,703,433	40,092,618	54,105,996
1944	724	....	11,871	23,118,465	30,058,974	43,986,511
Northwest Territories						
1940	16	3,037,930	441	880,414	623,965	(a) 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	1,999,661	364,802	2,305,032
1944	71	....	566	1,798,896	213,041	1,219,472
Yukon						
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	3,300,804
1943	8	11,963,738	352	1,043,663	705,323	1,652,496
1944	8	....	139	482,424	72,348	867,920
Canada						
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**	**497,904,632**
1942	**12,897**	**1,145,345,913**	**112,013**	**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**
1944	**12,952**	....	**104,878**	**204,808,314**	**443,384,744**	**454,022,468**

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.

(a) The value of Pitchblende refinery products is credited to the non-ferrous smelting and refining industry in Ontario and data relating to Pitchblende mining operations are included with Yukon. The value of Pitchblende refinery products are not included in 1943 or 1944.

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

(c) See footnote, preceding table.

⊕ Revised data.

TREND IN EMPLOYMENT, 1944

(Employment and Payroll Statistics Branch—D.B.S.)

General Summary

Further curtailment of employment was noted during 1944 in the mining industries, in which the index in each month was lower than had been the case in either 1943 or 1942. The annual average fell from 158·5 in the preceding 12 months to 154·5 in the year under review, when the variations were generally on the smaller scale. A combined working force of 72,427 was reported in 1944 by the 484 mining operators furnishing data, who disbursed a weekly average of \$2,755,156 in salaries and wages. This represents \$38.05 per employee. In 1943, the 457 co-operating employers had indicated a staff of 74,070, whose weekly payrolls had averaged \$2,672,498; the per capita figure had then been \$36.09, while that in 1942 was \$34·81. The annual index of payrolls was 105·3 in the year under review, compared with 102·7 in 1943. Thus a decline of 2·5 per cent in employment was accompanied by a rise of 2·5 per cent in the payrolls.

Coal Mining.—Employment in coal mining on the whole was in rather greater volume than in 1943 or any other year since 1930. Statistics were received from 134 operators whose employees averaged 26,788; the annual index of employment was 97·3. In 1943, 115 employers had ndicated a working force of 25,614, while the annual index was 93·2.

The reported payrolls in the year under review amounted to \$989,370 per week, a per capita figure of \$36.95. In 1943, the typical worker in recorded employment in coal mining had averaged \$33.18 per week, while the 1942 mean had been \$31.09. The latest annual index of payrolls was 154·3, substantially exceeding the 1943 average of 134·5.

Metallic Ores.—Continued curtailment of activity was noted in metallic ore mining, particularly gold mining; the 1944 index, at 274·1, was lower than in 1943, or, indeed, than in any earlier year since 1936. At the 1941 all-time high, the mean had been 366·2, while that in 1943 was 303·3. Information tabulated from 224 employers showed a personnel of 34,693, varying from 32,329 at October 1 to 36,512 at the beginning of April. The salaries and wages disbursed by the firms making returns averaged \$1,411,020, a per capita of \$40.68; in the year before, the payrolls were reported at \$1,502,469, and the average earnings as \$39.70.

Table 25.—Strikes and Lock-outs in Canada, by Industries, 1943 and 1944 (Department of Labour)

—	1943					1944				
	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	...	...	...	...	...	...	...	...	...	...
Logging	6	632	0·3	7,287	0·7	2	90	0·1	145	0·0
Fishing and trapping	...	...	...	...	...	...	...	...	...	...
Mining, etc. (a)	120	59,552	27·3	208,314	20·0	49	12,044	16·0	29,371	6·0
Coal mining	(111)	(59,017)	(27·0)	(204,980)	(19·7)	(46)	(11,180)	(14·9)	(28,507)	(5·8)
Manufacturing	222	139,656	63·9	777,661	74·7	120	53,093	70·5	401,385	81·9
Construction	12	785	0·4	1,920	0·2	6	427	0·6	1,212	0·2
Transportation and Public Utilities	24	8,712	3·9	18,958	1·8	13	7,484	10·0	45,426	9·3
Trade	7	202	0·1	718	0·1	3	105	0·1	334	0·1
Finance	...	...	...	...	...	...	...	...	...	...
Service	16	8,865	4·1	26,340	2·5	6	2,047	2·7	12,266	2·5
Total	(b) **402**	**218,404**	**100·0**	**1,041,198**	**100·0**	**199**	**75,290**	**100·0**	**490,139**	**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.

Non-metallic minerals, other than coal.—Slightly greater activity was noted in the production of non-metallic minerals other than coal, according to data furnished by 126 firms, whose working forces averaged 10,946, as compared with 10,589 in 1943, when 121 employers had furnished returns. The salaries and wages reported averaged $354,766 per week, a sum which gave an average of $32.34 per employee. In 1943, the mean had been $30.84. The 1944 index of employment stood at 163·8, 4·8 per cent higher than that of 156·3 in 1943; in the same comparison, there was a gain of 14·3 per cent in the index of payrolls. Asbestos mining and certain other divisions of the group continued active, but quarrying and some other branches were quieter.

Of the 199 strikes and lockouts recorded for 1944, 49 were in mining, involving 16·0 per cent of the workers in all strikes and causing a time loss in man-working days of 6·0 per cent of the total. In the coal mining industry there were 46 strikes involving 14·9 per cent of the workers in all strikes and causing 5·8 per cent of the total time loss. Strikes in coal mining during 1944 caused less idle time than in any year since 1931 with the exception of 1938. In manufacturing, a strike in April of 13,346 motor vehicle factory workers was responsible for a time loss of 228,000 days or 47 per cent of the total. During the year five strikes accounted for more than 78 per cent of the total time loss. There was only one strike in gold mining during 1944, involving a small number of workers at Hedley, B.C., and none was recorded in 1943.

Table 26.—Employees, Salaries and Wages in the Mineral Industry in Canada, by Provinces, 1944

Province	*Average number of employees					Salaries and wages		
	Salaried employees		Wage-earners		Total†	Salaries	Wages	Total
	Male	Female	Male	Female				
						$	$	$
Nova Scotia	518	174	12,839	7	**13,538**	1,592,192	29,223,143	**30,815,335**
New Brunswick	74	28	1,525	4	**1,631**	218,059	2,022,419	**2,240,478**
Quebec	2,796	793	24,181	203	**27,973**	7,585,186	41,913,650	**49,498,836**
Ontario	3,023	709	28,276	1,186	**33,194**	9,992,152	54,774,823	**64,766,975**
Manitoba	166	45	1,429	92	**1,732**	562,108	2,807,212	**3,369,320**
Saskatchewan	204	69	2,101	188	**2,652**	935,897	4,392,638	**5,328,535**
Alberta	1,403	286	9,664	229	**11,582**	3,803,877	19,585,173	**23,389,050**
British Columbia	1,350	323	9,725	473	**11,871**	4,284,435	18,834,030	**23,118,465**
Yukon	16	3	120	....	**139**	102,934	379,490	**482,424**
Northwest Territories (a)	171	90	305	....	**566**	764,832	1,034,064	**1,798,896**
Canada	**9,811**	**2,529**	**90,165**	**2,382**	**104,878**	**29,841,672**	**174,966,642**	**204,808,314**

*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 not available.

Table 27.—Employees, Salaries and Wages in the Mineral Industry in Canada, by Industries, 1944

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	22	5	177	7	211	114,979	483,577	598,556
Auriferous Quartz Mines	1,744	222	15,140	120	17,226	5,871,597	31,151,908	37,023,505
Copper-Gold-Silver Mines	508	114	4,332	221	5,175	1,761,844	8,948,227	10,710,071
Silver-Cobalt Mines	20	4	140	1	165	43,960	216,615	260,575
Silver-Lead-Zinc Mines	318	56	2,336	59	2,769	920,827	4,889,463	5,810,290
Nickel-Copper Mines	445	50	6,977	156	7,628	1,431,118	13,247,577	14,678,695
Miscellaneous Metal Mines	198	39	1,094	54	1,385	485,401	2,323,612	2,809,013
Non-ferrous Smelting and Refining	2,445	926	19,550	1,006	23,927	7,816,181	36,720,810	44,536,991
Non-Metal Mining Including Fuels								
Coal	1,443	268	23,861	24	25,596	4,094,605	50,925,932	55,020,537
Natural gas	766	222	808	14	1,810	1,744,513	1,141,141	2,885,654
Petroleum	641	238	1,646	22	2,547	2,050,411	3,764,265	5,814,676
Other Non-Metallic Mining								
Asbestos	267	87	3,660	36	4,050	805,330	5,595,855	6,401,185
Feldspar and Quartz (a)	54	6	464	5	529	98,260	674,125	772,385
Gypsum	30	6	291	1	328	81,745	409,127	490,872
Iron Oxides	4	4	47		55	11,416	38,460	49,876
Mica	16	6	206	172	400	39,587	320,210	359,797
Peat (b)	55	18	961	149	1,183	145,653	1,008,356	1,154,009
Salt	87	59	504	60	710	397,113	905,030	1,302,143
Talc and Soapstone	11	3	99		113	29,532	104,351	133,883
Miscellaneous	99	17	744	5	865	240,499	1,259,751	1,500,250
Clay Products and Other Structural Materials								
Cement	76	16	1,066	49	1,207	229,490	2,025,285	2,254,775
Clay Products	195	58	1,786	208	2,247	594,282	2,582,522	3,176,804
Lime	80	22	713		815	178,802	1,235,624	1,414,426
Sand and Gravel	89	17	1,662	5	1,773	213,270	2,281,387	2,494,657
Stone	198	57	1,901	8	2,164	441,257	2,713,432	3,154,689
Total	**9,811**	**2,520**	**90,165**	**2,382**	**104,878**	**29,841,672**	**174,966,642**	**204,808,314**

*See footnote, preceding table.

(a) Includes nepheline-syenite mines.

(b) Includes fuel, moss and humus.

Table 28.—The Number of Wage-Earners in the Canadian Mining Industry, 1944, 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	329	2,172	117	302	11,751	152	321	74	1,066	195	16,479	637,774
New Brunswick	60	160	38	39	2,307	48	242	5	144	25	3,068	70,083
Quebec	985	2,160	480	553	18,811	825	1,604	350	3,444	874	30,086	976,117
Ontario	856	1,602	249	1,498	20,549	654	1,091	370	4,053	1,014	31,936	1,235,080
Manitoba	64	111	68	65	1,748	106	99	9	229	16	2,515	81,790
Saskatchewan	197	399	34	194	1,454	212	178	26	141	105	2,940	106,129
Alberta	490	985	389	205	8,009	268	764	36	562	308	12,016	514,493
British Columbia	889	1,893	1,262	167	6,995	85	329	77	969	72	12,738	475,971
Yukon	2	4	......	3	......	2	19	5	107	19	161	10,955
Northwest Territories (b)	4	18	......	1	305	1	11	....	25	3	368	25,236
Canada Total, Male	**3,600**	**9,074**	**2,365**	**2,906**	**70,352**	**2,331**	**4,548**	**946**	**10,578**	**2,616**	**109,316**	**4,066,067**
Canada Total, Female	**276**	**430**	**272**	**121**	**1,577**	**22**	**110**	**6**	**162**	**15**	**2,991**	**67,561**
Canada Total	**3,876**	**9,504**	**2,637**	**3,027**	**71,929**	**2,353**	**4,658**	**952**	**10,740**	**2,631**	**112,307**	**4,133,628**
METAL MINING												
Alluvial Gold Mines	2	11	1	3	53	2	19	5	128	21	245	13,859
Auriferous Quartz Mines	497	1,443	120	250	9,648	256	897	60	2,900	609	16,680	671,736
Copper-Gold-Silver Mines	270	583	59	168	3,105	267	452	33	329	68	5,334	205,128
Silver-Cobalt Mines	5	44	3	3	83	8	20	1	27	10	204	6,499
Silver-Lead-Zinc Mines	59	94	22	10	1,982	29	103	62	341	48	2,750	109,400
Nickel-Copper Mines	38	139	5	20	7,455	24	41	2	98	2	7,824	348,785
Miscellaneous Metal Mines	43	106	12	17	660	20	138	12	694	90	1,801	79,178
Non-Ferrous Smelting and Refining	574	1,456	224	1,392	17,391	374	452	78	1,428	119	23,488	787,017
Total, Male	**1,406**	**3,702**	**406**	**1,821**	**39,250**	**967**	**2,106**	**250**	**5,825**	**963**	**56,696**	**2,177,967**
Total, Female	**82**	**171**	**40**	**42**	**1,136**	**13**	**16**	**3**	**120**	**4**	**1,630**	**43,635**
Total	**1,488**	**3,876**	**446**	**1,863**	**40,386**	**980**	**2,122**	**253**	**5,945**	**967**	**58,326**	**2,221,602**
NON-METAL MINING, INCLUDING FUELS												
Coal	1,068	3,873	686	501	20,307	292	673	73	1,323	387	29,183	1,204,447
Natural gas	157	51	109	25	292	33	170	6	162	53	1,058	29,178
Petroleum	109	135	19	11	1,183	108	114	2	246	27	1,954	87,771
Total, Male	**1,319**	**4,052**	**809**	**533**	**21,744**	**432**	**953**	**81**	**1,721**	**466**	**32,110**	**1,318,973**
Total, Female	**15**	**7**	**5**	**4**	**38**	**1**	**4**	......	**10**	**1**	**85**	**2,423**
Total	**1,334**	**4,059**	**814**	**537**	**21,782**	**433**	**957**	**81**	**1,731**	**467**	**32,195**	**1,321,396**
OTHER NON-METAL MINING												
Asbestos	30	353	38	98	3,016	71	52	3	133	53	3,847	115,867
Feldspar and Quartz	41	50	13	29	145	54	55	36	171	57	651	19,780
Gypsum	43	34	12	17	81	24	60	36	45	50	402	11,121
Iron Oxides	......	......	......	......	35	......	......	17	......	......	52	1,277
Mica	21	88	68	39	120	53	46	11	32	6	484	8,484
Peat (a)	480	395	734	81	230	168	233	44	132	69	2,566	53,484
Salt	42	61	14	43	156	56	56	18	103	46	595	21,386
Talc and Soapstone	4	9	3	8	2	6	23	3	42	17	117	2,377
Miscellaneous	60	85	16	27	194	43	87	58	215	177	962	30,457
Total, Male	**551**	**847**	**673**	**269**	**3,822**	**467**	**555**	**224**	**855**	**466**	**8,729**	**248,151**
Total, Female	**170**	**228**	**225**	**73**	**157**	**8**	**57**	**2**	**18**	**9**	**947**	**16,085**
Total	**721**	**1,075**	**898**	**342**	**3,979**	**475**	**612**	**226**	**873**	**475**	**9,676**	**264,236**
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS												
Cement	29	86	71	41	622	44	79	76	191	31	1,270	42,707
Clay Products	81	67	134	89	462	243	410	129	513	216	2,344	68,371
Lime	28	46	53	21	140	28	114	13	281	108	832	27,984
Sand and Gravel	30	61	55	35	4,237	31	53	30	247	187	4,966	101,895
Stone	165	234	166	99	321	119	311	144	959	180	2,698	85,437
Total, Male	**324**	**473**	**477**	**283**	**5,536**	**465**	**934**	**391**	**2,177**	**721**	**11,781**	**320,976**
Total, Female	**9**	**21**	**2**	**2**	**246**	......	**33**	**1**	**14**	**1**	**329**	**5,418**
Total	**333**	**494**	**479**	**285**	**5,782**	**465**	**967**	**392**	**2,191**	**722**	**12,110**	**326,394**

*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.

(b) Exclusive of Pitchblende mining.

Table 29.—Employees and Salaries and Wages Paid in Canadian Mining Industry, 1930-1944

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	12,606,586	20,277	30,470,475	2,059	3,096,332	1,092	806,131
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	4,600,171	2,450	4,401,181
1943......	13,852	5,348,097	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
1944......	13,538	30,815,335	1,631	2,240,478	27,973	49,498,836	33,194	94,766,975	1,732	3,369,320	2,652	5,328,535

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	10,862,198	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**	**116,766,272**
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	1,174,903	**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**
1944...............	11,582	23,389,050	11,871	23,118,465	139	482,424	566	1,798,896	**104,878**	**204,808,314**

(a) Data relating to mining of Pitchblende ores included with Yukon until 1943; these data not available for 1944.

Table 30.—Wage-earners on Surface, Underground and in Mill, 1944

Province	Metal Mines			Fuels			Other†		
	Surface (a)	Underground	Mill	Surface	Underground	Mill	Surface	Underground	Mill
Nova Scotia	22	38	5	1,911	10,188	....	378	30	274
New Brunswick	....	....	....	307	619	....	465	13	125
Quebec	1,920	3,966	10,746	....	....	....	3,706	573	3,473
Ontario	5,175	11,515	8,872	710	....	....	1,788	148	1,254
Manitoba	327	495	177	....	....	....	309	17	196
Saskatchewan	550	410	537	263	338	....	59	....	132
Alberta	....	....	....	3,570	5,577	....	158	....	588
British Columbia	1,097	1,933	3,402	743	1,907	....	852	1	263
Yukon	5	....	115	....	....	....	....	....	....
Northwest Territories(b)	33	23	7	242	....	....	....	....	....
Total, 1944	**9,129**	**18,380**	**23,861**	**7,746**	**18,629**	....	**7,715**	**782**	**6,305**
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 until 1942; in 1943 and 1944 employees in these plants shown under mill.
(b) Exclusive of data on mining of Pitchblende ores.

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

Industry		Bituminous		Anthracite coal		Lignite coal	Coke	Gaso-line	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										
Alluvial Gold	Quantity	10	....	....	....	....	1	22,738	389	....
	$	776	....	....	....	....	112	13,376	304	....
Auriferous Quartz	Quantity	6,574	44,227	1,279	40	252	17	246,491	12,200	294
	$	75,938	522,905	18,205	1,187	1,764	373	88,536	3,066	2
Copper-Gold-Silver	Quantity	9,494	997	61	....	66,680	300	93,574	6,089	8,889
	$	90,950	13,170	1,110	....	280,991	4,747	32,159	1,441	200
Silver-Cobalt	Quantity	553	357	75	66	....	....	2,615	21	....
	$	8,903	3,934	1,301	690	....	....	993	6	....
Silver-Lead-Zinc	Quantity	42,236	2,143	1	....	....	37	53,110	1,637	....
	$	231,360	24,847	54	....	....	601	17,736	501	....
Nickel-Copper	Quantity	2,296	20,996	127	....	....	40	62,246	3,176	....
	$	18,893	177,574	1,890	....	....	520	14,809	667	....
Miscellaneous Metals	Quantity	....	2,611	34	....	70	24,159	152,840	10,420	....
	$	....	30,070	661	....	1,400	96,512	57,710	2,142	....
Non-Ferrous Smelting and Refining.	Quantity	344,619	718,285	160	....	....	340,956	307,403	48,362	1,595,857
	$	3,210,138	6,034,504	2,269	....	....	4,208,772	96,289	9,267	27,457
Total	*Quantity*	*405,782*	*789,616*	*1,737*	*106*	*67,002*	*365,510*	*941,017*	*82,294*	*1,605,040*
	$	*3,636,964*	*6,807,004*	*25,490*	*1,877*	*284,155*	*4,311,637*	*321,608*	*17,394*	*27,666*
NON-METAL MINING *Fuels*										
Coal	Quantity	531,791	....	....	....	53,269	....	169,516	3,569	....
	$	1,838,765	....	....	....	66,055	....	48,842	1,199	....
Natural Gas	Quantity	60	38	20	....	....	....	58,587	....	....
	$	653	529	260	....	....	....	17,050	....	....
Petroleum	Quantity	2,665	....	4	....	....	1	276,180	1,871	....
	$	22,884	....	57	....	....	15	74,515	254	....
Total	*Quantity*	*534,516*	*38*	*24*	....	*53,269*	*1*	*504,283*	*5,440*	....
	$	*1,862,302*	*529*	*317*	....	*66,055*	*15*	*140,407*	*1,453*	....
Other Non-Metal Mining										
Asbestos	Quantity	139	32,271	17,689	....	....	....	119,502	1,797	....
	$	1,474	322,672	160,610	....	....	....	37,389	344	....
Feldspar, nepheline syenite and quartz,	Quantity	34	6,174	11	....	1	30	135,892	2,552	....
	$	386	54,571	188	....	10	398	43,444	415	....
Gypsum	Quantity	8,284	1,659	....	....	....	2	61,632	652	....
	$	69,729	12,689	....	....	....	24	15,136	130	....
Iron Oxides	Quantity	....	1,208	15	....	....	3	1,325	50	....
	$	....	13,288	206	....	....	42	412	10	....
Mica	Quantity	29	172	36	....	....	30	33,179	2,880	....
	$	314	2,074	516	....	....	545	9,459	915	....
Peat	Quantity	714	18	....	....	....	....	94,863	4	....
	$	6,580	163	....	....	....	....	24,647	1	....
Salt	Quantity	9,945	68,753	....	....	23,473	....	8,266	257	....
	$	67,268	471,995	....	....	88,987	....	2,403	69	....
Talc and Soapstone	Quantity	....	....	....	....	....	....	8,434	140	....
	$	....	....	....	....	....	....	2,762	27	....
Miscellaneous	Quantity	13,511	30,531	20	....	21,334	7	128,206	814	....
	$	70,231	281,254	336	....	65,667	86	31,934	164	....
Total	*Quantity*	*32,656*	*140,786*	*17,771*	....	*44,808*	*72*	*591,299*	*9,146*	....
	$	*215,982*	*1,158,706*	*161,856*	....	*154,664*	*1,095*	*167,686*	*2,075*	....
STRUCTURAL MATERIALS AND CLAY PRODUCTS										
Cement	Quantity	108,292	219,802	....	....	....	....	136,170	6,949	....
	$	731,706	1,634,690	....	....	....	....	36,893	1,301	....
Clay Products	Quantity	26,042	80,098	390	14	2,116	560	111,685	2,325	....
	$	217,702	707,449	3,808	199	8,901	6,490	32,647	422	....
Lime	Quantity	21,472	87,824	11,966	8,582	347	18,425	111,758	349	....
	$	205,714	640,752	111,270	86,293	2,686	207,286	32,740	88	....
Sand and Gravel	Quantity	4,188	14,362	251	....	....	....	404,714	1,872	....
	$	34,039	104,334	2,566	....	....	....	119,535	329	....
Stone	Quantity	4,980	9,096	55	4	....	98	710,493	5,944	....
	$	42,515	81,553	803	60	....	1,199	209,143	993	....
Total	*Quantity*	*164,974*	*412,082*	*12,662*	*8,600*	*2,463*	*19,083*	*1,474,820*	*17,439*	....
	$	*1,231,676*	*3,228,778*	*118,507*	*86,552*	*11,677*	*214,966*	*430,958*	*3,136*	....
Grand Total	**Quantity**	**1,137,928**	**1,342,522**	**32,194**	**8,706**	**167,542**	**384,666**	**3,511,419**	**114,319**	**1,605,040**
	$	**6,946,924**	**11,195,017**	**306,170**	**88,429**	**516,551**	**4,527,713**	**1,060,559**	**24,058**	**27,666**

(a) On outgoing shipments only.
(b) Paid by mine operator only.
(c) Value of 54,613,700 cu. ft. compressed air.
(d) Exclusive cost of ores treated.

Mineral Industry in Canada, by Kinds and Industries, 1944

Fuel oil and diesel oil	Wood	Gas		Other fuel	Electricity purchased	Total	Electricity generated for own use	Electricity generated for sale	Process supplies	Freight (a)	Treatment charges (b)
		Manufactured	Natural								
Imp. gal.	Cords	M cu.ft.	M cu. ft.	$	K.W.H.	$	K.W.H.	K.W.H.	$	$	$
31,870	1,074						12,958,500	5,498,700			
15,087	13,920			16		**43,591**		26,488	13,703	16,927	9,883
1,799,804	35,362				709,437,980		28,320,882	172,720			
278,647	234,507			1,688	4,668,292	**5,895,117**		5,182	11,174,746	373,074	1,586,095
689,219	673				262,411,942		79,749,693	6,493,151			
95,526	5,140				876,809	**1,402,243**		46,799	5,170,581	720,920	16,898,032
7,406	107				1,641,789						
1,068	759			(c)14,149	16,520	**48,323**			35,809	3,138	12,330
483,987	1,170				83,025,582		22,534,783				
85,053	6,239				493,834	**860,231**			1,752,087	1,070,103	806,777
1,226,686	271				166,328,143		10,720				
129,494	1,897				544,174	**889,918**			8,040,700	18,427	99,681
1,064,689	10,289				741,712,764		2,311,490				
191,596	113,967				457,871	**951,929**			657,430	389,554	58,937
46,281,332	2,065	8,648	519		10,428,158,985		257,757,492	5,855,077			
3,244,852	22,807	7,805	387		20,043,076	**36,907,623**		25,748	32,730,138 (d)		
51,584,993	*51,011*	*8,648*	*519*		*12,392,717,185*		*403,643,560*	*18,019,648*			
4,041,323	*399,236*	*7,805*	*387*	*15,853*	*27,100,576*	*46,998,975*		*104,217*	*59,575,194*	*2,592,143*	*19,471,735*
111,675	25				165,998,397		53,677,006	9,352,570			
19,653	106			147	2,091,553	**4,066,320**		133,229	8,646,500		
507			1,035,060		22,482						
61			168,390		1,060	**188,003**			13,149		
423,709	749		7,631,540		1,800,260						
23,383	2,731		839,475	7,045	30,125	**1,000,484**			242,311		
535,891	*774*		*8,666,600*		*167,821,139*		*53,677,006*	*9,352,570*			
43,097	*2,837*		*1,007,865*	*7,192*	*2,122,738*	*5,254,807*		*133,229*	*8,901,960*		
85,032	15				144,189,107						
16,335	71				1,096,934	**1,635,829**			1,166,909		
283,199	792				3,311,024		2,326,433				
33,761	4,988				28,340	**166,501**			241,400	54,393	
41,221	25		7,776		3,863,316		1,554,806				
4,737	150		2,956		43,192	**148,743**			239,198		
605	267				221,648						
73	1,862				3,222	**19,115**			6,700	11,670	
1,410	880				289,200						
235	3,553				5,975	**23,586**			33,038		
8,059	68				868,315		880				
1,246	646				15,140	**48,423**			46,527		
486			78		3,729,678		7,853,875				
52			42		21,310	**652,126**			134,235		
19,445	75				1,841,340		167,850				
2,985	510				21,358	**27,612**			40,523		
1,813,508	3,737	217,314			9,578,007		6,497,349				
107,531	23,336	32,032			94,358	**706,929**			462,999		
2,252,965	*5,865*	*217,314*	*7,854*		*167,891,635*		*18,401,193*				
166,955	*35,116*	*32,032*	*2,998*		*1,329,829*	*3,428,894*			*2,371,529*	*66,063*	
51,392	48				137,259,162		394,218				
6,249	348				786,765	**3,197,955**			1,541,063		
156,349	17,335	23,924	1,409,415		13,417,619		258,166				
13,917	100,646	5,744	20,585	2,286	176,427	**1,357,313**			161,189		
1,555,615	45,417				13,336,125		2,042,217				
90,752	289,634			493	85,015	**1,752,723**			168,886		
120,765			62		5,164,909						
11,762			37		60,657	**333,259**			58,479		
381,886	1,439		2,200		19,522,228		443,650				
47,334	7,098		1,596		278,711	**671,056**			826,824		
[illegible]	*64,239*	*23,924*	*1,411,677*		*[illegible]*		*3,738,251*				
[illegible]	*[illegible]*	*5,744*	*22,218*	*2,779*	*1,387,575*	*7,612,306*			*2,756,441*		
56,639,856	**121,889**	**249,886**	**10,086,650**		**12,917,130,002**		**479,460,010**	**27,372,218**			
4,421,389	**834,915**	**45,581**	**1,033,468**	**25,824**	**31,940,718**	**62,994,982**		**237,116**	**73,605,121**	**2,658,206**	**19,471,735**

Table 32.—Fuel and Electricity Used for All Purposes

Industry	Bituminous		Anthracite coal		Lignite coal	Coke	Gasoline	Kerosene	Charcoal
	Canadian	Imported	From United States	From other countries					
	Tons	Tons	Tons	Tons	Tons	Tons	Imp. gal.	Imp. gal.	lb.
METAL MINING									
Nova Scotia............Quantity	358,321	....	....	....	....	1,143	132,996	838	....
$	1,453,087	....	....	....	....	9,250	32,734	185	....
New Brunswick..........Quantity	20,440	3	....	....	....	2	71,795	341	....
$	143,874	63	....	....	....	18	17,749	68	....
Quebec..................Quantity	181,545	373,337	29,512	8,600	....	5,298	1,111,069	61,245	48,550
$	2,075,336	3,410,206	272,634	86,552	....	71,868	358,902	11,358	904
Ontario..................Quantity	12,614	969,077	2,674	66	2	319,084	1,180,813	31,325	1,542,584
$	116,545	7,782,522	33,136	690	19	3,813,681	351,785	6,985	26,294
Manitoba................Quantity	57,848	12	....	....	23,820	550	68,037	985	1,422
$	519,140	260	....	....	91,673	7,261	23,865	260	32
Saskatchewan...........Quantity	70,007	63	....	....	51,640	191	115,601	4,461	7,467
$	601,072	1,366	....	....	101,860	2,775	36,788	1,125	168
Alberta..................Quantity	192,348	....	....	....	25,078	....	370,787	4,414	....
$	603,455	....	....	....	38,844	....	98,499	1,200	....
British Columbia........Quantity	244,791	30	8	40	67,002	58,397	437,093	10,092	5,017
$	1,433,355	600	400	1,187	284,155	622,748	127,150	2,453	268
Yukon..................Quantity	10	....	....	....	....	1	18,371	357	....
$	776	....	....	....	....	112	10,698	291	....
Northwest Territories...Quantity	4	....	....	....	....	....	4,857	261	....
$	284	....	....	....	....	....	2,389	133	....
Canada................Quantity	**1,137,928**	**1,342,522**	**32,194**	**8,706**	**167,542**	**384,666**	**3,511,419**	**114,319**	**1,605,040**
$	**6,946,924**	**11,195,017**	**306,170**	**88,429**	**516,551**	**4,527,713**	**1,060,559**	**24,058**	**27,666**

(a) On outgoing shipments only.
(b) Paid by mine operator only.

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	152,842	112,569	....	....	....	4,908	48,550
$	1,793,777	1,100,353	....	....	....	66,977	904
Ontario......................Quantity	....	568,384	103	....	....	277,450	1,542,290
$	....	4,629,117	1,420	....	....	3,516,626	26,285
Manitoba....................Quantity	10,038	....	....	....	....	....	....
$	95,094	....	....	....	....	....	....
Saskatchewan................Quantity	52,702	....	....	....	....	....	....
$	499,243	....	....	....	....	....	....
British Columbia............ Quantity	92,602	....	....	....	....	57,794	5,017
$	606,180	....	....	....	....	615,809	268
Canada....................Quantity	**308,184**	**680,953**	**103**	....	....	**340,152**	**1,595,857**
$	**2,994,294**	**5,729,470**	**1,420**	....	....	**4,199,412**	**27,457**

*All used in the non-ferrous smelting and refining industry and included in table 32.

in the Mineral Industry in Canada, by Provinces, 1944

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	Mcu. ft.	Mcu. ft.	$	K.W.H.	$	K.W.H.	K.W.H.	$	$	$
51,433	449	217,314	....	....	115,090,163	....	24,581,212	5,546,578	....	....	....
5,520	1,718	32,032	....	....	1,254,046	**2,788,572**	....	67,019	4,833,915	352	2,138
19,989	10,873	....	34,348	....	2,512,461	....	1,554,806	....	....	....	....
2,301	66,124	....	13,757	493	52,348	**296,795**	....	....	143,920	....	....
29,196,407	43,192	8,648	....	....	9,261,816,867	....	258,170,695	5,259,000	....	....	....
2,198,940	299,463	7,805	....	645	18,729,557	**27,524,170**	....	22,614	26,461,602	825,943	11,853,667
20,994,726	27,816	23,888	208,137	....	2,364,390,797	....	27,845,678	596,077	....	....	....
1,566,092	180,188	5,733	122,010	14,158	7,452,229	**21,472,067**	....	3,134	30,126,121	423,422	1,044,497
104,996	9,504	36	....	....	121,421,127	....	2,651,594	....	....	....	....
15,505	59,583	11	....	....	407,601	**1,125,191**	....	....	1,611,396	92,115	1,345,772
1,780,113	837	....	....	....	334,059,586	....	3,573,676	....	....	....	....
110,619	6,376	....	....	7	394,045	**1,256,201**	....	....	2,515,137	....	3,595,072
471,975	3,759	....	9,844,165	....	58,311,526	....	13,633,557	292,958	....	....	....
29,967	17,689	....	897,701	7,185	697,301	**2,391,841**	....	22,757	3,124,867	....	....
3,958,228	23,473	....	....	....	657,473,638	....	134,750,292	10,178,905	....	....	....
470,482	178,050	....	....	2,679	2,921,050	**6,044,577**	....	95,434	4,639,293	1,295,761	1,610,254
27,580	640	....	*	....	....	....	12,698,500	5,498,700	....	....	....
13,919	9,325	....	....	....	....	**35,121**	....	26,488	6,335	18,942	11,950
34,409	1,346	....	....	....	2,044,837	....	....	....	....	....	....
8,044	16,399	....	....	657	32,541	**60,447**	....	....	142,538	1,671	8,355
56,639,856	**121,889**	**249,886**	**10,086,650**	....	**12,917,130,002**	....	**479,460,010**	**27,372,218**	....	....	....
4,421,389	**834,915**	**45,581**	**1,033,468**	**25,824**	**31,910,718**	**62,994,982**	....	**237,446**	**73,605,124**	**2,658,206**	**19,471,725**

Purposes in the Mineral Industry of Canada, by Provinces, 1944(*)

Gasoline	Kerosene	Fuel oil and diesel oil	Wood	Gas: Manufactured	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.
23,306	7,663	27,355,659	937	8,648	....	....	8,412,793,307	....	239,070,624
7,686	1,552	1,943,523	13,079	7,805	....	....	14,385,600	**19,321,256**	....
32,753	7,175	17,502,302	35	....	519	....	331,127,949	....	....
8,733	1,467	1,132,120	276	....	387	....	1,058,153	**10,374,584**	....
....	....	1,872	60	....	....	....	31,126,000	....	....
....	....	286	421	....	....	....	28,181	**123,982**	....
....	....	9,828	316	....	....	....	163,414,000	....	....
....	....	1,505	2,211	....	....	....	147,949	**650,908**	....
95,762	2,091	1,003,983	584	....	....	....	515,190,346	....	....
32,559	627	120,562	5,575	....	....	....	1,946,689	**3,328,269**	....
151,821	**16,929**	**45,873,644**	**1,932**	**8,648**	**519**	....	**9,453,651,602**	....	**239,070,624**
48,978	**3,646**	**3,197,996**	**21,562**	**7,805**	**387**	....	**17,566,572**	**33,798,999**	....

Table 34.—Electricity Purchased by Canadian Mining Industry, 1935-1944

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.	$*
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	21,060,734
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	738,795,434	4,947,060	12,288,710,388	32,308,193	12,834,163,470	36,971,372
1944	709,437,980	4,668,292	12,392,717,185	46,998,975	12,917,130,002	31,940,718

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

Table 35.—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.	....	....	4	15	4	*23*	....	**23**	32	....
	H.P.	....	....	127	271	15,080	*15,478*	....	**15,478**	3,888	....
Auriferous Quartz Mines	No.	5	....	31	36	13	*85*	8,301	**8,386**	830	139
	H.P.	240	....	8,052	3,698	9,257	*21,247*	226,551	**247,798**	15,527	11,893
Copper-Gold-Silver Mines	No.	....	1	14	5	6	*26*	2,855	**2,881**	584	27
	H.P.	....	10,000	3,855	231	8,900	*22,986*	106,024	**129,010**	17,913	4,013
Silver-Cobalt Mines	No.	1	....	....	1	....	*2*	38	**40**	....	5
	H.P.	175	....	....	45	....	*220*	851	**1,071**	....	140
Silver-Lead-Zinc Mines (a)	No.	....	3	19	8	5	*35*	947	**982**	471	35
	H.P.	....	6,000	3,248	351	1,070	*10,669*	22,670	**33,339**	8,362	2,837
Nickel-Copper Mines	No.	....	....	2	1	....	*3*	953	**956**	....	4
	H.P.	....	....	180	4	....	*184*	42,987	**43,171**	....	420
Miscellaneous Metal Mines	No.	....	....	12	17	....	*29*	494	**523**	54	9
	H.P.	....	....	2,468	763	....	*3,231*	18,075	**21,306**	1,715	890
Non-ferrous Smelting and Refining	No.	20	12	15	22	11	*80*	12,148	**12,228**	393	51
	H.P.	920	9,470	3,874	2,008	51,125	*67,397*	307,159	**374,556**	8,292	39,270
Total	**No.**	**26**	**16**	**97**	**105**	**39**	*283*	**25,736**	**26,019**	**2,364**	**270**
	H.P.	**1,335**	**25,470**	**21,804**	**7,371**	**85,432**	*141,412*	**724,317**	**865,729**	**53,697**	**59,463**
NON-METAL MINING, INCLUDING FUELS—											
Coal	No.	168	11	25	239	2	*445*	3,112	**3,557**	507	221
	H.P.	51,788	17,762	1,598	4,855	12,000	*88,003*	118,886	**206,889**	22,164	50,336
Natural Gas	No.	4	4	....	261	....	*269*	95	**364**	24	14
	H.P.	140	80	....	8,661	....	*8,881*	1,040	**9,921**	1,398	2,460
Petroleum	No.	63	11	9	87	....	*170*	160	**330**	2	98
	H.P.	25,220	1,130	1,078	2,681	....	*30,109*	1,228	**31,337**	2	8,683
Total	**No.**	**235**	**26**	**34**	**587**	**2**	*884*	**3,367**	**4,251**	**533**	**333**
	H.P.	**77,148**	**18,972**	**2,676**	**16,197**	**12,000**	*126,993*	**121,154**	**248,147**	**23,564**	**61,479**
OTHER NON-METAL MINING											
Asbestos	No.	6	1	1	22	....	*30*	1,111	**1,141**	....	3
	H.P.	210	120	105	1,425	....	*1,860*	54,939	**56,799**	....	80
Feldspar, nepheline syenite and quartz	No.	8	....	24	49	....	*81*	99	**180**	124	10
	H.P.	508	....	2,582	2,380	....	*5,470*	2,038	**7,508**	1,198	865
Gypsum	No.	4	....	18	18	....	*40*	153	**193**	22	4
	H.P.	1,190	....	2,158	951	....	*4,299*	5,038	**9,337**	527	600
Iron Oxides	No.	....	....	....	....	....	....	13	**13**	....	....
	H.P.	....	....	....	....	....	....	100	**100**	....	....
Mica	No.	1	....	1	29	....	*31*	9	**40**	....	4
	H.P.	50	....	75	963	....	*1,088*	215	**1,303**	....	135
Peat	No.	1	....	3	99	2	*105*	83	**188**	....	1
	H.P.	30	....	225	3,080	70	*3,405*	1,155	**4,560**	....	15
Salt	No.	16	14	....	3	....	*33*	172	**205**	231	8
	H.P.	1,385	1,840	....	27	....	*3,252*	1,080	**4,332**	2,307	3,970
Talc and Soapstone	No.	....	....	4	13	....	*17*	37	**54**	14	....
	H.P.	....	....	343	365	....	*708*	680	**1,388**	121	....
Miscellaneous	No.	4	....	25	27	2	*58*	311	**369**	147	17
	H.P.	65	....	3,020	916	650	*4,651*	5,040	**9,691**	1,799	772
Total	**No.**	**40**	**15**	**76**	**260**	**4**	*395*	**1,988**	**2,383**	**538**	**47**
	H.P.	**3,438**	**1,960**	**8,508**	**10,107**	**720**	*24,733*	**70,285**	**95,018**	**5,952**	**6,437**

Reserve or Idle, in the Mineral Industry in Canada, by Industries, 1944

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
1	1	4	4	2	*12*	...	**12**	267	1	4
15	14	39	62	30	*160*	...	**160**	1,740	15	239
10	1	34	80	1	*126*	983	**1,109**	157	47	433
1,897	5	5,257	6,579	780	*14,518*	25,046	**39,564**	3,627	2,940	19,397
...	3	3	2	...	*8*	192	**200**	36	6	102
...	7,500	710	245	...	*8,455*	4,149	**12,601**	1,831	882	28,730
1	...	1	5	...	*7*	15	**22**	...	1	...
20	...	120	124	...	*264*	516	**780**	...	65	...
...	...	3	4	...	*7*	127	**134**	42	3	31
...	...	242	430	...	*672*	4,457	**5,129**	824	76	3,347
...	...	...	...	...	...	70	**70**	...	2	80
...	...	...	...	...	...	2,862	**2,862**	...	145	32,269
1	...	6	3	...	*10*	38	**48**	5	3	6
125	...	1,095	415	...	*1,635*	1,829	**3,464**	335	260	524
1	4	2	1	...	*8*	1,508	**1,516**	45	7	210
1,074	6,515	175	60	...	*7,824*	36,928	**44,752**	2,757	4,110	107,606
11	**9**	**53**	**99**	**3**	*178*	**2,933**	**3,111**	**552**	**70**	**866**
3,131	**14,034**	**7,638**	**7,915**	**810**	*33,528*	**75,787**	**109,315**	**11,114**	**8,493**	**192,112**
38	5	1	23	...	*67*	218	**285**	36	23	90
7,080	2,063	8	466	...	*9,617*	4,270	**13,887**	752	4,649	8,019
...	...	...	4	...	*4*	...	**4**	...	...	4
...	...	...	115	...	*115*	...	**115**	...	...	202
18	2	...	28	...	*48*	17	**65**	...	11	9
1,981	198	...	306	...	*2,485*	372	**2,857**	...	425	515
56	**7**	**1**	**55**	...	*119*	**235**	**354**	**36**	**34**	**112**
9,061	**2,261**	**8**	**887**	...	*12,217*	**4,642**	**16,859**	**752**	**5,074**	**8,736**
...	...	...	7	...	*7*	39	**46**	...	...	4
...	...	...	77	...	*77*	3,254	**3,331**	...	...	117
...	...	...	4	...	*4*	5	**9**	20	...	17
...	...	...	76	...	*76*	71	**147**	120	...	333
4	...	4	16	...	*24*	9	**33**	...	...	7
185	...	659	795	...	*1,639*	365	**2,001**	...	...	345
...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...
6	...	...	1	...	*7*	2	**9**	...	1	...
152	...	...	3	...	*155*	30	**185**	...	40	...
...	...	1	3	...	*4*	...	**4**	...	...	1
...	...	115	90	...	*205*	...	**205**	...	...	1
...	...	...	1	...	*1*	10	**11**	18	7	2
...	...	...	12	...	*12*	73	**85**	266	1,135	18
...	...	...	...	...	...	5	**5**	...	...	...
...	...	...	...	...	...	320	**320**	...	...	...
1	1	7	3	...	*12*	24	**36**	32	9	4
35	165	1,285	65	...	*1,550*	633	**2,183**	515	530	234
11	**1**	**12**	**35**	...	*59*	**94**	**153**	**70**	**17**	**35**
372	**165**	**2,059**	**1,118**	...	*3,714*	**4,746**	**8,460**	**901**	**1,705**	**1,048**

Table 35.—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
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—											
Cement	No.	......	......	5	43	......	*48*	1,478	**1,526**	32	2
	H.P.	......	......	1,176	1,300	......	*2,476*	77,304	**79,780**	1,193	250
Clay Products	No.	36	4	6	55	17	*118*	488	**606**	25	53
	H.P.	3,340	20	427	1,869	712	*6,368*	11,938	**18,306**	234	5,012
Lime	No.	5	......	5	21	6	*37*	508	**545**	65	10
	H.P.	190	......	570	695	105	*1,560*	7,799	**9,359**	843	1,664
Sand and Gravel	No.	10	......	13	74	7	*104*	193	**297**	2	8
	H.P.	577	......	1,243	3,107	240	*5,167*	6,647	**11,814**	45	518
Stone	No.	44	1	69	184	58	*356*	747	**1,103**	45	37
	H.P.	1,916	2	5,533	6,542	2,407	*16,400*	21,039	**37,439**	2,155	1,804
Total	**No.**	**95**	**5**	**98**	**377**	**88**	*663*	**3,411**	**4,077**	**169**	**110**
	H.P.	**6,023**	**22**	**8,949**	**13,513**	**3,464**	*31,971*	**121,727**	**156,698**	**4,470**	**8,887**
Grand Total 1944	**No.**	**396**	**62**	**305**	**1,329**	**133**	*2,225*	**34,505**	**36,730**	**3,604**	**760**
	H.P.	**87,944**	**46,424**	**41,937**	**47,188**	**101,616**	*325,109*	**1,040,483**	**1,365,592**	**87,683**	**136,266**
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**	**1,155,193**	**89,290**	**138,028**

Table 36.—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.	45	8	20	39	1	*113*	1,035	**1,148**	135	92
	H.P.	36,609	16,333	2,323	1,644	25	*56,934*	69,637	**126,571**	8,877	30,561
New Brunswick	No.	14	......	4	59	1	*78*	225	**303**	14	18
	H.P.	1,610	......	380	1,854	75	*3,919*	1,677	**5,596**	227	1,180
Quebec	No.	25	11	94	296	60	*486*	11,180	**11,666**	656	133
	H.P.	1,005	4,990	15,190	11,884	55,372	*88,441*	303,800	**392,211**	11,785	35,394
Ontario	No.	89	13	63	475	6	*646*	13,108	**13,751**	676	185
	H.P.	4,296	3,892	6,348	18,907	2,745	*36,188*	411,630	**417,818**	9,870	25,194
Manitoba	No.	3	1	5	34	......	*43*	1,028	**1,071**	102	12
	H.P.	140	500	735	632	......	*2,007*	33,559	**35,566**	1,400	1,917
Saskatchewan	No.	19	1	26	59	......	*105*	1,826	**1,931**	151	24
	H.P.	1,630	1,250	2,838	1,415	......	*7,133*	72,536	**79,669**	2,064	3,960
Alberta	No.	170	21	26	217	......	*434*	1,789	**2,223**	396	215
	H.P.	38,354	3,230	1,918	5,383	......	*48,886*	47,540	**96,425**	8,948	26,925
British Columbia	No.	31	7	66	148	62	*314*	4,241	**4,555**	1,449	79
	H.P.	4,300	16,229	12,049	5,451	28,399	*66,428*	99,074	**165,502**	40,682	11,025
Yukon	No.	......	......	......	1	3	*4*	......	**4**	25	......
	H.P.	......	......	......	8	15,000	*15,008*	......	**15,008**	3,830	......
N.W.T.	No.	......	......	1	1	......	*2*	73	**75**	......	2
	H.P.	......	......	156	10	......	*166*	1,030	**1,196**	......	110
Canada	**No.**	**396**	**62**	**305**	**1,329**	**133**	*2,225*	**34,505**	**36,730**	**3,604**	**760**
	H.P.	**87,944**	**46,424**	**41,937**	**47,188**	**101,616**	*325,109*	**1,040,483**	**1,365,592**	**87,683**	**136,266**

or Idle, in the Mineral Industry in Canada, by Industries, 1944—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
1	...	...	7	...	*8*	301	**309**	6	1	12
50	...	...	482	...	*532*	14,484	**15,016**	211	40	1,424
3	...	...	9	...	*12*	41	**53**	2	9	3
335	...	...	297	...	*632*	2,008	**2,640**	55	830	70
...	...	...	1	...	*1*	14	**15**	2	7	...
...	...	...	100	...	*100*	338	**438**	40	392	...
2	...	1	2	...	*5*	12	**17**	...	2	5
170	...	60	105	...	*335*	462	**797**	...	150	1,612
15	1	5	8	4	*33*	121	**154**	...	4	21
627	2	522	218	150	*1,519*	3,813	**5,332**	...	135	886
21	**1**	**6**	**27**	**4**	*59*	**489**	**518**	**10**	**23**	**41**
1,182	**2**	**582**	**1,202**	**150**	*3,118*	**21,105**	**24,223**	**306**	**1,547**	**3,992**
102	**18**	**72**	**216**	**7**	*415*	**3,751**	**4,166**	**668**	**144**	**1,054**
13,746	**16,462**	**10,287**	**11,122**	**960**	*52,577*	**106,280**	**158,857**	**13,073**	**16,819**	**205,888**
77	**18**	**94**	**274**	**8**	*1,290*	**3,235**	**3,706**	**719**	**154**	**1,017**
11,895	**14,230**	**13,851**	**14,850**	**890**	*193,744*	**95,939**	**151,655**	**25,413**	**19,631**	**228,225**

or Idle, in the Mineral Industry in Canada, by Provinces, 1944

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
8	...	6	18	...	*32*	47	**79**	...	8	20
853	...	820	902	...	*2,575*	1,629	**4,204**	...	2,686	2,580
1	...	...	1	...	*2*	77	**79**	...	2	...
50	...	...	2	...	*52*	575	**627**	...	65	...
18	1	16	51	...	*86*	1,236	**1,322**	50	35	286
506	4,000	1,950	3,025	...	*9,481*	33,516	**42,997**	1,385	4,062	30,124
11	2	18	77	...	*108*	1,284	**1,392**	85	40	495
1,775	7	2,971	5,191	...	*9,944*	42,251	**52,195**	4,657	2,793	100,016
...	...	3	4	...	*7*	58	**65**	18	6	28
...	...	501	550	...	*1,051*	2,029	**3,080**	286	530	6,291
2	4	5	7	...	*18*	118	**136**	28	9	45
300	2,680	1,155	280	...	*4,415*	3,765	**8,180**	652	1,330	35,386
44	5	1	29	...	*79*	118	**197**	34	24	73
7,718	2,257	8	445	...	*10,428*	4,741	**15,169**	752	2,204	4,542
18	6	19	29	7	*79*	813	**892**	189	17	103
2,544	7,518	2,290	727	960	*14,039*	17,774	**31,813**	3,671	2,194	26,710
...	...	...	...	...	...	...	...	264	...	3
...	...	...	...	...	...	...	...	1,670	...	234
...	...	4	...	...	*4*	...	**4**	...	3	1
...	...	592	...	...	*592*	...	**592**	...	55	5
102	**18**	**72**	**216**	**7**	*415*	**3,751**	**4,166**	**668**	**144**	**1,054**
13,746	**16,462**	**10,287**	**11,122**	**960**	*52,577*	**106,280**	**158,857**	**13,073**	**16,819**	**205,888**

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 1944 totalled 2,922,911 troy ounces valued at $112,532,073 compared with 3,651,301 troy ounces worth $140,575,088 in 1943. The quantity of gold recovered from Canadian ores, of all kinds, during the year under review, was the smallest since 1931 and reflected the strain borne by a nation that had experienced over five 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 ones has 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 1944, Ontario contributed 59 per cent, Quebec 25 per cent and British Columbia 7 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 1944, according to the nature of the ores from which the metal was recovered, was as follows: placer deposits 1·14 per cent; auriferous quartz ores 83·33 per cent; copper-gold-silver ores 13·04 per cent; nickel-copper ores 1·89 per cent, and silver-lead and other ores 0·60 per cent.

Fine gold production in Canada, from all sources, from 1858 to 1944 inclusive, totalled 92,297,754 troy ounces valued at $2,684,387,981 in Canadian currency.

Table 37.—Production of New Gold in Canada, by Provinces and Sources, 1943 and 1944 (Gold at $20·671834 per fine ounce)

—	1943		1944	
	Fine troy ounces	$	Fine troy ounces	$
NOVA SCOTIA—				
In gold bullion	4,129	85,354	5,840	120,724
Estimated exchange equalization on gold produced		73,613		104,116
Total Value—Canadian Funds		**158,967**		**224,840**
QUEBEC—				
In gold bullion	578,512	11,958,904	485,892	10,044,[illegible]
In anode copper (b)	331,475	6,852,196	245,886	5,082,915
In ores, etc., exported	12,546	259,349	15,006	310,[illegible]
Total	**922,533**	**19,070,449**	**746,784**	**15,437,395**
Estimated exchange equalization on gold produced		16,447,072		13,313,789
Total Value—Canadian Funds		**35,517,521**		**28,751,184**

Table 37.—Production of New Gold in Canada, by Provinces and Sources, 1943 and 1944 —Concluded

—	1943		1944	
	Fine troy ounces	$	Fine troy ounces	$
ONTARIO—				
(c) Porcupine Area—In gold bullion	1,020,977	21,105,467	873,062	18,047,793
(c) Kirkland Lake—In gold bullion (a)	635,393	13,134,739	498,260	10,299,948
(c) Other gold mines—In gold bullion	405,007	8,372,237	305,208	6,309,209
In converter copper from nickel-copper ores	36,065	745,530	50,516	1,044,259
In ores, matte, etc., exported	19,773	408,744	4,790	99,018
Total	2,117,215	43,766,717	1,731,836	35,800,227
Estimated exchange equalization on gold produced	....	37,746,060	....	30,875,459
Total Value—Canadian Funds	....	81,512,777	....	66,675,686
MANITOBA—				
In gold bullion	62,254	1,286,905	40,669	840,703
In blister copper	27,184	561,943	31,408	649,261
In ores, etc., exported	2,337	48,310	2,091	43,225
Total	91,775	1,897,158	74,168	1,533,189
Estimated exchange equalization on gold produced	....	1,636,179	....	1,322,279
Total Value—Canadian Funds	....	3,533,337	....	2,855,468
SASKATCHEWAN—				
In alluvial gold	....	....	5	103
In gold bullion	4	83	....	....
In blister copper	174,086	3,598,677	122,777	2,538,026
Total	174,090	3,598,760	122,782	2,538,129
Estimated exchange equalization on gold produced	....	3,103,705	....	2,188,978
Total Value—Canadian Funds	....	6,702,465	....	4,727,107
ALBERTA—				
In alluvial gold	21	434	51	1,054
Estimated exchange equalization on gold produced	....	374	....	909
Total Value—Canadian Funds	....	808	....	1,963
BRITISH COLUMBIA—				
In alluvial gold	11,680	241,447	9,402	194,357
In gold bullion	136,340	2,818,397	98,117	2,028,258
In base bullion	6,724	138,998	3,399	70,264
In ores, etc., exported	86,602	1,790,222	85,939	1,776,516
Total	241,346	4,989,064	196,857	4,069,395
Estimated exchange equalization on gold produced	....	4,302,757	....	3,509,599
Total Value—Canadian Funds	....	9,291,821	....	7,578,994
YUKON—				
In alluvial gold	41,157	850,790	23,816	492,321
In ores exported	3	62	2	41
Total	41,160	850,852	23,818	492,362
Estimated exchange equalization on gold produced	....	733,808	....	424,631
Total Value—Canadian Funds	....	1,584,660	....	916,993
NORTHWEST TERRITORIES—				
In ores, etc., shipped	5	103	....	....
In gold bullion produced	59,027	1,220,196	20,775	429,457
Total	59,032	1,220,299	20,775	429,457
Estimated exchange equalization on gold produced	....	1,052,433	....	370,381
Total Value—Canadian Funds	....	2,272,732	....	799,838
Total for Canada	3,651,301	75,479,087	2,922,911	60,421,932
Total estimated exchange equalization on gold produced	....	65,096,001	....	52,110,141
Grand Total Value, including exchange	....	**140,575,088**	....	**112,532,073**

NOTE.—The estimated average price of a troy ounce of fine gold in Canadian funds was $38.50 in both 1944 and 1943.
(a) Includes production of Larder Lake area.
(b) Includes a considerable quantity of gold recovered from gold ores.
(c) Includes certain quantities of gold contained in slags, ores,etc., shipped to Canadian and foreign smelters.

Table 38.—Estimated Average Monthly Value of an Ounce of Fine Gold, Expressed in Canadian Funds, 1931-1944

Month	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940-1944
	$	$	$	$	$	$	$	$	$	$
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, 1944 the price paid by the United States Treasury for gold purchased by the Mints 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 1944, was equal to $34·9125 per ounce. The United States Senate Banking and Currency Committee, on March 14, 1945, rejected a proposal to increase the price of gold from $35 an ounce to $56. The Committee voted to reduce to 25 per cent the gold reserve requirements against Federal Reserve Bank deposits and notes.

Table 39.—Production of Gold in Canada, by Principal Mines, 1944

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—						
Consolidated Mining & Smelting Co. of Canada Ltd	8,177	....	8,202	(b) 424	40	(a)
Queens Mines Ltd	7,391	....	7,391	1,497	120	(a)
Total Nova Scotia	....	....	....	(c) 5,840	....	....

FOOTNOTES—

(a) Amalgamation.
(b) In addition, 42 ounces of gold were contained in concentrates produced but not treated.
(c) 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	131,490	....	124,600	13,339	1,800	(c) (b)
Belleterre Quebec Mines Ltd	126,695	16,031	110,257	40,048	350	(c)
Canadian Malartic Gold Mines Ltd	334,575	....	334,575	36,118	1,000	(c)
Cere, Gustave	1,100	800	300	2,000	12	....
East Malartic Mines Ltd	290,873	....	290,873	39,288	1,500	(c)
Francoeur Gold Mines Ltd	65,628	....	65,628	10,676	175	(c) (d)
Lamaque Mining Co. Ltd	203,435	....	203,435	52,696	1,200	(c)
Malartic Gold Fields Ltd	207,339	....	207,339	35,644	750	(c)
McWatters Gold Mines Ltd	18,202	186	18,016	2,770	150	(c) (e)
Mic-Mac Mines Ltd	177,737	....	177,967	21,077	650	(a) (f)
O'Brien Gold Mines Ltd	53,597	....	53,590	26,034	200	(a) (c) (g)
Perron Gold Mines Ltd	109,180	7,502	101,678	23,766	425	(c)
Powell Rouyn Gold Mines Ltd	190,361	....	186,725	22,328	450	(h)
Senator-Rouyn Ltd	95,030	....	93,101	12,815	300	(c)
Sigma Mines (Quebec) Ltd	304,967	....	304,967	57,098	1,100	(c)
Siscoe Gold Mines Ltd	369,290	44,812	324,478	39,432	1,000	(a) (c)
Sladen-Malartic Mines Ltd	207,215	....	207,215	19,901	700	(c)
Stadacona Rouyn Mines Ltd	137,420	....	137,420	23,029	500	(c)
Sullivan Consolidated Mines Ltd	161,923	18,218	140,146	30,925	500	(c)
West Malartic Mines Ltd	84,832	....	84,220	10,655	300	(c)
Total Principal Gold Mines	3,270,889	87,549	3,166,530	519,699	12,997	....
Copper-gold-silver and other ores	....	....	....	227,105	....	(i)
Total Quebec	....	....	....	746,784	....	....

FOOTNOTES—

(a) Amalgamation.
(b) Also shipped refined arsenic; milling suspended September 30.
(c) Cyanided.
(d) Milling suspended October 31; ore treated included 17,227 tons silicious ore shipped to smelter.
(e) Milling suspended August 31.
(f) Concentrates shipped to smelter; in addition 112 ounces gold contained in concentrates not shipped.
(g) Also shipped crude arsenic.
(h) All crude ore shipped to smelter for treatment.
(i) Production taken off chiefly at smelter.

Table 39.—Production of Gold in Canada, by Principal Mines, 1944—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	
ONTARIO—						
Porcupine District						
Aunor Gold Mines Ltd.	137,321	....	137,321	50,154	300	(c)
Bonetal Gold Mines Ltd.	28,877	2,870	26,081	3,912	....	(c)
Broulan Porcupine Mines Ltd.	112,808	12,327	100,481	20,001	350	(c)
Buffalo Ankerite Gold Mines Ltd.	237,183	2,842	235,442	41,066	1,200	(c)
Coniaurum Mines Ltd.	98,540	....	98,540	26,905	600	(c)
Delnite Mines Ltd.	92,894	....	93,112	14,799	520	(c)
Dome Mines Ltd.	519,800	....	519,800	134,230	1,700	(a) (c)
Hallnor Mines Ltd.	102,742	....	102,742	41,145	400	(c)
Hollinger Cons. Gold Mines Ltd. (Ross)	77,480	....	77,544	14,247	300	(c)
Hollinger Cons. Gold Mines Ltd. (Timmins)	954,611	....	955,447	226,434	3,900	(c)
Hoyle Gold Mines Ltd.	....	....	....	1,101	....	(b)
McIntyre Porcupine Mines Ltd.	591,210	....	589,940	170,636	2,400	(c)
Pamour Porcupine Mines Ltd.	470,532	....	470,532	41,908	1,600	(c)
Paymaster Cons. Mines Ltd.	117,933	....	132,063	28,754	600	(c)
Preston East Dome Mines Ltd.	248,970	....	249,268	57,561	1,000	(a) (c)
Kirkland Lake District						
Bidgood Kirkland Gold Mines Ltd.	48,609	....	48,594	8,966	125	(c)
Kirkland Lake Gold Mining Co. Ltd.	77,457	....	77,457	27,326	400	(c)
Lake Shore Mines Ltd.	258,544	....	258,544	109,469	2,300	(c)
Macassa Mines Ltd.	83,392	....	83,392	36,241	400	(c)
Sylvanite Gold Mine Ltd.	137,498	....	137,822	44,650	600	(c)
The Teck-Hughes Gold Mines Ltd.	102,920	....	102,920	25,660	600	(c)
Toburn Gold Mines Ltd.	40,864	924	39,940	12,780	175	(c)
Upper Canada Mines Ltd.	78,036	....	78,036	27,461	250	(c)
Wright Hargreaves Mines Ltd.	184,520	....	184,520	90,614	1,200	(c)
Larder Lake District						
Chesterville Larder Lake Gold Mining Co. Ltd.	152,696	....	152,696	18,590	700	(c)
Kerr-Addison Gold Mines Ltd.	484,844	....	484,583	80,722	1,800	(c)
Omega Gold Mines Ltd.	115,675	....	115,675	15,526	500	(c)
Matachewan District						
Hollinger Cons. Gold Mines Ltd. (Young-Davidson)	162,999	....	161,773	14,567	1,050	(c)
Matachewan Consolidated Mines Ltd.	179,586	....	179,586	14,068	1,000	(c)
Sudbury District						
Jerome Gold Mines Ltd.	....	....	....	....	500	(d)
Thunder Bay District						
Hard Rock Gold Mines Ltd.	109,932	18,885	91,047	21,776	450	(c)
Leitch Gold Mines Ltd.	25,673	4,436	21,727	16,209	90	(a) (c)
Little Long Lac Gold Mines Ltd.	83,313	15,775	67,538	22,782	300	(a) (c)
MacLeod-Cockshutt Gold Mines Ltd.	180,222	32,021	124,964	39,900	650	(c)
Patricia District						
Berens River Mines Ltd.	40,436	....	40,436	10,048	225	(e)
Central Patricia Gold Mines Ltd.	91,512	....	91,512	29,569	400	(c)
Cochenour Willans Gold Mines Ltd.	44,928	....	44,928	19,932	250	(a) (c) (f)
Hasaga Gold Mines Ltd.	142,344	24,000	118,249	16,789	350	(c)
Madsen Red Lake Gold Mines Ltd.	132,759	....	132,759	37,547	400	(a) (c)
McKenzie Red Lake Gold Mines Ltd.	93,588	15,309	78,279	19,013	250	(c)
McMarmac Red Lake Gold Mines Ltd.	31,890	....	31,890	5,060	75	(c) (g)
Pickle Crow Gold Mines Ltd.	69,368	6,130	63,388	37,699	400	(a) (c)
Total Principal Gold Mines	**6,944,512**	**135,519**	**6,800,568**	**1,675,817**	**30,310**	....
Nickel-copper mines	....	....	....	55,286	....	....
Other mines	....	....	....	733	....	....
Total Ontario	....	....	....	**1,731,836**	....	....

FOOTNOTES—
(a) Amalgamation.
(b) No operations; concentrates shipped from stock.
(c) Cyanided.
(d) Development work only.
(e) Chiefly gold content of precipitate shipped; in addition, there are lead and zinc concentrates exported.
(f) Exclusive of gold in 246 tons concentrates not shipped to smelter.
(g) Operations suspended October 15.

Property and Province	Ore raised	Material sorted (discarded)	Ore treated	Gold production	Mill capacity 24 hours	See footnotes
MANITOBA—						
San Antonio Gold Mines Ltd.	140,085	....	140,085	40,669	550	(a) (c)
Copper-gold-silver and other mines	....	....	....	33,499	....	(b)
Total Manitoba	....	....	....	74,168	....	....

FOOTNOTES—
(a) Amalgamation.
(b) Ores smelted.
(c) Cyanided.

Table 39.—Production of Gold in Canada, by Principal Mines, 1944—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	
SASKATCHEWAN—						
Copper-gold-silver and other ores	......	......	......	122,782	......	(a)

FOOTNOTE—
(a) Ores smelted; includes 5 ounces placer gold.

Property and Province	Ore raised	Material sorted (discarded)	Ore treated	Gold production	Mill capacity 24 hours	See footnotes
ALBERTA—						
Placer gold	......	......	......	51	......	......

Property and Province	Ore raised	Material sorted (discarded)	Ore treated	Gold production	Mill capacity 24 hours	See footnotes
BRITISH COLUMBIA—						
Bralorne Mines Ltd.	115,391	5,640	109,751	70,350	500	(a) (b)
Cariboo Gold Quartz Mining Co. Ltd.	32,832	......	33,040	13,588	375	(a) (b) (c)
Hedley Mascot Gold Mines Ltd.	40,171	......	42,285	13,434	200	(b) (c)
Island Mountain Mines Co. Ltd.	21,186	......	21,186	9,441	150	(b) (c)
Kelowna Exploration Co. Ltd.	88,491	......	88,491	32,526	275	(b)
Pioneer Gold Mines of B.C. Ltd.	16,989	2,776	16,865	9,111	350	(a) (b) (c)
Sheep Creek Gold Mines Ltd.	13,092	......	13,092	4,781	150	(c) (d)
Silbak Premier Mines Ltd.	68,496	......	68,496	15,289	500	(b) (e)
Total Principal Gold Mines	396,648	8,416	393,206	168,520	2,500	......
Placer gold	......	......	......	9,402	......	......
Copper-gold ores	......	......	......	14,852	......	......
Silver-lead and other ores	......	......	......	4,083	......	......
Total British Columbia	......	......	......	196,857	......	......

FOOTNOTES—
(a) Amalgamation.
(b) Concentrates shipped to smelter.
(c) Cyanided.
(d) Milling suspended August 31.
(e) Concentrates also included 115,400 ounces silver and 3,189,000 pounds lead.

Property and Province	Ore raised	Material sorted (discarded)	Ore treated	Gold production	Mill capacity 24 hours	See footnotes
YUKON—						
Placers	......	......	......	23,816	......	......
Silver-lead ores	......	......	......	2	......	(*)
Total Yukon	......	......	......	23,818	......	......

FOOTNOTE—
(*) In ores exported.

Property and Province	Ore raised	Material sorted (discarded)	Ore treated	Gold production	Mill capacity 24 hours	See footnotes
NORTHWEST TERRITORIES—						
Negus Mines Ltd.	22,007	3,336	18,869	20,723	56	(a) (b) (c)
Other gold ores	......	......	......	52	......	......
Total Northwest Territories	......	......	......	20,775	......	......

FOOTNOTES—
(a) Amalgamation.
(b) Milling suspended October 18.
(c) Cyanided.

Property and Province	Ore raised	Material sorted (discarded)	Ore treated	Gold production	Mill capacity 24 hours	See footnotes
CANADA—						
Total Canada	......	......	......	**2,922,911**	......	......

Table 40.—Production of New Gold* by Provinces and Territories, 1932-1944

Year	Nova Scotia		Quebec		Ontario		Manitoba	
	Fine ounces	$	Fine ounces	$	Fine ounces	$	Fine ounces	$
1932	964	22,634	401,105	9,417,572	2,280,105	53,534,743	122,507	2,876,350
1933	1,382	39,525	382,886	10,950,530	2,155,519	61,647,843	125,310	3,583,866
1934	3,525	121,613	390,097	13,458,347	2,105,339	72,634,195	132,321	4,565,075
1935	9,376	329,942	470,552	16,558,725	2,220,336	78,133,624	142,613	5,018,551
1936	11,960	418,959	666,905	23,361,683	2,378,503	83,818,960	139,273	4,878,733
1937	19,918	696,931	711,480	24,894,685	2,587,095	90,522,454	157,949	5,526,636
1938	26,560	934,248	881,203	30,998,426	2,896,477	101,883,578	185,706	6,532,209
1939	29,943	1,082,170	953,377	34,455,998	3,086,076	111,533,873	180,875	6,537,003
1940	22,219	855,432	1,019,175	39,238,238	3,261,698	125,574,988	152,295	5,863,357
1941	19,170	738,045	1,089,339	41,939,552	3,194,308	122,980,858	150,553	5,796,290
1942	12,989	500,076	1,092,388	42,056,938	2,763,819	106,407,032	136,226	5,244,701
1943	4,129	158,967	922,533	35,517,521	2,117,215	81,512,777	91,775	3,533,337
1944	5,840	224,840	746,784	28,751,184	1,731,836	66,675,686	74,168	2,855,468
Total	**167,975**	**6,123,382**	**9,727,884**	**351,599,408**	**32,778,326**	**1,156,860,611**	**1,791,571**	**62,811,576**
	Saskatchewan		British Columbia		Yukon		Northwest Territories	
1932	11	258	199,004	4,672,429	40,608	953,438	....	....
1933	5,400	154,440	238,995	6,835,257	39,493	1,129,500	....	....
1934	5,405	186,472	296,106	10,218,762	38,798	1,338,531	....	....
1935	14,323	504,026	391,633	13,781,565	35,707	1,256,529	200	7,038
1936	48,981	1,715,805	451,938	15,831,388	50,358	1,764,041	1	35
1937	65,886	2,305,351	505,857	17,699,936	47,982	1,678,890	....	....
1938	50,021	1,759,489	605,617	21,302,578	72,368	2,545,544	6,800	239,190
1939	77,120	2,787,194	626,970	22,659,323	87,745	3,171,192	51,914	1,876,224
1940	102,925	3,962,613	617,011	23,754,924	80,458	3,097,633	55,159	2,123,621
1941	138,015	5,313,578	608,203	23,415,816	70,959	2,731,922	74,417	2,865,054
1942	178,871	6,886,533	474,339	18,262,052	83,248	3,204,971	99,394	3,826,669
1943	174,090	6,702,465	241,346	9,291,821	41,160	1,584,660	59,032	2,272,732
1944	122,782	4,727,107	196,857	7,578,994	23,818	916,993	20,775	799,838
Total	**983,830**	**37,005,331**	**5,453,966**	**195,304,845**	**712,700**	**25,373,841**	**367,692**	**14,010,401**

NOTE: The annual production in Alberta was less than 400 ounces for any of the years specified.
(*) From all sources.

Table 41.—Canadian Gold Production According to Method of Computation and Recovery, 1932-1944

Year	In alluvial gold	In crude gold bullion produced at mines (a)	In base bullion produced at lead smelters	In blister and anode copper produced (b)	In ores, matte, slags, etc., exported	Total gold produced
	%	%	%	%	%	fine oz.
1932	1·8	79·3	1·0	15·1	2·8	3,044,387
1933	2·0	79·8	0·7	14·2	3·3	2,949,309
1934	2·0	78·7	1·1	13·4	4·8	2,972,074
1935	1·8	78·3	2·2	13·2	3·9	3,284,890
1936	2·2	77·4	1·6	13·8	5·0	3,748,028
1937	2·2	80·2	0·9	11·7	5·0	4,096,213
1938	2·5	80·8	0·9	11·2	4·5	4,725,117
1939	2·5	82·1	0·6	10·4	4·4	5,094,379
1940	2·1	82·7	0·6	10·0	4·6	5,311,145
1941	2·0	82·6	0·4	10·3	4·7	5,345,179
1942	2·3	80·8	0·2	12·1	4·6	4,841,306
1943	1·45	78·71	0·19	15·61	4·04	3,651,301
1944	1·14	78·98	0·12	15·41	4·35	2,922,911

(a) Includes a relatively small quantity of gold contained in shipments of gold ores, slags, etc., to Canadian smelters.
(b) Canadian blister copper is sometimes refined in the United States; also contains a relatively small quantity of gold recovered from auriferous quartz ores.

Table 42.—Gold Recovered in Canada According to Nature of Ore, by Provinces, 1940-1944

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.
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	474,339
Northwest Territories	...	99,394	...	...	...	99,394
Yukon	83,198	...	...	...	48	83,246
Total Canada	**109,564**	**4,135,307**	**515,226**	**70,861**	**10,348**	**4,841,306**
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**	**3,018,071**	**505,857**	**55,776**	**18,736**	**3,651,301**
1944						
Nova Scotia	...	5,840	...	...	...	5,840
Quebec	...	522,894	209,989	...	(*) 13,901	746,784
Ontario	...	1,676,486	...	55,286	64	1,731,836
Manitoba	...	40,669	33,499	...	...	71,168
Saskatchewan	5	...	122,777	...	...	122,782
Alberta	51	...	...	...	...	51
British Columbia	9,402	169,132	14,852	...	3,471	196,857
Northwest Territories	...	20,775	...	...	...	20,775
Yukon	23,816	...	...	...	2	23,818
Total Canada	**33,274**	**2,435,796**	**381,117**	**55,286**	**17,438**	**2,922,911**

(†) 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 prior to 1943 as auriferous quartz.

Table 43.—Gold Production of the World (a)—(In fine ounces)—1938 and 1944

Country	1938	1944
(Taken from American Bureau of Metal Statistics)		
North America—		
United States	5,008,178	1,001,865
Canada	4,725,117	2,913,716
Mexico	923,819	650,000
Newfoundland	24,104	18,500
Total North America	10,681,218	4,584,081
Central America and West Indies	164,000	295,000
South America—		
Brazil	174,041	270,000
Chile	294,092	200,000
Colombia	520,715	553,530
Ecuador	74,042	120,000
Peru	260,319	* 200,000
Guiana—British	38,482	* 18,000
Dutch	12,000	5,000
French	40,605	* 20,000
Venezuela	114,978	77,716
Other South America	40,000	25,000
Total South America	1,569,274	1,489,246
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	62,610
Queensland	151,432	* 90,000
Victoria	144,243	52,000
Western Australia	1,167,792	466,261
Tasmania	22,200	* 20,000
New Guinea	236,397	...
New Zealand	152,050	150,000
Fiji	92,400	* 60,000
Other Oceania (c)	52,600	* 40,000
Total Oceania	2,107,822	940,871
Asia—		
British India	322,397	187,200
China, including Manchuria	188,000	...
Korea	948,447	...
Netherlands Indies	76,300	...
Formosa	* 60,000	...
Japan	* 760,000	...
Other Asia	104,000	...
Total Asia	2,459,144	* 1,500,000
Africa—		
Belgian Congo	473,246	(d)
French West Africa	127,153	(d)
Kenya	69,436	(d)
Madagascar	13,760	(d)
Rhodesia	815,191	595,000
British West Africa (b)	729,754	566,000
Tanganyika	82,168	100,000
Transvaal, Cape Colony and Natal	12,161,392	12,277,228
Other Africa	150,000	(d)
Total Africa	14,622,100	13,800,000
Totals for World	**38,030,782**	**27,109,198**

(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 44.—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	...	...	...	...	24,266,820
1601-1700	...	...	...	...	29,330,455
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	291,584	39,412,823
1896-1900	...	12,578,869	15,728,572	3,469,791	62,234,698
1901-1905	...	13,632,908	19,303,722	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		451,865	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	22,605,068
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	4,887,004	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	554,558	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	73,045	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	18,619,481
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	385,890	10,354,157	2,233,251	1,890,592	18,885,849
1929	707,309	10,412,326	2,208,386	1,928,308	19,207,452
1930	1,501,083	10,716,349	2,285,603	2,102,068	20,903,736
1931	1,655,725	10,877,708	2,395,878	2,693,892	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	25,409,295
1934	3,858,000	10,479,194	3,091,183	2,972,074	27,372,374
1935	4,784,030	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) 4,900,000	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) 3,741,806	4,841,306	(m) (k) 36,000,000
1943	(b)	12,800,021	(q) 1,394,522	3,651,301	(o)
1944	(b)	12,277,228	(p) 1,002,000	2,922,911	(o)
Total	...	**420,534,631**	**273,563,505**	(r) **92,297,754**	...

(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 to 1944 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) American Bureau of Metal Statistics—preliminary.
(q) Includes 13,764 ounces received from Philippine Islands.
(r) The total value of Canadian gold production from 1858-1944 inclusive totalled $2,084,387,981.

Table 45.—Precious Metals Consumed by the Jewellery and Silverware Industry in Canada, 1942, 1943 and 1944

Material	Cost at works		
	1942	1943	1944
	$	$	$
Fine gold	2,789,986	3,138,717	3,665,017
Gold alloys	607,604	704,571	828,199
Fine silver	1,476,788	1,421,459	1,749,154
Sterling silver and silver alloys	754,421	837,907	1,014,775
Platinum	361,006	169,467	150,966
Old gold, jewellers' findings, waste and scrap for refining	1,324,155	1,828,906	1,379,536
Gold-filled wire and stock	557,245	269,249	349,871
Precious and semi-precious stones	697,703	724,011	1,252,769

GOLD EXPORTS

(Order-in-Council P.C. 9312—December 15, 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. 207, dated January 13, 1944, continued in force until December 31, 1944;

AND WHEREAS in the opinion of the Minister of Finance it is expedient that the said regulations be continued in force beyond December 31, 1944;

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, 1945, 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 46.—Trade of Canada, by Months, January, 1941 to December, 1944 (External Trade Branch, D.B.S.)

Balance of Trade (Excluding Gold)

Month	1941	1942	1943	1944
	$	$	$	$
January	− 9,429,803	+ 10,180,853	+ 51,236,770	+ 119,620,647
February	+ 10,892,522	+ 48,641,010	+ 55,052,562	+ 90,896,845
March	− 5,023,835	+ 32,063,651	+ 60,460,065	+ 139,157,039
April	+ 12,124,675	+ 27,884,655	+ 78,378,660	+ 149,193,311
May	+ 34,566,669	+ 88,179,951	+ 98,913,387	+ 211,811,232
June	+ 31,898,663	+ 58,170,621	+ 104,375,178	+ 193,508,555
July	+ 43,193,512	+ 59,824,137	+ 155,643,568	+ 133,330,706
August	+ 12,582,786	+ 45,905,877	+ 145,971,168	+ 101,862,939
September	+ 5,905,452	+ 81,170,827	+ 110,097,386	+ 107,630,886
October	− 1,141,275	+ 72,774,449	+ 99,953,595	+ 158,399,115
November	+ 29,888,112	+ 82,758,195	+ 133,101,370	+ 175,855,893
December	+ 26,205,413	+ 133,669,887	+ 173,091,680	+ 142,033,247
Total	+ **191,662,891**	+ **741,224,113**	+ **1,266,275,389**	+ **1,724,200,415**

Net Exports of Non-Monetary Gold

(Additional to Balance of Trade—Millions of Dollars)

January	19·2	15·1	13·9	9·4
February	14·7	16·6	12·6	8·1
March	19·7	16·1	12·8	12·9
April	14·3	14·1	13·5	9·3
May	16·1	15·5	12·5	9·4
June	18·4	16·8	12·2	10·9
July	17·3	16·3	10·0	6·6
August	12·6	13·1	10·2	10·0
September	21·2	15·0	11·8	8·7
October	17·4	19·3	11·3	8·4
November	15·4	12·6	8·8	10·1
December	17·4	13·9	12·2	5·9
Total	**203·7**	**184·4**	**142·0**	**109·7**

Table 47.—World's Monetary Stocks of Gold at the Close of 1940, 1942 and 1943 (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, 1942 (e)	Per capita	Total Gold Stock Value, 1943 (e)	Per capita
	$	$	$	$	$	$
United States (d)	21,991,102,000	165·98	22,726,255,000	168·85	21,937,794,000	159·65
Canada (f)	7,251,000	0·63	5,629,000	0·49	5,346,000	0·46
Mexico	47,000,000	2·45	39,000,000	1·95	203,000,000	9·60
Argentina	438,078,000	34·33	353,728,000	25·80	939,000,000	68·50
Brazil	51,000,000	1·18	115,140,000	2·66	254,563,000	5·89
Belgium	736,000,000	88·03	735,000,000	89·02	734,000,000	88·89
Denmark	52,003,000	13·82	44,000,000	11·39	44,000,000	11·30
France	2,000,068,000	47·73	2,000,000,000	47·64	2,000,000,000	47·37
Germany	40,280,000	0·60	29,000,000	0·42	29,000,000	0·42
Great Britain	1,991,000	0·04	1,000,000	0·02	4,665,000	0·10
Italy	137,000,000	3·13	(a)	(a)	(a)	(a)
Netherlands	617,299,000	71·49	506,000,000	56·71	500,000,000	56·03
Norway	84,388,000	20·03	(a)	(a)	(a)	(a)
Portugal	92,284,000	12·69	59,000,000	7·60	60,000,000	7·73
Roumania	157,400,000	8·01	241,000,000	12·09	316,000,000	15·85
Russia (Soviet Union)	(a)	(a)	(a)	(a)	(a)	(a)
Spain	(a)	(a)	42,000,000	1·60	91,000,000	(a)
Sweden	304,955,000	48·52	335,000,000	52·58	387,000,000	60·74
Switzerland	502,115,000	120·29	824,000,000	193·56	964,000,000	226·45
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	1·01	(a)	(a)	(a)	(a)
Netherlands East Indies	139,659,000	2·17	(a)	(a)	(a)	(a)
Egypt and Anglo Egyptian Sudan	52,000,000	3·10	112,208,000	4·85	112,208,000	4·85
Australia	10,683,000	2·43	(a)	(a)	1,953,000	0·27
New Zealand	23,087,000	14·41	23,087,000	14·13	23,087,000	14·13
Union of South Africa	352,713,000	36·00	634,457,000	60·30	710,360,000	67·51
Other countries	804,251,000	....	(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.

(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.

(f) Exclusive of gold held by Foreign Exchange Control Board.

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.

Table 48.—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	1936	77·09
1750	14·55	1910	38·22	1937	77·44
1800	15·68	1915	40·48	1938	80·39
1850	15·70	1920	20·28	1939	88·84
1875	16·64	1925	29·78	1940	99·76
1880	18·05	1930	53·74	1941	99·73
1885	19·41	1932	73·29	1942	90·57
1890	19·75	1933	59·06	1943	77·67
1895	31·60	1934	72·49	1944	
1900	33·33	1935	54·19		

ORDER-IN-COUNCIL P.C. 1008—FEBRUARY 15, 1945

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. 1004 dated February 18, 1944, 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, 1944,

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, 1945, 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, 9/10ths 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 reported 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 the 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

Gold deposited at the Mint again showed a decrease, the receipts being the lowest since the year 1933. 3,857 deposits weighing 3,487,810 ounces gross were received from Canadian Mining Companies and sundry persons, and 96 deposits weighing 49,924 ounces gross were received from the Dominion of Canada Assay Office, Vancouver, B.C. The total gross weight of gold received at the Mint, including mutilated gold coin, was 3,537,734 ounces, containing by assay 2,862,048 ounces fine gold and 385,991 ounces fine silver. This shows a decrease as compared with the year 1943 of 1,037 in the number of deposits, gross weight 918,703 ounces, gold 754,910 ounces fine and silver 88,394 ounces fine.

The net amount paid by cheque to depositors was $107,504,172.45. In addition 5,603·962 ounces of fine gold with a statutory value of $115,844.59 were also issued in payment of gold deposits.

Postage collected for the Postmaster General on deposits shipped by mail, postage collect, amounted to $13,165.36.

There were 577 gold deposits received at the Dominion of Canada Assay Office, Vancouver, B.C.

Details of the origin of the bullion deposited at Vancouver and Ottawa are shown in the following table.

Source	Gross Weight	Fine Gold	Fine Silver
	Ounces	Ounces	Ounces
From Canadian mines and refineries—			
Ontario	2,135,742·075	1,724,975·760	225,046·97
Quebec	1,073,876·275	880,766·502	120,627·19
British Columbia	135,588·080	109,626·768	19,824·88
Manitoba	103,842·375	84,301·336	6,297·93
Yukon	30,569·640	23,814·864	5,124·83
Nova Scotia	6,251·250	5,841·465	187·68
Northwest Territories	30,644·600	21,927·511	5,760·22
Alberta and Saskatchewan	79·315	57·322	5·05
Total from mines and refineries	3,516,593·610	2,851,311·528	382,874·73
From jewellery and scrap	20,200·410	9,456·454	2,784·56
Mutilated gold coin	0·236	0·213	....
Grand Total	**3,536,794·256**	**2,860,768·195**	**385,659·29**

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

	Ounces Fine
6,858 Trade Bars to Bank of Canada	2,739,922·833
Depositors	5,603·962
Sales to Manufacturers	74,866·088
Medals	5·009
Sweep	9,357·108
	2,829,755·000

This total shows a decrease of 815,984·964 ounces fine as compared with the year 1943.

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

The sum of $1,436,665.86 was disbursed for the purchase of gold bullion deposited at this office during the calendar year 1944.

A statement of the origin, weights, etc., of the deposits received during 1944, and comparative statements for the years 1939 to 1944, inclusive, are shown hereunder.

Source	Number of Deposits	Gross Weight	Fine Gold	Fine Silver
		Ounces	Ounces	Ounces
Yukon Territory	207	30,569·64	23,814·864	5,124·83
British Columbia	253	15,360·93	12,486·271	2,015·01
Alberta and Saskatchewan	4	68·59	51·498	4·16
Jewellery and dental scrap	113	2,984·71	1,326·395	505·55
	577	48,983·87	37,679·028	7,649·55

THE TORONTO STOCK EXCHANGE

Price Action of Canadian Gold Mining Shares in 1944 and the First Six Months of 1945
(By J. B. WHITE, President, The Toronto Stock Exchange)

In common with the other war years, the trend of Canadian gold mining shares during 1944 and the first six months of 1945 continued to mirror exactly the progress of Allied arms in Europe. As depicted by the Toronto Stock Exchange gold index, the prices of gold shares moved hesitantly through the first few months of 1944 to jump sharply with the Allied invasion of Normandy in June in a move similar to that which had occurred with the invasion of North Africa in the late autumn of 1942.

From June on, the trend was progressively higher with the sweep to the Rhine, the monthly average index figure mounting from 100·89 to a high of 112·35, only to break sharply in December to 107·88 when Von Runstedt mounted his abortive offensive on the American lines. His subsequent defeat was portrayed in the index by an average gain of some five points in the January figures, and steadily advancing monthly prices, culminating in the Third Reich's capitulation in May, to 126·40. June's average monthly price, the highest the Exchange's index had been since 1937, was 127·64 and contrasted with a low during the war years of 53·15, the month before the landing in North Africa in 1942.

The following table gives the monthly averages of the Toronto Stock Exchange gold index for the period under review and also since 1939.

Table 49.—Monthly Average During War Period of Toronto Stock Exchange Gold Index, 1939-1945

Month	1939	1940	1941	1942	1943	1944	1945
January	....	120·59	107·30	81·52	73·88	103·55	112·29
February	....	117·50	99·97	74·14	78·17	103·98	119·93
March	....	111·99	100·58	67·99	80·20	101·93	118·84
April	....	110·33	99·35	62·84	83·59	101·57	118·63
May	....	94·51	96·58	64·14	82·10	110·89	126·40
June	....	80·19	97·80	69·39	83·97	104·53	127·64
July	....	83·19	101·12	63·29	98·20	112·28	....
August	....	89·78	101·09	60·07	94·51	111·94	....
September	104·07	97·10	101·12	59·51	99·65	112·35	....
October	110·47	101·22	96·55	53·15	97·19	110·45	....
November	116·04	107·53	90·10	60·77	96·00	110·41	....
December	118·30	107·59	84·95	65·45	96·98	107·88	....

As with the trend, volume in gold shares on the Toronto Stock Exchange followed the vicissitudes of the war during the past eighteen months. Trading totals show 167,127,391 shares for 1944, the months contributing most being those of June to September. It must be pointed out that the trading figures used represent all stocks traded, and not the golds alone, since the latter are not segregated as such in Toronto Stock Exchange share totals. Nevertheless, the total figures give a good indication of the volume in the golds because of the dominance of this type of stock in Exchange share transactions.

Similarly, the share totals for the first six months of 1945 also show the influence of war. April's turnover was 74 million shares, topping the previous high made in March of 1934 of 67 millions, and higher than all of 1942 or 1941. May's volume was on a like scale and helped to lift the half year's figures to 263,023,860 which is more than double that of the whole of the 1944 and more than seven times that of the whole of 1942.

Table 50.—Volume of Trading on the Toronto Stock Exchange, 1939-1945

Year	First Six Months (January-June	Entire Year (Twelve Months)
1939	68,313,702	113,995,569
1940	45,113,229	70,748,529
1941	23,889,909	51,145,467
1942	19,089,607	36,870,992
1943	50,820,393	109,702,365
1944	94,100,636	172,234,102
1945	240,046,947	....

GOLD LISTINGS ON THE TORONTO STOCK EXCHANGE

A significant factor evincing the increased public awareness of gold mining is found in the number of new gold issues listed on the Exchange during 1944 and the first half of 1945. In this period 44 new gold companies applied for listing privileges and were subsequently approved by the listing committee of the Exchange. The new companies, although mostly of the Yellowknife area, represented every mining camp in the Dominion and comprised such issues as Frobisher, East Sullivan, Campbell, Red Lake, Hosco, Heva, Aubelle, Giant Yellowknife, Harricana, Eldona, Donalda, Lexindin and Louvicourt.

The following table gives the aggregate number of outstanding shares of all gold mining companies (seniors, juniors and gold prospects) listed on the Toronto Stock Exchange, together with the total market valuation at the end of each month. Total listed gold mining companies is also given as well as the total number and valuation of all companies listed.

Table 51.

Year	Total Gold Shares Issued	Quoted Market Values	Number of Issues	Total Value of all Stocks	Total Number of Issues
1944					
January	318,263,925	563,220,541	111	4,564,334,002	550
February	318,476,925	539,398,848	111	4,529,640,824	553
March	323,728,368	541,599,969	113	4,458,375,582	554
April	328,639,379	576,057,275	114	4,688,297,448	574
May	333,530,618	594,736,772	116	4,817,744,490	577
June	342,960,228	658,230,456	121	5,280,786,361	583
July	347,866,154	676,328,268	123	5,290,180,741	591
August	345,271,213	671,991,392	122	5,303,515,070	592
September	351,796,223	661,790,717	125	5,244,515,763	599
October	352,580,223	639,988,615	125	5,220,804,543	599
November	352,955,223	647,741,818	125	5,243,410,083	601
December	355,628,228	652,830,904	126	5,376,505,274	604
1945					
January	361,588,238	739,793,609	128	5,555,196,676	605
February	368,308,248	774,857,585	131	5,881,827,660	608
March	385,637,446	745,828,934	137	5,772,564,233	616
April	398,809,333	831,481,576	142	6,020,365,398	621
May	420,461,812	841,424,188	150	6,139,403,004	632
June	445,234,680	873,870,252	162	6,365,934,969	646

THE ALLUVIAL GOLD MINING INDUSTRY, 1944

In 1944, and for many years past, the greater part of the Canadian production of alluvial gold came from the Yukon Territory and British Columbia; relatively small quantities are also obtained in Alberta, Saskatchewan, and sometimes Quebec.

During the year under review there were 33,274 troy ounces of fine gold recovered from crude gold obtained in Canadian alluvial mining operations. This represents a decrease of 37 per cent from the corresponding output in 1943 and 70 per cent from that of 1942. These decreases reflect the increasing scarcity of experienced men available for mining operations and prospecting.

Quebec and Ontario.—No placer gold mining operations were reported during 1943 and 1944 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. During 1944 receipts of gold, considered as being placer in origin, at the Vancouver assay office, and the Royal Canadian Mint, Ottawa, included 51 fine ounces from Alberta and 5 ounces from Saskatchewan. The exact locations from which this metal came are not known.

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 1944 were made chiefly from deposits located in the Atlin and Cariboo districts; other districts to report production included Kamloops, Quesnel, Fort Steele, Revelstoke, Vancouver Island and Clinton. It was estimated that 9,402 troy ounces of fine gold were recovered from crude alluvial gold produced in British Columbia during 1944.

REVIEW OF PLACER MINING ACTIVITIES IN THE YUKON TERRITORY DURING THE YEAR 1944

(Department of Mines and Resources)

In the Dawson District the extent of mining operations was dependent entirely on man power available, and the situation in this respect was even worse than in 1943.

The Yukon Consolidated Gold Corporation, Limited, operated three dredges throughout the season, namely, No. 3 on Hydraulic Lease No. 18 in the Klondike River valley; No. 4 on Bonanza Creek, and No. 7 on Quartz Creek. Dredge No. 7 was closed down for a few weeks during the summer and the crew was put on No. 10 on Middle Dominion Creek, and this dredge was operated for a time until it was moved into a safer harborage. In 1943 five dredges were operated, No. 10, and No. 11 on Hunker Creek being the other two operated in 1943.

Sufficient labour was available in addition to the three dredge crews to operate stripping plants on Middle Dominion Creek, on Hunker Creek, and on Quartz Creek.

The Hydro-electric power plant was operated throughout the whole year, as well as the machine shop at the Bear Creek camp.

The season was very favourable for mining, and there was an ample supply of water, more than in ordinary years.

Clear Creek Placers, Limited, operated a dredge on the Left Fork of Clear Creek for a full season, with excellent results. Scarcity of labour prevented further expansion of operations of this company in the Clear Creek area.

Mining operations were carried on by individual miners on Bonanza, Quartz, Hunker, Last Chance, Gold Bottom, Dominion, Gold Run and Eldorado Creeks, and on Glacier and Miller Creeks. Hydraulic operations were carried on by Osborn and Colbourne on Bonanza Creek, Bremner and Franich and Wilson and Townshend on Last Chance Creek, Medby and Sembsmoen on Miller Creek, and W. A. Williams on Glacier Creek.

In the Mayo Mining District placer mining was continued on Dublin Gulch by O. Lunde, and on Highet Creek by E. Middlecoff.

In the Whitehorse District, B. Beloud and associates who have placer property on Bates and Iron Creeks put in a tote road from the Haines Highway Cut-off to Mush Lake. The Territorial Council contributed $2,500 towards the cost of this.

Placer gold production, as reflected in royalty export tax returns for the calendar year 1944, was as follows:

Dawson district	29,092.29 ounces
Mayo district	272.00 "
Whitehorse district	178.71 "
Total	29,543.00 "

The Government Regulation permitting the renewal of placer claims and prospecting leases by payment of fees only, and without representation work, resulted in practically all ground held in 1943 being renewed during 1944. There was great activity in the staking of claims and prospecting leases during 1944. Two hundred and sixty-nine and one-half miles of ground on creeks and rivers were located in prospecting leases and for which grants were issued. In addition, renewal prospecting grants were issued for fifty miles, making a total of three hundred and nineteen and one-half miles of creeks and valleys held under prospecting grants. This was divided as to districts as follows:

Dawson Mining District	254½ miles
Whitehorse Mining District	53 "
Mayo Mining District	12 "

Ground held under placer claim grants was as follows:

Dawson Mining District	1,750 claims
Whitehorse Mining District	57 "
Mayo Mining District	78 "
Total	1,885 "

Of this total 164 were new locations, 121 of these being in the Dawson District, 39 in the Whitehorse District, and 4 in the Mayo District.

During 1944 the Numalake Mines, Limited, of Toronto, Ontario, carried on prospecting and development operations on Scroggie Creek with a small crew. Over one hundred miles of prospecting leases have been acquired by this Company, and it is anticipated that if labour conditions improve and equipment can be secured, prospecting on a much larger scale will be carried on in 1945.

Clear Creek Placers, Limited, and its allied company the Yukon Alluvial Golds, Limited, have acquired considerable mileage of new ground under leases. In post war years they are planning a rather ambitious development program in Yukon Territory. During 1944 they optioned large areas on Matson, Thistle, Barker and Rosebute Creeks. At the present time a crew is on Matson Creek putting down twenty or thirty prospecting shafts, and if the results are sufficiently encouraging a drill and equipment will be put in this inaccessible area for prospecting purposes. Drilling operations are planned on Thistle Creek to start in May or June, 1945, if men are available for a prospecting crew. A drill will also be placed on Barker Creek during the summer of 1945 for prospecting purposes.

There appears to be a greater interest in prospecting with modern equipment on many old time placer creeks which have been prospected or worked to a very limited extend in the past

Table 52.—Summary Statistics of Alluvial Gold Mining in Canada, 1943 and 1944

—	1943			1944		
	British Columbia (d)	Yukon (e)	Alberta (a)	British Columbia (d)	Yukon (e)	Alberta and Saskatchewan (a)
Number of firms and individual operators (†)	39	4	....	41	6	....
Capital employed $	631,157	10,741,692	....	(g)	(g)	(g)
Number of employees	62	175	....	72	139	....
Salaries and wages paid $	101,119	545,164	....	116,132	482,424	....
Electricity generated for own use K.W.H.	260,000	10,605,900	....	260,000	12,698,500	....
Electricity generated for sale	....	4,301,788	....	....	5,498,700	....
Crude gold recovered crude oz.	14,600	52,710	22	11,433	30,570	66
Platinum recovered oz.	7	....	....	....	....	....
Value of platinum recovered $	269	....	....	....	....	....
Quantity of material handled (f) cu. yd.	754,202	7,273,915	....	531,737	4,687,174	220
Tungsten recovered (pounds concts.) lb.	....	12,083	....	....	....	....
Length of ditches miles (b)	53	50	....	47	50	....
Total gross value of alluvial products $	451,000	1,598,164	808	361,977	916,877	2,271
Fuel and electricity used (purchased) $	8,288	43,811	....	8,470	35,121	....
Process supplies used $	4,441	50,952	....	7,368	6,355	....
Cost of freight and express on dust, nuggets, bullion, etc., shipped (c) $	829	30,742	....	1,140	15,787	....
Cost of smelter, refinery and mint treatment on material shipped (c) $	2,240	16,455	....	1,464	8,419	....
Total net value of alluvial products $	435,202	1,456,204	808	343,535	851,215	2,271

(a) Recoveries for Alberta and Saskatchewan represent receipts of crude gold from Alberta and Saskatchewan at the Dominion Assay Office, Vancouver, B.C., or Royal Canadian Mint, Ottawa, Ont. No other statistics available.
(b) Includes flume; in use.
(c) Information not completely available.
(d) Value of crude gold in Canadian funds in 1944 was estimated to be \$31.66 per crude ounce. In 1943 it was \$30.87.
(e) Value of crude gold in Canadian funds in 1944 was estimated to be \$29.99 per crude ounce. In 1943 it was \$30.10.
(f) Includes some overburden or barren material. Partly conjectural.
(g) Not compiled or recorded in 1944.
(†) In addition to the number shown in the table, there were numerous small operators from whom returns were not obtainable; subject to revision.

Table 53.—Alluvial Gold Recovered and Quantity of Material Handled (†), 1925-1944

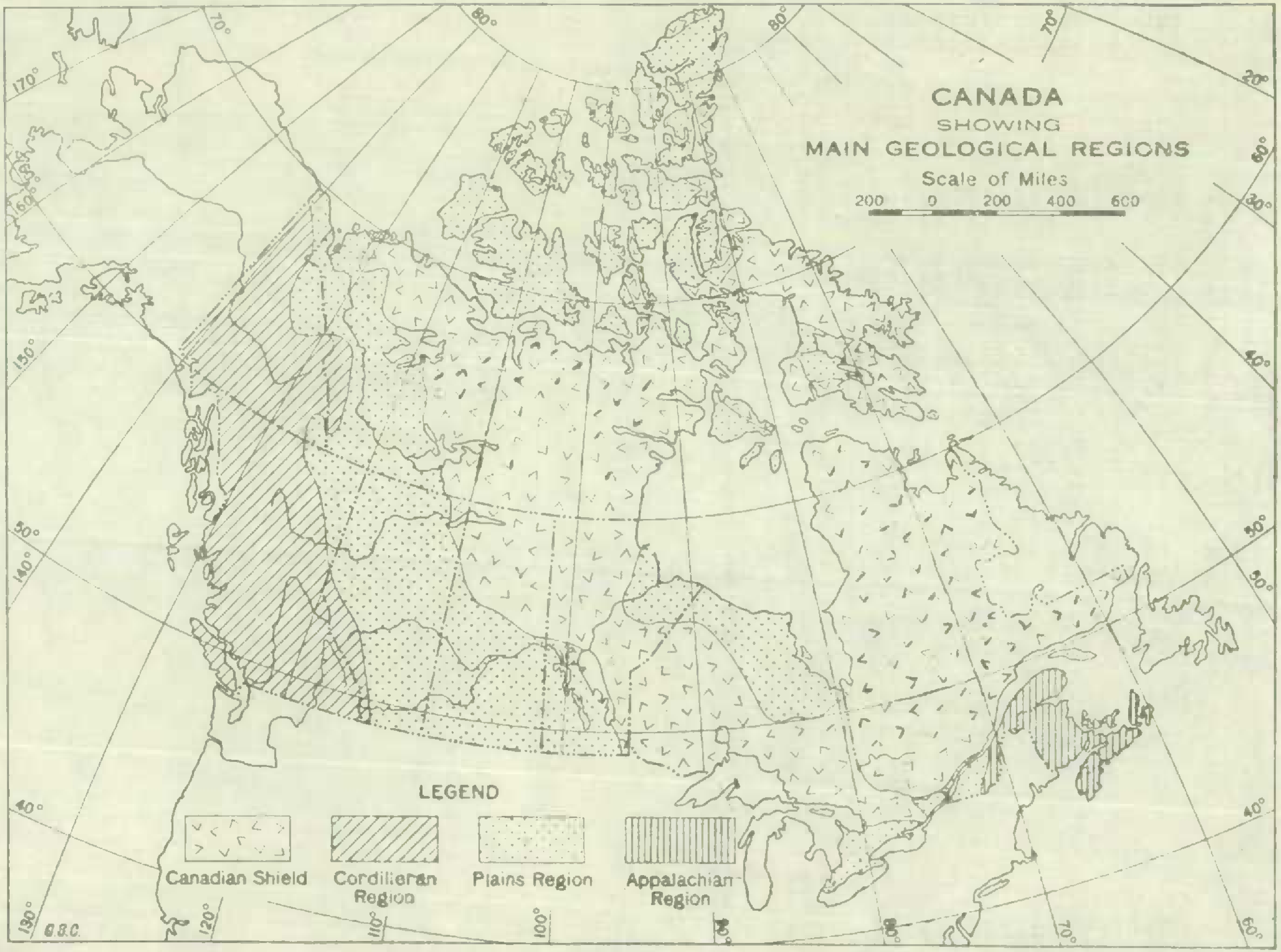
Year	British Columbia				Yukon				Average value gold per fine oz.
	Material handled (*)	Gold recovered	Ounces per cu. yd.	Value per cu. yd.	Material handled (*)	Gold recovered	Ounces per cu. yd.	Value per cu. yd.	
	cu. yd.	fine oz.	fine oz.	$	cu. yd.	fine oz.	fine oz.	$	$
1925	(a)	13,181	(a)	....	3,103,892	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	3,559,042	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	8,007,159	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	79,905	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	(b) 83,198	0·0070	0·2695	38·50
1943	754,202	11,680	0·0156	0·6006	8·028,117	(b) 41,157	0·0051	0·1964	38·50
1944	531,737	9,402	0·0177	0·6815	4,687,174	(b) 23,816	0·0050	0·1956	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 include 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
G.S.C.

THE AURIFEROUS QUARTZ MINING INDUSTRY IN CANADA, 1944

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.

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 to the St. Lawrence and (4) the Appalachian region embracing southeastern Quebec and the Maritime Provinces. A description of these regions, by George Hanson, Ph.D., Chief Geologist of the Geological Survey, Ottawa, appeared in the Dominion Bureau of Statistics' Annual Mining Report for 1943.

In 1944 mining operations were conducted at 262 auriferous quartz mines compared with 156 in 1943. The number of producing properties totalled 85 during the year under review as against 135 in the preceding year and 33 in 1923. From official returns received, it was estimated that 6 of the more important gold mines ceased or suspended regular production in 1944 compared with 22 in 1943.

The gross value of output of the entire auriferous quartz mining industry, including the value of all recoverable metals, gold, silver, etc., totalled $94,263,416 in 1944 compared with $116,833,847 in 1943. Of the 1944 total, $64,870,440 represented recoveries from Ontario ores, $20,179,341 from Quebec ores and $6,627,114 from the gold mines of British Columbia.

Employees in the lode gold mining industry totalled 17,226 compared with 19,038 in 1943 and 5,524 in 1923. Salaries and wages paid amounted to $37,023,505 against $40,665,283 in the preceding year. Fuel and purchased electricity consumed by the industry in 1944 totalled $5,895,117 and the cost of explosives, drill steel and other process supplies used amounted to $11,174,746. A total of $10,084,691 was paid in 1944 by operating Canadian gold mining companies in Government taxes and $1,319,620 expended for prospecting and preliminary exploration of new areas or deposits.

BUREAU OF MINES, OTTAWA, EQUIPPED TO SERVE CANADA'S GOLD INDUSTRY

(Bureau of Mines, Ottawa, Canada)

After three years of declining production, the results of conditions arising from the war, the outlook for Canada's gold industry is improving. The recent lifting of restrictions on development work has largely cleared the way for an expansion of activities, though it will probably be several months before sufficient labour and supplies become available to enable the industry to greatly extend its operations. Aside from the producing mines, attention has been centred chiefly on exploratory work which has been exceptionally active during the past year or more, especially in Quebec, Manitoba and the Northwest Territories. From the results of this work to date it is apparent that many properties will be added to the list of producers in due course, on some of which large deposits have been disclosed. Also, as conditions improve, operations at producing properties will be expanded. These operations were, in many cases, greatly curtailed owing to war conditions, and at some mines production was discontinued. Thus the stage appears to be set for a steady enlargement of the industry's activities, with the likelihood that its past achievements will eventually be matched, or even surpassed. There is still considerable ground to be regained, however, as is evident from the fact that gold production has decreased in value from a peak of $205,789,392 in 1941 to $112,532,073 in 1944. Returns for the first five months of 1945 show also that production was appreciably lower than in the corresponding period of 1944.

The anticipated expansion in the industry is of special interest to the Bureau of Mines in Ottawa, for if past experience can be used as a guide, the facilities of its Ore Dressing and Extractive Metallurgy Laboratories will be used to work out treatment processes for most of the milling plants that come into operation. Prior to 1941, by far the greater part of the work in the Laboratories was on gold ores from mining areas throughout the Dominion. Gold production had been increasing steadily and for several years in succession the annual value of gold output exceeded that of all the other metals. From 20 to 30 milling plants were entering production each year, and even though additions had been made to its facilities, the Bureau found it difficult at times to handle the many requests for test work on gold ores. To an increasing extent the ores received were refractory, containing either arsenopyrite or pyrite, and frequently such ores require roasting to liberate the gold. Even then the gold recovery is often in the neighbourhood of 90 per cent, compared with recoveries of 95 per cent or higher in the case of ores free of arsenic and pyrite.

Ores from several of the gold prospects which have been receiving active exploratory attention are known to be refractory to a varying degree and thus the experience gained by the Bureau in working out treatment methods for these types of ores will be of particular advantage. For its work on gold and other metallic ores, the Bureau has all the necessary equipment for small and large-scale tests, and the layout allows for flexibility in the devising of flow sheets. For large-scale work the equipment includes a sampling plant with a capacity of four tons an hour; two large grinding units with classifiers; three batteries of flotation machines; small ball mill units for use in grinding middlings; a gravity concentrative section with a full deck Wilfley table and three tables of quarter deck size; a pair of jigs; magnetic concentrating equipment, comprising various types of high and low intensity separators; a sink-and-float pilot plant; a precipitating unit; and a small cyanide plant with four agitators and thickeners and drum type filter and accessories. Fully equipped laboratories are also maintained for assay, chemical, microscopic and spectroscopic analyses.

Samples of ores from a few hundred pounds to 50 tons or more are accepted for investigative work, and a staff of engineers undertakes the development of the most economic method of treatment, and prepare a report detailing the results that may be anticipated and a flow sheet by which such results may be attained. The samples originate from prospectors; prospecting and mining syndicates; the mining companies that develop the properties to a stage where a milling plant is erected; consulting engineers; contractors who design and erect the plants; and operating companies who may be experiencing difficulties in their extraction methods, or who are endeavouring to improve their methods of treatment.

Conditions governing the shipment and acceptance of samples of ores, minerals and metallurgical products for examination and test are as given below.

The application should state the exact location of the property from which the sample was taken and the nature of the test work desired.

Samples should be representative of the grade and character of the ore that it is proposed to treat. According to the nature and scale of the tests desired, the size of the sample should be within the following ranges:

1. For examination and identification of the mineral constituents only—from a few pounds up to 100 pounds.
2. For examination and preliminary tests—100 pounds to 1,000 pounds.
3. For examination, preliminary tests, and for small-scale continuous tests—2 to 5 tons.
4. For large-scale continuous tests on tonnage check basis—5 tons to carload lots.

All samples under two tons in weight must be bagged and properly tagged. Two tons or over may be shipped in bulk if desired.

All transportation charges must be paid by the shipper. These charges must be prepaid, except on shipments from points where there is no Agent, in which case the Bureau of Mines will pay and will bill the shipper for the amount. No examination or test work will be made until reimbursement of such payment is made.

In addition to the transportation charges, the shipper of bulk or tonnage samples intended for analysis only, must pay a fee based on the size of the bulk sample and on the elements determined. This fee is payable in advance of submittal of the report of the analysis.

Information regarding the results of any work undertaken in the Laboratories, whether contained in a report or in related correspondence shall not be used as publicity or advertising matter for the sale of shares in any promotion.

Shipments should be addressed to "The Ore Dressing and Extractive Metallurgy Laboratories, Bureau of Mines, 552 Booth Street, Ottawa, Canada".

Co-operation of the shipper's representative and consulting engineers in doing the test work is welcomed, and in this connection it may be noted that the facilities of the Laboratories have been used at various times by several mining companies in working out some particular problem or process, using their own staff, with the guidance of the Bureau's engineers.

Although research and investigative work in ore dressing and extractive metallurgy has been left mainly with the Dominion Government, the provinces of British Columbia, Ontario, Quebec, and Nova Scotia have separately established less pretentious laboratories that have been of noticeable assistance to the mineral industries in the respective provinces. The other provinces, where mining is on a smaller scale, have no special laboratory facilities for such work, except in some respects through provincial assistance to university laboratories.

In British Columbia, the Metals and Minerals Division of the British Columbia Industrial and Scientific Research Council is carrying on the work of the British Columbia War Metals Research Board which ceased to function at the close of 1944. Its laboratory is housed in the Mining Building of the University of British Columbia and will be available to render useful service within the Province to the mineral industry.

In Ontario, the Ontario Research Foundation in Toronto does a very limited amount of ore dressing work, but does considerable work on other metallurgical problems, the Foundation is almost self-sustaining by means of service charges from industry. The Ontario Department of Mines provides an assay and mineral identification service to prospectors free of charge or at nominal cost.

The Province of Quebec provides a service through its Department of Mines to prospectors by maintaining well equipped chemical, assay, spectrographic, and mineralogical laboratories. The Province has supplied certain universities with ore dressing and metallurgical equipment. For instance, the Laval University Laboratories have been equipped with modern testing facilities.

In Nova Scotia, the Provincial Government has provided the Nova Scotia Technical College with small-scale equipment for test work in ore dressing.

The Bureau of Mines in Ottawa co-operates fully with all the provinces by supplying any information desired and by supplying the provincial departments concerned copies of all reports on investigations on ores originating in the respective provinces.

Table 54.—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
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	843,463	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**	(e) **40,665,283**	**6,387,869**	**12,773,650**	**453,720**	**1,620,898**	**116,833,817**	**95,597,710**
1944—											
Nova Scotia	3	3	(f)	72	100,670	29,710	29,970	352	2,138	218,420	156,250
Quebec	144	146	(f)	4,516	9,302,580	1,557,531	2,986,898	83,946	530,613	20,179,341	15,020,353
Ontario	75	76	(f)	11,119	24,452,204	3,838,979	7,343,078	101,730	773,600	64,870,440	52,813,053
Manitoba	1	1	(f)	180	372,871	97,459	125,465	3,329	17,520	1,568,175	1,324,402
Saskatchewan	1	1	(f)	20	31,603	4,795	1,662	.....	.....	.....	−6,457
British Columbia	21	23	(f)	1,241	2,542,570	306,196	585,135	182,046	253,839	6,627,114	5,299,898
Northwest Territories	12	12	(f)	78	221,007	60,447	102,538	1,671	8,385	799,926	626,885
Yukon	.....	.....	(f)	.....	.....	.....	.....	.....	.....	.....	.....
Canada	**257**	**262**	(f)	**17,226**	(e) **37,023,505**	**5,895,117**	**11,174,746**	**373,074**	**1,586,095**	**94,263,416**	**75,234,384**

(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; 1944—85.

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

(e) Includes $6,088,392 in salaries in 1943 and $5,871,597 in 1944.

(f) Not recorded in 1944.

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

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Table 55.—Principal Statistics Relating to Producers Only in the Auriferous Quartz Mining Industry in Canada, 1944

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 (c)	Net value of bullion, ore, concentrates or residues shipped from mines (f)
		$		$	$	$	$	$	$	$
Nova Scotia	2	(e)	70	98,122	29,710	29,970	352	2,138	218,420	156,250
Quebec	21	(e)	4,159	8,795,121	1,550,597	2,977,725	83,946	530,613	20,179,341	15,036,460
Ontario	43	(e)	10,985	24,205,540	3,807,970	7,298,532	101,730	773,600	64,870,440	52,888,608
Manitoba	1	(e)	180	372,871	97,459	125,465	3,329	17,520	1,568,175	1,324,402
Saskatchewan	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
British Columbia	17	(e)	1,198	2,482,044	304,930	585,035	182,046	253,839	6,627,114	5,301,264
Northwest Territories	1	(e)	65	200,293	60,240	102,513	1,671	8,385	799,926	627,117
Yukon	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total Canada 1944	**85**	(e)	**16,657**	(d) **36,153,991**	**5,850,906**	**11,119,240**	**373,074**	**1,586,095**	**94,263,416**	**75,334,101**
Total Canada 1943	**135**	**211,116,754**	**18,933**	(d) **40,485,008**	**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**	(d) **54,033,613**	**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**	**178,794,078**	**147,289,865**
Total Canada 1939	**232**	**214,326,089**	**29,001**	**50,891,920**	**7,701,026**	**19,001,782**	**694,165**	**2,249,312**	**160,014,172**	**130,367,887**

(a) Explosives, etc.
(b) Includes handling charges.
(c) Value of bullion *produced* plus value of ore, concentrates, etc., *shipped*.
(d) Includes $5,560,946 in salaries in 1944, $6,051,901 in 1943 and $6,878,890 in 1942.
(e) Not recorded in 1944.
(f) Gross value less cost of fuel, process supplies, freight and treatment charges.

Table 56.—Ores Mined and Milled, Crude Bullion Recovered and Crude Bullion and Concentrates Shipped in the Auriferous Quartz Mining Industry, 1944

—	Nova Scotia	Quebec	Ontario	Manitoba	Saskatchewan	British Columbia	Northwest Territories	Yukon	**Canada**
Number of producing mines	2	21	43	1	...	17	1	...	**85**
Ore mined ton	15,568	3,270,889	6,944,512	140,085	420	397,014	22,007	...	**10,790,495**
Material discarded (sorted) ton	...	87,549	135,519	...	...	8,416	3,336	...	**234,820**
Ore milled (ground, etc.) ton	15,593	2,962,578	6,800,568	140,085	...	393,206	18,869	...	**10,330,899**
Tailings retreated ton	...	2,500	15,732	...	...	...	...	...	**18,232**
Gold content of ores, slags, residues and concentrates shipped (*)—									
To Foreign smelters fine oz.	...	...	19,302	...	...	70,886	...	...	**90,188**
Canadian smelters fine oz.	...	37,001	2,004	...	...	1,288	...	...	**40,293**
Bullion bars shipped—									
Gold content fine oz.	5,738	482,166	1,642,236	40,668	...	99,754	20,723	...	**2,291,285**
Silver content fine oz.	184	121,127	278,567	6,306	...	17,684	5,420	...	**429,288**
Bullion produced by amalgamation crude oz.	6,044	42,350	151,069	4,374	...	74,983	12,319	...	**291,139**
Bullion produced by cyanidation crude oz.	...	609,037	1,892,131	55,813	...	43,221	16,506	...	**2,616,708**
Total Bullion Produced crude oz.	6,044	651,387	2,043,200	60,187	...	118,204	28,825	...	**2,907.847**
Content of bullion bars produced—									
Gold fine oz.	5,738	480,644	1,654,734	40,668	...	97,583	20,723	...	**2,300,090**
Silver fine oz.	184	121,136	274,423	6,307	...	17,696	5,420	...	**425,166**
Gold value (standard) $	117,234	9,935,793	34,206,501	840,694	...	2,017,249	428,381	...	**47,545,852**
Silver value $	71	52,088	108,809	2,434	...	6,869	2,092	...	**172,363**
Exchange premium on bullion bars produced $	101,115	8,569,001	29,500,390	725,047	...	1,739,752	369,453	...	**41,004,758**
Value of ores, concentrates, slags and residues sold (shipped) $	...	1,622,459	1,054,740	...	...	2,863,244	...	...	**5,540,443**
Total Gross Value of Production $	**218,420**	**20,179,341**	**64,870,440**	**1,568,175**	...	**6,627,114**	**799,926**	...	**94,263,416**
Value of fuel, electricity and process supplies used, also freight on shipments, marketing, smelter and refining charges $	62,170	5,158,988	12,057,387	243,773	6,457	1,327,216	173,041	...	**19,029,032**
Net Value of Production $	**156,250**	**15,020,353**	**52,813,053**	**1,324,402**	**−6,457**	**5,299,898**	**626,885**	...	**75,234,384**

(*) In addition, there were 481,622 ounces of silver contained in concentrates, etc., shipped to smelters. (See following table for other details).

Table 57.—Ores, Concentrates, Slags, Etc., Shipped to Smelters from Canadian Gold Mines, 1930-1944

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.
1930	52,540	22,910	1,187	9,665	2	117	70,497	22,432	18,276	46,102	53	[illegible]
1931	51,579	21,756	3,120	16,805	12	1,505	24,244	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	29,688	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	50,949	40	34,704
1944	205,379	26,535	4,835	11,900	143	1,858	....	....	20,755	54,233	73	35,955
Grand Total	**1,832,406**	**387,676**	**63,513**	**233,990**	**2,502**	**42,591**	**166,370**	**106,342**	**532,914**	**1,473,726**	**2,230**	**314,033**

Note.—In addition, other material contained in ores shipped by gold mines to Canadian plants in 1944 included: Silver, 10,926 fine ounces; copper, 892,565 pounds; lead, 10,123 pounds, and crude As_2O_3, 892,000 pounds.

Note.—In addition, other material contained in ore exported by gold mines in 1944 included: Silver, 470,696 fine ounces; copper, 264,034 pounds; lead, 3,894,312 pounds; tungsten concentrates, 32 tons, and 808 tons refined 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 58.—Ores, Concentrates and Slag Shipped from the Auriferous Quartz Mines in Canada, 1944

—	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	8	6	8	1	8	7
Tons of ore, etc., shipped	335	4,131	208,595	808	1,427	16,729
Metal content—						
Gold oz.	2,004	19,302	37,001	...	1,288	70,886
Silver oz.	3,926	341,602	5,389	...	1,611	129,094
Copper lb.	5,261	...	887,304	...	...	264,034
Lead (a) lb.	...	705,067	...	...	10,123	3,189,245
Antimony (b) lb.	...	...	...	...	...	...
Arsenic lb.	...	...	358	808	...	(c)
Zinc lb.	...	1,021,685	...	...	5,712	...
Tungsten concentrates* lb.	...	7,515	...	...	...	...
Cadmium lb.	...	...	...	...	...	...
Value—Gross $	**74,234**	**980,506**	**1,517,408**	**105,051**	**46,803**	**2,816,441**

(a) Some B.C. gold ores exported contain relatively large quantitites 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) Arsenic not paid for and quantity not reported.

Table 59.—Specified Costs per Ton of Ore Milled at Certain of the Principal Auriferous Quartz Mines in Canada, 1944

Name of Mine	Development and exploration (a)	Mining	Milling	General (b)	Total before taxes (c)	Total including taxes
	$	$	$	$	$	$
QUEBEC						
Beattie Gold Mines (Quebec) Limited	0·61	2·71	2·69	1·02	7·03	(f)
Belleterre Quebec Mines Limited	1,080	4·355	1·369	0·405	7·209	8·677
Canadian Malartic Gold Mines Limited	0·61	1·30	0·70	0·47	3·08	3·10
Francoeur Gold Mines Limited	1·03	2·10	1·57	0·91	5·61	5·65
Lamaque Mining Company Limited	0·80	2·43	0·94	1·03	5·20	6·60
McWatters Gold Mines Limited	0·69	2·51	1·76	1·61	6·57	(f)
O'Brien Gold Mines Limited	1·61	5·01	1·98	2·80	11·40	(f)
Senator-Rouyn Limited	0·86	2·22	1·01	1·13	5·22	5·22
Sigma Mines (Quebec) Limited	0·617	2·320	0·705	0·384	4·026	4·858
Siscoe Gold Mines Limited	0·30	1·73	0·74	0·43	3·20	(f) (g)
Sladen-Malartic Mines Limited	0·46	1·68	0·83	0·37	3·34	3·37
Stadacona Rouyn Mines Limited	0·96	2·24	0·86	0·47	4·53	(f)
West Malartic Mines Limited	0·559	2·110	1·018	0·536	4·223	(f)
ONTARIO						
Porcupine District						
Aunor Gold Mines Limited	0·59	4·17	1·21	1·00	6·97	10·44
Bonetal Gold Mines Limited	0·48	3·32	1·46	0·81	6·07	(f)
Broulan Porcupine Mines Limited	0·40	2·65	0·94	1·18	5·17	(f)
Buffalo Ankerite Gold Mines Limited	1·158	3·355	0·822	0·867	6·202	6·646 (e)
Coniaurum Mines Limited	1·66	3·20	1·20	1·55	7·61	8·45
Dome Mines Limited	0·560	1·889	1·048	0·744	4·241	6·335 (d)
Hollinger Cons. Gold Mines Ltd. (Timmins)	1·0575	3·3284	0·7272	0·9765	6·0896	6·9319
Hollinger Cons. Gold Mines Ltd. (Ross)	0·3495	1·5260	2·0427	0·5984	4·5166	4·9808
McIntyre Porcupine Mines Limited	0·654	4·398	1·050	0·304	6·406	8·096
Pamour Porcupine Mines Limited	0·11	1·20	0·63	0·22	2·16	2·41
Paymaster Cons. Mines Limited	0·90	3·28	1·51	0·61	6·30	6·78
Preston East Dome Mines Limited	1·31	3·52	0·81	0·30	5·94	7·98 (g)
Kirkland Lake District						
Bidgood Kirkland Gold Mines Limited	2·73	3·28	1·60	0·94	8·55	8·55
Macassa Mines Limited	1·41	4·00	1·54	1·76	8·71	10·70
The Teck-Hughes Gold Mines Limited	(h)	3·80	1·26	1·37	6·43	7·42
Upper Canada Mines Limited	1·15	5·30	1·18	1·06	8·69	9·84
Wright-Hargreaves Mines Limited	(h)	5·053	1·600	1·714	8·367	11·713

Table 59.—Specified Costs per Ton of Ore Milled at Certain of the Principal Auriferous Quartz Mines in Ontario, 1944—Concluded

Name of Mine	Development and exploration (a)	Mining	Milling	General (b)	Total before taxes (c)	Total including taxes
	$	$	$	$	$	$
Larder Lake District						
Chesterville Larder Lake Gold Mining Co. Limited...	0·85	1·64	1·09	0·63	4·21	4·21
Kerr-Addison Gold Mines Limited	0·622	1·014	0·675	0·471	2·782	3·528
Omega Gold Mines Limited	0·152	2·896	1·492	0·100	4·640	(f)
Matachewan District						
Hollinger Cons. Gold Mines Ltd. (Young Davidson) ..	0·0383	1·3133	0·8561	0·4723	2·6800	2·8477
Matachewan Cons. Mines Limited	0·271	1·018	0·824	0·543	2·656	(f)
Thunder Bay District						
Leitch Gold Mines Limited	0·97	10·41	3·49	0·38	15·25	20·32
Little Long Lac Gold Mines Limited	2·54	4·14	2·35	1·87	10·90	11·59
MacLeod-Cockshutt Gold Mines Limited	1·6899	3·4087	2·3266	1·7545	9·1797	12·4903
Patricia District						
Central Patricia Gold Mines Limited	0·72	3·22	1·32	1·57	6·83	9·22
Cochenour Willans Gold Mines Limited	2·493	3·332	2·002	2·711	10·538	14·659
Hasaga Gold Mines Limited	0·747	1·506	1·188	0·47	3·91	3·922
Madsen Red Lake Gold Mines Limited	0·370	2·007	1·058	1·013	4·448	5·578
McKenzie Red Lake Gold Mines Limited	0·947	3·39	1·41	1·303	7·05	(f)
McMarmac Red Lake Gold Mines Limited	0·63	1·79	0·77	1·10	4·29	(f)
Pickle Crow Gold Mines Limited	2·22	4·65	1·48	1·58	9·93	(f)
BRITISH COLUMBIA						
Bralorne Mines Limited	1·03	3·56	0·97	3·04	8·60	10·61
Cariboo Gold Quartz Mining Co. Limited	1·435	10·632	3·464	1·069	16·600	19·868
Hedley Mascot Gold Mines Limited	2·13	2·02	2·44	3·45	10·04	10·22
Island Mountain Mines Co. Limited	0·79	7·18	4·11	0·42	12·50	14·10
Kelowna Exploration Co. Limited	1·3265	2·9068	2·1026	3·4127	9·7486	11·8316
Pioneer Gold Mines of B.C. Limited	5·58	6·34	3·58	4·70	20·20	20·20
Sheep Creek Gold Mines Limited (i)	0·133	3·733	1·908	1·398	....	7·172

(a) Exclusive of outside exploration.
(b) Marketing, head office, etc. (exclusive of taxes).
(c) Depreciation not included.
(d) Includes depreciation and outside exploration.
(e) Includes depreciation.
(f) Not recorded, or no taxes reported.
(g) Includes write-offs.
(h) Included with mining.
(i) Data for 1943; milling ceased June 17, 1944.

Table 60.—Dividends Paid and Ore Reserves of Specified Canadian Gold Mining Companies 1944

Name of Firm	Dividends Paid		Estimated Ore Reserve (*)	
	During 1944	Total to Dec. 31, 1944	Total	Average ounces or dwts. fine gold or $ per ton
	$	$	tons	
QUEBEC				
Beattie Gold Mines (Quebec) Limited	....	4,435,036	(a) 3,778,400	0·130 oz.
Belleterre Quebec Mines Limited	....	....	631,660	(o) 0·351 oz.
Canadian Malartic Gold Mines Limited	146,054	2,007,020	(b) 1,690,000	0·123
East Malartic Mines Limited	....	2,200,000	(n) 2,805,399	$7·49
Francoeur Gold Mines Limited	....	208,884	(d) 329,000	0·25 oz.
Lamaque Mining Company Limited	555,650	8,757,521	(c) 2,530,212	4·29 dwts.
Malartic Gold Fields Limited	....	400,000	(e) 534,040 895,845	(e) 0·19 oz. 0·24 oz.
McWatters Gold Mines Limited	....	653,577	(f)	....
Mic-Mac Mines Limited	....	....	(g)	(g)
O'Brien Gold Mines Limited	130,000	1,462,500	(p) 200,151	0·424
Perron Gold Mines Limited	160,000	2,100,000	(l) 263,100	0·199
Powell Rouyn Gold Mines Limited	25,000	287,500	(i) 460,024 100,000	0·135 0·109
Senator-Rouyn Limited	....	102,250	(j) 213,588	0·186
Sigma Mines (Quebec) Limited	900,000	2,850,000	(k) 1,403,000	4·16 dwt.
Siscoe Gold Mines Limited	139,202	8,163,203	(l) 589,372	$4·24
Sladen-Malartic Mines Limited	....	....	(d) 664,000	$4·10
Stadacona Rouyn Mines Limited	....	....	(g)	(g)
Sullivan Consolidated Mines Limited	200,000	2,240,000	(m) 632,100	5·37 dwt.
West Malartic Mines Limited	....	....	(g)	(g)
ONTARIO				
Porcupine District				
Aunor Gold Mines Ltd	400,000	1,400,000	(c) 568,750	0·351 oz.
Bonetal Gold Mines Ltd	....	....	(d)	(d)
Broulan Porcupine Mines Ltd	228,900	1,037,192	345,000	0·18 oz.
Buffalo Ankerite Gold Mines Ltd	105,252	2,727,925	(f) 293,170	$7·464
Coniaurum Mines Ltd	221,339	3,006,412	(g) 77,451	5·86 dwts.
Delnite Mines Ltd	....	625,541	(d)	(d)
Dome Mines Ltd	2,920,002	58,541,873	(c) 2,353,000	(d)
Hallnor Mines Ltd	400,000	5,500,000	(c) 550,372	0·35 oz.
Hollinger Cons. Gold Mines Ltd. (Timmins)	2,263,200	118,549,600	(c) 7,507,976	0·33 oz.
Hollinger Cons. Gold Mines Ltd. (Ross)	....	....	(c) 648,010	0·230 oz.
Hoyle Gold Mines Ltd	....	....	(d)	(d)
McIntyre Porcupine Mines Ltd	2,657,340	35,726,493	(i) 4,444,117	0·3132 oz.
Pamour Porcupine Mines Ltd	250,000	3,300,000	(j) 1,317,000	0·110 oz.
Paymaster Cons. Mines Ltd	86,290	604,034	(k) 562,666	0·227 oz.
Preston East Dome Mines Ltd	600,000	3,300,000	(j) 675,490	0·225 oz.
Kirkland Lake District				
Bidgood Kirkland Gold Mines Ltd	....	....	(d)	(d)
Kirkland Lake Gold Mining Co. Ltd	213,068	4,146,943	(l) 352,968	$14·85
Lake Shore Mines Ltd	1,600,000	92,420,000	(d)	(d)
Macassa Mines Ltd	482,052	6,808,183	(j) 462,800	0·452 oz.
Sylvanite Gold Mines Ltd	395,040	9,060,427	(m) 57,021	(h) (b)
Teck-Hughes Gold Mines Ltd	1,201,786	39,729,152	(j) 285,478	6·92 dwts.
Toburn Gold Mines Ltd	74,000	2,275,500	(j) 77,600	0·51 oz.
Upper Canada Mines Ltd	222,229	1,422,249	(d)	(d)
Wright-Hargreaves Mines Ltd	1,375,000	42,402,500	(n) 1,060,835	$18·76

(a) Exclusive Dorchester mine; January 1, 1945.
(b) Probable; December 31, 1944.
(c) Positive; December 31, 1944; includes broken ore.
(d) January 1, 1943.
(e) Fully developed January 1, 1944.
(f) Operations ceased August 31, 1944.
(g) Data not available at present.
(h) October 1, 1944; broken and probable ore.
(i) March 31, 1945.
(j) January 1, 1944, to 1300 feet.
(k) January 1, 1945; includes 475,500 tons broken ore.
(l) January 1, 1944.
(m) March, 1944.
(n) January 1, 1944; solid and broken ore above 10th level, before dilution; $35.00 gold.
(o) Broken and in place March 31, 1945.
(p) October 1944 broken and probable.
(*) Subject to revision.

Table 60.—Dividends Paid and Ore Reserves of Specified Canadian Gold Mining Companies 1944—Continued

Name of Firm	Dividends Paid: During 1944	Dividends Paid: Total to Dec. 31, 1944	Estimated Ore Reserve (*): Total	Estimated Ore Reserve (*): Average ounces or dwts. fine gold or $ per ton
	$	$	tons	
Larder Lake District				
The Chesterville Larder Lake Gold Mining Co. Ltd.	....	442,568	(o) 470,000	$5·26
Kerr-Addison Gold Mines Ltd.	1,419,090	7,095,451	(p) 8,300,918	0·2004 oz.
Omega Gold Mines Ltd.	....	....	(q) 308,000	0·147 oz.
Matachewan District				
Hollinger Cons. Gold Mines Ltd. (Young-Davidson)	23,762	277,219	(m) 1,125,456	(d)
Matachewan Consolidated Mines Ltd.	....	68,600	(r) 1,150,200	0·108 oz.
Sudbury District				
Jerome Gold Mines Ltd.	....	....	(s) 295,373	0·199 oz.
Thunder Bay District				
Hard Rock Gold Mines Ltd.	....	926,923	(t) 142,000	$10·42
Leitch Gold Mines Ltd.	229,100	1,454,603	(u) 186,226	$30·01
Little Long Lac Gold Mines Ltd.	110,460	3,811,275	(c) 499,449	0·349 oz.
MacLeod-Cockshutt Gold Mines Ltd.	143,124	1,424,145	(v) 586,652	0·227 oz.
Patricia District				
Berens River Mines Ltd.	....	420,000	(c) 112,500	Gold 0·25 oz. Silver 10 oz.
Cochenour Willans Gold Mines Ltd.	177,699	975,846	(d)	(d)
Central Patricia Gold Mines Ltd.	300,000	3,675,000	(j) 441,912	0·36 oz.
Hasaga Gold Mines Ltd.	....	....	(r) 282,726	$5·16
Madsen Red Lake Gold Mines Ltd.	279,962	1,013,663	(h) 628,545	0·199 oz.
McMarmac Red Lake Gold Mines Ltd.	(b)	(a) 82,000	(d)	(d)
McKenzie Red Lake Gold Mines Ltd.	205,450	2,801,850	(d)	(d)
Pickle Crow Gold Mines Ltd.	300,000	7,950,000	(w) 651,865	$13·10

(a) To end of 1943.
(b) Not recorded.
(c) January 1, 1945.
(d) Not available at present.
(e) January 1, 1945; exclusive of dilution.
(f) January 1. 1945; positive and broken gold at $38.50 per ounce.
(g) January 1, 1944; broken ore.
(h) February 28, 1945 in place and broken.
(i) March 31, 1945; in place and broken.
(j) January 1, 1945; in place and broken.
(k) June 30, 1944; broken and in place.
(l) January 1, 1945; broken and in place; gold at $35 per ounce.
(m) January, 1945; broken ore.
(n) August 31, 1944; gold at $38.50 per ounce.
(o) January 1, 1944; broken and in place.
(p) January 1, 1945; in place and broken above 1,450 foot level after allowing for dilution.
(q) March 31, 1945.
(r) January 1, 1945; partial.
(s) January, 1945; after making allowance for dilution.
(t) January, 1945, after sorting.
(u) January 1, 1945; gold at $35.
(v) September 30, 1944.
(w) December 31, 1944; gold at $35 per ounce.

MANITOBA				
San Antonio Gold Mines Ltd.	478,513	4,274,417	(b) 860,000	(a)

(a) Not available.
(b) January 1, 1945.

Table 60—Dividends Paid and Ore Reserves of Specified Canadian Gold Mining Companies 1944—Concluded

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	
British Columbia				
Bralorne Mines Limited	1,496,400	12,958,550	(c) 1,100,000	0·514 oz.
Cariboo Gold Quartz Mining Co. Limited	....	1,679,968	(d) 378,068	0·39 oz.
Hedley Mascot Gold Mines Limited	....	1,290,556	(e) 164,792	0·364 oz.
Island Mojntain Mines Co. Limited	52,536	1,034,944	(g) 68,000	0·46 oz.
Kelowna Exploration Co. Limited	150,000	1,350,000	(f)	(f)
Pioneer Gold Mines of B.C. Limited	....	9,299,392	(a) 201,487	0·428 oz.
Privateer Mine Limited (inc. Prident)	49,082	1,914,183	(h) 23,870	$15·30
Sheep Creek Gold Mines Limited	225,000	2,362,500	(i) 100,397	0·367 oz. 0·26 oz.
Silbak Premier Mines Limited	125,000	2,250,000	(b) 92,802	0·26 oz. gold 2·59 oz. silver

(a) March 31, 1944; in place and broken.
(b) December 31, 1944; assured and probable ore, broken and unbroken.
(c) December 31, 1944; exclusive of 195,000 tons low-grade averaging 0·20 oz.
(d) July 31, 1944.
(e) December 31, 1943.
(f) Data not available at present.
(g) December 31, 1943.
(h) December 31, 1943; gold at $35 per oz.; operations suspended November, 1943.
(i) May 31, 1944.

Northwest Territories				
Negus Mines Ltd	99,850	449,325	(a) 23,800	0·74 oz.

(a) December 31, 1944; milling suspended October 18, 1944.
(*) 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 producing mines are often in excess of those recorded in this report.

Table 61.—Certain Data Relating to the Production of Gold by the Entire Auriferous Quartz Mining Industry in Canada, 1928-1944 (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	(d) 0·33	....	**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**
1944	159	2·43	12·81	4·60	0·81	4·15	**24·80**

(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 62.

Table 62.—Certain Data (Averages) Relating to the Total Production of Gold by Producers Only in the Auriferous Quartz Mining Industry in Canada, 1931, 1939-1944

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	(*)	(*)	(*)	....
1939	164	1·76	10·25	4·33	0·67	(*)	**17·01**
1940	165	1·72	10·20	4·41	0·69	(*)	**17·02**
1941	158	1·79	11·37	4·46	0·77	(*)	**18·39**
1942	177	1·83	11·41	4·33	0·75	(*)	**18·32**
1943	177	2·12	11·42	4·23	0·69	4·89	**23·35**
1944	163	2·41	12·59	4·57	0·81	4·12	**24·50**

(*) Data not available.

Table 63.—Principal Statistics Relative to All Ontario Gold Mines by Areas (d), 1942-1944

Camp or district	Number of producers	Ore (e) treated	Total gold recovered	Average ounces per ton recovered	Employees	Salaries and wages paid	Cost of fuel, electricity and process supplies
1942	No.	Tons	Fine oz.		No.	$	$
Porcupine	20	5,624,554	1,308,291	0·23	8,499	18,209,637	7,501,441
Kirkland Lake	10	(b)1,309,361	543,284	0·41	2,946	6,028,485	2,812,489
Larder Lake	4	1,166,209	214,751	0·18	1,057	2,119,060	1,033,205
Matachewan	2	611,982	59,085	0·10	392	810,796	621,333
Sudbury	2	200,011	33,414	0·17	339	687,691	269,285
Algoma	3	52,125	8,804	0·16	98	197,350	94,898
Thunder Bay	10	662,816	218,430	0·24	1,366	3,061,671	1,790,286
Rainy River and Kenora	5	36,449	12,039	0·25	125	243,690	93,348
Patricia	11	987,697	294,103	0·23	1,754	3,721,469	1,760,838
Total	**67**	**10,651,204**	**2,692,201**	**0·24**	**16,576**	**35,079,849**	**15,977,123**
1943							
Porcupine	17	4,297,973	1,020,973	0·24	6,519	14,115,867	5,581,209
Kirkland Lake	9	(b)1,114,818	466,052	0·42	2,514	5,429,511	2,435,094
Larder Lake	4	981,020	169,281	0·17	730	1,561,707	995,761
Matachewan	2	442,506	38,722	0·09	279	569,835	465,629
Sudbury	1	107,608	18,641	0·17	119	289,018	126,721
Algoma	1	1,782	254	0·14	10	14,965	5,566
Thunder Bay	5	(a) 438,522	141,504	0·32	919	2,011,819	1,145,151
Rainy River and Kenora	3	3,420	1,546	0·45	13	26,111	10,255
Patricia	9	681,714	203,964	0·30	1,227	2,707,544	1,348,422
Total	**51**	**8,069,363**	**2,060,937**	**0·25**	**12,330**	**26,726,377**	**12,113,808**
1944							
Porcupine	16	3,788,313	873,027	0·23	6,022	13,225,351	5,085,404
Kirkland Lake	9	1,011,225	383,167	0·38	2,346	5,129,054	2,396,345
Larder Lake	3	752,954	114,838	0·15	644	1,371,210	875,748
Matachewan	2	341,359	28,635	0·08	238	507,215	421,418
Sudbury	1	....	(c) 49	....	64	157,374	74,995
Thunder Bay	4	(a) 305,276	100,667	0·33	695	1,576,544	943,352
Rainy River and Kenora	....	....	....	....	3	4,233	....
Patricia	8	601,441	175,657	0·29	1,107	2,481,223	1,384,795
Total	**43**	**6,800,568**	**1,676,040**	**0·24**	**11,119**	**24,452,204**	**11,182,057**

(a) In addition, 5,887 tons tailings were retreated in 1943 and 15,732 tons in 1944.

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

(c) Mill clean-up.

(d) Includes data for all active properties.

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

Table 64.—Milling Capacity of Operating Canadian Gold Mines, 1935-1944
(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	502	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
1944	180	13,059	30,710	550	....	2,650	66

Table 65.—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	3,046,460	3,527,021	(g) 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	16,160,173	275,519	660,578	18,426	4,160,352	56,044	167,448
1940	18,986,306	18,083,430	209,304	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
1944	10,790,495	10,330,899	205,379	234,820	(f) 18,233	2,300,090	26,535	103,946

(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.
(f) Gold recovered from tailings 4,898 fine ounces; included with bullion.
(g) In addition, a relatively small tonnage of unclassified ores was shipped.

Table 66.—Gold Content of Bullion Produced and of Ores, Concentrates, etc., Shipped, with Average Grade of Ore Shipped and Ore Milled at Auriferous Quartz Mines in Canada, with Average Price of Gold in Canadian Funds, 1929-1944

Year	Tonnage treated (c)	Gold content fine oz. (b)	Oz. of fine gold per ton	Average price of gold
1929	4,371,143	1,771,526	0·41	20·67
1930	4,429,906	1,884,791	0·43	20·67
1931	5,526,379	2,271,278	0·41	21·55
1932	5,997,492	2,502,327	0·42	23·47
1933	6,480,164	2,455,365	0·38	28·60
1934	7,524,803	2,490,513	0·33	34·50
1935	8,907,610	2,645,659	0·30	35·19
1936	10,510,750	3,095,427	0·29	35·03
1937	(a) 11,919,965	3,490,170	0·29	34·99
1938	(a) 14,335,377	4,046,679	0·28	35·17
1939	(a) 16,425,692	4,383,844	0·27	36·14
1940	(a) 18,292,833	4,619,252	0·25	38·50
1941	(a) 19,236,669	4,646,326	0·24	38·50
1942	(a) 17,102,776	4,131,579	0·24	38·50
1943	(a) 12,474,852	3,015,119	0·24	38·50
1944	(a) 10,536,278	2,430,571	0·23	38·50

(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.
(c) Does not include tailings retreated, but includes ore milled plus crude ore shipped to smelters.

Table 67.—Specified Taxes Paid by Active Canadian Auriferous Quartz Mines in 1943 and 1944 by Provinces (*)

Nature of Tax	Nova Scotia	Quebec	Ontario	Manitoba	British Columbia	North-west Terri-tories	Canada
	$	$	$	$	$	$	$
1943							
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	....	(b) 9,127	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**
1944							
Dominion Income Tax, including tax on non-operating revenue	....	467,394	3,568,048	112,499	221,954	29,538	**4,399,433**
Dominion Excess Profits Tax	....	433,886	3,422,893	211,655	256,872	23,914	**4,349,220**
Provincial taxes	561	241,873	646,464	....	106,401	4,677	**999,976**
Municipal taxes	938	122,090	194,250	....	16,847	1,937	**336,062**
Total all specified taxes	**1,499**	**1,265,243**	**7,831,655**	**324,154**	**(c)602,074**	**60,066**	**10,084,691**

(*) 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.
(c) Includes $5,739 other taxes.

Table 68.—Certain Specified Expenditures Made by Auriferous Quartz Mining Companies, 1942, 1943 and 1944

Province and year		Workmen's compensa-tion	Silicosis assessment	Unemploy-ment insurance	Aggregate cost of all supplies purchased	Aggregate cost of plant and equipment purchased	Cost of buildings, machinery and equipment erected or installed
		$	$	$	$	$	$
Nova Scotia—	1942	4,413	....	958	13,624	5,400	(*)
	1943	5,032	....	1,000	28,508	6,000	(*)
	1944	4,511	....	935	30,108	5,290	....
Quebec—	1942	356,993	3,733	70,804	6,156,189	1,294,283	(*)
	1943	276,270	3,864	65,393	4,985,946	392,997	(*)
	1944	268,668	604	54,237	4,486,519	484,699	514,139
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	(*)
	1944	629,785	295,269	154,672	11,639,621	571,010	378,[illegible]
Manitoba—	1942	29,554	7,003	4,988	459,890	34,674	(*)
	1943	20,561	4,920	3,264	263,082	18,646	(*)
	1944	12,492	3,123	2,074	225,705	12,844	20,[illegible]
Saskatchewan—	1942	(*)	(*)	(*)	(*)	(*)	(*)
	1943	(*)	(*)	(*)	(*)	(*)	(*)
	1944	379	....	197	8,820	20,000	25,660
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	(*)
	1944	114,866	71,630	13,852	1,230,811	30,289	32,415
Northwest Territories—	1942	17,485	....	3,788	1,034,559	118,045	(*)
	1943	17,206	....	2,575	451,798	573,969	(*)
	1944	6,191	....	850	178,193	18,552	8,852
Total Canada—	**1942**	**1,398,910**	**896,606**	**331,252**	**26,018,137**	**3,443,066**	(*)
	1943	**1,103,569**	**675,653**	**284,326**	**19,529,190**	**1,552,656**	(*)
	1944	**1,036,892**	**370,626**	**226,817**	**17,799,777**	**1,142,664**	**980,283**

(*) Data not available.

Table 69.—Cost of Prospecting Conducted by Canadian Auriferous Quartz Mining Companies, 1943 and 1944

(a) Province prospecting was conducted in—	By Quebec companies (b)	By Ontario companies (b)	By Manitoba companies (b)	By British Columbia companies (b)	By Northwest Territories companies (*)	Total
	$	$	$	$	$	$
1943						
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**
1944						
Nova Scotia						
New Brunswick						
Quebec	503,901	80,056				583,957
Ontario	81,406	437,265	4,932	6,733		530,336
Manitoba	5,869	3,319		12,176		21,355
Saskatchewan						
British Columbia		12,815		117,701		130,516
Northwest Territories	95			1,563	46,837	48,495
Yukon				4,961		4,961
Total Canada	**591,271**	**533,446**	**4,932**	**143,134**	**46,837**	**1,319,620**

(a) Prospecting includes the search for new mineral deposits on the surface, and preliminary exploration.
(b) Province in which the companies' principal operations are conducted.

Table 70.—Drilling Completed on Auriferous Quartz Deposits in 1943 and 1944

—	Footage Drilled (a)	
	1943	1944
Diamond drilling for exploration (testing)—		
By companies with their own equipment and personnel	543,062	513,333
By contractors	1,321,727	1,648,418
Other drilling—		
Diamond drilling for breaking rock or ore:		
By companies with their own equipment and personnel	97,298	83,672
By contractors	591,598	444,859
Drilling by percussion and other machines (b)	20,014,708	17,830,270

(a) Subject to revision as drilling was not reported by some new companies.
(b) This is not complete as some companies do not compile these data.

The value of diamonds in all forms (bits, etc.) purchased by gold mining companies in 1944 totalled $128,115.

Table 71.—Classification of Employees in Entire Auriferous Quartz Mining Industry, 1944

Province	Salaried employees		Wage-earners					Salaries	Wages
	Number		Number						
			Mine			Mill			
	Male	Female	Surface		Under-ground				
			Male	Female	Male	Male	Female		
								$	$
Nova Scotia	7	....	22	....	38	5	....	17,573	83,097
Quebec	594	58	1,075	20	2,376	392	1	1,569,091	7,733,489
Ontario	919	127	2,681	64	6,397	931	....	3,534,811	20,917,393
Manitoba	28	7	52	4	74	15	....	90,594	282,277
Saskatchewan	5	1	14	....	....	....	....	9,077	22,526
British Columbia	178	27	311	31	546	148	....	603,678	1,938,892
Northwest Territories	13	2	33	....	23	7	....	46,773	174,234
Yukon	....	....	....	....	....	....	....	....	....
Canada	**1,744**	**222**	**4,188**	**119**	**9,454**	**1,498**	**1**	**5,871,597**	**31,151,908**

Table 72.—Average Annual, Weekly and Hourly Earnings of Male and Female Wage-Earners in the Producing Auriferous Quartz Mines, 1939-1944

Year	Average Earnings			Hours Worked per Week	Average Earnings			Hours Worked per Week
	Annual	Weekly	Hourly		Annual	Weekly	Hourly	
	Male			Number	Female			Number
	$	$	$		$	$	$	
1939	1,686	33·23	0·667	50·6	....	....	....	....
1940	1,687	33·83	0·658	51·4	....	....	....	....
1941	1,840	35·73	0·692	51·6	....	....	....	....
1942	2,020	37·56	0·732	51·3	1,141	21·23	0·425	49·9
1943	2,035	38·97	0·776	50·2	1,260	24·13	0·487	49·5
1944	2,055	40·39	0·818	49·4	1,286	25·27	0·513	49·3

Table 73.—Wage-Earners, by Months, in the Entire Auriferous Quartz Mining Industry, 1931, 1939, 1941, 1943 and 1944

Month	1931	1939	1941	**1943**	1944					
	Total	Total	Total	**Total**	Surface		Under-ground	Mill		**Total**
					Male	Female	Male	Male	Female	
January	8,273	27,402	29,772	**19,332**	4,017	112	10,157	1,510	....	**15,796**
February	8,482	27,278	29,765	**19,160**	4,070	110	10,300	1,521	....	**16,001**
March	8,681	26,941	29,783	**18,822**	4,064	111	10,295	1,544	....	**16,014**
April	8,746	26,767	29,633	**18,123**	4,017	111	9,967	1,538	1	**15,634**
May	9,030	27,669	29,869	**17,421**	4,180	109	9,474	1,550	1	**15,314**
June	9,319	28,238	29,807	**17,138**	4,361	120	9,145	1,545	1	**15,172**
July	9,345	28,537	30,310	**16,743**	4,482	118	8,986	1,547	1	**15,134**
August	9,285	28,743	30,158	**16,173**	4,370	117	8,827	1,523	....	**14,837**
September	9,391	28,577	30,605	**15,687**	4,204	121	8,697	1,479	....	**14,501**
October	9,524	28,621	30,870	**15,241**	4,107	117	8,822	1,440	....	**14,486**
November	9,496	28,402	29,567	**15,479**	4,118	119	9,143	1,406	....	**14,786**
December	9,323	27,516	27,566	**14,976**	3,944	114	9,150	1,387	....	**14,595**

THE COPPER-GOLD-SILVER MINING INDUSTRY, 1944

The mining of "copper-gold-silver" ores in Canada during 1944 was confined to the provinces 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 (sulphides) during 1944 were reported by 23 firms compared with 20 in 1943 and 26 in 1942. The gross value of crude ore, concentrates, etc., shipped in 1944 from the mines and mills to smelters was estimated at $62,389,815; the cost of fuel, purchased electricity, process supplies, freight and treatment totalled $24,191,776 and the net value of shipments was computed at $38,198,039. Employees in 1944 totalled 5,175 compared with 5,748 in 1943 and 5,646 in 1942.

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 Limited: "A total of 4,078 feet of drifting, 88 feet of raising and 53,804 feet of exploratory diamond drilling was done in 1944 at the Horne mine. Due to the acute shortage of miners, the driving of exploratory drifts and raises was greatly curtailed during the first half of the year and entirely stopped during the second half. Consequently, the exploration of the deeper levels of the mine was largely confined to diamond drilling. During the early months of 1944 a body of medium grade ore was located in the No. 5 mineralized zone and explored by diamond drilling from the 5,975 foot level.

"During 1944 the Noranda smelter treated 1,048,438 tons of ore, concentrate and slag, including 339,820 tons of custom ores and concentrates, and produced 117,171,962 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 113,086,814 pounds of fine copper, 246,990 ounces of gold and 1,373,482 ounces of silver. The estimated recovery from Horne mine ore and concentrate was 56,580,845 pounds of copper, 196,402 ounces of gold and 508,126 ounces of silver. During the year under review the concentrator treated 1,055,473 tons of ore from the Horne mine, from which 203,833 tons of copper-gold concentrate were produced and sent to the smelter. The cyanide mill treated 217,267 tons of pyrite from the flotation circuit tailing, from which 16,586 ounces of gold were recovered; 187,485 tons of pyrite were recovered from the cyanide mill tailing and sold to chemical plants."

Waite Amulet Mines Limited.—"No underground development was done in 1944 at the Waite mine. Due to the manpower shortage, the mining crew was reduced from two shifts to one in October. Ore hoisted totalled 105,027 tons and a total of 23,000 feet of diamond drilling was completed by stope diamond drills. Ore hoisted from the 'C' shaft totalled 96,818 tons; ore hoisted from the Amulet Dufault amounted to 405,929 tons. Most of the exploratory drilling on Amulet Dufault was for the purpose of outlining ore contacts; this work resulted in the finding of 100,000 tons of ore. Tonnage treated in the mill totalled 608,574, including 406,707 tons from the Amulet Dufault, 105,019 tons from the Waite and 96,848 tons from 'C' shaft. The average mill feed assays were: Copper 3·67 per cent; zinc 7·25 per cent; gold

0·033 ounces, and silver 1·73 ounces. Production in 1944 comprised 41,007,234 pounds of copper; 74,175,112 pounds zinc; 12,104 ounces gold and 685,265 ounces silver. A pyrite concentrating plant was built and put in operation in 1944. Exploratory diamond drilling at the Waite mine was laid out to cover the ground to the north, east and west of the known orebodies; it will require at least one more year to thoroughly explore the Waite ground. The area north, south and east of 'C' shaft was thoroughly drilled from the surface and a total of 49,848 tons of ore was found by this drilling."

Quemont Mining Corporation Limited.—"In March, 1944, a magnetometer survey was made on part of the property and a number of magnetometer anomalies were indicated. Some 5,684 feet of diamond drilling was done to test some of these anomalies but as no values and no mineralization of importance were encountered, the drilling was stopped in September until after the freeze-up and was then started again in the winter from the ice on the lake for the purpose of testing an area underlying the lake in the southeastern part of the property, through which pass the Horne Creek fault and also a subsidiary shear north of the fault. The first hole known as No. 10 was located to cut through the Horne Creek fault and a magnetometer anomaly north of it. This hole intersected encouraging mineralization across a wide width containing values in copper and precious metals, a short distance north of the fault. . . . As soon as this intersection was obtained, three additional drills were put in operation. In August 1945 it was announced that an underground program was designed to thoroughly develop the orebodies indicated by the drilling and also to prospect from the bottom or 900 foot level (old shaft)."

Geological structure at the Quemont is reported to be almost identical with that obtaining at the neighbouring Noranda mines.

Normetal Mining Corporation Limited.—"A total of 192,994 tons of ore averaging 3·28 per cent copper and 6·22 per cent zinc were milled in 1944, producing 25,996 tons of copper concentrates averaging 22·65 per cent copper, 0·139 ounces gold and 11·03 ounces silver, and also 16,528 tons of zinc concentrates averaging 53·32 per cent zinc. Development work consisted of 451 feet of shaft sinking, 1,217 feet of lateral work and raising, and 271 feet of stations and pockets. Operations during the year were again handicapped by a shortage of labour and shortage of power. Normetal and Noranda Mines Limited entered into an option on a fifty-fifty basis on the Alamac mines, which adjoins the Normetal mine on the east; diamond drilling under the supervision of Normetal, was started late in December and it is planned to do a minimum of 5,000 feet of drilling for the purpose of testing the possible extension of the Normetal ore zone to the east."

Aldermac Copper Corporation Limited.—Milling commenced August 1, 1944 at the company's new property located in Ascot township, near Sherbrooke, Quebec. Mining operations were conducted continuously throughout the year and shipments of both zinc and copper-lead concentrates were made to plants in the United States. In October 1944 it was reported that the property had been opened up by a vertical shaft to 240 feet and two levels driven at 156 and 277 feet, respectively; on the first level a length of 550 feet over an average width of 4·99 feet gave the following results: Zinc 6·47 per cent; lead 2·24 per cent; copper 1·68 per cent; gold 0·109 ounce and silver 1·56 ounces.

Ontario.—Kam-Kotia Porcupine Mines Limited: Mining operations were conducted in 1944 until December 12. This copper property lying west of Timmins, in which Hollinger Cons. Gold Mines Ltd. holds an 85 per cent interest, was financed as to plant and operation by the Metals Reserve. During the operation 189,064 tons of ore were mined by electric shovel and milled at the property. The resultant concentrates were trucked to Timmins, a distance of 22 miles, and thence by rail to the smelter at Noranda, Quebec. A summary of the results obtained in this operation, which at the request of the Government, was discontinued on January 1, 1945, showed 5,542,116 pounds of copper produced at a cost of 15 cents per pound. This includes the payment of the minimum royalty which was granted as a return for depletion of ore reserves. The total amount of royalties so received was $65,000.

Diamond drilling of an exploratory nature was conducted in 1944 by Bandolac Mining Company Limited on a property located at Lower Shebandowan Lake, Thunder Bay district, and by the Royalite Gold Syndicate on a deposit situated in Mallard township, Sudbury district.

Manitoba and Saskatchewan.—Hudson Bay Mining and Smelting Co. Limited: "The high rate of production established during 1943 was continued for the first quarter of 1944, but there was a gradual decline from that time on for the balance of the year as the result of labour shortages. Ore mined and hoisted from underground during 1944 totalled 2,059,206 tons assaying 2·59 per cent copper; 4·7 per cent zinc; 0·091 ounce gold and 1·37 ounces silver. The tonnage mined was excelled only in the years 1942 and 1943. A total of 229,955 cubic yards of waste filling, consisting principally of smelter slag, was placed in underground stopes. Ore milled totalled 2,027,926 tons from which were produced 391,739 tons copper concentrates assaying 11·71 per cent copper; 0·319 ounce gold and 4·84 ounces of silver and 149,526 tons of zinc concentrates assaying 45·94 per cent zinc; 0·055 ounce gold; 1·52 ounce silver and 0·50 per cent copper. From the treatment of 1,437,216 tons flotation tailings, there were recovered 18,103 ounces gold; 178,861 ounces silver and 95,638 pounds copper. The tonnage of zinc concentrates treated during the year was the highest on record, totalling 161,314 tons from which 102,458,756 pounds of slab zinc were produced. Metallic cadmium produced totalled 140,560 pounds. The copper smelter treated 408,554 tons of Hudson Bay concentrates and ores and 59,034 tons of custom concentrates; the company shipped for its own account 86,481,746 pounds of copper, 145,441 ounces of gold, 2,017,443 ounces of silver and 136,299 pounds of selenium. In addition to smelting the usual custom concentrates from Sherritt Gordon Mines Limited the company treated copper concentrates shipped from Emergency Metals Limited during the latter half of the year.

"Emergency Metals Limited completed the mining and milling of all the known ore tributary to the old Mandy shaft, thus terminating this operation. During the year 62,227 tons of ore were milled which produced concentrates yielding 6,000,585 pounds of copper, 10,644,284 pounds of zinc, 3,501 ounces of gold and 69,265 ounces of silver."

Sherritt Gordon Mines Limited: "The company in 1944 milled 731,783 tons of ore. Mill feed assayed copper 1·888 per cent; zinc 2·678 per cent; gold 0·0159 ounce and silver 0·470 ounce. Recoveries were as follows: copper 91·05 per cent; zinc 64·92 per cent; gold 63·33 per cent and silver 69·31 per cent. Throughout the year the mill operated approximately five days per week; the period of operation was ample to take care of the weekly mine output. No new ore was found during the year, so that ore reserves were reduced by the tonnage milled. In 1944 considerable diamond drilling was completed on the easterly extension of the Bob Lake structure but nothing of economic importance was encountered. Other diamond drilling was done to the east of the east orebody and, although considerable further drilling will have to be done to determine potentialities, there is nevertheless encouragement in that disseminated copper mineralization was found in this area. Towards the end of 1944, the British Ministry of Supply gave notice that, after the end of January, its contract to buy copper from the company would be terminated, but satisfactory arrangements have been made to sell this copper to one of the government agencies in the United States. Zinc concentrates can now be sold at a reasonable profit, and a contract is now in force which runs to the end of September 1945. Production in 1944 comprised 24,541,313 pounds copper; 7,059 ounces gold; 226,349 ounces silver and 23,910 tons of zinc concentrates. The net cost of electrolytic copper f.o.b. refinery was 8·786 cents per pound and the production cost of zinc concentrate $13·243 per ton."

British Columbia.—Britannia Mining and Smelting Co. Limited conducted mining and milling operations throughout 1944 at Britannia Beach; copper concentrates and copper precipitate were exported to the United States and pyrite was marketed in both Canada and the United States. The company reported that "The Britannia property produced at about 50 per cent of normal capacity. The labour shortage which became acute during 1943, did not improve and continued about static during the past year. Development and exploration work were again curtailed. A contract with Wartime Metals Corporation, an agency of the Canadian Government, under which production costs were guaranteed and a small profit allowed, remained in effect throughout the year, but has now been cancelled, as of December 31, 1944.

Until an adequate labour supply is available for this mine the outlook for a satisfactory operation is not good." Ore milled totalled 606,717 tons and production comprised 34,101 tons copper concentrates; 524 tons copper precipitate and 17,053 tons of iron pyrites.

Granby Consolidated Mining, Smelting and Power Co. Limited.—Mining and milling operations were carried on continuously by the company during 1944 at its property located at Copper Mountain. The company milled 1,383,296 tons of ore for the production of 41,217 dry tons of copper concentrates containing approximately 5,891 ounces gold; 155,406 ounces silver, and 22,652,000 pounds copper. Concentrates produced in 1944 were shipped to a smelter located at Tacoma, Washington, U.S.A.

Twin "J" Project—Wartime Metals Corporation operated at the Twin "J" mine, Duncan, until May 17, 1944. Ore mined and milled totalled 17,341 short tons for a production of 860 tons of copper concentrates and 1,500 tons of zinc concentrates. The copper concentrates contained 671 ounces gold; 16,777 ounces of silver and 322,232 pounds copper. Zinc concentrates shipped totalled 2,409 tons containing 2,338,517 pounds of zinc. Both copper and zinc concentrates were shipped to plants in the United States.

Table 74.—Employees, Salaries and Wages in the Copper-Gold-Silver Mining Industry in Canada, by Provinces, 1944*

Province	Number of employees								Salaries	Wages
	On Salary		Wage-earners					Total employees		
			Surface		Underground	Mill				
	Male	Female	Male	Female		Male	Female			
									$	$
Quebec	107	20	488	4	1,021	215	17	**1,872**	363,750	3,284,345
Ontario	7	....	22	....	31	14	....	**74**	24,981	149,139
Manitoba	73	19	230	41	421	80	7	**871**	277,871	1,613,864
Saskatchewan	186	53	459	77	410	114	36	**1,335**	651,944	2,312,498
British Columbia	135	22	190	23	371	266	16	**1,023**	443,298	1,588,361
Canada	**508**	**114**	**1,389**	**145**	**2,254**	**689**	**76**	**5,175**	**1,761,844**	**8,948,227**

* Not including smelters and refineries.

Table 75.—Wage-earners, by Months, in the Copper-Gold-Silver Mining Industry in Canada, 1944*

Month	Surface		Underground	Mill		Total
	Male	Female		Male	Female	
January	1,501	140	2,732	709	80	**5,162**
February	1,496	143	2,655	706	79	**5,079**
March	1,440	140	2,564	697	75	**4,916**
April	1,404	141	2,425	678	75	**4,723**
May	1,435	142	2,228	680	73	**4,558**
June	1,439	138	2,153	686	73	**4,489**
July	1,481	150	2,055	687	78	**4,451**
August	1,362	150	1,984	696	73	**4,265**
September	1,310	144	1,915	675	77	**4,121**
October	1,299	146	1,988	687	79	**4,199**
November	1,276	148	2,176	687	78	**4,365**
December	1,227	148	2,156	685	76	**4,292**
Average	**1,389**	**145**	**2,254**	**689**	**76**	**4,553**

* Smelter employees not included.

Table 76.—Specified Data Relating to the Copper-Gold-Silver Mining Industry 1929-1944*

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	4,770,641
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
1944	4,539	8,927,879	1,967	602	1,721,494	10,649,373
Total	....	**107,252,291**	....	....	**14,675,834**	**121,928,125**
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
1944	14	20,348	....	20	40,350	60,698
Total	....	**4,837,210**	....	....	**1,111,053**	**5,948,263**

(*) Not including smelters or refineries.

(†) Including any bonus paid.

Table 77.—Average Annual, Weekly and Hourly Earnings of Male and Female Wage-Earners in the Entire Copper-Gold-Silver Mining Industry, 1939-1944

Year	Average Earnings Male			Hours worked per week	Average Earnings Female			Hours worked per week
	Annual	Weekly	Hourly		Annual	Weekly	Hourly	
	$	$	cents	No.	$	$	cents	No.
1939	1,567	30·60	61·4	49·8	....	....	....	....
1940	1,679	31·84	63·3	50·3	....	....	....	....
1941	1,736	33·88	67·8	50·0	....	....	....	....
1942	1,904	37·53	77·2	48·6	....	....	....	....
1943	1,983	38·29	79·1	48·4	1,424	27·51	59·3	46·4
1944	1,999	38·90	82·6	47·1	1,313	25·54	55·0	46·4

(*) Data not complete or available prior to 1943.

Table 78.—Dividends Paid by Specified Copper-Gold-Silver Mining Companies

Name of Firm	Dividends paid in 1944	Total dividends paid to December 31, 1944
	$	$
Noranda Mines Ltd.	8,959,088	98,21[illegible]
Waite Amulet Mines Ltd.	2,640,000	7,920,[illegible]
Amulet Dufault Mines Ltd.	2,112,000	7,744,[illegible]
Sherritt Gordon Mines Ltd.	293,722	2,408,[illegible]
Hudson Bay Mining & Smelting Co. Ltd.	5,515,946	46,[illegible]
Britannia Mining & Smelting Co. Ltd.	183,932	11,511,[illegible]
Granby Cons. Smelting & Power Co. Ltd.	135,070	11,80[illegible]

Table 79.—Taxes Paid by the Copper-Gold-Silver Mining Industry in Calendar Years 1943 and 1944

	1943	1944
	$	$
Dominion Income Tax, including tax on non-operating revenue	4,512,299	3,432,927
Dominion Excess Profits Tax	6,147,405	5,731,452
Provincial Tax	1,397,691	1,289,936
Municipal Tax	163,781	179,045
Grand Total Taxes Paid	**12,221,176**	**10,633,360**

Table 80.—Specified Expenditures by the Copper-Gold-Silver Mining Industry, 1942, 1943 and 1944

—	1942	1943	1944
	$	$	$
Workmen's compensation	375,289	423,422	409,782
Silicosis assessment	102,965	119,982	86,744
Unemployment insurance	79,117	84,818	75,832
Aggregate cost of all supplies purchased	9,168,768	9,466,714	6,065,754
Aggregate cost of plant and equipment purchased	1,022,614	1,514,959	989,675
Cost of buildings, machinery and equipment erected or installed during year	(*)	(*)	1,304,542

(*) Not recorded.

Table 81.—Cost of Prospecting Conducted by the Copper-Gold-Silver Mining Industry, by Provinces, 1943 and 1944

Conducted in—	1943	1944	Conducted in—	1943	1944
	$	$		$	$
Nova Scotia		2,463	Saskatchewan		
New Brunswick		4,245	British Columbia	24,898	11,128
Quebec	53,490	34,602	Yukon	542	22,642
Ontario	56,985	84,935	Northwest Territories	500	
Manitoba	18,669	36,589			
			Canada	**155,084**	**196,604**

Table 82.—Specified Data Relating to the Copper-Gold-Silver Mining Industry, 1929-1944 (†)

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 (*)	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
1944	262.411.942	1,401,935	8,900	5,170,105	720,920	16,898,032	.....	308	.....	476
Total	**2,864,107,415**	**14,827,386**	.....	**48,777,808**	**9,651,337**	**148,096,247**	**18,436,540**	**601,870**	.....	**257,557**

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

Table 83.—Shipments from Copper-Gold-Silver Mines of Canada, 1943 and 1944

—	Quantity	Value	Total metal content as determined by settlement assay (c)				
			Gold	Silver	Copper	Sulphur	Zinc
	tons	$	fine oz.	fine oz.	pounds	tons	pounds
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 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**	**301,811,900**
Value of process supplies, etc. (b)	....	29,695,643	....	....	....	....	....
Net Value	....	**43,840,679**	....	....	....	....	....
1944							
12 mines shipped to Canadian plants (a)—							
Ores	530,579	7,438,664	79,516	508,091	35,392,376	....	....
Copper concentrates	757,837	33,233,915	253,193	3,061,569	204,189,160	....	....
Zinc concentrates	149,522	5,190,289	8,318	227,036	1,508,641	....	137,386,498
Iron pyrites concentrates	68,064	142,617	....	....	....	33,178	....
Slags, residues, bullion, and gold precipitates	366	1,411,241	34,625	193,697	266,486	....	....
11 mines shipped to foreign plants—							
Ores	....	....	....	....	....	....	....
Copper concentrates	84,920	5,676,914	18,194	306,198	39,940,660	....	(d) 943,067
Zinc concentrates	125,465	8,837,074	421	11,575	....	....	128,873,442
Iron pyrites concentrates	182,007	352,405	....	....	....	88,595	....
Copper precipitate	570	106,696	3	69	705,277	....	....
Total	**1,899,330**	**62,389,815**	**394,270**	**4,308,235**	**282,002,600**	**121,773**	**266,259,940**
Value of process supplies, etc. (b)	....	24,191,776	....	....	....	....	....
Net Value	....	**38,198,039**	....	....	....	....	....

(†) Includes some copper precipitate.

(a) Certain mines sometimes operated in the Rossland area by several leasers are usually treated, statistically, as one mine.

(b) Includes freight on ore shipments, smelter charges and fuel and purchased electricity.

(c) In addition, cadmium, thallium, tellurium and selenium are recovered from these ores.

(d) Lead.

Table 84.—Ores Mined, Milled, and Concentrates Produced by the Copper-Gold-Silver Mining Industry, 1929-1944

Year	Ore mined		Ore milled	Copper concentrates produced (f)	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	262,941	....	76,581	(a)	21,859,907
1930	5,768,664		4,926,431	298,085	72,112	53,453	(a)	15,629,584
1931	6,002,865		5,243,382	469,059	63,828	63,293	(a)	15,951,103
1932	5,453,173		4,507,659	518,609	76,507	71,945	(a)	11,143,759
1933	5,448,690		4,521,301	521,399	88,645	59,354	(a)	7,707,270
1934	6,065,692		5,127,189	587,045	81,811	80,684	(a)	8,205,071
1935	5,650,665		4,693,387	614,942	96,466	66,700	(a)	16,670,447
1936	5,052,222		4,091,570	503,650	101,303	105,669	(a)	19,271,965
1937	6,749,809		5,802,031	630,664	116,698	201,494	(b)	30,655,784
1938	7,929,434		6,961,188	756,065	123,887	173,444	(b)	34,739,439
1939	8,474,855		7,760,725	828,963	105,842	161,238	(b)	32,991,716
1940	8,931,291		8,125,079	930,622	126,346	172,500	(b)	34,914,051
1941	9,263,071		8,402,656	974,250	187,622	309,050	(b)	36,990,853
1942	8,575,626	(d)	7,816,813	858,580	264,739	219,874	(b)	40,730,834
1943	8,251,579		7,482,831	914,360	315,670	292,007	(b)	50,774,104
1944	7,395,608	(e)	6,873,542	870,726	276,737	257,423	(b)	44,770,863
Total 16 years	**110,148,068**		**97,149,490**	**10,539,960**	**2,098,213**	**2,364,709**		**423,072,730**

(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.

(e) In addition, 1,440,216 tons of tailings were retreated.

(f) Exclusive of copper precipitate in 1943 and 1944.

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 1938-39.

Table 85.—Ore Mined and Milled in the Copper-Gold-Silver Mining Industry, in Canada, by Provinces, 1944

—	Manitoba and Saskatchewan	Quebec	British Columbia	Ontario	Canada
	(a)	(b)			
	tons	tons	tons	tons	tons
Ore mined	2,853,024	2,387,969	2,002,599	152,016	**7,395,608**
Ore milled	2,821,936	1,892,236	2,007,354	152,016	**6,873,542**
Copper concentrates produced	458,616	324,969	76,178	10,963	**870,726**
Copper precipitates produced	....	....	570	....	**570**
Pyrites concentrates produced	....	240,370	17,053	....	**257,423**
Zinc concentrates produced	184,775	90,462	1,500	....	**276,737**

(a) In addition, 1,437,216 tons of tailings were retreated.

(b) In addition 3,000 tons of tailings were retreated.

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 passes through the Flin Flon mine.

Table 86.—Content (†) of Ores, Concentrates, Etc., Shipped from Copper-Gold-Silver Mines, 1938-1942

—	Tons	Content				
		Gold	Silver	Copper	Zinc	Sulphur
		fine oz.	fine oz.	pounds	pounds	tons
To Canadian Smelters						
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	808,328	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	35,648,576	....	....
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	162,553	68,337	....
1942—						
Copper ore	760,973	146,412	318,805	28,927,383	....	....
Copper concentrates	816,793	342,995	4,700,629	234,276,699	....	....
Zinc concentrates	172,519	11,424	293,259	1,409,389	159,543,348	....
Pyrites	69,014	....	....	....	....	32,580
Slag, precipitates, etc.	193	35,146	227,776	129,659	....	....
To Foreign Smelters						
1938—						
Copper ore	850	479	3,191	80,245	....	....
Copper concentrates and precipitates	152,995	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
1942—						
Copper ore	....	....	....	....	....	....
Copper concentrates and precipitates	101,752	19,892	283,596	50,619,295	....	....
Zinc concentrates	92,135	....	....	....	94,931,818	....
Pyrites	310,479	....	....	....	....	150,199

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

Note.—For total estimated values of annual shipments see table 84.

Table 87.—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	5,266,000	6·88	....	0·152	(a)
Sulphide ore under 4 per cent copper	15,997,000	0·80	....	0·192	(a)
Silicious fluxing ore	891,000	0·10	....	0·104	(a)
Capacity of mill: 24 hours	3,000	....	....	....	....
Waite Amulet Mines Ltd., December 31, 1944—					
Waite Mine—					
Copper ore	123,840	4·2	....	0·04	0·5
Zinc ore	25,000	....	11·0	....	....
Other Waite Amulet orebodies—					
"F" orebody	30,000	3·2	9·9	0·01	1·01
"C" shaft orebodies	101,000	1·5	10·5	0·02	4·0
Amulet Dufault—					
Lower "A" orebody	2,565,615	5·81	4·54	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, 1944—	(b)1,380,800	3·56	6·77	0·32	2·39
Capacity of mill: 24 hours	750	....	....	....	....
Sherritt Gordon Mines Ltd., December 31, 1944—					
East orebody—					
Zinc ore	113,000	0·95	9·04	0·006	0·42
Copper ore	157,000	2·45	2·93	0·022	0·68
West orebody	2,018,000	2·60	2·14	0·019	0·64
Capacity of mill: 24 hours	3,000	....	....	....	....
Hudson Bay Mining & Smelting Co. Ltd., January 1, 1943	(c)27,378,240	2·59	4·16	0·085	1·25
Capacity of mill: 24 hours	6,000	....	....	....	....
Granby Cons. Mining, Smelting & Power Co. Ltd. 1944	12,235,000	1·25	....	(a)	(a)
Capacity of mill: 24 hours	4,800	....	....	....	....
Britannia Mining & Smelting Co. Ltd			Not reported		
Capacity of mill: 24 hours	6,000	....	....	....	....

(a) Not reported.

(b) In place and broken, before dilution; no allowance for ore below the 2,750 foot level.

(c) Corresponding data for 1944 not available; includes dilution and Emergency Metals Ltd., Emergency Metals Ltd. ceased operations at end of 1944 on exhaustion of ore at Mandy mine.

(*) Subject to revision; from companies' annual printed reports.

Table 88.—Drilling Completed on Copper-Gold-Silver Deposits in Canada, 1943 and 1944

—	Footage Drilled	
	1943	1944
Diamond drilling for exploration (testing only)—		
By mining companies with their own personnel and equipment	107,867	97,961
By diamond drilling contractors	152,284	149,881
Other diamond drilling—		
Blast hole diamond drilling—		
By mining companies with their own personnel and equipment	943,486	811,609
By diamond drilling contractors	32,042	139,552
Drilling by percussion or other machines	(*) 6,166,551	(*) 3,221,786

(*) 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 early in 1944.

The only straight custom plant at Cobalt was the old O'Brien 100-ton mill, operated until late in 1943 by C. W. J. O'Shaughnessy. In August of 1943 the concentrating plant at Cobalt of Cobalt Products Ltd. was taken over by Silanco Mining & Smelting Company; this mill was operated in 1944. 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 since 1942 from a deposit located at Werner Lake, some 40 miles north of Minaki near the Ontario-Manitoba boundary.

The number of operators reported officially as actively engaged in the mining or shipping of silver-cobalt ores in 1944 totalled 10; employees numbered 165 and salaries and wages paid amounted to $260,575. The gross value of mine and mill shipments totalled $422,860 and the net value of sales was estimated at $323,260; these figures include the value of concentrates and ores placed on the stock pile of the Metals Reserve Company located at Deloro, Ontario.

Table 89.—Statistics of the Silver-Cobalt Mines and Mill Operations in Canada (b), 1941-1944

——		1941	1942	1943	1944
Number of mines in operation (*)		14	14	21	11
Ore mined	tons	11,507	25,550	39,184	27,184
Ore salvaged from surface (e)	tons	(c)	18,532	395	2,189
Ore treated (milled) (a)	tons	38,715	43,851	39,625	30,190
Tailings treated	tons	....	....	8,865	....
Concentrates produced	tons	1,396	1,415	1,346	862
Gross value of bullion, ore, concentrates and residues sold	$	788,815	(d) 750,250	(d) 721,173	(d) 422,860
Cost of freight	$	7,017	1,439	4,192	3,138
Smelter charges	$	18,710	16,255	15,361	12,330
Cost of fuel and purchased electricity used	$	40,875	68,349	74,691	48,323
Cost of process supplies used	$	59,761	64,000	48,068	35,809
Net value of sales	$	662,443	600,207	578,861	323,260

(*) 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.

(e) Complete data not available.

Table 90.—Mine and Mill Shipments of Canadian Silver Cobalt Ores and Concentrates in 1944

——	Gross Weight	Metal Content			
		Silver	Cobalt	Nickel	Copper
	lb.	oz.	lb.	lb.	lb.
To Canadian smelters and to Government stock pile at Deloro, Ontario	1,734,460	489,614	176,813	43,424	16,678
To foreign plants	183,143	2,216	25,951	6,006	710
Total	**1,917,603**	**491,830**	**202,764**	**49,430**	**17,388**

Table 91.—Employees, Salaries and Wages in the Silver-Cobalt Mining Industry in Canada, 1944

——		Number	Salaries and wages
			$
SALARIED EMPLOYEES—			
Total	(a)	24	43,960
WAGE-EARNERS—			
Surface	(b)	43	216,615
Underground		74	
Mill		24	
Total		141	216,615
Grand Total		**165**	**260,575**

(a) Includes 4 females. (b) Includes 1 female.

Table 92.—Number of Wage-Earners on Payroll or Time Record at End of Month in the Silver-Cobalt Mining Industry, 1940-1944

Month	1940	1941	1942	1943	1944			
					Mine			Mill
					Surface		Underground	
					Male	Female	Male	Male
January	63	140	144	170	41	....	64	22
February	72	144	109	179	42	....	64	10
March	79	159	115	181	39	....	72	10
April	84	97	141	177	44	....	77	27
May	122	139	179	191	50	1	79	29
June	138	146	183	181	51	1	76	31
July	144	186	200	176	50	1	74	29
August	133	193	200	174	48	1	71	30
September	128	181	195	216	33	1	72	27
October	127	184	180	167	40	1	68	27
November	88	161	172	185	36	1	74	31
December	74	154	150	145	33	1	83	28

(b) The Silver-Lead-Zinc Mining Industry

In 1944 the silver-lead-zinc mining industry of Canada reported 20 operators or firms as being actively engaged in the mining, exploration or development of silver-lead-zinc deposits, and of these operators 17 reported commercial shipments during the year under review. Employees numbered 2,769 and salaries and wages paid amounted to $5,810,290. The cost of explosives and other process supplies consumed totalled $1,752,087 and fuel and electricity used was recorded at $860,231. The gross value of production, as reported by the entire industry, totalled $21,291,957 and the net value of same was estimated at $16,802,759.

A report prepared by the Lands, Parks and Forests Branch of the Department of Mines and Resources, Ottawa, contains the following information relating to lode mining in the Yukon in 1944:

"The only production from lode mining has been in the Mayo District. A very small tonnage of high-grade silver-lead ore was shipped in 1944.

"Considerable interest was shown in prospecting for lode during 1944. The Consolidated Mining and Smelting Company, International Nickel, Pioneer and Bralorne Companies, and Hudson's Bay Mining and Smelting Company all had engineers and prospectors in the areas adjacent to the Alaska Highway, Canol Access Road, Haines Cut-Off Highway and Airport Access roads.

"There was some prospecting for lode in the Dawson District.

"New locations in the Territory for which Quartz Mining Grants were issued were as follows:

Whitehorse Mining District	78 Claims
Dawson Mining District	93 "
Mayo Mining District	20 "
Total	191 Claims

Renewals of Quartz Claims were: Whitehorse District 26; Dawson District 117; Mayo 264, and in addition 132 claims were held in the Mayo District under 21-year leases.

"The Territorial Assay Office at Keno was kept busy making assays for individual prospectors for which no charge is made."

The annual report "Lead in 1944", as prepared by the Bureau of Mines, Ottawa, contains the following information:

"In British Columbia the lead and zinc concentrates produced in the 8,000-ton concentrator of the Sullivan mine are shipped by rail 185 miles to the company's smelter and refinery at Trail. A total of 2,141,400 tons of ore was milled in 1944, a decrease of about 15 per cent compared with 1943. The grade of ore treated was also lower, due largely to the cleaning out of stope bottoms in preparation for filling, and to the curtailment of development work in the early years of the war so that greater attention could be given to production.

"Western Exploration Company at Silverton produced zinc and lead concentrates for export.

"Reco Mountain Base Metal Mines, Limited, near Sandon, operated the renovated Noble Five concentrator until May, when the plant was destroyed by fire.

"Retallack Mines, Limited, at Retallack, completed the renovation of its 300-ton mill in April. A contract for sale of the zinc concentrate, made in December, 1943, with United States Commercial Company, a United States Government subsidiary company, was replaced in April, 1944, by a contract for the sale of lead and zinc concentrates to American Smelting and Refining Company in the United States.

"The Kootenay Florence mine at Ainsworth was operated by Wartime Metals Corporation as the Kootenay Florence Project from early in 1943 until May, 1944, when the contract for sales to Metals Reserve Company (United States) was cancelled.

"Base Metal Corporation's power house was destroyed by fire in January and as a result there was no production from the company's Kicking Horse zinc-lead mine at Field from then until June 12. The mine was in continuous production during the remainder of the year, and until near the end of November, when a small crew was placed in the Monarch zinc-lead mine, also at Field, to complete salvage operations. The company's concentrator treated an average of 122 tons a day during the period of regular operation, compared with a daily average of 169 tons in 1943. Development work was carried on at the Kicking Horse mine during the time that production was suspended.

"The Tyee zinc-lead-copper property, near Chemainus, Vancouver Island, was in production until May when the contract with Metals Reserve Company was cancelled. The property was acquired in 1942 by Twin "J" Mines, Limited, and was operated by the company under the supervision of Wartime Metals Corporation. Zinc, lead, and copper concentrates were produced in the 125-ton mill. The Reeves McDonald zinc-lead mine on the Pend-d'Oreille River remained idle in 1943.

"Several small lead-zinc properties, mainly in the Ainsworth-Slocan area shipped crude ore to the Trail Smelter.

"In Ontario, Lake Geneva Mining Company's property in Hess township, Sudbury district, was operated by Wartime Metals Corporation. The sales contract with Metals Reserve Company was cancelled, effective April 30, and operations ceased near the end of May, following which the plant was dismantled and sold.

"In Quebec, New Calumet Mines, Limited, with mine and 500-ton concentrator at Calumet Island, Pontiac county, operated at capacity. The lead and zinc concentrates are shipped to American smelters designated by Metals Reserve Company, with which New Calumet has a contract.

"The Tetreault property near Notre-Dame-des-Anges, Portneuf county, was operated by Siscoe Gold Mines, Limited, under the general supervision of Wartime Metals Corporation until May, when activities were discontinued. The lead and zinc concentrates were sold under contract to Metals Reserve Company.

"Aldermac Copper Corporation, Limited equipped its property at Moulton Hill, 4 miles from Sherbrooke, with a complete mining plant and a 250-ton concentrator, which was put into operation on July 15. The mill produces lead, copper, and zinc concentrates for shipment to the United States. In due course, a pyrites concentrate may also be produced. The ore contains appreciable amounts of gold and silver."

Table 93.—Ore Mined and Milled in the Silver-Lead-Zinc Mining Industry in Canada, 1943 and 1944

		Yukon and Northwest Territories	British Columbia	Quebec and Ontario	Canada
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	(*)	....	....	**(*)**
Gold precipitate	ton	....	....	20	**20**
1944—Ore mined	ton	101	2,359,839	551,884	**2,911,824**
Ore milled	ton	....	2,355,675	549,891	**2,905,566**
Concentrates produced—Lead	ton	4	201,417	9,831	**211,252**
Zinc	ton	....	286,754	64,763	**351,517**
Pitchblende-silver	ton	(*)	....	....	**(*)**
Gold precipitate	ton	....	....	18	**18**

(*) Data not available for publication.

Table 94.—Destination of Shipments From Silver-Lead-Zinc Mines of Canada, 1943 and 1944

—	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
		$				
1943						
To Canadian smelters—						
Lead ore	3,033	178,543	481	341,528	193,202	11,483
Lead concentrates (†)	308,379	15,246,727	37	6,630,217	406,083,211	30,559,105
Pyrites concentrates	509	19,245	471	6,054	....	....
Zinc concentrates	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 (*)	82,627	3,751,444	86	283,606	145,593	90,270,160
Gold precipitate	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**	....	....	....	....
1944						
To Canadian smelters—						
Lead ore	1,440	131,446	110	202,413	162,521	16,920
Lead concentrates	202,014	9,294,664	....	4,087,122	272,917,775	21,932,674
Pyrites concentrates	....	....	....	....	....	....
Zinc concentrates (*)	256,303	5,218,329	....	535,010	27,172,583	247,806,425
Dry ore	700	37,415	494	48,814	20,465	27,071
Total	**460,457**	**14,681,854**	**604**	**4,963,359**	**300,273,344**	**269,783,090**
To Foreign smelters—						
Lead ore	97	19,045	2	26,976	106,144	....
Lead concentrates	15,178	1,192,527	3,562	1,094,099	15,294,423	....
Zinc concentrates (*)	96,029	4,831,603	47	93,490	47,078	106,422,436
Gold precipitate	18	566,928	9,940	376,353	....	....
Total	**111,322**	**6,610,103**	**13,551**	**1,590,918**	**15,447,645**	**106,422,436**
Grand Total (gross)	....	**21,291,957**	....	....	....	....
Cost of freight	....	1,070,103	....	....	....	....
Cost of fuel and purchased electricity	....	860,231	....	....	....	....
Smelter charges	....	806,777	....	....	....	....
Cost of process supplies	....	1,752,087	....	....	....	....
Net Value	....	**16,802,759**	....	....	....	....

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

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

NOTE.—In addition to the metals contained in shipments listed in Table above, 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 95.—Drilling Completed on Silver-Lead-Zinc Deposits in Canada, 1943 and 1944

—	Footage Drilled 1943	Footage Drilled 1944
Diamond drilling for exploration and testing—		
By mining companies with their own personnel and equipment	5,591	1,283
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

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

Table 96.—Employees, Salaries and Wages in Silver-Lead-Zinc Mining Industry, 1944

Province	On salary		Mine			Mill		Total	Salaries and wages
			Surface		Underground				
	Male	Female	Male	Female		Male	Female		
									$
Quebec	49	10	151	7	403	94	.....	**714**	1,350,153
Ontario	11	1	4	.....	17	5	.....	**38**	75,626
British Columbia	258	45	387	14	938	337	38	**2,017**	4,384,511
Yukon	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)
Canada	**318**	**56**	**542**	**21**	**1,358**	**436**	**38**	**2,769**	**5,810,290**

(a) No data available; work done under lease.

Table 97.—Number of Wage-Earners, by Months, in the Silver-Lead-Zinc Mining Industry, 1943 and 1944

Month	1943	1944				
		Mine			Mill	
	Total	Surface		Underground		
		Male	Female	Male	Male	Female
January	2,484	600	13	1,524	485	33
February	2,560	576	13	1,548	479	33
March	2,533	557	15	1,469	481	34
April	2,522	598	16	1,368	467	36
May	2,568	592	16	1,336	456	42
June	2,725	571	24	1,266	431	41
July	2,790	542	24	1,271	425	40
August	2,780	547	25	1,218	418	39
September	2,730	498	25	1,223	402	41
October	2,790	487	25	1,249	397	41
November	2,946	469	23	1,401	395	39
December	2,827	457	25	1,403	399	39
Average	**2,690**	**542**	**21**	**1,358**	**436**	**38**

Table 98.—Taxes Paid in 1943 and 1944 by Canadian Silver-Lead-Zinc Mining and Smelting Companies (*)

Tax Paid	1943	1944
	$	$
Dominion income tax	2,207,043	997,482
Dominion excess profits tax	3,690,312	1,068,459
Provincial tax	599,927	448,265
Municipal tax	167,201	270,278
Other	1,580	14,955

(*) Subject to revision.

Table 99.—Total Cost of Prospecting Conducted in Provinces by Silver-Lead-Zinc Mining and Smelting Companies, 1944

	$		$		$
N.S.	2,463	Ont.	48,820	B.C.	127,916
N.B.	4,245	Man.	5,738	Yukon	33,370
Que.	28,276	Sask.	9,605	N.W.T.	43,493
Total					**303,926**

Note.—Prospecting includes the search for new mineral deposits on the surface and preliminary exploration.

Table 100.—Other Expenditures by the Silver-Lead-Zinc Mining and Smelting Companies

—	1944
	$
Workmen's compensation	276,400
Silicosis assessment	160,483
Unemployment insurance	104,001
Aggregate cost of all supplies purchased	3,478,930
Aggregate cost of plant and equipment purchased	479,593
Cost of buildings, machinery and equipment erected or installed during the year	422,288

ARSENIC

Canadian production of arsenic (As_2O_3) during 1944 from domestic ores totalled 2,627,022 pounds valued at $180,866 compared with 3,153,538 pounds worth $254,009 in 1943. The output in 1944 consisted entirely of refined arsenic, of which 2,268,067 pounds valued at $153,944 represented recoveries from auriferous quartz ores mined in the province of Quebec; refined arsenic was produced in that province at the Beattie gold mine and crude arsenic produced at the O'Brien mine was refined by the Deloro Smelting and Refining Co. Ltd. at Deloro, Ontario; the balance of Canadian output in 1944 consisted of refined arsenic produced at the Deloro smelter from Ontario silver-cobalt ores. In addition to the arsenic recovered from Quebec and Ontario 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 gold mines receive no payment for any part of the arsenic content; it is therefore not credited as commercial production. Deposits containing arsenopyrite in association with gold occur in various other parts of Canada.

The following information is from the annual 1944 report on Arsenic as prepared by the United States Bureau of Mines:

"Roughly, three-quarters of the consumption of white arsenic has been for the preparation of agricultural insecticides used mainly to combat the cotton boll weevil, the codling and gypsy moths that cause widespread damage to apples and pears, and as herbicides. Of the remainder, the glass industry is the largest user. For the immediate future a good market for all probable United States output of arsenic at or near the current price level seems assured, especially as world needs for foods and fibres will be at a high level. The major one of price will be determined by the cost of imported arsenic and its relation to the cost of the by-product material obtained principally in copper and lead smelting. After Atlantic shipping becomes available, prices cannot be expected to rise substantially because of the huge stocks of arsenic that have accumulated in Sweden as a by-product from the treatment of the Boliden copper-gold-silver ores. The wartime development of effective new organic insecticides, such as DDT, may be strong competitors of arsenicals, although not yet sanctioned for commercial use."

The principal arsenic 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 since 1942. The Canadian price of white arsenic, as given by Canadian Chemistry & Process Industries in May 1945 was 7¾ to 8½ cents per pound.

Table 101.—Production in Canada, Imports and Exports of Arsenic, 1943 and 1944

—	1943		1944	
	Quantity	Value	Quantity	Value
	Pounds	$	Pounds	$
PRODUCTION—				
White arsenic	3,153,538	254,009	2,627,022	180,866
IMPORTS—				
Arsenic acid	(a)	(a)	4,202,829	156,652
White arsenic (arsenious oxide) (b)	400	124	2,405	1,749
Sulphide of arsenic (b)	3,373	1,123		
Soda, arseniate of, binarseniate	83,329	18,712	86,475	24,488
Arsenate of lead	4,432	484	....	....
Arsenate of lime	9,664	665	....	....
Total	....	21,108	....	182,889
Exports—Arsenic—Total	6,617,100	353,481	5,997,500	306,891

(a) Not classified separately prior to 1944.
(b) Data combined in 1944.

Table 102.—Consumption of Arsenious Oxide and Arsenic Acid in the Manufacture of Canadian Insecticides, 1932-1944

Year	Pounds	$	Year	Pounds	$
1932	1,721,044	69,250	1939	4,287,435	132,584
1933	3,116,401	110,011	1940	3,607,444	122,265
1934	4,709,443	168,185	1941	5,707,499	212,687
1935	2,736,089	86,983	1942	6,106,887	273,919
1936	3,368,956	106,132	1943	4,807,049	211,998
1937	3,296,559	102,651	1944	4,697,120	208,976
1938	3,029,145	93,873			

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; 1943, 383,050 pounds at $26,373, and 597,741 pounds at $40,345 in 1944.

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 either 1943 or 1944, and the 36,283 pounds valued at $34,106 credited as Canadian cobalt production during the year under review, represents the metal content of Canadian ores exported. Included in these exports is the cobalt content of ores and concentrates reshipped from the stock pile of the Metals Reserve Company, located at Deloro, Ontario. Ores placed on this stock pile are not credited as commercial production until reshipped from Deloro.

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 three years the company has been treating cobalt residues from Africa and has processed little or no Canadian ores. The Canadian production of cobalt ore from 1942 to 1944 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. The purchase of these ores for the Metals Reserve Company was discontinued February 22, 1944.

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, reported recently 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 war years.

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 for the ceramic industry

$1.85 a pound. The nominal Canadian price for cobalt ore, 10 per cent grade, f.o.b. cars, Ontario, was approximately $0.94 a pound of cobalt in 1944.

Since 1904, the first year for which cobalt production was recorded in Canada, there were produced, to the end of 1944, in all forms, 34,417,386 pounds of Canadian cobalt valued at $33,726,917.

A detailed investigation was made recently, by the University of British Columbia, of deposits of cobalt ore which have been known for years to exist on Nickel Plate Mountain and at the Little Gem mine; an average concentrate from the Kelowna Exploration Company's mill averaged 0.88 per cent cobalt.

COBALT-SILVER ORES DURING 1944

(A. A. Cole, Manager, Temiskaming Testing Laboratories, Cobalt, Ontario)

In July 1942 the United States Government, through a subsidiary purchasing agency (Metals Reserve Company), completed a contract with the Canadian Government through a similar Canadian purchasing agency (War Supplies Limited) for the purchase of cobalt ores for stock-piling purposes. The first shipment of cobalt ore left Cobalt on this contract in July 1942. This contract was operating during the year 1943 and the year 1944 opened with the market for cobalt ore active, as all cobalt ore purchased was immediately absorbed by this contract at a good price. The contract terminated on the 22nd February 1944 and by that date every available pound of cobalt ore had been shipped from the district.

The uncertainty as to the intentions of the United States Government regarding the stock-pile of accumulated cobalt ore unsettled the market to such an extent that a number of operators closed their mines till the market was more settled. This is reflected in the fact that only one car of cobalt ore was shipped from Cobalt during the balance of the year. It went to the Shepherd Chemical Co., Cincinnati, Ohio, U.S.A. The year closed with the market still uncertain.

Ores of the Cobalt District.—The metals contained in the ores from this district are principally cobalt and silver, with sometimes payment also being made for nickel. The silver content varies from zero up to several thousand ounces per ton. But for contract purposes the ores are generally divided into silver ores and cobalt ores, an arbitrary point of division being chosen. Ores containing 500 ozs. silver per ton or over are called silver ores.

Cobalt ores.—Cobalt ores to be marketable have to assay at least 8 per cent cobalt, but the average of the shipments that have been made will run about 10 per cent. The movement of cobalt ores during 1944 has been covered in the above paragraph.

Silver ores.—The main producer of silver ore during the year was the Cross Lake Lease, whose ore for the most part was crude ore and not concentrates. The other shipper of importance was the Ausic Mining & Reduction Co., working its own mill on the Silver Cliff Property, the mill-feed being obtained mostly from the Genesee Mine.

Since the Deloro Smelting & Refining Co., of Deloro, Ontario gives the most attractive contract for silver-cobalt ores, all the silver ores shipped from the district go to Deloro. As the aggregate shipments are small, the Deloro Company only runs its silver smelter when sufficient ore is accumulated to make the run worth while. This amount they set at 300 tons. A furnace run was made early in 1944 and the next run was a year later in March, 1945.

COBALT 1944

(United States Bureau of Mines)

The United Nations did not lack supplies of cobalt in 1944. Indeed with the output of Finland available, the United Nations control virtually the entire world cobalt supply, except that of Burma (1944). On the other hand, with Germany's loss of cobalt production from French Morocco in 1943 and Finland in 1944, its remaining source of supply was limited to a small domestic output. Presumably, Japan was in a more favourable position than Germany with respect to cobalt because of a small domestic output and the Burmese production.

However, Burmese speiss, which is obtained by smelting lead ore, is difficult to refine. In the United States, despite the fact that cobalt was free from allocation and that imports were 32 per cent less than in 1943, available supplies were more than adequate for requirements in 1944. Maximum prices for cobalt metal, fines, powder, oxides and other alloys and compounds established by the Office of Price Administration on November 2, 1943, continued in effect in 1944. The maximum price for metal containing 97 per cent cobalt was fixed at $1.50 to $1.57 a pound on contract and $1.60 to $1.67 on spot sales. The maximum prices for other cobalt products were the highest charged by the seller on a delivery made during January, February or March 1942. Cobalt ores, concentrates and crudes are exempt from the provisions of the price regulation. Production of cobalt ore in the United States was 13 per cent greater in 1944 than in 1943, but shipments were 27 per cent less. The Bethlehem Steel Co., Bethlehem, Pa., was again the chief producer, but during the last quarter of 1944 it was exceeded by the St. Louis Smelting and Refining Co., Fredericktown, Mo., which began producing cobalt commercially at its property near Fredericktown, Mo., in July 1944; the complex ore yields a lead concentrate, a copper concentrate containing some lead, and a nickel-cobalt concentrate. Production by the Bethlehem Steel Company represents the cobalt (averaging 1·37 per cent in 1944) contained in the sulphides that accompany the magnetite mined at Cornwall, Pa. Belgian Congo has been the chief source of cobalt imports into the United States; in 1944 it supplied 8,500,516 pounds in the form of an alloy containing 3,737,000 pounds of cobalt.

Table 103.—Production of Domestic Cobalt in Canada, 1935-1944

Year	Pounds	Year	Pounds
1935	681,419	1940	794,359
1936	887,591	1941	263,257
1937	507,064	1942	(*) 83,871
1938	459,226	1943	(*) 175,961
1939	732,561	1944	(*) 36,283

(*) Exclusive of cobalt in ores placed on United States Government stock pile at Deloro, Ontario, but includes metal in ores reshipped from this stock pile.

Table 104.—Production in Canada From Domestic Ores, Imports and Exports of Cobalt, 1943 and 1944

—	1943		1944	
	Quantity	$	Quantity	$
Production (In terms of metallic cobalt and cobalt in oxides and salts sold and in ores exported) pounds	(*) 175,961	191,407	(*) 36,283	34,106
Imports—Cobalt ore pounds	2,236,300	785,721	3,676,400	1,327,755
Oxide of cobalt pounds	55	130	1,720	2,595
Exports—Cobalt, contained in ore pounds	163,100	188,510	25,900	24,379
Cobalt, metallic pounds	911,107	1,507,635	1,009,068	1,665,984
Cobalt, alloys pounds	214,202	1,021,663	176,589	789,202
Cobalt oxides and cobalt salts pounds	67,040	135,630	462,656	829,469

(*) Exclusive of cobalt in ores placed on United States Government stock pile at Deloro, Ontario, but includes metal in ores reshipped from this stock pile.

Table 105.—Cobalt Salts Used in the Manufacture of Canadian Pigments and Paints, 1932-1944

Year	Pounds	$	Year	Pounds	$
1932	17,021	10,960	1939	52,979	21,638
1933	10,885	7,463	1940	89,332	28,111
1934	26,300	14,009	1941	74,445	39,349
1935	110,419	33,292	1942	200,228	145,433
1936	170,932	43,230	1943	179,995	75,233
1937	37,258	17,062	1944	182,437	78,554
1938	43,703	17,993			

WORLD PRODUCTION

(U.S. Bureau of Mines)

As cobalt production data for many countries are lacking, it is impossible to prepare an accurate statement of present world output. The following table shows world production by countries in 1938 in so far as statistics are available.

Table 106.—

Country (a)	Cobalt-bearing Material	Cobalt Content
		metric tons
Australia	Cobalt ore	(b)
Belgian Congo	Cobalt alloy	1,532
Bolivia (exports)	Cobalt ore	....
Burma	Cobaltiferous nickel speiss	(c) 238
Canada	Cobalt ores, oxide, and metal	208
Morocco, French	Cobalt ore	720
Northern Rhodesia	Cobalt alloy	(c) 1,073
United States	Cobalt ore	(d)

(a) In addition to countries listed, Brazil, Chile, China, Finland, Germany, Italy, Japan and Mexico produce cobalt, but production data are not available.

(b) Data not available.

(c) Year ended June 30 of year stated.

(d) Bureau of Mines not at liberty to publish figures.

SILVER

Production of fine new silver from all types of Canadian ores totalled 13,627,109 troy ounces valued at $5,859,656 in 1944 compared with 17,344,569 troy ounces worth $7,849,111 in 1943. The average estimated price of the fine metal in Canadian funds was 43 cents per troy ounce in 1944 as against 45·254 cents in 1943. Of the total Canadian production in 1944, the mines of British Columbia contributed 5,631,572 ounces, Ontario 3,143,275 ounces, Quebec 2,500,681 ounces, Saskatchewan 1,735,773 ounces, Manitoba 569,873 ounces, with lesser quantities from Yukon, Northwest Territories and Nova Scotia. 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 annual 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 1944, totalled 880,919,928 troy ounces valued at $494,565,826.

The following information is taken from the review of the 1944 silver market by Handy & Harman, New York:

"For the fifth successive year the silver markets of the world have operated under governmental control. Price ceilings, import and export embargoes and exchange restrictions created artificial conditions in silver dealing everywhere, but this was necessary in order that the white metal might function to best advantage in the war effort. As in 1943 the London spot and forward quotations were pegged at 23½d. throughout the year. . . . While rigid stabilization of silver at a fixed level was not attempted in India, nevertheless the authorities exercised considerable price control in a market which was extremely sensitive and subject to wide fluctuations; industrial consumption of silver in India is practically nil. Therefore that country's absorption of silver represents merely the peoples' desire to accumulate a store of value. . . . The United States OPA import price ceiling of 45 cents per ounce was maintained, but imports declined as compared with 1943. Nevertheless, supplies of foreign origin were more than sufficient to meet requirements for the uses specified by the War Production Board. . . During 1944 less than 200,000 ounces of the United States silver production were acquired by the U.S. Treasury Department under the Domestic Silver Purchase Act of 1939; all the rest of such newly mined metal was bought by industry for civilian purposes as permitted by the War Production Board. . . .

"United States Treasury disposals during the eleven-month period were comprised as follows: the minting of 'silver' nickels accounted for 8,489,000 ounces; sales under the Green Act absorbed 43,672,000 ounces; lend-lease procedure made 202,807,000 ounces available to foreign governments, a total of 255,000,000 ounces. The governments receiving lend-leased silver were Australia, Ethiopia, Great Britain, India, the Netherlands and Saudi-Arabia. There were 1,175,700,000 ounces of silver pledged as backing for U.S. silver certificates and 868,700,000 ounces which remained unpledged. . . . England's industrial consumption of silver, restricted entirely to war purposes, is estimated at 14,000,000 to 18,000,000 ounces. Canadian arts and industries absorbed an estimated 5,000,000 ounces, a new high record. An estimate for the arts and industries in the United States in 1944 is 125,000,000 ounces; of this, 65 per cent was for war and other essential purposes. Among war purposes in the United States, solders and brazing alloys moved into first place, followed in order of quantity by photographic products and processes, electrical parts, airplane engine bearings and military insignia. There was a marked growth in the employment of silver for electrical purposes, including Radar and a continued heavy rate of use in aircraft engine bearings. . . ."

On January 2, 1945, the London silver market commenced to quote bar silver in pence per troy ounce 0·999 fine instead of in pence per ounce standard, that is, per ounce troy 0·925 fine.

Increase in Silver Price in United States 1945

(E & M J Metal & Mineral Markets, New York)

"The office of United States Price Administration raised the ceiling price of foreign silver in September, 1945, from 45 cents a fine ounce to 71·111 cents. The higher level became effective on September 21, 1945. In taking this action OPA established a uniform maximum price for both foreign and domestic silver.

"Foreign silver is defined by the pricing organization as 'all silver other than newly mined domestic silver or silver sold by the United States Treasury under the Green Act'. The measure, sponsored by Senator Green, which became law in 1943, permitted the sale of Treasury silver for war purposes and other uses at a price equivalent to the domestic price of 71·111 cents.

"Use of foreign silver had been restricted under the war program to essential war needs. Consumers of silver who could not qualify to obtain the lower-priced foreign metal, such as manufacturers of silverware and jewellery, had to purchase the higher-priced domestic or Treasury silver.

"WPB Order M-199, which limited and controlled the uses of silver, was revoked August 20, 1945, and continuance of different maximum prices for foreign and domestic silver after that date was no longer practicable, OPA said. Foreign consumers were paying higher prices than 45 cents for silver and the flow of foreign metal into the United States market threatened to decline appreciably. . . ."

Table 107.—Production of Silver From All Ores in Canada for Years Specified, 1887-1944

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
1896	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 (*)	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	16,020,657	(†) 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	1944	13,627,109	43·0

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

Refined silver produced in Canada during 1944 totalled 12,021,146 fine troy ounces compared with 15,900,840 fine troy ounces in 1943.

Canadian refined silver is sold in Canada (September 1945) to the Canadian consumer at 40 cents per ounce. Silver, in all forms (bullion, ores, etc.), is under export permit designed to see that the Canadian consumer is protected as to his supply, after which all excess can be exported to foreign markets. Silver in ores exported to the United States is paid for by the U.S. smelter in the usual way. Export permit forms can be obtained from Canadian customs offices.

Table 108.—Production of Silver in Canada, by Provinces and Method of Computation, 1943 and 1944

—	1943		1944	
	Quantity	Value	Quantity	Value
		$		$
NOVA SCOTIA—				
In gold bullion	144	65	188	81
QUEBEC—				
In anode copper	1,509,610	683,159	1,255,790	539,990
In gold bullion made and in concentrates exported	702,505	317,912	1,244,891	535,303
Total	2,212,115	1,001,071	2,500,681	1,075,293
ONTARIO—				
In silver recovered in Canada from cobalt ores	97,411	44,082	684,092	294,160
In gold bullion	339,640	153,701	278,413	119,717
In blister copper	1,608,787	728,040	1,812,447	779,352
In ores, concentrates, residues, matte, etc., exported	625,482	283,056	368,323	158,379
Total	2,671,320	1,208,879	3,143,275	1,351,608
MANITOBA—				
In blister copper	533,906	241,614	519,707	223,474
In gold bullion (gold mines) and ores exported	53,373	24,153	50,166	21,571
Total	587,279	265,767	569,873	245,045
SASKATCHEWAN—				
In blister copper	2,812,623	1,272,825	1,735,773	746,382
In gold bullion and in crude alluvial gold	1	.....	.....	.....
Total	2,812,624	1,272,825	1,735,773	746,382
ALBERTA—				
In alluvial gold	1	.....	4	2
BRITISH COLUMBIA—				
In alluvial gold	2,628	1,189	2,000	860
In gold bullion	30,431	13,771	17,725	7,622
In base bullion and in ores, etc., exported	8,962,429	4,055,858	5,611,847	2,413,094
Total	8,995,488	4,070,818	5,631,572	2,421,576
YUKON—				
In alluvial gold	8,810	3,987	5,124	2,203
In silver-lead ores exported	43,538	19,703	26,942	11,585
Total	52,348	23,690	32,066	13,788
NORTHWEST TERRITORIES—				
In pitchblende-silver ores shipped to smelters (*) and in gold bullion	13,250	5,996	13,677	5,881
Canada—Total	**17,344,569**	**7,849,111**	**13,627,109**	**5,859,656**

(*) Complete data relating to recovery of silver from pitchblende ores are not available since 1942.

NOTE.—For 1944, silver was valued at 43 cents per fine ounce, the average price of domestic sales and sales on the New York market adjusted and expressed in Canadian funds; for 1943, the corresponding price was 45·254 cents.

Table 109.—Source of Canadian Silver Production, by Percentages, 1939-1944

Source	1939	1940	1941	1942	1943	1944
In silver-cobalt ores	6·5	5·38	2·6	4·13	0·81	5·05
In base bullion (a)	(b) 39·7	(b) 44·39	45·3	46·16	45·58	35·52
In gold ores (bullion and placer)	4·6	3·60	4·1	3·71	3·07	3·21
In blister and anode copper (c)	23·6	27·62	31·8	34·28	37·28	39·07
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	17·15
	100·0	100·0	100·0	100·0	100·0	100·0

(a) Chiefly from silver-lead ores.
(b) Includes silver recovered in Canada from pitchblende-silver ores.
(c) Made from copper-gold-silver and nickel-copper ores.

Table 110.—Canadian Silver Production According to Nature of Ores, by Provinces, 1944

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		188					188
Quebec		126,958	1,272,181		1,101,542		2,500,681
Ontario		577,516		1,828,978	48,526	(*) 688,255	3,143,275
Manitoba		6,307	563,566				569,873
Saskatchewan			1,735,773				1,735,773
Alberta	4						4
British Columbia	2,000	140,624	223,154		(†)5,265,794		5,631,572
Northwest Territories		5,428				8,249	13,677
Yukon	5,124				26,942		32,066
Canada	**7,128**	**857,021**	**3,794,674**	**1,828,978**	**6,442,804**	**696,504**	**13,627,109**

(*) Exclusive of silver in cobalt-silver ores placed on United States Government stock pile at Deloro, Ontario, but includes any silver in ores reshipped from this stock pile.
(†) Contains a relatively small quantity recovered from gold ores.

Table 111.—Imports Into Canada and Exports of Silver and Films, 1943 and 1944

	1943		1944	
	Quantity	Value	Quantity	Value
	oz.	$	oz.	$
Imports—				
Silver, unmanufactured				
Silver, manufactures of, n.o.p.		31,427		36,296
Toilet articles of which the most important component, in value, is sterling silver		254		53
Total		**31,681**		**36,349**
Exports—				
Silver contained in ore, concentrates, etc.	2,253,018	1,040,297	2,389,739	1,170,475
Silver bullion (Canadian)	9,198,617	4,517,756	3,577,243	1,762,944
Silver manufactures		71,300		208,387
Total		**5,629,353**		**3,141,806**
Imports of Photograph Film—				
Photographers		407,054		610,890
Cinematograph (positives) (ft.)	4,565,195	368,470	7,016,432	563,674
Films for aerial photography		65,442		89,342
Cinematograph (negatives)		76,880		75,763
Educational		338,313		277,289
X-Ray film		(*)		451,778
Exports—				
Film for photographers' use and for moving pictures		803,267		1,559,626

(*) Not shown separately.

Table 112.—Silver Consumed in Specified Canadian Industries, 1943 and 1944

—	1943		1944	
	Fine oz.	Value	Fine oz.	Value
		$		$
Electrical apparatus	15,815	8,538	11,112	5,646
Scientific equipment (*)	702,882	279,885	742,774	298,765
Fountain pens and pencils	54,712	25,497	11,668	5,239
Jewellery and silverware (fine silver)	....	1,421,459	....	1,749,154
Jewellery and silverware (silver alloys)	....	837,907	....	1,014,775
Medicinal and pharmaceutical preparations (bullion)	147,254	61,038	130,061	54,068
White metal alloys	400,736	163,230	256,237	104,125

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

Table 113.—Silver Production of the World (American Bureau of Metal Statistics)—Fine troy ounces

—	1938	1944
North America—		
United States (inc. Philippine Islands)	58,736,000	37,370,000
Canada	22,219,195	13,545,905
Mexico	81,016,939	63,000,000
Newfoundland	1,645,590	1,163,000
Total North America	**163,617,724**	**115,078,905**
Central America and West Indies	4,300,000	4,000,000
South America—		
Argentina	3,755,000	1,695,000
Bolivia	6,373,660	6,797,378
Chile	1,375,498	950,000
Colombia	192,872	205,000
Ecuador	89,111	325,000
Peru	20,552,177	11,650,000
Other South America	47,000	(*) 100,000
Total South America	**32,385,318**	**21,722,378**
Europe—		
Czechoslovakia	1,190,326	....
France	(*) 565,000	....
Great Britain	107,985	....
Germany	(*) 7,000,000	....
Greece	150,000	....
Italy	812,500	....
Norway	235,338	....
Poland	62,244	....
Romania	819,864	....
Russia	(*) 7,000,000	....
Spain	237,653	....
Sweden	1,123,835	....
Yugoslavia	2,524,074	....
Other Europe	140,000	....
Total Europe	**21,968,819**	(†)
Oceania—		
New South Wales	9,558,550	....
Queensland	3,533,490	....
Tasmania	1,219,550	....
Western Australia	271,346	103,000
New Guinea	141,760	....
New Zealand	357,709	....
Other Oceania	20,000	....
Total Oceania	**15,102,405**	(†)
Asia—		
India and Burma	6,450,000	....
China	(*) 150,000	....
Korea	(*) 3,000,000	....
Netherlands Indies	579,131	....
Cyprus	106,522	....
Japan	(*) 10,000,000	....
Turkey	350,000	....
Other Asia	140,000	....
Total Asia	**20,775,653**	(†)

Table 113.—Silver Production of the World (American Bureau of Metal Statistics) —Fine troy ounces—Concluded

—	1938	1944
Africa—		
Algeria	90,000	.....
Nigeria	(*) 50,000	.....
Rhodesia	254,654	103,800
Transvaal, Cape Colony and Natal	1,135,374	.....
Belgian Congo	3,122,215	.....
French Morocco	208,980	.....
Southwest Africa	636,396	.....
Tunis	61,149	.....
Other Africa	60,000	.....
Total Africa	**5,618,768**	(†)
Total for world	**263,768,687**	(†)

(*) Conjectural.
(†) Data not available.

Table 114.—World's Monetary Stocks of Silver at the Close of 1943 (Supplied by the United States Mint and Subject to Revision) Stated in United States money, 000's omitted

Country	Monetary unit	Silver stocks in banks and treasuries	Per capita
		$	$
North America—			
United States (including Alaska, Hawaii and Puerto Rico)	dollar	3,287,817	24·43
Canada	dollar	40,010	3·50
Mexico	Peso	(1)	(1)
Newfoundland and Labrador (2)	dollar	2,281	7.60
Central America and West Indies—			
British Honduras	dollar	196	3.21
British West Indies—			
Barbados	dollar	1,560	7.88
Jamaica	pound	838	0.68
Trinidad and Tobago (3)	dollar	1,200	2.37
Costa Rica	colon	128	0.19
Cuba (5)	peso	88,000	20.95
Dominican Republic (4)	dollar	489	0.28
Guatemala	qetzel	1,707	0.50
Haiti (5)	Gourde	(1)	(1)
Honduras	Lempira	4,450	3.85
Nicaragua	cordoba	103	0.07
Panama, Republic of (5)	balboa	1,010	1.60
Salvador (6)	colon	.....	.....
South America—			
Argentina	peso	.....	.....
Bolivia	Bolivian	3,873	1.12
Brazil	cruzeiro	(1)	(1)
British Guiana (2)	dollar	1,188	3.42
Chile	peso	.....	.....
Colombia	peso	9,503	1.01
Ecuador	sucre	438	0.15
Paraguay	peso	.....	.....
Peru	sol	3,538	0.50
Surinam	florin	526	2.81
Uruguay	peso	6,403	2.91
Venezuela	bolivar	(1)	(1)
Europe—(1)	.....	(1)	(1)
Asia—			
British India (excluding Burma) (7)	rupee	37,050	0.10
Iran	rial	20,204	1.68
Palestine and Trans-Jordan	pound	6,698	4.23
Africa—			
British East Africa (Kenya, Tanganyika, Uganda and Zanzibar)	shilling	17,578	1.37
British West Africa (Gambia, Gold Coast, Nigeria and Sierra Leone)	pound	386	0.01
Egypt and Anglo Egyptian Soudan	pound	22,875	0.99
Portuguese East Africa (8)	escudo	240	0.06
Southwest Africa	pound	79	0.22
Oceania—			
Fiji Islands	pound	657	3.06
New Zealand	pound	7,168	4.39

(1) Data not available.
(2) Canadian coin and currency also circulate.
(3) Estimated.
(4) Dominican Republic—Silver: Dominican and United States; Paper: United States.
(5) United States coin and currency also circulate.
(6) Silver was demonetized under decree of December 23, 1941 effective February 28, 1942.
(7) Source: The Statist, January 30, 1943. Silver represents rupee coin in Reserve Bank of India.
(8) Silver escudos converted at rate of 15 per dollar ($0·0666+).

LEAD AND ZINC

Statistics relating to Canadian primary production of lead and zinc represent the content of these metals contained 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 and Smelting Company Limited and at Trail, British Columbia by the Consolidated Mining and Smelting Company of Canada Ltd.

The following information is from reports on lead and zinc as prepared by the Bureau of Mines, Ottawa:

"Lead production in Canada is obtained from the various silver-lead-zinc mines of British Columbia and to a smaller extent from the few zinc-lead mines in Quebec and Ontario. The Sullivan mine at Kimberley, British Columbia, operated by Consolidated Mining and Smelting Company of Canada, is the principal source of production. Canada exports the greater part of its output of lead.

"Lead is used chiefly in the lead pigment, cable covering, storage battery, building, and ammunitions industries, and in the manufacture of tetraethyl lead for gasoline. So far in the present war it 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. There are many purposes for which lead is normally used to a greater or lesser extent in competition with other materials now critical; for example, lead in plumbing, for sheet metal work on buildings, as bearing metal to replace tin, and as chemical tank linings and pipes.

"Tetraethyl lead, which has become an important outlet for lead, plays an indispensable role in the production of aviation gasoline. Much interest has been shown in combinations of lead with iron, particularly leaded steel. A lead coating is being used as a lubricant for successive wire-drawing operations on alloy steel, the coating being removed finally with the use of solvents. Lead-base bearings are still used extensively in low-speed applications.

"The average price of pig lead (quotations on the London market, converted to Canadian funds) was 4·5 cents a pound throughout 1944. The price at New York was 6.50 cents throughout 1944.

"Close to 55 per cent of the zinc produced in Canada in 1944 came from Consolidated Mining and Smelting Company's Sullivan silver-lead-zinc mine near Kimberley, British Columbia. The remainder was from Hudson Bay Mining and Smelting Conpany's copper-zinc deposits at Flin Flon, which straddle the Manitoba-Saskatchewan boundary; the Sherritt-Gordon copper-zinc mine in northern Manitoba; several small lead-zinc properties in West Kootenay district, British Columbia; the Lake Geneva lead-zinc property, Sudbury district; the Normetal and Waite-Amulet copper-zinc mines in western Quebec; and the Tetreault and New Calumet lead-zinc mines in Quebec. About 77 per cent of the Canadian production of zinc in 1944 was exported, mostly in the refined form.

"Zincton Mines, Limited operated the Lucky Jim zinc mine and its 350-ton concentrator at Zincton, B.C., at a reduced rate.

"Golden Manitou Mines, Limited operated its mine and 1,000-ton concentrator near Val d'Or, Quebec. Its contract with the United States Government agencies for zinc concentrates expired January 1, 1945, but it made a new contract with American Zinc Company of Illinois for a period of 3 years. The company reports ore reserves above the 960-foot level of 983,100 tons averaging 7·74 per cent zinc, 0·045 ounce of gold, and 3·06 ounces of silver. Ore of good grade not included in the above estimate has been proved by diamond drilling down to a depth of 1,500 feet.

"Hollinger North Shore Exploration Company (Hollinger Consolidated Gold Mines) investigated occurrences of zinc that were disclosed in 1943 on its concession near the Quebec-Labrador boundary. Limited exploratory work on an outcrop indicated a width of 13 feet of zinc ore and a length, determined by trenching, of 660 feet, the grade being 6·75 per cent zinc, 1·32 per cent copper, and $2.00 in precious metals. Prior to the war, United States, Canada, Australia, Germany, Poland, Mexico, and Russia, in the order named, were the principal producers of zinc from ores of domestic origin.

"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 castings industry; as paint pigments; in radio and flashlight batteries; and in the making of zinc oxides. A large percentage of the Canadian consumption of zinc is used in the war effort in the making of brass and bronze products, for galvanizing, for die casting, in zinc oxide, in dry batteries; and for miscellaneous purposes.

"The average price of zinc in 1944, in Canadian funds (based on London quotations), was 4·3 cents per pound, compared with 4·0 cents in 1943. The St. Louis price was 8·25 cents throughout 1944. This price has prevailed since 1942."

The Canadian prices for both lead and zinc are controlled by Wartime Prices and Trade Board (October, 1945). Permit forms for the export of non-ferrous ores can be obtained from customs offices.

The Mining Journal, London, in its annual review for 1944, stated: "It is not possible to present with any accuracy statistics of world production and consumption of lead and zinc in 1944. So far as the United Nations are concerned they have ample supplies of these metals to meet all their wartime requirements and the prospect at the end of the year was that, though stocks of zinc were tending to increase still further, stocks of lead were declining rapidly. Prices of lead in both Britain and the United States remain unchanged, British prices being £25 per long ton and the United States (New York) price 6·5 cents per pound. There was no change in zinc prices during the year. In Britain, foreign zinc, duty paid, continued to be controlled at £25·15s. per ton and electrolytic zinc at £27·5s. per ton. In the United States the price of prime western zinc was 8.25 cents per pound."

The agreement made in 1939 by the large Canadian 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 in 1944 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.

Table 115.—Production (b) of New Lead in Canada, 1935-1944

Year	Pounds	$	Average Price per pound (Canadian funds)
			cents
1935	339,105,079	10,624,772	3·133
1936	383,180,909	14,993,869	3·913
1937	411,999,484	21,053,173	5·110
1938	418,927,660	14,008,941	3·344
1939	388,569,550	12,313,768	3·169
1940	471,850,256	15,863,605	3·362
1941	460,167,005	15,470,815	3·362
1942 (a)	512,142,562	17,218,233	3·362
1943	444,060,769	16,670,041	3·754
1944	304,582,198	13,706,199	4·500

Note.—Year of maximum value of Canadian lead production: $23,127,460 in 1925.
(a) Year of maximum output of Canadian lead.
(b) Primary lead in base bullion produced plus lead in ores exported.

RESTRICTIONS ON THE PURCHASE OF LEAD IN CANADA

(Department of Munitions and Supply)

In order to conserve the supplies of lead, Order M.C. 11 was put into force on May 2, 1942. This order prohibited any person acquiring virgin lead from a primary smelter. In June of the same year this order was amended to include certain lead and lead alloys and effective October 1, 1943, consumers' inventories of lead were limited to sixty days' requirements. On June 23, 1945, a new order M.C. 11E allowed the purchase of up to 2000 pounds of lead per month without permission from the Metals Controller, but restricted inventories to two months' requirements or 2000 pounds whichever was greater.

Although lead is still under allocation by the Combined Raw Materials Board, the Canadian lead situation was so favorable that on August 27, 1945, Order No. M.C. 11E was rescinded and all restrictions on the purchase of lead in Canada were removed.

Table 116.—Production in Canada, Imports and Exports of Lead, 1943 and 1944

—	1943		1944	
	Pounds	Value	Pounds	Value
		$		$
PRODUCTION—				
Quebec	2,435,523	91,430	10,487,842	471,953
Ontario	2,273,896	85,362	1,065,741	47,958
British Columbia	439,155,635	16,485,902	292,922,888	13,181,530
Yukon	195,715	7,347	105,727	4,758
Total	**444,060,769**	**16,670,041**	**304,582,198**	**13,706,199**
IMPORTS—				
Pig and block	19,481	3,561	20,225	2,868
Old and scrap	2,183	87	6,096	282
Bars and sheets	8,862	1,379	10,156	1,504
Litharge for storage batteries	2,397,300	203,677	3,155,100	266,530
Acetate of lead	62,307	8,013	131,876	16,998
Nitrate of lead	123,163	15,453	303,265	36,658
Other manufactures	....	229,644	....	382,455
Pipe lead	59	10	2,533	528
Shots and bullets	141,484	22,176	15,721	2,479
Lead arsenate	4,432	484	....	....
Lead tetraethyl, compounds of	10,556,057	3,568,496	10,033,373	3,378,702
Lead capsules for bottles	....	25,465	....	16,019
Lead pigments—				
Dry white lead	435,835	37,606	336,000	29,690
White lead, ground in oil	....	....	180	23
Dry red lead and orange mineral	114,123	11,936	400,392	39,175
Total	....	**4,127,987**	....	**4,174,111**
EXPORTS—				
Lead, contained in ore	11,470,200	425,306	19,000,300	650,433
Pig lead	308,695,300	9,222,104	205,759,600	6,394,550
White lead	205,500	20,380	373,000	39,734
Total	....	**9,667,790**	....	**7,084,717**

Production of lead in all forms and from all types of Canadian ores from 1887 to 1944 inclusive, totalled 8,566,923,587 pounds valued at $368,433,325.

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

Table 117.—Refined Lead Production in Canada(*) 1929-1944

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	(†) 400,763,914
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	1944	(†) 285,102,139

(*) 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 118.—Available Statistics on the Consumption of Lead in Specified Canadian Manufacturing Industries, 1942 and 1944

Industry	Items used	1942	1943	1944
		Pounds	Pounds	Pounds
Brass and copper products	Pig lead	1,780,402	1,689,325	2,187,292
	Scrap and other lead	641,465	400,760	1,375,903
White metal alloys	Pig lead	48,281,959	51,823,690	52,700,766
	Scrap lead	21,194,878	22,714,238	28,674,358
Electrical apparatus	Pig lead (pure and antimonial)	39,690,349	42,655,554	44,399,623
	Scrap lead	127,733	77,422	203,459
Iron and steel	Lead	6,050,028	4,281,005	3,327,184
Ammunition	Pig lead	10,467,968	6,883,360	4,425,391
Total accounted for	...	**128,235,382**	**130,525,354**	**137,293,976**

Table 119.—Lead Production of the World on Mine Basis, 1938 and 1944 (American Bureau of Metal Statistics)

(Tons of 2,000 pounds)

—	1938	1944
United States	369,726	410,750
Canada	209,457	150,537
Newfoundland	31,856	30,000
Mexico	311,255	197,437
Total North America	**922,294**	**788,724**
Argentina	26,125	21,000
Bolivia	14,578	9,973
Chile	1,016	...
Peru	63,982	53,000
Total South America	**105,701**	**83,973**
Austria	(a)	...
Bulgaria	375	...
Czechoslovakia	4,409	...
Finland	95	...
France	5,511	...
Germany	105,821	...
Great Britain	33,312	...
Greece	4,519	...
Italy	43,541	...
Norway	161	...
Poland	5,842	...
Romania	6,233	...
Russia	(b) 76,000	...
Spain	35,063	30,000
Sweden	9,502	...
Yugoslavia	85,649	...
Total Europe	**416,033**	(c)
Burma	89,712	...
China, including Hong Kong	7,716	...
Japan	(b) 13,000	...
Korea	(b) 11,000	...
Turkey	6,173	...
Total Asia	**127,601**	(c)
Australia	307,203	197,303
Algeria	5,071	...
French Morocco	20,944	...
Nigeria	332	...
Southwest Africa	19,302	...
Tunis	20,833	...
Other Africa	7,700	...
Total Africa	**74,182**	(c)
Grand Total	**1,953,101**	(c)

(a) Included with Germany.
(b) Conjectural.
(c) Data not available.
Small productions from Brazil, Ecuador and the Philippines are not included in the above table.

ZINC

Table 120.—Production (b) of Zinc From All Types of Canadian Ores, 1935-1944

Year	Pounds	$	Average price per pound Canadian funds
			c.
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 (a)	610,754,354	24,430,174	4·00
1944	550,823,353	23,685,405	4·30

(a) Year of maximum Canadian zinc production.
(b) Comprises refined zinc made in Canada plus zinc in ores, etc., exported.

The total value of Canadian zinc production since the first recording of Canadian zinc statistics in 1898, and inclusive of 1944, totalled $280,533,781.

Table 121.—Production in Canada, Imports and Exports of Zinc, 1943 and 1944

—	1943		1944	
	Pounds	Value	Pounds	Value
		$		$
Production—				
Quebec	128,169,810	5,126,792	137,378,439	5,907,273
Ontario	3,299,812	131,993	2,429,176	104,455
Manitoba	46,783,873	1,871,355	45,822,278	1,970,358
Saskatchewan	96,350,404	3,854,016	87,130,087	3,746,594
British Columbia	336,150,455	13,446,018	278,063,373	11,956,725
Total	**610,754,354**	**24,430,174**	**550,823,353**	**23,685,405**
Imports—				
Zinc dust	7,500	1,014	40,200	4,089
Zinc in blocks, pigs, bars and rods, and zinc plates, n.o.p.	138,400	26,257	156,900	26,722
Zinc in sheet and strips, and zinc plates for marine boilers	987,300	141,997	991,600	153,054
Zinc spelter	27,076,400	2,429,945	8,883,000	794,865
Zinc slugs for dry batteries		64,385		86
Zinc white (zinc oxide)	2,218,564	174,075	1,745,535	137,612
Zinc sulphate	708,869	31,743	986,136	41,278
Zinc, chloride of	189,305	11,745	192,935	11,928
Zinc, manufactures of, n.o.p.		377,486		351,218
Lithopone	17,754,879	857,507	18,999,905	932,787
Total		**4,116,154**		**2,454,539**
Exports—				
Zinc, manufactures of (from Jan. 1, 1944)				193,519
Zinc, contained in ore	222,550,300	6,097,117	226,606,900	7,046,844
Zinc, scrap, dross and ashes	4,291,000	159,218	9,144,200	301,941
Zinc, spelter	258,629,700	10,260,030	191,970,000	7,668,731
Total	**485,471,000**	**16,516,365**	**427,721,100**	**15,209,035**

Canadian zinc refineries have an estimated annual capacity of 237,500 tons of cathode zinc.

Table 122.—Canadian Zinc Production (Recoverable) According to Nature of Ores, by Provinces, 1939-1944

Year and Province	Recovered from copper-gold-silver ores	Recovered from silver-lead-zinc and other ores	Total
	Pounds	Pounds	**Pounds**
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**
1944—Quebec	78,069,636	59,308,803	**137,378,439**
Ontario	.....	2,429,176	**2,429,176**
Manitoba	45,822,278	.....	**45,822,278**
Saskatchewan	87,130,087	.....	**87,130,087**
British Columbia	1,953,077	276,110,296	**278,063,373**
Total Canada	**212,975,078**	**337,848,275**	**550,823,353**

RESTRICTIONS ON THE PURCHASE OF ZINC IN CANADA

(Department of Munitions and Supply)

Due to a shortage of zinc for the production of munitions for war, it became necessary to restrict the use of zinc to essential purposes. Accordingly, on May 11, 1942, an Order (M.C. 12) was issued which prohibited any person from buying or selling zinc without a permit from the Metals Controller.

As the war continued and munitions orders increased, amendments were made to Order M.C. 12 to include Zinc Oxide and Zinc Mill Products. Not until after the cessation of the war in Europe was it possible to lift these restrictions in any way, but on June 7, 1945, the control of Zinc Oxide and Zinc Dust was removed by Order M.C. 12E, and only an inventory control was retained on slab zinc.

In August, 1945, immediately following the termination of the war with Japan, Order No. M.C. 12E was rescinded and restrictions on the purchase of zinc were removed.

Table 123.—Refined New Zinc Produced in Canada, 1933-1944

Year	Average price (*) per pound	Short tons	Year	Average 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	1944	4·30	168,518

(*) In Canadian funds.

Table 124.—Available Statistics on the Consumption of Zinc in Specified Canadian Manufacturing Industries, 1942, 1943 and 1944

Industry	Items Used	1942	1943	1944
		Pounds	Pounds	Pounds
Brass and copper products	Zinc ingots and slabs	76,990,715	84,315,181	56,378,930
	Zinc scrap	525,767	119,050	216,857
White metal alloys	Zinc spelter	26,581,960	17,795,100	10,457,447
	Zinc scrap	1,746,106	3,223,818	2,237,019
Electrical apparatus	Zinc ingots and bars	2,826,831	3,227,960	3,493,108
	Zinc sheets	1,477,013	1,627,460	2,324,543
Acids, alkalies and salts	Zinc metal	16,033,434	20,689,824	21,919,325
Iron and steel	Zinc	45,378,520	35,855,555	43,284,193
Ammunition	Zinc spelter	342,000	1,834,000	2,956,000
Grant Total		**171,902,346**	**168,687,948**	**143,267,422**

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

Table 125.—World's Production of Zinc Spelter (a) 1938 and 1944 (American Bureau of Metal Statistics)

(Tons of 2,000 pounds)

Country	1938	1944
United States (b)	446,341	866,100
United States (c)	31,613	48,600
Mexico	39,552	51,401
Canada	171,656	169,634
Total North America	**689,162**	**1,135,735**
Belgium	231,924	.....
Czechoslovakia	9,784	.....
France	68,532	.....
Germany	212,173	.....
Great Britain	61,938	.....
Italy	37,550	.....
Netherlands	27,888	.....
Norway	51,257	.....
Poland	122,119	.....
Russia	(d) 88,200	.....
Spain	8,435	19,313
Yugoslavia	4,361	.....
Total Europe	**924,161**	(e)
Peru	.....	1,611
Australia	78,198	88,458
Japan	(d) 55,115	.....
French Indo-China	4,900	.....
Rhodesia	11,441	.....
Grand Total	**1,762,977**	(e)

(a) The statistics in this table are the summaries of production as made by the metallurgical works in the several countries. The statistics for the United States are given separately in respect of the production from ore (domestic and foreign) and the production from secondary material, such as galvanizers' dross, skimmings, ashes, etc. Production from such material is included in the statistics for many of the countries of Europe, especially Great Britain, Belgium, France and Netherlands. Such inclusion in 1938 was about 40,000 tons per annum, omitting Great Britain. Not included in the statistics for Europe is the production from old material by concerns that treat nothing else.

(b) Production from ores, foreign and domestic, as per U.S. Bureau of Mines.

(c) Production from secondary material.

(d) Conjectural.

(e) Not available.

Table 126.—Cadmium Recovered From Canadian Ores, 1938-1944

Year	From copper-gold-silver-zinc ores	From silver-lead-zinc-ores	**Total**
	Pounds	Pounds	**Pounds**
1938	188,796	510,342	**699,138**
1939	140,438	799,253	**939,691**
1940	129,336	778,791	**908,127**
1941	169,917	1,081,374	**1,251,291**
1942	176,550	972,413	**1,148,963**
1943	187,938	598,673	**786,611**
1944	140,560	386,410	**526,970**

Since 1939 the Consolidated Mining and Smelting Company has produced antimony metal at the Trail smelter; the total production of the metal from British Columbia ores in 1944 totalled 1,937,933 pounds valued at $281,000. Bismuth metal is also recovered at the Trail smelter from silver-lead-zinc ores, the production in 1944 amounting to 123,875 pounds valued at $154,844. In addition to metals, there has been an increasing quantity of sulphur salvaged yearly in the smelting of silver-lead-zinc ores in the Trail plants of the Consolidated Mining and Smelting Company. This has been recovered in both the gaseous and elemental forms and is utilized in the manufacture of sulphuric acid and fertilizers.

Gold recovered from Canadian silver-lead-zinc ores in 1944 totalled 17,438 fine ounces.

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 \$121,193,774 in 1944 compared with \$128,583,784 in 1943.

Two companies operated both mines and metallurgical plants in the Sudbury area in 1944. 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. was treated since 1940 in the Canadian plants of the International Nickel Co. of Canada, Limited. Shipments of matte to Norway were resumed in July of 1945.

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 1944 the International Nickel Company of Canada Limited shipped ore from the Garson, Creighton, Levack, Frood, Stobie and Murray mines.

The nickel property of Harlin Nickel Mines Limited, located near Porquis Junction, Ontario, was operated from January 1 to August 31, 1944; crude ore produced by this company was shipped to the Copper Cliff smelter of the International Nickel Company of Canada. Mining operations were conducted during 1944 in Foy township, Ontario, by Nickel Offsets Limited; crude ore was consigned to the Copper Cliff smelter and work was suspended on October 31. Operations in Bowell township, Ontario, by North Range Nickel Mines Limited, were confined to diamond drilling.

In 1944 the industry, as a whole, provided employment for 15,457 persons and distributed $29,217,445 in salaries and wages. Fuel and electricity consumed totalled $12,795,637 and explosives, chemicals, drill steel and other process supplies used amounted to $18,449,774. Female wage-earners in 1944 numbered 792 compared with 641 in 1943 and 96 in 1942. The industry reported that $51,036 were spent on prospecting for new mineral deposits in 1944.

Copper recovered from the nickel-copper ores of Ontario totalled 280,790,592 pounds in 1944 compared with 276,032,919 pounds in 1943. Production in 1944 of nickel, in all forms from these same ores amounted to 274,589,040 pounds against the all-time high record of 288,018,615 pounds in 1943.

A considerable tonnage of blister copper produced in Manitoba was also treated in 1944 at Copper Cliff, Ontario, by the International Nickel Company of Canada Limited; scrap copper is also refined at Copper Cliff.

Table 127.—Principal Statistics of the Nickel-Copper Mining, Smelting and Refining Industry in Canada, 1942-1944 (*)

—	1942	1943	1944
Number of firms	(a) 4	(a) 6	(a) 5
Number of mines	8	10	9
Number of smelters	3	3	3
Number of copper refineries	1	1	1
Number of nickel refineries	1	1	1
Capital employed	$ 159,777,493	167,097,138	(c)
Number of employees—On salary	1,098	1,230	1,282
On wages	12,680	13,420	14,175
Total	13,778	14,650	15,457
Salaries and wages—Salaries	$ 3,184,248	3,414,557	3,661,427
Wages	$ 25,171,893	26,781,415	25,556,018
Total	$ 28,356,141	30,195,972	29,217,445
Fuel and purchased electricity used (2)	$ 11,188,825	12,649,118	12,795,637
Process supplies used (1)	$ 15,911,153	17,872,418	18,449,774
Cost of freight and treatment (3) (d)	....	130,321	118,108
Estimated gross value of matte exported and Canadian refinery products (b)	$ 128,340,860	128,583,781	121,493,774
Value of production less items (1) (2) and (3)	$ 101,240,882	97,931,927	90,130,255

(*) Does not include data for mines, power plants, etc., operated by subsidiary companies.
(a) All in Ontario.
(b) Includes value of customs material.
(c) Not recorded in 1944.
(d) Exclusive of data for International Nickel Company and Falconbridge Nickel Mines.

Table 128.—Output From Ontario Nickel-Copper Mines and Smelters, 1942-1944 (Short tons)

—	1942	1943	1944
Ore shipped from mines	12,072,485	12,920,917	12,955,208
Ore treated (*)	12,078,722	12,912,332	12,966,679
Converter copper produced in Ontario (a) from Ontario ores	146,362	130,905	133,879
Nickel produced in Ontario (b)	102,478	106,069	104,677
Matte exported (c)	61,226	56,833	48,287
Nickel content of matte exported	40,112	37,911	32,618
Copper content of matte exported (a)	7,582	7,532	6,516

(*) Represents the tonnage of crude ore smelted together with the tonnage of ore milled.
(a) Copper content, including copper content of Ontario ores purchased, less reverts.
(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 129.—Dividends Paid by Specified Nickel-Copper Mining Companies, 1944

—	Dividends 1944	Total dividends paid to end 1944
	$ (*)	$ (*)
International Nickel Co. of Canada Ltd. only (†)	28,038,849	360,060,883.70
Falconbridge Nickel Mines Ltd.	500,637	9,137,234

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

Table 130.—Employees, Salaries and Wages, in the Nickel-Copper Mining, Smelting and Refining Industry in Canada, 1944

—	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	445	50						495	1,431,118
Smelters and refineries	585	202						787	2,230,309
Total	**1,030**	**252**						**1,282**	**3,661,427**
Wage-earners—									
Mine and mill			1,833	59	4,954	190	97	7,133	13,247,577
Smelters and refineries			6,406	636				7,042	12,308,441
Total			**8,239**	**695**	**4,954**	**190**	**97**	**14,175**	**25,556,018**
Grand Total	**1,030**	**252**	**8,239**	**695**	**4,954**	**190**	**97**	**15,457**	**29,217,445**

Table 131.—Number of Wage-Earners by Sex and Months, Entire Industry, 1942-1944

Month	1942		1943		1944	
	Male	Female	Male	Female	Male	Female
January	12,112		13,381	511	14,006	770
February	12,199		13,379	527	14,048	779
March	12,214		13,210	599	13,843	754
April	12,143		12,844	628	13,447	740
May	12,560		12,690	648	13,171	782
June	12,960		12,844	668	13,186	791
July	12,870		12,648	673	13,095	814
August	12,287		12,510	688	13,012	828
September	12,234	101	12,167	708	12,731	835
October	12,961	262	12,159	695	12,771	822
November	13,216	379	12,521	670	13,319	799
December	13,444	411	12,978	676	13,543	788

Table 132.—Wage-Earners, by Months, in Nickel-Copper Mines Only, 1944 (*)

Month	Mine			Mill	
	Surface		Under ground	Male	Female
	Male	Female			
January	1,861	69	5,364	211	98
February	1,879	70	5,457	198	106
March	1,853	64	5,292	207	97
April	1,766	60	5,112	201	95
May	1,877	59	4,838	198	95
June	1,866	57	4,793	185	101
July	1,896	59	4,681	184	98
August	1,837	59	4,670	182	98
September	1,783	57	4,594	175	100
October	1,812	55	4,583	182	96
November	1,778	55	4,916	172	87
December	1,787	55	5,149	177	88

(*) Included in Tables 131 and 132.

Table 133.—Wage-Earners, by Months, in Nickel-Copper Smelters and Refineries Only, 1944 (*)

Month	Male	Female	Month	Male	Female
January	6,570	603	July	6,334	657
February	6,514	603	August	6,323	671
March	6,491	593	September	6,179	678
April	6,368	585	October	6,194	671
May	6,258	628	November	6,453	657
June	6,342	633	December	6,430	645

(*) Included in Tables 131 and 132.

Table 134.—Total Employees and Salaries and Wages Paid by Mines and by Metallurgical Plants, 1944

—	Salaried Employees				Wage-earners			
	Male No.	Female No.	Total No.	Total salaries	Male No.	Female No.	Total No.	Total wages
				$				$
Mines	445	50	495	1,431,118	6,977	156	7,133	13,247,577
Metallurgical plants	585	202	787	2,230,309	6,406	636	7,042	12,308,441
Total	**1,030**	**252**	**1,282**	**3,661,427**	**13,383**	**792**	**14,175**	**25,556,018**

Table 135.—Other Expenditures (*), 1942 and 1944

—	1942	1943	1944
	$	$	$
Workmen's compensation	254,196	296,284	377,501
Silicosis assessment	56,204	40,660	69,878
Unemployment insurance	154,749	175,389	182,478
Aggregate cost of all supplies purchased	25,463,212	28,445,891	28,378,357
Aggregate cost of plant and equipment purchased	11,925,016	5,018,845	4,017,231

(*) 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 restricted to essential war uses, remained entirely under the direction of governmental agencies during 1944.

Table 136.—Production of Nickel (*), From Canadian Ores, 1926-1944

Year	Pounds	Value	Year	Pounds	Value
		$			$
1926	65,714,204	14,374,163	1936	169,739,393	43,876,525
1927	66,798,717	15,262,171	1937	224,905,046	59,507,176
1928	96,755,578	22,318,907	1938	210,572,738	53,914,494
1929	110,275,912	27,115,461	1939	226,105,865	50,920,305
1930	103,768,957	24,455,133	1940	245,557,871	59,822,591
1931	65,666,320	15,267,453	1941	282,258,235	68,656,795
1932	30,327,968	7,179,862	1942	285,211,803	69,998,427
1933	83,264,658	20,130,480	1943	288,018,615	71,675,322
1934	128,687,340	32,139,425	1944	274,598,629	69,204,152
1935	138,516,240	35,345,103			

(*) 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 137.—Production in Canada, Imports and Exports of Nickel, 1943 and 1944

	1943		1944	
	Quantity	Value	Quantity	Value
	lb.	$	lb.	$
PRODUCTION—				
Nickel in matte exported / Refined and electrolytic nickel produced / Nickel in oxides and salts sold or produced	288,018,615	71,675,322	274,598,629	69,204,152
IMPORTS—				
Nickel and nickel silver in ingots	60,423	17,620	16,029	4,355
Nickel rods for wire (90% nickel)	723	510	12,882	8,853
Nickel in bars and rods, strips and sheets	976,516	529,517	753,147	391,353
Nickel silver bars, rods and strips	4,612	2,594	3,709	1,739
Nickel chromium in bars	47,785	44,966	63,213	54,973
Nickel, manufactures of, not plated	...	45,846	...	33,411
Nickel-plated household hollow-ware	...	1,906	...	...
Nickel household hollow-ware	...	44		
Nickel-plated ware, n.o.p.	...	524,455	...	424,247
Total Nickel and Its Products	...	**1,167,458**	...	**918,931**
Exports—Total Metal in All Forms	**271,094,400**	**68,346,346**	**265,197,100**	**68,400,634**

Table 138.—Nickel Production by Principal Countries, 1937-1939 (American Bureau of Metal Statistics)

(Tons of 2,000 pounds)

—	1937	1938	1939
Canada (a)	(e) 112,453	105,286	113,053
New Caledonia (b)	6,600	8,500	9,000
Burma (c)	1,345	1,050	(g) 860
Greece (d)	1,160	1,330	(f)
Norway	968	1,373	1,293

(a) Production in all forms from Canadian ores, as reported by the Dominion Bureau of Statistics.

(b) Estimated content of ore and matte exported.

(c) Nickel content of speiss obtained as a by-product.

(d) Nickel and cobalt content.

(e) Not including production in British Columbia.

(f) Not yet reported.

(g) January-September only.

NOTE.—World data since 1939 are not available.

COPPER

Table 139.—Production of Copper From Ontario Ores Only, 1926-1944

Year	Pounds	Value	Year	Pounds	Value
		$			$
1926	41,312,867	4,828,964	1936	287,914,078	26,898,920
1927	45,341,295	4,946,533	1937	322,039,208	41,716,364
1928	66,607,510	8,770,149	1938	309,030,106	30,405,500
1929	88,879,853	14,622,572	1939	328,429,665	32,637,305
1930	127,718,871	15,187,259	1940	347,931,013	34,742,229
1931	112,882,625	9,096,463	1941	333,829,767	33,192,644
1932	77,055,413	4,407,928	1942	308,282,414	30,625,404
1933	145,504,720	10,118,847	1943	(a) 277,840,560	32,232,027
1934	205,059,539	14,822,704	1944	(b) 285,307,278	33,845,632
1935	252,027,928	19,295,965			

NOTE.—Almost entirely from nickel ores.

(a) Includes 276,032,919 pounds recovered from nickel-copper ores only.

(b) Includes 280,790,592 pounds recovered from nickel-copper ores only.

Table 140.—Total Production of New Copper in Canada, by Provinces and Method of Computation, 1943 and 1944

—	1943		1944	
	Pounds	Value	Pounds	Value
		$		$
By Provinces—				
Quebec	131,163,776	15,411,744	108,055,172	12,966,620
Ontario	277,840,560	32,232,027	285,307,278	33,845,632
Manitoba	38,014,872	4,466,747	43,878,639	5,265,437
Saskatchewan	85,948,719	10,098,974	73,514,499	8,821,740
British Columbia	42,222,205	4,961,109	36,302,628	4,356,315
Northwest Territories	....	....	11,902	1,428
Total	**575,190,132**	**67,170,601**	**547,070,118**	**65,257,172**
By Sources (†)				
In blister and anode copper produced	513,106,247	60,289,984	493,946,346	59,273,337
In ores, concentrates and copper matte exported (*)	47,020,656	5,524,926	40,090,591	4,810,849
In nickel-copper matte exported	15,063,229	1,355,691	13,033,181	1,172,986
Total	**575,190,132**	**67,170,601**	**547,070,118**	**65,257,172**

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

Table 141.—Production (*) of Refined Copper in Canada for Years Specified

Year	Tons	Year	Tons
1915	....	1938	227,240
1916 (†)	483	1939	231,684
1917	3,901	1940	261,878
1918	3,809	1941	278,224
1919	3,467	1942	268,447
1935	173,290	1943	251,495
1936	191,595	1944	256,244
1937	215,080		

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

Table 142.—Canadian Copper Production Recoverable According to Origin of Ores and by Provinces 1943 and 1944

Province	From copper-gold-silver ores	From nickel-copper ores	From gold and other ores	Total
	(Pounds)			
1943				
Quebec	130,301,726	....	862,050	**131,163,776**
Ontario	1,786,171	276,032,919	21,470	**277,840,560**
Manitoba	38,014,872	....	....	**38,014,872**
Saskatchewan	85,948,719	....	....	**85,948,719**
British Columbia	42,121,563	....	100,642	**42,222,205**
Northwest Territories	....	....	....	....
Canada	**298,173,051**	**276,032,919**	**984,162**	**575,190,132**
1944				
Quebec	107,150,904	....	904,268	**108,055,172**
Ontario	4,508,996	280,790,592	7,690	**285,307,278**
Manitoba	43,878,639	....	....	**43,878,639**
Saskatchewan	73,514,499	....	....	**73,514,499**
British Columbia	35,997,974	....	304,654	**36,302,628**
Northwest Territories	....	....	11,902	**11,902**
Canada	**265,051,012**	**280,790,592**	**1,228,514**	**547,070,118**

Table 143.—Imports and Exports of Copper, 1943 and 1944

—	1943		1944	
	Pounds	$	Pounds	$
Imports				
Copper in blocks, pigs and ingots	....	....	4,500	762
Copper, scrap	3,500	177	26,700	2,604
Copper in bars or rods for the manufacture of trolley, telegraph and telephone wires, electric wires and electric cables	1,336,300	205,738	578,400	87,325
Copper bars and rods for the manufacture of electrical conductors	9,300	1,126	(*)	(*)
Copper bars or rods, n.o.p.	330,300	76,062	193,300	41,581
Copper in strips, sheets or plates	64,000	16,416	165,400	49,657
Copper tubing, not manufactured	320,759	107,501	375,731	133,802
Copper rollers	....	176	....	1,289
Cooper wire, n.o.p.	32,116	13,700	90,248	49,850
Copper wire cloth, woven	....	745	....	475
Copper manufactures, n.o.p.	....	489,807	....	274,771
Copper sub-acetate	420	132	440	140
Copper sulphate (blue vitriol)	6,448,817	365,695	8,259,600	491,473
Total	....	**1,277,335**	....	**1,133,729**
Exports				
Copper, fine, contained in ore, matte, regulus, etc.	72,419,400	5,069,358	55,978,500	3,918,495
Copper blister	8,548,600	846,896	....	....
Copper, old and scrap	1,133,500	48,844	1,927,400	116,899
Copper in ingots, bars, cakes, slabs and billets	128,665,800	12,731,158	270,466,200	29,049,257
Copper in rods, strips, sheets, plates and tubing	49,133,800	5,329,685	36,126,900	4,193,044
Copper wire and cable, insulated	....	1,438,161	....	2,200,550
Copper wire, bare	....	5,317,169	....	1,018,040
Copper wire, screen	....	8,668	....	8,332
Copper manufactures, n.o.p.	....	26,510	....	38,426
Total	....	**30,816,449**	....	**40,543,943**

(*) Included with copper bars or rods, n.o.p.

Table 144.—World Production of Copper (a), 1937, 1938 and 1944, by Countries According to Origin of the Ore (American Bureau of Metal Statistics)

(Tons of 2,000 pounds)

Country	1937	1938	1944
United States	834,835	556,673	997,027
Mexico	51,538	45,662	43,489
Canada	262,432	290,200	273,972
Cuba	13,800	14,800	6,256
Newfoundland	7,165	6,000	5,500
Bolivia	4,076	3,178	6,800
Chile	455,562	387,409	537,500
Peru	39,354	41,368	34,900
Ecuador	....	....	4,065
Total America	1,668,762	1,345,290	1,909,509
Austria	2,283	(b)	....
Finland	13,812	14,458	....
France	(d) 1,100	(d) 1,100	....
Germany	32,518	33,069	....
Norway	22,260	23,148	....
Russia	101,963	(d) 108,000	....
Spain and Portugal	34,546	37,964	....
Sweden	7,669	9,921	....
Yugoslavia	43,442	46,288	....
Other Europe	3,086	6,614	....
Total Europe	262,679	280,562	(e)
Japan	83,665	(d) 84,900	....
India, including Burma	11,200	8,700	....
Turkey	....	2,543	(d) 15,000
Philippines	1,100	3,713	....
Other Asia (c)	32,959	44,092	....
Total Asia	128,924	143,948	(e)
Belgian Congo	165,993	136,622	180,000
Rhodesia	234,405	237,362	....
Other Africa	15,930	21,353	....
Total Africa	416,328	395,337	(e)
Australia	22,000	21,900	(d) 40,000
Grand Total	**2,498,693**	**2,187,037**	(e)

(a) Production from ore excluding copper derived from junk.
(b) Included with Germany.
(c) Includes Cyprus.
(d) Conjectural.
(e) Data not available.

Table 145.—Available Statistics on the Consumption of Copper in Specified Canadian Industries, 1941-1944

Industry		1941	1942	1943	1944
BRASS AND COPPER PRODUCTS (x)—					
Ingots, wire bars, slabs, etc.	lb.	176,679,478	335,793,693	339,895,762	127,812,259
Scrap	lb.	12,199,005	12,617,777	10,253,098	8,309,097
Pipe and tubing	lb.	188,074	191,106	183,822	154,798
Plates and sheets	lb.	971,838	846,308	804,125	815,359
Wire	lb.	384,929	348,000	213,906	294,010
Other	$	61,163	57,438	69,778	55,120
WHITE METAL ALLOYS—					
Scrap, all kinds	lb.	10,200,476	9,699,323	9,250,095	10,314,229
Copper—ingots and slabs	lb.	590,178	4,470,119	5,297,447	2,232,446
ELECTRICAL APPARATUS AND SUPPLIES—					
Castings	lb.	480,687	148,237	107,226	111,982
Ingots, slabs, wire bars, etc.	lb.	2,109,395	2,036,221	1,280,078	587,252
Rods	lb.	61,700,539	62,982,899	67,704,908	44,254,722
Scrap	lb.	91,333	149,731	55,598	29,810
Tubing and pipe	lb.	641,402	542,064	339,100	284,308
Sheets and plates	lb.	846,949	883,936	910,257	920,500
Wire, bare	lb.	8,607,762	7,862,294	6,826,654	12,363,727
Wire, enamelled	$	902,013	711,706	1,014,440	1,024,920
Wire, other insulated	$	1,577,960	1,551,529	1,317,370	2,438,546
IRON AND STEEL AND THEIR PRODUCTS—					
Copper sheets, bars, etc.	lb.	17,400,122	18,629,920	15,804,341	14,287,852

(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.

The peak Canadian production of copper for all time was in 1940, when the output stood at 643,316,713 pounds. From 1940 to 1943 all provinces showed a reduction in output with the exception of Saskatchewan. The Saskatchewan-Manitoba production is unique in Canadian mining history in that the ore body of the Flin Flon mine, the principal producer in these provinces, lies across the interprovincial boundary. In 1944 increases in copper output over 1943 were recorded only for Ontario and Manitoba.

The most important Canadian copper-bearing ore deposits are those of the Noranda, Waite-Amulet and Normetal mines 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 mines in British Columbia. Early in 1945 the Quemont Mining Corporation Limited located a new and important copper-gold-silver ore body on its property adjoining that of Noranda Mines Limited; the exploration and development of this deposit is now proceeding.

Canada has two copper refineries, one at Copper Cliff, Ontario, owned by the International Nickel Company, and one at Montreal East, Quebec, 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 during the war in brass and copper was instituted by the Canadian Metals Controller through the surveillance of export licences 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. All controls on the domestic use of copper and brass in Canada were removed in September, 1945.

METALS OF THE PLATINUM GROUP

The London Mining Journal reviews the platinum metals in 1944 as follows:

"So far as available statistics go there was a marked decline in the output of metals of the platinum group in 1944 as compared with the previous year, but without knowledge of what the Russian output was, it is impossible to say categorically that the world's supply declined. Platinum supplies so essential for the war, especially in aircraft production, were adequate for the enormous expansion that took place in allied aircraft production. . . . Russian production is again conventionally reckoned by the trade at 200,000 ounces of platinum, but no data are available here to show whether production increased or the reverse during the year. No difficulty appears to have arisen in securing what supplies may have been needed by industry both in Great Britain and in the United States in excess of the production from fields within their respective spheres. Russia probably carries large stocks of platinum and the output is likely to have been regulated in accordance with wartime economy. On the assumption, however, that the Russian output amounted to 200,000 ounces of platinum, she would have regained her old position of the world's principal producer.

"Third in importance comes the Transvaal where the Rustenberg platinum mines produced about 7,000 ounces of the platinum metals monthly, or roughly 84,000 ounces for the whole year. As the percentage of platinum is given as 63 per cent, this would represent roughly 53,000 ounces, to which may be added about 500 ounces as a product from the osmiridium concentrates from the Rand mines, giving South Africa a total of 53,500 fine ounces.

"Production from Columbia is believed to have maintained its previous figure of 50,000 ounces. The only other producer of importance is the Goodnews district of Alaska, in which we can only repeat last year's estimate of 20,000 ounces; nothing has been heard of any production from Abyssinia, which at best was small.

"The adequacy of the supply of the platinum metals generally is indicated by the prices remaining unchanged during the year. United States figures were: Platinum $35 per ounce; palladium $24; rhodium $125 and ruthenium $35 per ounce. In the second half of the year the price of iridium was lowered from $165 to $120. . . . The reservation of platinum for war purposes has meant that in the industrial jewellery and dental fields increased recourse has been made to palladium; this metal is being increasingly used as a catalyst in the growing number of hydrogenation plants. . . ."

Table 146.—Production of Metals of the Platinum Group From Ontario Copper-Nickel Ores, 1935-1944

Year	Platinum (*)		Palladium (†)	
	Fine ounces	$	Fine ounces	$
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
1933	219,706	8,458,681	126,004	5,233,008
1944	157,523	6,064,635	42,929	1,960,085

(*) In addition, a relatively small quantity of alluvial platinum is usually recovered annually in British Columbia; such recovery in 1943 totalled 7 ounces valued at $270; nil in 1944.

(†) Includes other platinum metals except platinum and represents the entire Canadian production.

Table 147.—Platinum Consumed in Canadian Jewellery and Silverware Industry, 1935-1944

Year	Value	Year	Value
	$		$
1935	45,627	1940	148,748
1936	101,129	1941	208,338
1937	112,295	1942	361,008
1938	85,503	1943	169,467
1939	160,688	1944	150,968

Table 148.—Production of Selenium and Tellurium from Nickel-Copper Ores, 1939-1944

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
1944	65,000	117,000	9,900	17,325

Table 149.—Production of Gold and Silver From Nickel-Copper Ores, 1939-1944

Year	Gold		Silver	
	Fine oz.	Value	Fine oz.	Value (*)
		$		$
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
1944	55,286	2,128,472	1,828,978	786,461

(*) Estimated.

CHAPTER FIVE

MISCELLANEOUS METAL MINING INDUSTRIES IN CANADA

Including General Statistics Relating to the Industries in this Group and Commodity Statistics Showing any Production by Provinces and Prices on:

Aluminum	Manganese
Antimony	Mercury
Beryllium	Molybdenum
Bismuth	Pitchblende
Boron	Selenium
Cadmium	Tantalum-Columbium
Calcium	Tellurium
Cerium	Tin
Chromium	Titanium (ilmenite)
Iron and steel	Tungsten
Indium	Vanadium
Lithium	Zirconium
Magnesium	

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 1944 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 mining of certain ores, classified as strategic during the war years, and including molybdenite, tungsten minerals, etc., was curtailed or terminated in 1944. The production of these ores, described in some instances as "projects" was conducted principally by or under the supervision of the Wartime Metals Corporation, a Canadian Government organization.

The number of firms reported as active in the miscellaneous metals mining industries during 1944 totalled 27; $2,809,013 were distributed in salaries and wages to 1,385 employees and the cost of fuels, process supplies, freight, treatment, etc., aggregated $2,074,107. The gross value of production totalled $5,360,993 and the corresponding net value of same was estimated at $3,286,886.

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 1944.

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 1944 totalled 924,130,162 pounds compared with 991,499,296 pounds in 1943 and 93,812,965 pounds in 1937. The output during 1943 was the largest ever attained by the Canadian aluminum industry.

Aluminum prices, New York, January, 1945, 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 refining industry, and are therefore not included with corresponding statistics shown in this report.

Table 150.—Production of Primary Aluminum in Canada, 1935-1944

Year	Pounds	Year	Pounds
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
1939	165,680,869	1944	924,130,162

Table 151.—Consumption of Aluminum in Specified Canadian Industries, 1943 and 1944

Industry	1943		1944	
	Pounds	Cost at works	Pounds	Cost at works
		$		$
Aluminum products (ingots) (a)	70,423,825	14,676,377	71,351,867	11,795,374
White metal alloys*	1,108,762	212,754	1,221,910	390,237
Electrical apparatus and supplies		1,019,525		923,346
Brass and copper products (b)		799,339		756,193
Iron and steel products (b) (c)	11,487,493	3,373,018	12,114,244	3,587,692

(a) Largely for the manufacture of cooking utensils, cable, etc.

(*) In addition in 1944 there were consumed 6,309,852 pounds of scrap valued at $415,789, 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.

Table 152.—Imports of Aluminum and Bauxite Into Canada, 1943 and 1944

Item	1943		1944	
	Cwt.	Value	Cwt.	Value
		$		$
Alumina	1,780	31,795	2,442	38,530
Bauxite ore	60,211,389	21,242,907	26,560,509	9,984,818
Cryolite	448,521	1,893,702	50,373	248,562
Aluminum pigs, ingots and blocks	23	650	1,324	27,085
Aluminum scrap	1,548	17,013	4,564	33,034
Aluminum angles, channels and beams	7,481	355,880	3,372	180,226
Aluminum bars, rods and wire	22,270	533,720	35,424	853,672
Aluminum leaf	....	3,054	....	47,845
Aluminum pipes and tubes	1,429	129,718	594	70,323
Aluminum plates, sheets and strips	12,578	438,034	27,007	945,287
Aluminum powder	38·5	2,083	28	2,435
Aluminum wire and cable	7	285	....	....
Aluminum household hollow ware	....	3,551	....	11,635
Aluminum manufactures n.o.p.	....	489,593	....	420,261

Cwt. = 100 pounds.

Table 153.—Exports of Aluminum From Canada, 1943 and 1944

Item	1943		1944	
	Cwt.	Value	Cwt.	Value
		$		$
Aluminum scrap	2,005	18,305	36,040	214,572
Aluminum in bars, ingots, blocks, etc. (b)	7,507,670	124,460,894	....	....
Aluminum wire and cable	....	2,082	....	59,498
Aluminum manufacture, n.o.p.	....	4,780,904	....	9,441,522
Aluminum in bars, blocks, ingots and blooms (a)	....	....	5,904,532	93,493,588
Aluminum in rods, sheets and circles (a)	....	....	62,485	2,310,424
Aluminum kitchen utensils and hollow ware	....	....	....	799

(a) From January, 1944.
(b) To December 31, 1943.
Cwt. = 100 pounds.

Table 154.—World Production of Aluminum 1938, 1941 and 1944 (American Bureau of Metal Statistics)

Country	1938	1941 (b)	1944
	Metric tons	Metric tons	Tons 2,000 lb. (Available data)
United States	130,129	280,383	776,400
Canada	66,000	193,000	462,065
Total America	**196,129**	**473,383**	**1,238,465**
Austria (a)	(c)	(c)	....
France	45,300	60,000	....
Germany (a)	165,600	300,000	....
Great Britain (a)	22,500	23,400	(e) 61,700
Hungary	1,500	5,000	....
Italy	25,768	50,000	....
Norway	29,035	35,000	....
Russia	48,000	60,000	....
Spain	800	1,120	....
Sweden	1,892	2,500	....
Switzerland (a)	26,500	29,000	....
Yugoslavia	1,200	3,000	....
Total Europe	**368,095**	**569,020**	....
Japan (d)	17,000	90,000	....
Total World	**581,224**	**1,132,403**	....

(a) Metallgesellschaft.
(b) Estimated, except for U.S.A., Canada, Great Britain and Spain.
(c) Austrian production included with Germany.
(d) Probably includes Manchuria and Formosa, and anyway is quite conjectural.
(e) 1943 data.

ANTIMONY

Production of antimony metal in Canada during 1944 totalled 1,937,933 pounds valued at $281,000 compared with 1,114,166 pounds worth $189,408 in 1943. Production in both years 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. It was reported that the antimony plant at Trail was closed down in September, 1944, largely as a labour economy measure.

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 in Canada in either 1943 or 1944.

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, and 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, and solder, and it is also used in the manufacture of rubber goods, paints, and fixtures. The greatest single gain in use in 1944 was of antimony oxide in the flameproofing of textiles, principally duck for military purposes. 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 in nitrocellulose enamels. Demand for antimony in the post-war years will possibly exceed that of the pre-war level partly because of the large requirements for storage batteries and other metal products and partly because of the new applications developed during the war.

Prices in Canada for imported antimony metal of a purity of 99·6 per cent or higher (grade R.M.M.) as set in August 1944 by the Wartime Prices and Trade Board (Order No. A-1315) were as follows:—

Quantity lbs.	Montreal cents per lb.	Toronto cents per lb.
10,000 and over	17.90	17.60
10,000–2,000	18.65	18.35
2,000–1,000	20.65	20.35
Less than 1,000	21.15	20.85

Chinese grade with a purity of not less than 99·0 per cent:—

Quantity lbs.	Montreal and Toronto cents per lb.
10,000 and over	18.00
10,000–2,000	18.75
2,000–1,000	20.75
Less than 1,000	21.25

The New York price of antimony metal (ordinary brand) in 1944 remained fixed at 15·84 cents per pound throughout the year. The price for Chinese brand, duty paid, remained at 16·5 cents. The price of antimony ore, c.i.f. New York in 1944 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 per cent Sb, \$2.20 to \$2.30.

It was reported that all restriction on the use and distribution of antimony in Canada was removed in August, 1945.

Table 155.—Antimony Produced in Canada, 1937-1944

Year	In Ores Exported		Metal Produced in Canada		Total	
	Pounds	$	Pounds	$	Pounds	$
1937	48,163	7,334	......	......	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
1944	......	......	1,937,933	281,000	1,937,933	281,000

Table 156.—Antimony Used in Specified Canadian Industries, 1943 and 1944

Industry	1943		1944	
	Pounds	$	Pounds	$
White metal alloys	1,814,414	269,718	2,382,290	371,243
Electrical apparatus and supplies	251,763	39,455	345,404	135,530

Table 157.—Imports of Antimony and Specified Antimony-Bearing Products Into Canada, 1943 and 1944

—	1943		1944	
	Pounds	$	Pounds	$
Antimony or regulus of, not ground, pulverized or otherwise treated	240,700	38,755	1,558,198	237,334
Antimony oxide and titanium oxide (*)	16,889,500	1,533,462	20,174,795	1,871,434
Antimony salts—tartar emetic, etc.	10,990	6,066	68,765	20,749
Type metal in blocks, bars, plates and sheets	268	63	......	......
Plates, cylinders (engravers)	......	144,952	......	137,635
Stereotypes for books (sq. inches)	1,756,520	131,684	2,494,489	183,211
Stereotypes for advertisements (sq. inches)	1,827,222	78,143	1,691,220	73,324
Printing plates for publications	......	162,648	......	208,155
Storage batteries and parts	......	513,463	......	356,068

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

BERYLLIUM

Beryl, a silicate of aluminum and beryllium, is the commonest beryllium mineral, and is the only present commercial source of the element. It generally contains from 10 to 12 per cent of beryllium oxide, corresponding to from 4 to 4·5 per cent of beryllium. The occurrence of beryl is restricted to pegmatite dykes, in which it is usually found as disseminated crystals, sometime of very large size. Only rarely, however, is the beryl content of pegmatites sufficient to enable the deposits to be worked for this mineral alone, and a large part of the comparatively small world production has been obtained as a by-product from the mining of feldspar, mica, or lithium minerals.

Canada produces no beryl and very little beryl is used or required by domestic industries. Most of the world supply in recent years has come from Brazil, Argentina, India, the United States, and South Africa.

The most noteworthy occurrences of beryl in Canada are in Ontario, south-eastern Manitoba, and the Northwest Territories.

In Ontario, intermittent work was done prior to 1941 on a beryl pegmatite in Lyndoch township, Renfrew county. A few tons of clean cobbed crystals were obtained, and about 200 tons of milling grade rock was stockpiled. Most of the work on the property was done by the present owners, Canadian Beryllium Mines and Alloys, Limited, 901 Royal Bank Building, Toronto, who, however, have reported no sales. A detailed examination of the main, easterly workings, made in 1943 by the Bureau of Mines, Ottawa, and the Metals Controller's Office, indicated an average content of 0·188 per cent beryl in the total rock excavated, with a maximum for the richest quarry sections of 1·24 per cent. Grade of selected clean beryl crystals was 10·41 per cent BeO.

In Manitoba, a little work was done several years ago on beryl showings in pegmatites opened originally for feldspar and lithium minerals in the Winnipeg River and Oiseau (Bird) River areas, but no shipments were reported.

In the Northwest Territories, exploration in the area north and east of the Yellowknife gold camp has disclosed numerous occurrences of beryl in pegmatites which also contain lithium minerals and tantalite-columbite. Some of these are considered to be of possible economic interest.

In Quebec, scattered occurrences of beryl are known in Lacorne and Preissac townships, Abitibi county, often associated with molybdenite. None of these, however, is believed to be of economic importance.

Beryllium is used chiefly in the form of beryllium-copper alloys, the most important of which contains about 2 per cent beryllium. A beryllium-aluminum alloy containing 5 per cent beryllium is used as a deoxidizer in making aluminum-magnesium products. Straight beryllium metal has only limited applications, notably for the windows of X-ray tubes, where it is used for its transparency to the rays.

Various beryllium salts, principally the oxide and carbonate, are used in industry. A growing demand has developed for the oxide for the preparation of zinc-beryllium silicate, used as a coating for fluorescent lighting tubes and lamps, and for fluorescent screens. The oxide and carbonate, activated by uranium salts or rare earths, act as "phosphors" and are utilized in luminescent paints. The oxide is a super-refractory, with a melting-point of 2,570°C., or 520 degrees above that of alundum, and is used in crucibles, insulators, electrodes, furnace linings, and as a filament coating in lamps. Beryllium acetate is used as a coagulating, hardening bath for sodium alginate, a new English textile made from seaweed.

Ground beryl is used as a batch ingredient in sparkplugs and other ceramic specialties, to which it imparts high electrical and impact resistance and transverse strength. Some is also used in cooking utensil enamels. Consumption for such uses in the United States is estimated at about 100 tons a year.

Most of the present world production of beryl is marketed in the United States, where the following companies engaged in the primary production of beryllium metal, alloys, and compounds are the chief purchasers: Beryllium Corporation of Pennsylvania, Temple (Reading), Pennsylvania; Brush Beryllium Company, 3714 Chester Avenue, Cleveland, Ohio; and Clifton Products Incorporated, Painesville, Ohio. All of these companies considerably expanded their production facilities in 1944, under Government subsidy.

War demands occasioned a sharp increase in the price of beryl during the 1940-1944 period. Metals Reserve Company quotations rose progressively from the pre-war figure of $30 to $35 per short ton, f.o.b. mines, for ore with 10 to 12 per cent BeO content, respectively, to $145 per ton for 10 per cent grade, or $14.50 per unit of contained BeO, in 1944. Completion of an adequate United States Government stockpile reserve, and return of purchase to consumers at the end of 1944, is expected to result in a material lowering of the above price in 1945.

In June, 1945, it was announced by the United States War Production Board that the supply of beryllium exceeded essential requirements, and that the controls on the use of the metal had been removed through the revocation of order M-160. On June 4, 1945, it was announced that the United States War Production Board, in amending General Imports order M-63, removed beryllium ore, metal, and salts from import control. (Bureau of Mines, Ottawa)

BISMUTH

Production of bismuth in Canada during 1944 totalled 123,875 pounds valued at $154,844 compared with 407,597 pounds worth $562,484 in 1943. 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 1944 came entirely from the Trail metallurgical plants. The total output of bismuth in the Dominion to the end of 1944 amounted to 2,476,820 pounds worth $3,064,123.

Statistics of the world production of bismuth are incomplete, but the output is estimated at about 1,800 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, Austrialia, 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 metallurgical 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 aluminium alloys improve machinability. There are numerous alloys of bismuth containing from 33 to 56 per cent bismuth.

The price of bismuth in 1944 (London price in Canadian funds) remained at $1.38 a pound. The price at New York remained fixed at $1.25 a pound throughout 1944. The American product is protected by a duty of 7½ per cent ad valorem.

Imports of bismuth salts into Canada during 1944 were appraised at $2,667 compared with $15,675 in 1943; there were no imports of bismuth metal in 1944. Data relating to the bismuth content of alloys imported are not available. No separate records of exports of either bismuth or bismuth salts are available.

Table 158.—Production of Bismuth in Canada, 1931-1944

Year	Pounds	$	Year	Pounds	$
1931	118,207	157,650	1938	9,516	9,754
1932	16,855	7,340	1939	† 409,449	466,362
1933	78,303	81,520	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
1937	5,711	5,654	1944	123,875	154,844

(†) High record output.

Table 159.—Bismuth Used in the Manufacture of Canadian Medicinal and Pharmaceutical Preparations, 1942, 1943 and 1944

Item	1942		1943		1944	
	Pounds	$	Pounds	$	Pounds	$
Bismuth metal	24,420	30,534	56,019	70,107	45,412	56,820
Bismuth salts	18,153	35,793	22,080	43,786	22,936	44,781

Canadian white metal alloy foundries consumed approximately 40,224 pounds of bismuth metal in 1944 compared with 55,115 pounds in 1943 and 25,979 pounds in 1942.

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 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 1944, in packages of 25 pounds or over, totalled 9,570,148 pounds valued at $280,930. Borax was quoted in the United States in 1945 at $41.50 per ton, granular technical, March 1945—United States prices:—Ferroboron, per pound of alloy, f.o.b. shipping point, ton lots $120. Nickel boron, per pound of alloy, f.o.b. shipping point: ton lots, $2.00 (15–18% boron). Manganese-boron, per pound of alloy, f.o.b. shipping point, $1.89-ton lots (15–20% boron).

CADMIUM

"Cadmium is present in small amounts in most zinc ores and in some lead ores, and is obtained as a by-product in the production of these metals.

"Metallic cadmium is produced by Consolidated Mining and Smelting Company at Trail, British Columbia, and by Hudson Bay Mining and Smelting Company at Flin Flon, Manitoba. The plant at Trail started to produce early in 1928 and like the plant at Flin Flon which has been in operation since 1936, treats the cadmium residue from the zinc refinery, the procedure being similar. The cadmium plant at Flin Flon was in continuous operation and treated all current purification precipitates from the zinc plant.

"Canadian production of cadmium in 1944 was 526,970 pounds valued at $579,677, compared with 786,611 pounds valued at $904,602 in 1943. The exports of cadmium in 1944 were 383,324 pounds valued at $412,332, compared with 572,215 pounds valued at $626,379 in 1943.

"The world production in 1944 is estimated at 5,500 short tons, the production in 1938, the latest year for which complete figures are available being 4,200 short tons. The chief Allied producing countries are: the United States, Canada, Mexico, Belgium, Austrialia (Tasmania), Poland, Norway, England, Russia, and France. The Mexican output is contained in ores exported for treatment mainly to the United States.

"Cadmium 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.

"Cadmium is used mainly in electroplating and in the manufacture of alloys and compounds. The most common use of cadmium is as a protective coating for steel, and to a much lesser extent for copper alloys. The use of cadmium alloys in motor vehicle bearings and for solders has created a strong demand for the metal. Cadmium is used also in the arts, paints, ceramics, and dyeing, etc. In the United States, the consumption of cadmium is distributed approximately as follows: electroplating, 87 per cent; alloys and solders, 7·5 per cent; pigments and chemicals, 5·5 per cent. Cadmium is marketed in metallic form, 99·5 per cent pure and better, and as a sulphide. The principal compounds are cadmium sulphide, cadmium oxide, cadmium lithopone, and cadmium selenide.

"Cadmium sulphide and cadmium sulphoselenide are standard agents for imparting bright resistant yellow and red colours respectively to paints, ceramics, inks, rubber, leather, and other products. Paper coated with cadmium sulphide acts as a mustard-gas detector. Cadmium nitrate is used in white fluorescent lamp coatings. The oxide, hydrate, and chloride are used in electroplating solution; the carbonate in ceramics; and the halides in photography.

"The price of cadmium in 1944 (in Canadian funds) averaged $1.10 a pound, compared with $1.15 in 1943. The price of metallic cadmium, f.o.b. New York, in commercial sticks remained at 90 cents a pound throughout, 1942 1943, and 1944. 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." (Bureau of Mines, Ottawa)

Table 160.—Cadmium Production in Canada, 1928-1944

Year	British Columbia		Manitoba		Saskatchewan	
	Pounds	$	Pounds	$	Pounds	$
1928 (*)	491,894	341,374	....	....	....	....
1929	773,976	675,294	....	....	....	....
1930	456,582	337,871	....	....	....	....
1931	323,139	180,958	....	....	....	....
1932	65,425	26,824	....	....	....	....
1933	246,041	78,733	....	....	....	....
1934	293,611	95,665	....	....	....	....
1935	580,530	441,203	....	....	....	....
1936	520,034	468,170	148,133	131,838	111,749	99,457
1937	436,431	715,747	164,223	269,326	144,553	237,007
1938	510,342	410,090	115,160	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
1944	386,410	425,051	20,921	23,013	119,639	131,603

(*) First production.

Table 161.—Cadmium Consumed by Specified Canadian Industries, 1940-1944—(Pounds)

Industry	1940	1941	1942	1943	1944
White metal alloys	121,008	243,717	347,725	267,586	190,183
Steel foundries	6,000	32,000	18,000	15,477	14,000
Iron foundries	9,528	12,000	34,000	23,178	22,000
Non-ferrous smelters	....	....	2,000	....	....
Other industries	5,483	11,000	12,000	34,709	34,000
Total Accounted for	**142,019**	**298,717**	**413,725**	**340,950**	**260,183**

CALCIUM

The commercial production of calcium in Canada was commenced for the first time in 1945 when the metal was recovered from dolomite by Dominion Magnesium Limited in its plant located at Haley, Ontario.

Calcium metal was imported into the United States from France and Germany prior to the second 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, September, 1945, was $1.85 per pound, ton lots. Data relating to imports into Canada of calcium are not shown separately in Canadian trade reports.

CERIUM (Monazite)

"Cerium is obtained from monazite, a monoclinic phosphate of cerium metals containing about 32 per cent cerium oxide (Ce_2O_3) and up to 18 per cent thoria (ThO_2). Monazite is distributed widely in igneous rocks throughout the world, especially in gneisses that have been intruded by pegmatites, but usually it forms only a small fraction of one per cent of the containing rock and only the natural concentrations in stream gravels and beach sands have paid for exploration. The chief commercial sources of monazite sand are beach deposits in Brazil and India. There are a few occurrences of monazite in Nova Scotia, Quebec and British Columbia, none of which is of commercial interest. 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, Lillooet district, British Columbia. In the United States there are commercial deposits in Carolina, Florida, and Idaho, and known occurrences in many other States.

"Cerium is usually regarded as belonging to the general group of "rare earths", as it invariably occurs in nature associated with the other fourteen members of the group and is very similar to the other rare-earth elements in many of its chemical properties.

"In Canada, Shawinigan Chemicals, Limited, Shawinigan Falls, Quebec, has been producing cerium products from cerium chloride since 1940. The output is sold to Cerium Company, Limited, of Montreal, for the manufacture of sparking flints.

"Prior to the war the leading producers of rare-earth products for the European market were located in Berlin, London, and Paris, and those for the American market, in Chicago. In the United States the present supply of cerium products is provided by Cerium Metals Corporation, Niagara Falls, N.Y.

"World production of monazite is approximately 5,000 tons a year.

"Thoria, which was used in gas mantles, was formerly the only commercial constituent of monazite, and monazite is still marketed on the basis of its thoria content, although its content of ceria (Ce_2O_3) and of other rare-earth oxides is of chief interest at present. Probably 50 per cent of monazite derivatives are consumed, chiefly as fluorides, in the cores of arc carbons to increase lighting intensity in searchlights, motion-picture projectors, and therapeutic lamps. About 25 per cent of the consumption of monazite derivatives is used in pyrophoric (sparking) alloys or in ferroceriums for use in sparking flints for lighters. The remainder is used for a variety of purposes, but principally for making optical glassware. Cerium metal is used in the evacuation of radio tubes.

"Nominal prices for monazite as given by Metal and Mineral Markets, New York, remained at \$60 per short ton, 8 per cent minimum thoria, throughout 1944. No quotations are published for most of the rare-earth products, although prices for small lots may be obtained on request from mineral dealers and chemical manufacturers." (Bureau of Mines, Ottawa)

CHROMITE

"The improvement in the Allied supply situation, which started in 1943, continued to such an extent in 1944 that the government-operated Chromeraine mine at Black Lake, Quebec, was closed in August. At the end of the year the only shippers were Chromite, Limited, near Richmond, Quebec, and Orel Parc, operating the 'Montreal' pit in the Black Lake district for Union Carbide Company. Chromite, Limited discontinued operations in the spring of 1945.

"Pure chromite (FeO, Cr_2O_3) contains 68 per cent chromic oxide, but in nature it always contains, besides iron, varying amounts of magnesia and alumina. It is a heavy, almost black, lustrous and brittle mineral and the ore usually occurs in dunite bands in serpentine rocks. Fresh dunite is a fine-grained, dark grey-green olivine rock. Chromite is distinguished in the field from other black minerals of similar appearance by its chocolate-brown powder or streak when struck or scratched with a hammer.

"Most of the deposits from which production has been obtained are between Quebec City and Sherbrooke in the Eastern Townships of Quebec.

"Chromite, Limited obtained its output from the old Sterrett mine in Cleveland township. The chromite in the mine occurs as fairly uniformly disseminated zones, scattered through which are plums of the massive mineral. The ore zone has been traced on the surface for about 1,700 feet and varies in width from 5 to 20 feet. The mine has been developed at 5 levels to a depth of 500 feet.

"The ore in the Chromeraine mine is chiefly low-grade, banded and disseminated chromite with a small amount of the massive mineral. The zone has been traced intermittently for 2,000 feet, has an average width of 30 feet, and in places is 60 feet wide. A small amount of diamond drilling has indicated that the ore extends to a depth of at least 440 feet. The ore was extracted by caving methods to a depth of 375 feet.

"In Manitoba little prospecting was done on the large bodies of low-grade chromite deposits that were discovered early in 1942 north of Oiseau (Bird) River in the southeastern part of the province. Various zones have been traced for lengths of several thousand feet. The ore is high in iron and an economical method of bringing the chrome-iron ratio to within market requirements has not been devised.

"About 78 per cent of the total imports of 41,520 tons valued at \$643,560 came from Southern Rhodesia and Transvaal, and nearly all the rest from India. All of the exports, which amounted to 18,868 tons, were to the United States.

"Production was started in the 100-ton mill of Chromite, Limited early in 1942 and its capacity was increased to 150 tons late that year. In 1944 about 37,000 tons of ore averaging 15 per cent Cr_2O_3 was treated, mostly from between the second and fifth levels south of the shaft. Over 12,000 tons of concentrate containing 48 per cent Cr_2O_3 was shipped to the United States. The development loan received from the Dominion Government in September, 1942, was all repaid by September, 1944, after which the mine was taken over by Basin Montana

Tunnel Company, which had originally financed the operations. The contract for shipments to the United States Metals Reserve Company was not renewed and the mine was closed in the spring of 1945. Total shipments of concentrates and high-grade crude ore since the outbreak of the war were nearly 36,000 tons.

"Wartime Metals Corporation operated the old Reed-Belanger deposits (Chromeraine project) 2 miles southwest of Black Lake. Production in the 600-ton mill was started in May, 1943, and in that year 77,500 tons of ore averaging about 8 per cent Cr_2O_3 was treated, in addition to which about 750 tons of custom ore averaging 18 per cent Cr_2O_3 was treated. In 1944, until operations ceased near the end of August, 87,500 tons was milled. No custom ore was received in 1944, but 2,400 tons of such ore that was received in 1943 was treated. About 11,000 tons of concentrate averaging 47 per cent Cr_2O_3 was shipped in 1944, compared with about 8,000 tons in 1943.

"Orel Pare shipped about 4,000 tons of high-grade crude ore direct to a Canadian consumer from Union Carbide Company's 'Montreal' pit, 5 miles southeast of the Chromeraine project. The old workings were reopened in the fall of 1941 and since then regular monthly shipments have been maintained. The deposit was first opened 50 years ago, and 20,000 tons was shipped from it during the last war. From the fall of 1941 to the end of 1944 a total of about 14,000 tons of ore was shipped. About 500 tons of high-grade crude ore was shipped by Chrome Association, Limited from the old Greenshields mine, and three car lots were shipped by LaBonte and Metevier from the Hall mine, both in Coleraine township.

"In the United States the output of the 80 producers in 1944 amounted to about 40,000 tons, compared with a peak output of 160,000 tons from 175 producers in 1943.

"The world annual production of chromite just prior to the present war was about 1,300,000 tons. Russia, Turkey, Southern Rhodesia, and the Union of South Africa were each producing 200,000 tons or more a year, and the Phillippines, Cuba, New Caledonia, Yugoslavia, Greece, and India 50,000 tons or more each. Turkey is one of the most important sources of high-grade chromite.

"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. 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.

"Chromium Mining and Smelting Corporation, Sault Ste. Marie, Ontario, produces an addition agent known as Chrom-X.

"Metallurgical chromite should contain a minimum of 48 per cent Cr_2O_3 and a chrome-iron ratio of not less than 3 to 1. 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. The silica should be as low as possible. The chromite should be present in an evenly and finely distributed form, not a 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). Canadian production of high-carbon ferro was suspended early in the year.

"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. The types and grades of ore acceptable to these buyers are indicated under 'Specifications'.

"United States prices of domestic and imported ores of 48 per cent Cr_2O_3 and 3 to 1 ratio are $43.50; ores of lower grade and ratio vary down to a minimum of $28 a long, dry ton at seaboard. Canadian prices of 47 to 48 per cent Cr_2O_3 concentrates are $25 to $40 a long ton, f.o.b. mines, depending upon the Cr-Fe ratio and percentage of certain impurities." (Bureau of Mines, Ottawa.)

Table 162.—Production of Chromite in Canada, 1928-1944

Year	Short tons	$	Year	Short tons	$
1928	....	....	1937	(*)	43,250
1929	126	900	1938	....	....
1930	....	....	1939	....	....
1931	....	....	1940	335	5,780
1932	78	1,113	1941	2,372	42,679
1933	30	343	1942	11,456	343,568
1934	111	1,578	1943	29,595	919,878
1935	1,144	14,947	1944	27,034	748,494
1936	(*)	13,578			

(*) Quantity not published.

Table 163.—Consumption of Certain Chromium Products and Chrome Ore in Specified Canadian Industries, 1943 and 1944

Industry	Item	1943		1944	
		Pounds	$	Pounds	$
Ingots and castings	Chrome ore	2,738,000	63,838	2,408,000	56,831
Ingots and castings	Ferrochrome	12,994,000	1,417,215	8,344,000	858,626
Paints, pigments and varnishes	Chrome colours	2,563,058	535,527	2,430,180	531,160
Paints, pigments and varnishes	Sodium bichromate	941,456	95,805	832,473	84,523
Leather tanning	Sodium bichromate	2,114,862	211,913	1,937,207	193,532
Glass manufacture	Chromite	12,000	432	90,000	2,754

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 164.—Chromite Mining in Canada, 1942, 1943 and 1944 (all in Province of Quebec)

—		1942	1943	1944
Active firms	No.	14	15	7
Capital employed	$	380,027	1,691,315	(*)
Employees—Salaried	No.	45	48	42
Wage-earners	No.	286	322	202
Total	**No.**	**331**	**370**	**244**
Salaries and wages—				
Salaries	$	57,926	108,674	80,065
Wages	$	354,529	460,610	293,529
Total	**$**	**412,455**	**569,284**	**373,594**
Gross value of production	$	343,568	919,878	748,494
Fuel and electricity used	$	34,567	75,806	60,009
Process supplies used	$	116,725	75,995	83,828
Freight	$	17,945	37,969	45,373
Net value	$	174,331	730,108	559,284

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. Also, data shown in this table are included in tables 1 to 4.

(*) Data not recorded in 1944.

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 bearings 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

Deposits of iron ore in Canada are widespread and include hematite, siderite, magnetite, bog iron, and magnetic sand. Because of the availability at low cost of 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 Steel and Coal Corporation, Limited, Sydney, Nova Scotia, obtains its iron ore from its own mines at Wabana, Newfoundland. Steel Company of Canada, Limited, Hamilton, Ontario, and Canadian Furnace, Limited, Port Colborne, Ontario, obtain their iron ore 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, Ontario.

All but a small part of the iron ore produced in Canada in 1944 came from the New Helen mine of Algoma Ore Properties, Limited in the Michipicoten area, Ontario, and the remainder came from the hematite property of Steep Rock Iron Mines, Limited, near Atikokan, about 135 miles west of Port Arthur, Ontario. In 1943 a production of 125,000 tons of beneficiated magnetite was obtained from the Austin Brook mine near Bathurst, New Brunswick, but the property was idle in 1944.

Algoma Ore Properties, Limited (wholly owned subsidiary of Algoma Steel Corporation, Limited) began to develop the New Helen mine in 1937 and the first sinter was produced in July, 1939.

Large-scale tests on the treatment of ore from Algoma Properties' Goulais Iron Range, 50 miles northeast of Sault Ste. Marie, indicate that a product containing 65 per cent iron can be obtained, and further tests are being made. Based on the results of an extensive diamond-drilling program, the deposit is estimated to contain about 100,000,000 tons of siliceous magnetite. The active development of the Goulais Iron Range is not contemplated in the near future.

Directors of Steep Rock Iron Mines, Limited approved a three-year production program in the latter part of 1944 that calls for a total iron ore output of 5,000,000 tons from its hematite deposits in the Steep Rock Lake area, north of Atikokan, Ontario, during the shipping seasons of 1945 to 1947, inclusive. All mining is in the "B" ore-body, and open pit mining is planned to a maximum depth of 550 feet below bedrock. Exploratory work on the property in previous years had 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, are large. High-grade ore presumably makes up a considerable, but as yet very incompletely defined, part of them. The company reports that the property has 17,244,000 long tons of "proven ore" and 14,336,000 long tons of "probable ore", making a total of 31,580,000 long tons. Most of this ore is available for open pit mining. No estimate has been prepared of "possible ore".

Diversion of the Seine River was completed in 1943, and included about 20 miles of road building; the excavation of over 1,200,000 cubic yards of earth and of 500,000 cubic yards of rock; the lowering of Finlayson Lake by a tunnel; the construction of a spillway and control works in Raft Lake; the construction of coffer-dams to isolate the eastern part of Steep Rock

Lake; and the construction of a power line, the installation of pumps and barges, and works in preparation for pumping Steep Rock Lake. This pumping was commenced on December 10, 1943 and water was sufficiently down for the company to commence the production of iron ore by August, 1944. The first shipment from the Steep Rock mine left Atikokan on October 3, 1944 for delivery via Fort Frances to Superior, Wisconsin, for loading into Great Lakes boats. Difficulty was experienced, however, with viscous mud in the vicinity of the "B" ore-body which caused a curtailment of mining operations, but in the spring of 1945 the thickness of this mud had been reduced sufficiently by removal to overcome its tendency to flow over the site of the projected workings on the ore-body. Regular shipments to Lower Lake points via Duluth were commenced early in May, 1945. On June 22 advice was received to the effect that work on the ore docks at Port Arthur was by then sufficiently advanced to enable shipments of one of the three grades of ore through that port and that the docks would be ready for autumn use by September 1, 1945.

In 1944, the company erected a crusher and a screening plant capable of handling 700 tons an hour. In the screening plant the ore is separated into three sizes, namely 4 to 10-inch lump ore for open-hearth use; 1 to 4-inch charge ore for open-hearth use; and minus 1-inch blast furnace ore. The three sizes fall into separate sections of the bin below, where they are loaded into railway cars on the 3-mile spur (Canadian National railway) from Atikokan, and are hauled to the loading docks on the Great Lakes.

Michipicoten Iron Mines, Limited, which was formed in 1943 to take over the Josephine, Ruth, and Lucy iron properties, continued underground work in the Josephine mine throughout 1944. The three properties are owned jointly by Sherritt-Gordon Mines, Limited and Frobisher Exploration Company, Limited (Ventures, Limited), and are about 20 miles from Michipicoten Harbour, Algoma district, Ontario. In 1941, a transmission line was built to connect the Josephine mine with the power line at Hawk Junction, and the necessary electrically driven plant for development operations was installed. Shaft sinking was started in February, 1942, and was completed to a depth of 1,055 feet early in September of that year. Six stations were cut, the lowest being at the 1,015-foot level. While shaft sinking was in progress the ore-body was further explored by lateral diamond drilling at the first and second levels. The drainage of Parks Lake was then undertaken.

The underground work in the Josephine mine in 1944 was confined mainly to the three lowest (fourth, fifth, and sixth) levels, and most of its was on the fourth and sixth levels. The ore reserves were increased by 1,174,000 gross tons and now total 3,840,000 gross tons, averaging about 52 per cent iron, 15 per cent silica, 2·12 per cent sulphur, 0·04 per cent phosphorus, and 0·43 per cent manganese. Considerable headway was made toward equipping the Josephine mine for production on a scale of 375,000 gross tons of ore a year. This work involves the erection of a crushing plant, including a primary crusher underground, a concentrator for the production of open-hearth lump ore and a jig plant for the production of hematite concentrate. The plant was expected to be ready for operation by the end of April, 1945.

A contract for sale of the output from the Josephine mine has been made with Algoma Ore Properties, Limited (Algoma Steel Corporation). The contract is for a period of seven years from April, 1945 and it calls for the delivery of a minimum of 75,000 gross tons of open-hearth lump ore and 194,000 gross tons of hematite concentrate a year. The concentrate will be mixed and sintered with the siderite ore from the New Helen mine in Algoma Ore Properties sintering plant at Wawa, Ontario.

The Ruth property, which is 2 miles from the Josephine, remained idle in 1944. It was drilled extensively in 1942 and in the first three months of 1943, the indicated ore reserves to a depth of 800 feet being 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 averages 26·57 per cent iron and 21·46 per cent silica.

On the Lucy property in the same area, a small amount of assessment work was done.

No further work was reported on the magnetite deposits in Hastings county, Ontario. Some exploratory work was done on a few of these deposits in 1941, 1942 and 1943.

At Sarpedon Lake in Quetico Park, Rainy River district, Sarpedon Iron Mines, Limited has been diamond drilling an iron formation in search of ore under the lake. Most of the exposed iron formation in the area is magnetite-bearing. It is hoped, however, that large concentrations of hematite will be found.

No work in 1944 was reported on the Gunflint iron range at Round Lake, southwest of Port Arthur, nor on the Matawin iron range south of Shebandowan. In 1943 Gunflint Iron Mines, Limited did some diamond drilling on hematite deposits on these ranges.

Since 1936, Labrador Mining and Exploration Company, the control of which was acquired in 1943 by Hollinger Consolidated Gold Mines, Limited, has been making extensive surveys and doing exploratory work on iron deposits near Sawyer Lake and vicinity, along the Quebec-Labrador boundary. Work on the Labrador side is being done by Labrador Mining and Exploration, and that on the Quebec side by Hollinger North Shore Exploration Company. To date, 24 iron deposits have been found, 15 in Quebec and 9 in Labrador. In addition, 3 outcrops have been reported in Labrador. The Sawyer Lake deposit is the only one on which much exploration has been done, but it is proposed to conduct an extensive diamond-drilling program on the various deposits when conditions become favourable.

The following tabulation gives an idea of the great possibilities of the region:

Name of Deposit Labrador	Per cent Fe + Mn	Apparent width Feet	Apparent length Feet
Sawyer Lake	68·4	150	2,200
Ruth Lake No. 1	57·9	100	3,300
Ruth Lake No. 2	59·3	175	300
Ruth Lake No. 3	61·7	400	1,230
Wishart Lake	61·6	100	2,400
Fleming Lake No. 1	67·9	40	750
Fleming Lake No. 4	59·6	3	600
Timmins Bay	69·4	40	1,000
Ruth Lake Extension	64·9	175	1,250

No details are available on the deposits in Quebec, though one deposit with a known width at some places of 350 feet and a known length of 3,900 feet has been disclosed. Outcrops to the south indicate the possible extension of this body for a distance of over 2 miles

The Sawyer Lake area is about 325 miles from the St. Lawrence River at Seven Islands, which port is open to navigation throughout the year. Ample power will be available from the nearby Grand Falls on Hamilton River, where surveys have shown a potential minimum of 1,250,000 h.p. Hollinger has completed negotiations with M. A. Hanna Company of Cleveland, Ohio, for participation in the future exploration and development of the iron deposits both in Quebec and in Labrador.

Canadian production of iron ore in 1944 was 553,252 tons valued at $1,909,608, compared with 641,294 tons valued at $2,032,240 in 1943. Consumption of iron ore in 1944 totalled 3,478,800 short tons, of which 266,149 tons came from Canadian mines.

Exports of iron ore were 308,424 tons valued at $1,153,166, compared with 374,677 tons valued at $1,450,985 in 1943. Imports were 3,126,649 tons valued at $7,393,926, compared with 3,906,425 tons valued at $9,056,389 in 1943.

Shipments of sintered ore from the New Helen mine in 1944 amounted to 474,405 gross tons, and total shipments to the end of 1944 amounted to 2,328,900 gross tons. The ore was shipped via 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. The 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. 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 analysis of the sinter produced being approximately as follows:

	Per cent		Per cent
Iron	51·50	Alumina	2·35
Phosphorus	0·02	Lime	3·60
Silica	9·50	Magnesia	7·90
Manganese	3·00	Sulphur	0·04

It is expected that production from the property of Steep Rock Iron Mines, Limited will have an average grade (dry analysis) of:

	Per cent
Iron	60·48
Silica	3·40
Phosphorus	0·023
Sulphur	0·043
Loss by ignition	8·5

The moisture content is estimated to be 7 per cent. The natural iron content (averaging 56·54 per cent) is 4·54 per cent higher than the average of ore shipped from the Lake Superior ranges in the United States. The low silica content of 3·42 per cent will permit the use of the ore to "sweeten" other ores, and the extremely low phosphorus content of 0·017 per cent is well below the Bessemer limit. Though these qualities make Steep Rock ore a premium product, probably its most valuable quality is its physical structure, which should make it a good open-hearth lump ore, producing little minus 100-mesh fines and reducing the percentage of scrap normally required.

There are no official Canadian price quotations for iron ore. Prices, f.o.b. Lake Erie ports, a 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 was 7¼ to 7¾ cents a long ton unit.

Complete data on world production of iron ores have not been available since the commencement of the present world war. (Bureau of Mines, Ottawa.)

Table 165.—Production of Iron Ore(*) in Canada, 1939-1944

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
1944	553,252	1,909,608

(*) Exclusive of titanium-bearing iron ores. All from Ontario with the exception of 187 tons from Quebec in 1942 and 143,062 tons from New Brunswick in 1943.

Table 166.—Imports and Exports of Iron Ore, 1943 and 1944

—	1943		1944	
	Short tons	$	Short tons	$
Imports	3,906,425	9,056,389	3,126,649	7,393,926
Exports	374,677	1,450,985	308,424	1,153,166

Table 167.—Shipments of Iron Ore from Wabana Mines, Newfoundland, 1931-1944

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**
1944	622,573	....	30,587	**653,160**

* Shipments to Europe in 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 168.—Iron Ore Mining in Canada (a), 1942-1944

—		1942	1943	1944
Active firms		7	14	8
Capital		2,508,650	7,570,964	(b)
Employees—On salary		42	99	99
Wage-earners		318	404	580
Total		**360**	**503**	**679**
Salaries and Wages—				
Salaries	$	93,484	205,857	242,271
Wages	$	582,635	1,229,098	1,220,182
Total	$	**676,119**	**1,434,955**	**1,462,453**
Gross value of production	$	1,517,077	2,032,240	1,909,608
Fuel and electricity used	$	301,778	363,354	642,761
Process supplies used	$	347,690	396,915	200,438
Freight and treatment charges	$	236,307	222,013	276,653
Net value	$	631,302	1,049,958	780,756

(a) Does not include data relating to titaniferous iron ores, also data in this table are included in tables 201, 202, 203.
(b) Data not recorded in 1944.

IRON AND STEEL AND THEIR PRODUCTS

The Primary Iron and Steel Industry

Table 169.—Provincial Distribution of Active Plants in the Primary Iron and Steel Industry, 1944

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) **47**	**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 170.—Principal Statistics of the Primary Iron and Steel Industry, 1944

Province	Number of plants	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	5,752	10,160,736	2,380,179	13,066,103	24,733,729
Quebec	17	6,137	11,950,850	2,781,518	10,422,778	32,959,912
Ontario	27	17,470	36,167,112	11,612,931	67,151,835	148,598,186
Manitoba	4	720	1,208,643	324,537	963,820	3,093,027
Alberta	3	253	428,334	65,729	359,070	1,237,837
British Columbia	7	431	921,347	111,530	251,260	1,886,990
Canada	**64**	**30,763**	**60,837,031**	**17,276,424**	**92,214,866**	**212,509,681**

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 171.—Production of Pig Iron and Sale by the Producers, 1943 and 1944

Grade	Delivered in molten condition	Machine cast	Total tonnage made	Sales	
				Quantity	Income from sales
	Net tons	Net tons	Net tons	Net tons	$
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**
1944					
Basic	1,375,586	158,554	1,534,140	89,879	1,846,009
Foundry	....	143,763	143,763	143,498	3,091,233
Malleable	....	174,725	174,725	166,633	3,704,253
Total	**1,375,586**	**477,042**	**1,852,628**	**400,010**	**8,641,495**

NOTE.—Silvery pig iron has been included with ferro-alloys.

Table 172.—Materials Charged to Iron Blast Furnaces, 1943 and 1944

Material	1943		1944	
	Quantity	Cost at furnace	Quantity	Cost at furnace
	Net tons	$	Net tons	$
Iron ore—Imported (crude)	2,955,671	12,247,784	2,468,082	10,351,514
Canadian (beneficiated)	198,244	737,276	266,150	1,117,466
Foreign (beneficiated)	....	....	758,957	3,293,806
Canadian (crude)	104,536	460,160	....	....
Mill cinder, roll scale, flue dust, etc.	125,477	315,483	96,243	276,626
Scrap (net charge)	43,032	543,930	27,604	283,290
Limestone—				
From Canadian quarries	464,497	867,146	233,621	330,795
From foreign sources	321,441	362,195	520,571	889,501
Dolomite	32,064	71,945	57,822	96,857
Coke	1,646,191	13,989,052	1,687,967	15,518,097
Other materials	....	315,061	....	235,688
Total	....	**29,910,032**	....	**32,393,640**

Table 173.—Imports Into Canada and Exports of Pig Iron, 1933-1944

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
1944				

Table 174.—Blast Furnaces in Canada, 1942-1944

Name of Company	Location of Plants	Number of stacks	Total daily capacity (24 hours)	Number of days in blast		
				1942	1943	1944
			Net tons			
Dominion Steel and Coal Corporation, Ltd.	Sydney, N.S.	1	616		180	329
		1	616	365	358	366
		1	392	365	16	128
		1	336	365	326	
Total		**4**	**1,960**			
Canadian Furnace Company, Limited.	Port Colborne, Ont.	1	466	304½	196½	(*) 313
		1	147	289	332	
Total		**2**	**613**			
The Steel Company of Canada, Limited.	Hamilton, Ont.	1	364	365	347	342
		1	728	365	365	366
		1	980	365	365	363
Total		**3**	**2,072**			
Algoma Steel Corporation, Ltd.	Sault Ste. Marie, Ont.	1	336	360	317	
		1	336	184	277	
		1	616	349	346	348
		1	504	361	346	218
		1	1,120		32	360
Total		**5**	**2,912**			
Total for Canada		**14**	**7,557**			

(*) For making pig iron; ferro-alloys also made in this furnace.

Table 175.—Production of Ferro-Alloys, 1933-1944

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	1944	171,3[illegible]

Table 176.—Production of Steel Ingots and Steel Castings, by Grades, 1939-1944 (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	135,633	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
1944	2,517,894	355,974	35,032	2,470	104,792	3,016,162

Table 177.—Materials Used in Steel Furnaces, 1943 and 1944

Material	1943		1944	
	Quantity	Cost of purchased materials	Quantity	Cost of purchased materials
	Net tons	$	Net tons	$
Pig iron—Own make	1,435,020	....	1,439,310	....
Purchased	83,528	1,873,372	74,276	1,694,085
Scrap iron or steel—Own make	947,683	....	887,513	....
Purchased	804,096	17,554,265	754,737	15,661,279
Spiegeleisen	367	31,474	1,708	85,728
Silicospiegeleisen	....	....	358	28,330
Ferromanganese	19,096	2,356,754	20,224	2,510,354
Silicomanganese	9,568	1,094,239	9,014	1,018,475
Ferrosilicon	11,545	757,911	11,055	692,370
Ferrochrome—High carbon	4,669	702,817	3,154	453,650
Low carbon	1,828	714,398	1,018	404,976
Ferromolybdenum	....	280,813	303	553,032
Ferrophosphorus	380	33,967	405	35,533
Ferroselenium	2	5,793	2	4,406
Ferrotitanium	614	118,416	786	149,527
Ferrotungsten	550	1,721,967	86	287,116
Ferrovanadium	204	558,717	67	176,596
Ferrozirconium	8	2,153	15	1,613
Calcium silicon	515	166,923	241	76,374
Calcium manganese silicon	215	70,914	575	188,312
Other ferro-alloys	....	35,761	....	401
Aluminium ingot and shot	951	344,785	983	289,021
Copper ingots	37	8,467	95	20,451
Nickel	2,775	1,867,729	1,692	1,124,382
Other metals	....	141,285	....	79,024
Ore, iron, crude	107,619	671,079	154,217	1,203,977
Ore, iron, calcined, roasted or treated	62,052	668,843	198	1,004
Ore, manganese	....	....	25	592
Ore, chrome	1,369	63,838	1,204	56,831
Bentonite	3,853	97,975	3,745	88,527
Coal, anthracite	1,195	9,475	653	6,993
bituminous	133	1,264	6	236
Coke—Own make	....	....	....	....
Purchased	5,158	60,770	4,685	51,659
Charcoal	....	7,457	199	8,034
Dolomite, Crude	78,746	243,793	77,085	199,774
Calcined	10,310	99,740	8,516	125,990
Fluorspar	20,790	715,991	20,024	692,104
Lime—Own make	29,776	....	63,721	450,533
Purchased	36,080	344,488		
Limestone—Canadian	125,058	242,328	86,216	148,050
Imported	116,974	136,371	150,951	241,183
Magnesite	19,427	744,716	18,665	740,450
Electrodes	....	1,075,799	....	952,084
Silica sand	95,605	703,167	89,807	646,841
Other foundry sand	....	154,707	....	73,740
Firebrick, fireclay and other refractories	....	2,634,711	....	2,358,691
Calcium molybdate and molybdenum oxide briquettes	522	813,861	561	517,456
All other materials	....	3,323,942	....	2,701,048
Total Value of Metals, Ores and Other Materials Used	....	**43,257,235**	....	**36,800,822**

Table 178.—Summary of Steel Furnace Capacity, December 31, 1944

—	Number of 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

Amblygonite, spodumene, and lepidolite are the chief lithium minerals of commerce: their ores contain, respectively, about 8, 6, and 4 per cent of lithium oxide. Spodumene is in greatest supply, and is the base raw material for the manufacture of many lithium salts, lithium metal, and alloys. Amblygonite has similar uses, but is scarcer and more expensive. Lepidolite, or lithia mica, is employed mainly in the natural state as a batch ingredient in glass. The occurrence of all three minerals is confined to pegmatite dykes of a definite type, which usually have a localized, regional distribution and often carry, also, important amounts of beryl and tantalite-columbite. In some cases, such dykes have been worked for the recovery of all of these minerals.

There has been no recorded production of lithium minerals in Canada since 1937, when 32 tons of amblygonite and spodumene valued at about $1,700 was shipped, and little if any lithium ore is known to be used or required for any purpose in the Dominion. Thus, an outside market would have to be found for any production. Considerable development work has been done in recent years, however, on deposits in the Pointe du Bois area in southeastern Manitoba; and in the three years ended 1944 increased interest was shown in the commercial possibilities of lithium deposits in other sections of that province, though activities have been confined to exploratory drilling. Some attention has been given, also, to lithium-bearing deposits in the Yellowknife-Beaulieu area in the Northwest Territories.

Lithium ores and compounds early became of strategic importance in the present war, and to conserve supply for defence needs the United States Government placed both under allocation control in 1942. Government assistance also was given to the establishment of two spodumene mills, one in North Carolina, and the other in South Dakota. These measures resulted in a considerable easing of the general supply situation in 1944.

All of the small Canadian production of lithium minerals has come from the Pointe du Bois area in Manitoba. Lithium Corporation of Canada, 409 Avenue Building, Winnipeg, is the company that has been most actively interested in furthering the development of the lithium-bearing pegmatites in the area, and it has carried out considerable work on its holdings, mainly on those at Bernic Lake. It mined and stock-piled about 50 tons of mixed ore in 1941, but was inactive during 1942–1944. The material taken out in 1941 comprised about equal amounts of cobbed amblygonite and spodumene, and included also a few tons of triphylite, a phosphate of lithium and iron, containing, theoretically, about 9 per cent of lithium oxide.

Lithium is the lightest of the metals, having a specific gravity of only 0·53. A wide range of master alloys of lithium with calcium, silicon, brass, copper, manganese, zinc, lead, tin, magnesium, and aluminium has been developed in the United States. The alloys are being used to an increasing extent as deoxidizing, degasifying, and desulphurizing agents in copper, brasses, bronzes, etc.; as scavengers for cast iron and in the refining of high-carbon steel; and for the hardening of lead and aluminium. Alloys of lithium with zinc, aluminium, and magnesium are strong and highly resistant to corrosion.

Prices of lithium minerals in 1944 showed little change from those of the previous year. Amblygonite, 8 to 9 per cent Li_2O, was quoted at $40 to $50 per ton; spodumene, 6 per cent grade, at $5 to $6 per unit for mill concentrates; and lepidolite, 3 per cent Li_2O at $25 per ton, all f.o.b. mines. Lithium metal was unchanged at $15 per pound.

There are no plants in Canada for the chemical treatment of lithium ores. Most of the world production marketed prior to the war was treated by a few large chemical firms specializing in the business, the principal plants being in the United States, Great Britain, Germany, and France. Such firms usually purchased their requirements under individual contract, and there has thus been little in the way of an open market, price quotations given in trade journals being merely nominal. Some of the larger consumers own and operate their own mines.

MAGNESIUM

Magnesium, industry's lightest metal, is available from many sources in Canada and elsewhere. The present source of the metal produced in Canada is dolomite. Other potential sources are magnesite, brucite, serpentine, and sea-water.

Dolomite, the double carbonate of calcium and magnesium, and which contains 13 per cent of magnesium, is found in all provinces of Canada except Prince Edward Island. It is particularly abundant in Ontario and Manitoba.

Magnesite, the carbonate of magnesium, containing 28·7 per cent magnesium, and hydromagnesite, containing 26·5 per cent of magnesium, are available in British Columbia. Deposits of magnesitic dolomite consisting of an intimate mixture of magnesite and dolomite occur in Argenteuil county, Quebec, where they are being worked for the production of basic refractories. The magnesite deposits in British Columbia are undeveloped, but magnesium has been made from them on an experimental scale. Magnesitic dolomite possesses no advantages over dolomite or magnesite as a source of magnesium.

Brucite, in the form of granules 1 to 4 mm. in diameter thickly disseminated throughout crystalline limestone and forming 20 to 35 per cent of the volume of the rock, occurs in large deposits in Ontario and Quebec. Brucite is the hydroxide of magnesium and contains 41·6 per cent of magnesium. The Canadian deposits are the largest known in the world. The brucite is being recovered in the form of granules of magnesia from one of these deposits near Wakefield, Quebec, and though the granular magnesia so obtained is being used principally for the manufacture of basic refractories and as an ingredient in chemical fertilizers, it is a very suitable raw material for the production of magnesium metal.

Serpentine, the silicate of magnesium, contains 25·8 per cent of magnesium, and occurs in many deposits throughout Canada. It is also available in huge waste dumps aggregating probably 100,000,000 tons in the asbestos-producing region of Quebec. The average magnesium content of these dumps is about 23 per cent. A process has been worked out for the recovery of magnesium from serpentine.

Sea-water, although it contains only 0·13 per cent magnesium, is a source of the metal in England and the United States. Dolomitic lime is used to precipitate the magnesia from the sea-water in the form of hydroxide, and the magnesia from both is recovered in the process.

Underground brines containing $MgCl_2$ and residual brines from salt-making operations, containing $MgCl_2$, are used in the United States as sources of magnesia and magnesium, but brines containing sufficient $MgCl_2$ to render them of value are not available in Canada.

Processes for the production of the metal from the various raw materials may be divided into two groups, namely, electrolytic, and thermal. The electrolytic process provides most of the magnesium made, except in Canada where a thermal reduction process is used. The three thermal reduction processes in use throughout the world involve reduction of magnesia with carbon (in use in the United States); reduction of magnesia with calcium carbide (in use in the United Kingdom); and reduction of calcined dolomite with ferrosilicon (in use in Canada, the United States, and Italy).

The ferrosilicon reduction process in use in Canada involves the grinding and mixing together of ferrosilicon, calcined dolomite, and a catalyst, briquetting the mixture, and charging the briquettes to externally heated retorts operating under a vacuum. The magnesium vapour is condensed on the sides of a water-cooled condenser and is removed as a ring or crown of pure solid metal. These crowns are re-melted and cast into ingots, with or without alloying elements.

Dominion Magnesium, Limited, Haleys, Ontario, which began production in August, 1942, is the only producer of magnesium in Canada. The plant is operated by a private company under supervision of Wartime Metals Corporation, a Crown company. Production in 1944 amounted to 5,290 tons valued at $2,575,695, compared with 3,577 tons valued at $2,074,652 in 1943.

No data are available for publication on exports and imports of magnesium, but most of the production is exported.

The three magnesium foundries in Canada are located at Toronto, Montreal and at Renfrew, Ontario. They are operated respectively by Aluminum Company of Canada, Limited, Robert Mitchell Company, Limited, and Light Alloys, Limited. A plant for the making of magnesium powder is operated at Trail, British Columbia, by Consolidated Mining and Smelting Company of Canada, Limited.

The field of usefulness of magnesium is steadily expanding. Magnesium was formerly used almost exclusively in pyrotechnics, but it is used also as a structural metal, particularly in the form of castings and extruded shapes. For structural use it is alloyed with various portions of other elements. It is used as a constituent in many aluminium-base alloys.

The price quoted by Engineering and Mining Journal for magnesium in ingot form in carload lots during 1944 was 20½ cents per pound, U.S. currency, f.o.b. New York.

Complete data on world production of magnesium are not available. Production of primary magnesium ingot in the United States in 1944 totalled 168,337 short tons; in Great Britain the production of ingot in 1943 totalled 25,800 short tons. (Bureau of Mines, Ottawa.)

Table 179.—Production of Primary Magnesium Metal in Canada, 1916-1918 and 1941-1944

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**
1944	....	....	10,579,778	2,575,695	....	....	**10,579,778**	**2,575,695**

(a) Magnesium metal produced in 1918 at Shawinigan Falls, Quebec by Shawinigan Electro 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 180.—Consumption of Magnesium Ingots in Canada, 1940-1944

	1940	1941	1942	1943	1944
			(pounds)		
In non-ferrous smelters	192,000	825,717	1,072,346	1,298,650	1,480,528
In white metal alloy foundries	7,770	9,515	9,850	16,821	55,496
In brass and bronze foundries	163	42,821	44,553	132,465	51,040
In aluminum products	240	127	....	89,523	34,430
In ammunition	404	....	....	....	....
Total accounted for	**200,577**	**878,180**	**1,126,749**	**1,537,459**	**1,621,494**

MANGANESE

All manganese properties in Canada were inactive in 1944. The small Canadian production in the past has come from deposits in the Maritime Provinces.

The manganese ores that have been mined in Canada are pyrolusite (MnO_2), psilomelane (H_4MnO_6), 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, the most common and most important, contains, when pure, 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.

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 grade old properties were discontinued after a few months' work. Production ceased in the fall of 1943, in which year a carlot was shipped from Jordan Mountain, north of Sussex, New Brunswick. From 1939 until the fall of 1943 there was a small production in New Brunswick also from Gowland Mountain near Elgin, southeast of Sussex; Turtle Creek, near Berryton, and at Quaco Head, near St. Martin on the south coast.

In Nova Scotia, the principal output came from New Ross, 45 miles west of Halifax, and there was a small output from East Mountain, east of Truro.

From 1886 to the end of 1943, a total of about 18,600 short tons of manganese ore was produced in Canada, close to half of it from 1887 to 1890 inclusive.

Approximately 45 per cent of the imports of manganese ore in 1944 totalling 79,906 short tons, valued at $2,213,396, came from India; about 40 per cent from the Gold Coast; and the remainder from Egypt, Chile, and the United States. This was an increase of 56 per cent over the tonnage imported in 1943. Consumption was 81,824 tons, a 36 per cent increase over that of 1943.

World production of manganese ore is between six and seven million tons annually, the leading producing countries being Russia, British India, Gold Coast, United States, Union of South Africa, Brazil, 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 ferromanganese, silicomanganese, 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. About 13 pounds of manganese is used in each ton of steel. Ferromanganese, containing 75 to 82 per cent manganese and 5 to 7 per cent carbon, is by far the most important addition agent, and the highest "ferro" grade ore is used to make it. Such ore should contain at least 48 per cent of manganese and not more than 6 per cent iron, 10 per cent silica and alumina, and 0·18 per cent phosphorous; 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 4 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; namely, Electro-Metallurgical Company, 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). 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 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, namely: Canadian National Carbon Company, Toronto; Burgess Battery Company, Niagara Falls; and General Dry Batteries of Canada, Limited, Toronto. Chemical ore is used also as a colouring agent in the glass, ceramic, and paint industries; as pigments and dyeing materials; as salts in photography, fertilizers, disinfectants, bleachers; and for other minor purposes.

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 (based on a standard duty-free ore containing 48 per cent manganese and within the specifications outlined), are 85 cents per long ton 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 were obtained from the Metals Controller, Ottawa. The prices paid in 1944 by the Government and Canadian consumers for approximately 48 per cent manganese ore were $46 for Indian ore at Welland and $37 per long ton for Gold Coast ore at Canadian ports.

The delivered prices of chemical grade (battery grade) manganese ores 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 upon mesh and origin.

Known deposits of high-grade manganese ore in Canada are small, and are almost exhausted. No commercial grade deposits have been found and future production appears to be unlikely unless sufficient manganese is discovered during the operation of the Steep Rock iron deposits to warrant its recovery as a by-product. (Bureau of Mines, Ottawa.)

Table 181.—Production (Sales) of Manganese Ore in Canada for Years Specified

Year	Tons	Value	Year	Tons	Value
		$			$
1915	201	9,360	1936	221	1,596
1916	957	89,544	1937	85	817
1917	158	14,830	1938	...	...
1918	440	6,230	1939	306	3,688
1924	584	4,088	1940	152	4,315
1925–1929	...	...	1941	(*)	(*)
1930	273	1,356	1942	435	8,932
1931	117	2,893	1943	48	985
1932–1934	...	...	1944	...	...
1935	100	800			

(*) 7,500 pounds manganese metal produced at the mine from Nova Scotia manganese ore.

Table 182.—Consumption of Manganiferous Ore and Manganese Compounds in Specified Canadian Industries, 1943 and 1944

Industry	Items	Quantity	Value
			$
1943			
Electrical apparatus and supplies	Manganese dioxide . . . pound	6,105,401	215,[illegible]
Paints, pigments and varnishes	Manganese naphthenate . . . pound	70,271	12,[illegible]
Steel ingots and castings	Ore, manganiferous (foreign) . . . pound	...	...
	Spiegeleisen . . . short ton	367	31,[illegible]
	Ferromanganese . . . short ton	19,096	2,356,754
	Silicomanganese . . . short ton	9,568	1,094,239
White metal alloys	Manganese metal . . . pound	9,431	4,704
1944			
Electrical apparatus and supplies	Manganese dioxide . . . pound	6,627,920	236,404
Paints, pigments and varnishes	Manganese naphthenate . . . pound	67,059	14,604
Steel ingots and castings	Ore, manganiferous (foreign) . . . pound	50,000	592
	Spiegeleisen . . . short ton	1,708	85,728
	Ferromanganese . . . short ton	20,224	2,510,354
	Silicomanganese . . . short ton	9,014	1,018,475
White metal alloys	Manganese metal . . . pound	4,717	1,333

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

At the outbreak of the war the Allies were seriously deficient in mercury, as the bulk of world output came from Italy and Spain. Prices rose to nearly three times the pre-war level but within two years, owing to the greatly increased production from the United States and from the Pinchi mine in British Columbia, supplies became sufficient to enable the export of mercury to the other Allied countries. Early in 1944 many of the activities in the United States and some in Canada were suspended as the supply was much greater than the demand, and prices declined. The Pinchi mine was closed down in July and at present (April, 1945) no mercury is being produced in Canada. Late in the summer, however, a complete reversal took place, mainly due to unforeseen requirements for a new application, and prices increased appreciably. Towards the close of the year, stocks in the United States were at their lowest level and some of the mines in that country were reopened.

Cinnabar (HgS), the principal ore of mercury, is a heavy (s.g. $=8\cdot1$) mineral 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 presence of mercury can be readily detected by heating a small piece of rock to about 300°C and placing it between an ultra-violet ray lamp with purple filter and a screen coated with powdered willemite (zinc silicate). If mercury is present a fume shadow will be cast on the screen. As little as 0·02 per cent mercury can be detected in this manner, but better results are achieved with a powdered sample.

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 ore-bodies are on a steep mountainside and consist of large cinnabar-bearing areas in veins and as impregnations, mainly in dolomitized and brecciated limestone along zones of fracturing and shearing. The deposit was discovered in the summer of 1937 and was optioned late in 1938 to Consolidated Mining and Smelting Company. Production was started in June, 1940. The mine has been developed by a glory hole and by levels for 400 feet above the main 200-foot haulage level from which a 200-foot deep shaft was sunk early in 1944, giving a vertical distance of about 800 feet. Exploration and diamond drilling revealed ore all the way down to the bottom of the shaft, and at this depth the grade is better than the average (0·4 per cent mercury) of the milling ore. A number of cinnabar claims were staked and prospected in 1942 and 1943 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.

During the period 1939 to 1943 some prospecting was also carried out and a few flasks were produced from deposits north of Kamloops Lake; from the Yalakom River, 30 miles northwest of Lillooet; from Relay Creek and 16 miles north of Minto City, both north of Bridge River. Part of the Empire Mercury Mines plant, north of Minto City, was removed to Copper Creek, Kamloops Lake, in the autumn of 1942, but apparently was not re-erected.

Canadian production in 1944 was 9,683 flasks (of 76 pounds each) valued at $1,210,375, as compared with 22,240 flasks valued at $4,559,200 in 1943. Since the outbreak of the war Canada has produced 54,641 flasks or about 2,076 tons.

Exports amounted to 4,682 flasks, a decrease of 70 per cent compared with 1943. They were valued at $959,810 and were shipped to India, United States, and Australia. Imports were 466 flasks valued at $44,182, and were nearly all from Mexico. Producers and consumers stocks at the end of the year were 8,315 flasks.

The plant at the Pinchi mine, consisting of Wedge roasters, kilns, and condensers, is capable of treating about 1,200 tons of ore daily, but was treating only 400 tons daily before it was closed down in July because of the lack of a market and of an accumulation of stocks. The Pinchi mine was the largest single producer of mercury in the Western hemisphere, its output during its four years of operation being over 2,000 tons of refined mercury.

The Takla property was operated by Bralorne Mines, Limited, and production from the 100-ton plant was started in November, 1943. As the deposit is in comparatively flat country the mine is developed by shaft, mainly from the 100-foot level. Operations ceased in September, 1944, after the Metal Reserve Company (U.S.) cancelled the contract. Production during the period amounted to about 66 tons of mercury.

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, and the United States contributed about 11 per cent. The pre-war output from Russia, then the fourth largest producer, was about 300 metric tons a year. Production from Mexico in 1944 was reported to be about 900 tons. Czechoslovakia, China, Japan, Chile, and Peru are also producers of mercury. In the Union of South Africa, production was started at Monarch Kop in 1940 and its output has increased substantially each year since then. In 1944 it was nearly 1,200 flasks (45·3 tons).

Production in the United States in 1944 was about 37,500 flasks, compared with 51,929 in 1943, which was the highest since 1881. California contributed about 75 per cent of the output. The New Idria mine in San Benito county, California, continued to be the leading producing mine.

Canada uses about 3,000 flasks of mercury a year, about 75 per cent of it for medicinal and pharmaceutical purposes, and in heavy chemical industries. The consumption of mercury in Canadian gold mines, which is now about 7 per cent of the total, has decreased owing to wider use of cyanidation and to improvements in the recovery of the mercury after amalgamation.

In the United States the main cause for the recent marked increase in consumption was the large demand for mercury for use in the Ruben dry battery. This small cell, about ¾-inch high, containing mercuric oxide and layers of zinc and paper in the form of a spiral, will last five times as long as the standard flash lamp battery. It is being used widely in all branches of the armed forces; in small portable radios (walkie-talkie), etc.; and large peacetime markets are forecast. Other uses for mercury are: as a catalyst or in the electrolytic preparation of chlorine, caustic soda, acetic acid, and acetone. In the past an appreciable amount of the metal was consumed as fulminate of mercury, a powerful detonator, but this has been replaced by other compounds such as lead azide, and only a small quantity of mercury is now used for a special type of detonator. Mercury is used in the manufacture of mercury salts, thermometers, medical supplies, mirrors, mercury vapour, and fluorescent lamps; in the manufacture of electrical and chemical apparatus; for automatic electrical contacts; in electric rectifiers; as cathodes in electrolytic chemical processes; in the manufacture of felt; in boiler compounds; in especially designed mercury boilers to replace steam in power production; in cosmetics; and for anti-fouling paint.

In the first quarter of 1944 the controlled United States price of mercury was $176 per flask, but by July the price had dropped to $96. It rose to $140 in December and to $170 in February, 1945. In 1938 the average price was $75.

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 18 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 25 cents per pound, or $19 per flask in United States currency. Specifications call for a minimum of 99·5 per cent mercury and a maxima of 0·3 per cent antimony and 0·1 per cent arsenic.

Apart from direct war uses, it is possible that the demand for mercury will continue to rise, due to its new use in the manufacture of miniature dry batteries. In the event of an increased demand for this and other uses, Canada's output could be readily maintained at the record rate of 1943, when 22,240 flasks were produced, and, if necessary, this rate could be substantially increased. (Bureau of Mines, Ottawa.)

Table 183.—Production of Mercury in Canada

Year	Pounds	$	Year	Pounds	$
1895	5,396	2,343	1940	153,830	369,317
1896	4,408	1,940	1941	536,304	1,335,697
1897	684	324	1942	1,035,914	2,943,807
1924-1927 (*)	380	(*)	1943	1,690,240	4,559,200
1938	760	760	1944	735,908	1,210,375
1939	436	1,226			

(*) Data from a report issued by Bureau of Mines, Ottawa; value not recorded.

Table 184.—Consumption of Mercury in Specified Canadian Industries, 1940-1944

	1940	1941	1942	1943	1944
			(Pounds)		
Medicinals and pharmaceuticals	30,246	67,607	78,362	79,786	24,307
Heavy chemicals (catalyst)	30,904	35,319	50,968	72,531	78,300
Electrical apparatus	1,899	25,738	42,313	28,786	5,840
Non-ferrous smelters	1,636	4,635	1,201	1,838	2,022
Petroleum refineries	328	920	684	372	....
Gold mines	6,000	11,091	10,000	10,000	10,000
Ammunition	4,630	8,217	....	....	49
Other industries	....	2,591	1,650	5,752	7,000
Total accounted for	**75,643**	**156,118**	**185,178**	**199,065**	**127,518**

MOLYBDENITE

Molybdenum concentrates produced in Canada are shipped to Climax Molybdenum Company, Langeloth, Pennsylvania, for conversion into oxide or ferromolybdenum, and equivalent amounts of these products are shipped by that company to Railway and Power Company, Montreal, the distributor for Canada. The supply situation had improved to such an extent that in April, 1944, it was decided to discontinue operations at the Indian Molybdenum mine (Dome Mines, Limited) in Preissac township, Quebec, as the output from the LaCorne mine in LaCorne township, Quebec, would be sufficient to meet the Canadian requirements. In May, 1944, operations at the Quyon Molybdenite property near Quyon, Quebec, were also discontinued.

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, Quebec, and in British Columbia, molybdenite usually occurs in quartz or in quartz veins, along the contacts of, or intruded into granites, or diorites. It generally occurs in the form of soft, pliable flakes or leaves, but is sometimes semiamorphous, filling cracks and smearing the rock surface. It can be readily 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.

All of the production in 1944 came from the LaCorne and Indian Molybdenum mines in the Abitibi area and the Quyon Molybdenite mine near Quyon, Quebec, 35 miles northwest of Ottawa.

From the 187,130 tons of ore treated in 1944 by the three producers, about 1,097 tons of high-grade concentrate was produced and 1,064 tons of concentrate and molybdenum trioxide were shipped, the 561 tons of contained molybdenum being valued at $1,079,698. In 1943, 192 tons of contained molybdenum was shipped.

Wartime Metals Corporation took over the LaCorne property in July, 1942, and made arrangements for Siscoe Gold Mines, Limited, to operate the mine. Production at the enlarged mill was started in May, 1943, and by the end of December, 1944, nearly 150,000 tons of ore containing between 0·6 and 0·7 per cent MoS_2 had been treated, the average during 1944 being about 270 tons daily. The mine is producing over 30 tons of molybdenum (contained in high-grade concentrates) a month.

Indian Molybdenum's 600-ton mill entered production in September, 1943, and by April 30, 1944, when it was closed, it had treated a total of about 93,000 tons of ore.

Quyon Molybdenite Company treated about 150 tons of ore daily, which averaged 0·2 per cent MoS_2. The concentrate was converted to molybdix oxide in a small roasting plant on the property, and was 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. The company was acquired by J. J. Gray, of Toronto, in May, 1944.

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, Climax, Colorado, the world's largest producer, reduced its tonnage and is treating about 10,000 tons of ore daily containing about 0·5 per cent MoS_2. The company probably contributed about 60 per cent of United States total output of contained molybdenum in 1944. This total amounted to 19,267 tons, compared with 30,833 tons in 1943. Most of the remainder is obtained as a by-product of some of the large copper producers in Utah, New Mexico, and Arizona. Other producing countries are Norway, Mexico, Chile, Peru, French Morocco, Korea, Greece, Turkey, Yugoslavia, Australia, and recently Manchuria.

Molybdenite concentrate is converted into an addition agent that is introduced into steel as molybdenum trioxide, ferromolybdenum, or to a small extent as calcium molybdate. The oxide is usually moulded into briquettes.

Molybdenum has a widening range of uses, but by far the greater part of the output is used in steel to intensify the effect 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.

The Metals Controller's contract to purchase all domestic molybdenum products at a bonus price of not less than 85 cents a pound of contained sulphide in concentrate, f.o.b. Ottawa, was terminated on December 31, 1943, owing to changed conditions. New producers will have to sell in the open market at the normal price which is about 50 cents (Canadian funds).

The price a pound of contained molybdenum, f.o.b. Toronto, in Canadian funds, for the following imported compounds is approximately: Calcium molybdate (42 per cent Mo), 98 cents; ferromolybdenum (60 per cent Mo), $1.15; and molybdic oxide (52 per cent 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 5 pounds each and contain 2½ pounds of molybdenum.

Canadian ore and concentrate shipped to the United States is subject to a duty of 17½ cents a pound of contained molybdenum.

Imports of calcium molybdate into Canada during 1944 totalled 3,960 pounds valued at $3,596. In 1944 the quantity of calcium molybdate and molybdenum oxide used in Canadian steel furnaces totalled 522 short tons valued at $813,861. (Bureau of Mines, Ottawa)

Table 185.—Production of Molybdenite in Canada, 1902-1944

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	150,461
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)	6·5	4,500	(h)
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
1944	187,130	1064·0	1,079,698	1,870,132

(a) Value as given by the operators 1902 to 1939; 1940–1943 value estimated using market or Government prices.
(b) Not known.
(c) Mined.

Table 186.—Molybdenite Mining in Canada, 1942, 1943 and 1944

—		1942	1943	1944(a)
Active firms	No.	16	12	4
Capital	$	237.044	3,672,813	(*)
Employees—On salary	No.	43	38	31
Wage-earners	No.	127	221	148
Total	**No.**	**170**	**259**	**179**
Salaries and wages—Salaries	$	29,482	82,319	62,954
Wages	$	190,249	394,952	332,512
Total	$	**219,731**	**477,271**	**395,466**
Gross value of production	$	134,963	549,515	1,079,698
Fuel and electricity used	$	30,965	73,961	54,614
Process supplies used	$	21,124	81,072	103,774
Freight and treatment charges	$	34,243	3,249	72,681
Net value of production	$	48,631	391,219	848,629

(*) Data not recorded in 1944.
(a) Data included in last tables in chapter 5.

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.

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. (1941)

"E and M J Metal Markets", New York, quoted radium at $25 to $30 per Mg of radium content, depending on quantity; September, 1945.

Table 187.—Canadian Refinery Production of Pitchblende Products

Year	$	Year	$
1933(b)	247,900	1938	1,045,458
1934	159,400	1939	1,121,553
1935	413,709	1940	410,176
1936	605,509	1941–1944	(a)
1937	876,540		

(a) Not available for publication.
(b) First production.

SELENIUM

Selenium is fairly widely distributed, but is not abundant in nature. It occurs in association with sulphur and frequently accompanies the sulphides of heavy metals in the form of selenides. In no case does it occur in quantity large enough to be mined for itself alone.

Commercial selenium is recovered in association with tellurium from the slime or residue produced in the refining of copper. In Canada it is recovered during the refining of blister copper produced in Manitoba, Ontario, and Quebec, and was first produced in the Dominion in 1931 in the copper refinery of International Nickel Company of Canada at Copper Cliff, Ontario. The only other producer in Canada is Canadian Copper Refiners, Limited, with refinery at Montreal East, Quebec, where production was commenced in November, 1934. The Copper Cliff product is derived from the treatment of the copper-nickel ore of the Sudbury district, and that at Montreal East is obtained from the treatment of the gold-copper ore of Noranda, Quebec, and the gold-copper-zinc ore of the Flin Flon mine on the boundary line between Manitoba and Saskatchewan.

Canadian production of selenium in 1944 was 298,592 pounds valued at $537,466, compared with 374,013 pounds valued at $654,523 in 1943. The maximum production of 495,365 pounds was reached in 1942. Quebec is the source of about 58 per cent of the total output of the metal, Ontario about 18 per cent, and Manitoba and Saskatchewan the remainder.

Exports of selenium and selenium salts in 1944 were 250,404 pounds valued at $445,768, compared with 211,530 pounds valued at $380,493 in 1943.

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.

A plant for the manufacture of selenium compounds was erected in 1944 at Montreal East by Canadian Copper Refiners, Limited.

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.

The greatest single development in the utilization of selenium since the commencement of war has been its use in electrical rectifiers that have played such an important role in connection with radar and with generators for aeroplanes and army field equipment. Considerable quantities are being used as accelerators in the vulcanization of synthetic rubber. It is also being used to develop free machining qualities in stainless metal. Selenium is used as an ingredient of austenitic chromium steels. For this purpose it is supplied in bars of selenium-bearing stainless metal. The Battelle Institute has discovered that selenium is useful in producing good ruby glass; is a quality-improver in lubricating oil; and is a potent ingredient of anti-fouling paints for ship bottoms.

Since August, 1938, the nominal price for selenium, black powdered, 99·5 per cent pure at New York has been $1.75 a pound. "Glass Industry" gives the following quotations for selenium salts in 1943: (1944 not available) barium selenite, $1.40 to $1.60 a pound, and sodium selenite, $1.50 to $1.65 a pound.

Table 188.—Production of Selenium in Canada, 1931-1944

Year	Pounds	$	Year	Pounds	$
1931(*)	21,500	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	1944	298,592	537,466

(*) First commercial production in Canada.

Consumption of selenium in the manufacture of glass in Canada during 1944 was estimated at 2,167 pounds compared with 1,687 pounds in 1943.

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.

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 were of increasing importance in the war effort and tantalite was placed in the goup 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.

United States quotations for tantalum ore, August, 1945 were, per pound Ta_2O_5, $2 to $3 for 60 per cent concentrate, the price depending on the source. Columbium metal, per kilo, base prices: rod $560; sheet $500. Tantalum metal, per kilo, base prices, $160.60 for C.P. rod; sheet $143; discounts on volume business.

TELLURIUM

Tellurium occurs native and as an essential constituent of several minerals, none of which has been found in commercial quantities. Tellurium-bearing minerals also occur in minute quantities in association with other metallic ores, and the element may be recovered from residues in the refining of copper or lead, and also when sulphuric acid is manufactured from certain varieties of pyrites. The potential recovery and production of tellurium are great, but the demand remains small so that the quantity of refined metal produced is small. Ores containing tellurium occur in British Columbia, Saskatchewan, Manitoba, Ontario, and Quebec.

The electrolytic copper refineries operating in Canada have plants for the recovery of tellurium from their sludges, and for the production of the refined metal. Tellurium was first produced in Canada in 1934 at Copper Cliff, Ontario by International Nickel Company of Canada, Limited. The only other producer, Canadian Copper Refiners, Limited, started production in 1935 at its plant in Montreal East, Quebec. The former plant treats the slime from the refining of the blister copper produced by International Nickel Company at Copper Cliff; and the latter, the slime from the refining of the anode copper of Noranda Mines, Limited, Noranda, Quebec, and the blister copper of Hudson Bay Mining and Smelting Company, Flin Flon, Manitoba. There has been no recovery in Canada from the sludge of sulphuric acid chambers.

Canadian production of tellurium in 1944 was 10,661 pounds valued at $18,657, compared with 8,600 pounds valued at $15,050 in 1943 and 11,084 pounds valued at $17,735 in 1942. Exports of tellurium are not recorded separately.

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 a few years ago, 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 resistance requiring 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 in which case it is used in the form of a ferrotellurium.

A nominal price for tellurium of $1.75 per pound at New York has prevailed since 1938 and throughout 1944. (Bureau of Mines, Ottawa)

Table 189.—Production of Tellurium in Canada, 1934-1944

Year	Pounds	$	Year	Pounds	$
1934 (x)	5,130	25,699	1940	3,491	5,607
1935	16,425	32,850	1941	11,453	18,394
1936	35,591	62,997	1942	11,084	17,735
1937	41,490	71,777	1943	8,600	15,050
1938	48,237	82,067	1944	10,661	18,657
1939	2,940	4,769			

(x) First commercial production in Canada.

Table 190.—Consumption of Tellurium in Steel and White Metal Foundries, 1940-1944

Year	Steel Foundries	White Metal Foundries
	(Pounds)	
1940	400	629
1941	185	492
1942	50	612
1943	135	453
1944	398	531

THALLIUM

Thallium was produced commercially for the first time in Canada in 1944. The output totalling 128 pounds valued at $1,690 represented the metal contained in residues, produced by the Hudson Bay Mining and Smelting Company, Limited at the Flin Flon smelter, Manitoba. These residues were exported for treatment in foreign plants. Thallium metal was quoted in the United States at $12.50 per pound, nominal, September, 1945. The element has an atomic weight of 204 and has been used in alloys and glassmaking.

TIN

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 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. 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. Cassiterite occurs also in many other places in Canada, but no commercial deposits have 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 the gold-bearing placers in many creeks in the Mayo district contain some crystalline cassiterite. Some evidence has been gathered showing the likelihood of there being from 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 tin across an approximate width of 3 feet.

The tin concentration plant of Consolidated Mining and Smelting Company at Kimberley commenced operation on March 1, 1941, and has been functioning very satisfactorily. The plant for the production of refined tin also at Kimberley was brought into commercial operation in April, 1942. The tin content of the ore is small and the recovery is proportionately small.

Production of tin in 1944 was 516,626 pounds valued at $299,643, compared with 776,937 pounds valued at $450,623 in 1943. Imports of tin in the form of blocks, pigs, tin foil, and collapsible tubes in 1944 were valued at $2,178,118, compared with $1,766,334 in 1943.

The tin produced at Kimberley 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. These requirements were formerly 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 world smelter production of tin in 1939 (data for war years incomplete) was 175,500 long tons.

Because of changing conditions and the wide range in the market value of the metal, no definite statement can be made as to what constituted payable ore. Under wartime conditions, however, provided the deposit is reasonably large, it is worthy of attention even though the grade of the material is lower than would ordinarily be regarded as suitable for commercial development. Most tin ores are too low in grade to be treated directly and accordingly must be concentrated. Concentrates are in most cases purchased on a 60 per cent tin basis and for each unit or fraction above or below 60 per cent the returning charge is reduced or increased. They are subject to penalties if they contain more than one per cent sulphur and 5 per cent iron. Antimony, arsenic, bismuth, copper, lead, and other impurities are not penalized. Consolidated Mining and Smelting Company is prepared to treat tin concentrate at its new smelter at Kimberley to the limit of its relatively small capacity.

The only other tin smelter on the North American Continent is at Texas City, Texas. This Government-sponsored smelter was built by Tin Processing Corporation of New York and had originally a capacity of 50,000 long tons of concentrate or 18,000 long tons of tin a year. Built to treat the portion of Bolivian ores made available to the United States (50,000 long tons of concentrate), it was ready for operation in April, 1942. Subsequent enlargements raised the capacity of the smelter to 90,000 long tons a year. In 1944 it was producing at the rate of 30,000 long tons of metal a year. Following its entry into the war, the United States took over all the supplies of the metal in that country and specific allocation of tin was taken over by the Director of Priorities.

Tin is used chiefly in the manufacture of tin plate, mainly for use in the making of tin cans and of containers of all kinds. It is a necessary ingredient of solder and is a component part of most babbitt and other anti-friction metals, without which manufacturing and transportation would be impossible. Smaller quantities are used in foil, which in turn is used for wrapping food, tobacco, etc.; in terne-plate, pipe and tubing; type metal; bronze; galvanizing; and in bar tin.

The price of tin in New York was fixed in August, 1941, at 52 cents a pound and there has been no change since then. (Bureau of Mines, Ottawa)

Table 191.—Production of New Tin in Canada, 1941-1944

Year	Pounds	$
1941 (*)	64,744	33,667
1942	1,237,803	643,689
1943	776,937	450,623
1944	516,626	299,643

(*) First commercial production.

Table 192.—Consumption of Tin in Canada by Industries, 1940-1944

—	1940	1941	1942	1943	1944
			(short tons)		
Brass and bronze foundries	277	437	217	357	290
White metal foundries	2,087	3,141	1,530	1,106	1,264
Steel foundries (chiefly for tin plate)	1,207	2,349	1,428	1,148	1,517
Iron foundries	84	224	49	88	87
Galvanizing plants	90	50	226	28	28
Jewellery and silverware plants	64	146	15	....	....
Electrical apparatus plants	43	56	6	42	46
Miscellaneous industries	16	36	30	10	10
Total accounted for	**3,868**	**6,436**	**3,501**	**2,779**	**3,242**

Production of secondary tin in Canadian plants in 1944 was estimated at 22,935 pounds compared with 16,560 pounds in 1943.

Table 193.—Imports Into Canada and Exports of Tin and Tin Products, 1943 and 1944

Item	1943		1944	
	Pounds	$	Pounds	$
IMPORTS				
Tin in blocks, pigs or bars	2,631,100	1,504,438	2,682,300	1,767,779
Tinfoil	829,394	106,174	1,625,265	217,978
Collapsible tubes	....	155,722	....	192,361
Tin bichloride and tin crystals	11,054	5,031	10,139	4,807
Oxide of tin and copper	142,986	30,274	168,462	38,954
Phosphor tin and phosphor bronze in blocks, bars, plates, etc.	708,624	321,408	735,419	361,916
Tin plate food containers	....	258,084	....	244,780
Tin plate containers, n.o.p.	....	84,721	....	116,370
Sheets, tin and lead coated	20,230,500	877,446	35,589,700	1,582,839
Manufactures of tin plate painted, etc., manufactures of tin, n.o.p.	....	498,633	....	426,833
Kitchen or dairy holloware of iron or steel coated with tin	....	82,892	....	75,757
Arseniate, biarseniate and stannate of soda	83,329	18,712	86,475	24,488
Tin plate scrap	2,354,000	21,285	....	....
Tin plate, n.o.p.	64,485,400	3,679,160	44,332,300	2,496,682
EXPORTS				
Tinware	....	10,236	....	66,500
Tin plate scrap	26,799,600	135,557	31,914,500	145,824

TITANIUM

All known occurrences of titanium in Canada of possible economic interest are in Quebec and Ontario. Ilmenite or titanic iron ($FeTiO_3$), in commercial quantities and containing 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 (magnetite containing 3 to 15 per cent titanium) deposits 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.

The Canadian output 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 production of titanium ore (ilmenite) in 1944 was 33,973 tons valued at $165,195, compared with 69,437 tons valued at $308,290 in 1943. Imports of titanium, which are in form of the oxide, are not recorded separately.

The world production of titanium ore is estimated at about 300,000 tons of ilmenite and 9,000 tons of rutile. India is the principal producer of ilmenite, the other important producers being Norway, Malaya, Portugal, Australia, United States, and Canada. The principal producers of rutile are Brazil, New South Wales (Australia), and the United States.

The United States became virtually self-sufficient in supplies of ilmenite with the completion of the plan to exploit the Adirondack titaniferous iron ores. This deposit, known as the MacIntyre Development, is at Newcomb, Essex county, in northeastern New York State. Development of the property was started in 1941 by the Titanium Division of the National Lead Company, and the property was put into production in August, 1942. The program of operations called for a daily mine output of 5,500 long tons of ore analysing 16 per cent TiO_2, from which were to be produced 800 long tons of ilmenite concentrate containing about 48 per cent TiO_2. Titanium ore is also produced in the United States in Arkansas, Carolina, Florida, and Virginia. The ilmenite concentrates shipped run from 42 to 54 per cent TiO_2, and rutile concentrates from 92 to 95 per cent TiO_2.

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. In aluminium and sundry non-ferrous alloys, titanium refines the grain and otherwise contributes to better structure. A variety of carbontitanium alloys are now available. Titanium-treated rails are said to be superior to those treated with silicon. In other industries titanium compounds have many different uses. Rutile is used chiefly in welding-rod coatings, in steel manufacture, and in the ceramic industry.

The situation with respect to titanium dioxide pigments has remained unchanged during 1944. All of Canada's requirements were imported from the United States and the expanding demand continued to be met.

The New York quotation for ilmenite remained at $28 to $30 per gross ton of 60 per cent TiO_2 f.o.b. Atlantic seaboard. The price for rutile 94 per cent TiO_2 remained at 8 to 10 cents per pound of concentrate. The price of ferro-carbontitanium f.o.b. plant remained at $142.50 a ton, and metallic titanium at $5 to $5.50 a pound throughout 1944. (Bureau of Mines, Ottawa)

Table 194.—Production of Titanium Ore in Canada(*), 1927-1944

Year	Short ton	$	Year	Short ton	$
1927	2,029	8,980	1936	2,566	18,318
1928	2,244	6,732	1937	4,220	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	1944	33,973	165,195

(*) All from Quebec.

Table 195.—Consumption of Titanium Pigments in Canadian Paint Industry, 1937-1944

Year	Reduced Titanium Pigments (*)		Titanium White	
	Pounds	Cost at works	Pounds	Cost at works
		$		$
1937	3,748,341	362,869	1,299,857	193,107
1938	3,903,337	378,548	1,341,359	200,552
1939	5,088,234	494,914	1,855,288	275,103
1940	6,138,760	616,360	2,297,248	344,945
1941	8,971,805	1,004,591	3,076,490	560,621
1942	11,202,473	1,399,884	4,168,097	820,990
1943	13,994,999	1,580,995	4,436,382	811,086
1944	13,176,631	1,061,614	4,600,654	933,199

(*) Containing titanium oxide.

Table 196.—Consumption of Ferrotitanium in Manufacture of Steel in Canada, 1939-1944

Year	Tons	$
1939	118	23,498
1940	118	24,233
1941	181	52,128
1942	439	66,555
1943	614	118,416
1944	786	149,527

TUNGSTEN

The supply of tungsten, which was critically short during 1943, is now in excess of the demand. Consequently, the output of Canadian concentrates ceased at the end of 1943, but stocks at the mines were shipped during 1944. In the first quarter of 1945 consumption increased for a special war use, but by the end of April orders were cancelled, and at the present rate of consumption Canada has nearly two years' supply of tungsten. Resumption of mining operations thus appears unlikely, but if an urgent demand again arises, Canada's requirements can be adequately supplied from the Emerald property in southern British Columbia.

Wolframite, (Fe, Mn)WO_4, is the principal ore of tungsten; the next in importance being scheelite ($CaWO_4$), 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.

Intensive prospecting in 1941 and 1942 by means of the ultra-violet lamp revealed several hundred occurrences of scheelite distributed in every province except Alberta, the majority as well as the largest deposits being in British Columbia. All, except three or four, of the deposits are small and in many of them the scheelite is associated with gold ores and was recovered as a by-product of gold mining operations.

In Nova Scotia, the production came from the Indian Path mine near Lunenburg on the south coast, and from the Moose River property 35 miles northeast of Halifax.

The production from Quebec was hand-picked ore from a number of gold mining operations.

In Ontario, over 90 per cent of the output came from Hollinger Consolidated Gold Mines, Timmins, and most of the remainder came from Little Long Lac and Kerr Addison gold mines. Fairly massive scheelite occurs in the Hollinger mine in zones or bodies in quartz close to the porphyry, from the surface down to the 5,150-foot level.

In British Columbia, which was the leading producer of scheelite, the chief source of output was Consolidated Mining and Smelting Company's Red Rose mine, south of Hazelton. The remainder of the production came from the Emerald deposit, 6 miles southeast of Salmo in southern British Columbia, and from several producers in the Bridge River area. The Emerald ore is rather finely disseminated, usually in impure limestone with garnetite, and occurs in several contact metamorphic zones, mainly between granite and argillite.

In the Yukon, the output came from placer operations, and in the Northwest Territories it came mainly from Outpost Island in Great Slave Lake.

As noted, there was no production in 1944. Shipments consisted of concentrates on hand at mines and mills and comprised, in the main, the 1943 output from the Emerald property. The shipments amounted to 443·4 tons of high-grade and low-grade concentrates which contained 142·5 tons of WO_3 (114 tons of tungsten) valued at $245,780. They included 310 tons of low-grade concentrate (48 tons of WO_3) that was shipped to the United States for treatment.

Shipments in 1943 reached a record of 754 tons of concentrate (327 tons of tungsten) valued at $1,083,538, and from the start of the war to the end of 1944 they amounted to 1,510 tons of concentrate containing 742 tons of WO_3 (594 tons of tungsten) valued at $1,786,525. Most of this was 70 to 75 per cent WO_3 concentrate which was shipped to Atlas Steels, Limited, Welland, Ontario. The remainder consisted of low-grade (10 to 15 per cent WO_3) concentrate and was shipped to the United States for further treatment. All concentrates in stock at January 1, 1944, have now been shipped with the exception of about 33 tons of very low-grade material at the Val d'Or plant. Stocks at Welland and in storage at Niagara Falls at end of 1944 amounted to 515 tons of contained tungsten.

Consumption was about 232 tons of tungsten contained in scheelite and ferrotungsten, compared with 390 tons in 1943. No tungsten ore was imported in 1944.

In Nova Scotia, production of tungsten ore was discontinued late in 1942.

In Quebec, the output was shipped to the Val d'Or plant of the Quebec Department of Mines for treatment until November, 1943, when this service was discontinued.

In Ontario, the scheelite mill at the Hollinger mine entered production early in 1942 and was closed in September, 1943, during which period it produced about 275 tons of high-grade concentrate, which contained about 195 tons of WO_3. The ore averaged 0·37 per cent WO_3.

In British Columbia, production at the Red Rose property was started in January, 1942, and was discontinued in October, 1943, during which period 600 tons of high- (73·8 per cent) and low- (14 per cent) grade concentrates (344 tons of WO_3) were shipped, the average grade of the ore treated being 1·64 per cent WO_3.

The Emerald deposit was discovered early in 1942 and production from the 300-ton mill was started in July, 1943. The property, which was operated by a Crown company, was closed in October, 1943, as a result of the marked improvement in the tungsten situation. During the short period of operations high- (72 per cent) and low- (15 per cent) grade concentrates containing 137 tons of WO_3 were produced, the average grade of ore treated being 1·7 per cent WO_3. Estimates of reserves are 250,000 tons of 1·25 per cent WO_3 ore, apart from the ore in numerous minor bodies. The output from properties in the Bridge River area amounted to about 12 tons of WO_3.

The total output from the Yukon and the Northwest Territories amounted to about 21 tons of contained WO_3.

From 1939 to May, 1944, when shipments ceased, the Bureau of Mines, Ottawa, received about 210 tons of ore from about 60 producers across the Dominion for treatment. From this ore about 63 tons of concentrate which contained 40 tons of WO_3 was recovered and shipped. A small quantity of concentrates were on hand in 1945.

Canada has no plants for the manufacture of ferrotungsten 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 (not less than 70 per cent WO_3) concentrate is added directly to the steel bath. This is possible because of the comparative ease with which the calcium forms a slag.

World production of tungsten ore and concentrate in 1939, on a basis of 60 per cent WO_3, was about 40,000 metric tons, and the principal producers were China, Burma, United States, Bolivia, Malaya, Spain, Portugal, Korea, Japanese-controlled areas in south China, Australia, Argentina, Brazil, and South Africa. 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. The ore mainly occurs as wolframite. Most of the mines in Kiangsi Province, where the largest deposits occur, are still under Chinese control. In Burma, the Mawchi tin-tungsten mine, 170 miles northeast of Rangoon, was the principal producer. Bolivia is the principal producer in South America. In Europe the most extensive tungsten deposits occur in Trasos-Montes in north-eastern Portugal.

In the United States, output in 1944 is estimated at 10,500 tons of 60 per cent WO_3, compared with the record of 12,045 tons in 1943. Most of the output came from Idaho, California, and Nevada. Approximately half the United States 1944 production came from the Bradley Mining Company's operations at Yellow Pine, near Stibnite, Idaho. The tungsten plant at Salt Lake City, operated by the U.S. Vanadium Corporation for the Metal Reserve Company, closed down in April, 1944. Most of the Canadian low-grade concentrate was shipped in the past to this plant for chemical treatment. Most of the ore mined in the United States is scheelite which occurs mainly in contact metamorphic deposits of tactite or skarn (garnet-epidote-diopside-calcite-quartz-complex) and is somewhat similar to the deposits in southern British Columbia.

As an alloying metal in steel, tungsten (usually as ferrotungsten, but sometimes as calcium tungstate or scheelite concentrate) is used essentially to impart hardness and toughness, which are maintained even when the steel is heated to a high temperature. Almost 80 per cent of the consumption of tungsten in the United States is used for the production of high-speed steels for cutting tools, in which the tungsten content is 15 to 20 per cent. Alloy steels containing tungsten are being used extensively in making armour plate, armour-piercing projectiles, and other military equipment. The use of tungsten in hard facing compounds is growing. Minor amounts of tungsten are used in steels for dies, valves, and valve seats for internal combustion engines, and for permanent magnets. Stellite, the best known non-ferrous alloy, contains 10 to 15 per cent tungsten with higher percentages of chromium and cobalt, and accounts for about 2 per cent of the tungsten consumed. Tungsten carbide is widely used as an extra hard cutting tool and for projectiles. Pure tungsten is used in lamp filaments (about 1·5 per cent of the total tungsten consumption), in radio tubes, contact points, etc.

Until production ceased late in 1943, all sales of Canadian concentrate were made through the Metals Controller, Ottawa, at a price of $26.50 a short unit (20 pounds) of WO_3 for concentrate containing 70 per cent WO_3 (within specifications), delivered at Welland, Ontario. Since then the price has fluctuated downward and is unstable. (Bureau of Mines, Ottawa)

Table 197.—Production (Commercial Shipments) of Crude Tungsten Concentrates in Canada, 1912-1944

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
1944		886,745	245,780	31·9

(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 198.—Tungsten Consumed in Specified Industries, 1938-1944

Year	Tungsten wire used in manufacture of Canadian electrical apparatus and supplies	Ferro-tungsten consumed in Canada in the manufacture of steel (*)		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	82,696	482	1,003,314	29,729
1942	129,265	577	1,440,141	36,882
1943	93,862	491	1,721,967	23,000
1944	109,947	86	287,116	20,005

(*) Other than tungsten-chromium.

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 seems. 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 compared with 67 tons at $176,596 in 1944.

Vanadium ore was quoted September, 1945: 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.

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 September, 1945 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 199.—Principal Statistics(*) of the Miscellaneous Metal Mining Industry in Canada, 1943 and 1944

—		1943	1944
Number of firms		54	27
Number of plants		59	27
Capital employed (a)	$	15,603,307	(b)
Number of employees—On salary		277	237
On wages		1,687	1,148
Total		**1,964**	**1,385**
Salaries and wages—Salaries	$	600,684	485,401
Wages	$	3,694,469	2,323,612
Total		**4,295,153**	**2,809,013**
Value of production (gross)	$	9,062,368	5,360,093
Cost of fuel and electricity	$	1,059,552	951,929
Process supplies used	$	1,215,049	657,430
Smelter charges	$	2,759	58,937
Freight	$	263,513	389,554
Value of production (net)	$	6,521,495	3,286,886

(*) Does not include data relating to smelters and refineries or to mining in the Northwest Territories.
(a) Exclusive of ore reserves.
(b) Data not recorded in 1944.

Table 200.—Employees, Salaries and Wages in the Miscellaneous Metal Mining Industries in Canada, 1944

—	Number of employees		Salaries and wages
	Male	Female	$
Salaried employees— **Total**	**198**	**39**	**485,401**
Wage-earners—			
Surface	700	42	2,323,612
Underground	266		
Mill	128	12	
Total	**1,094**	**54**	**2,323,612**
Grand Total	**1,292**	**93**	**2,809,013**

Table 201.—Average Number of Wage-Earners Employed, by Months, 1942-1944

Month	1942 Total	1943 Total	1944				
			Surface		Under-ground	Mill	
			Male	Female		Male	Female
January	783	1,645	763	66	454	167	1
February	826	1,583	829	60	428	173	1
March	858	1,616	768	57	416	167	3
April	906	1,527	766	48	362	174	12
May	911	1,610	794	41	256	144	15
June	1,024	1,773	757	34	231	126	18
July	1,152	1,849	731	33	210	126	18
August	1,282	1,900	643	33	179	101	20
September	1,344	1,728	612	34	164	92	16
October	1,463	1,668	593	30	163	86	18
November	1,602	1,694	575	26	168	91	17
December	1,678	1,504	525	27	173	80	1

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, 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 1944 totalled $123,303,038 compared with $111,857,020 in 1943. Refined products included gold, silver, nickel, copper, lead, zinc, aluminum, tin, magnesium, antimony, bismuth, cobalt, cadmium, selenium, tellurium, and sulphur; other end products of individual plants or companies were copper-nickel matte, cobalt salts, cobalt oxide, nickel oxide, nickel salts, bauxite concentrates, arsenious oxide, sulphuric acid, platinum metals residues, zinc oxide, zinc dust, thallium residues and blister and anode copper. Statistics relating to the production of pitchblende products at Port Hope, Ontario, and general data pertaining to the recovery of mercury at Pinchi Lake, British Columbia, are not included in this report.

The value added by processing in non-ferrous metallurgical plants during 1944 represents a 10·4 per cent increase over the corresponding value realized in 1943. This increase is not the result of a general expansion in plant output but reflects chiefly the recovery of certain metal from relatively large quantities of crude material semi-processed and stock piled in 1943; the cost of this semi-processed material being included in the cost of material treated in 1943. This applied particularly to the aluminum industry. As thus qualified, the total costs of both foreign and domestic ores and concentrates and matte, scrap metal, etc., etc., treated in Canadian non-ferrous metallurgical plants during 1944 was estimated at $281,266,002 compared with $317,917,186 in 1943. It should be noted, in a study of these data, that firms 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 Dominion as a whole is, however, not affected by these arbitrary (internal) evaluations.

Fuels and purchased electricity consumed by the industry in 1944 totalled $36,907,623 compared with $43,105,101 in 1943. The value of chemicals and other process supplies consumed during the year under review amounted to $32,730,138 as against $38,334,069 in the preceding year.

Employees during 1944 totalled 23,927 compared with 26,749 in 1943. Salaries and wages paid in 1944 amounted to $44,536,991 as against $48,491,732 in the preceding year. The 20,556 wage-earners in 1944 included 19,550 males and 1,006 females compared with 22,577 and 797, respectively, in the preceding year.

Table 202.—Principal Statistics of the Non-Ferrous Metallurgical Industry in Canada, 1942-1944

		1942	1943 (b)	1944 (b)
Number of companies		10	9	9
Number of plants		15	16	16
Capital employed	$	356,052,965	392,217,159	(c)
Number of salaried employees		2,625	3,375	3,371
Salaries	$	5,286,755	7,160,290	7,816,181
Number of wage-earners		18,537	23,374	20,556
Wages	$	32,053,801	41,331,442	36,720,810
Value of plant products (gross) (a)	$	447,617,199	511,213,376	474,206,801
Estimated cost of ores, concentrates, etc., treated	$	258,903,818	317,917,186	281,266,002
Cost of fuel and purchased electricity	$	35,748,639	43,105,101	36,907,623
Process supplies, (other than ores, fuel, etc.)	$	27,083,695	38,334,069	32,730,138
Value added by smelting (net) (d)	$	125,881,047	11,857,020	123,303,038

(a) 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.
(b) Data in this report for 1943 and 1944 do not include those relating to Eldorado Mining and Refining Ltd.
(c) Data not collected in 1944.
(d) See preceding text.

Table 203.—Number of Wage-Earners, by Months, 1940-1944

Month	1940	1941	1942		1943		1944	
			Male	Female	Male	Female	Male	Female
January	11,225	12,927	15,778	31	22,322	522	22,193	954
February	11,297	13,052	16,298	32	23,120	560	21,737	943
March	11,298	13,102	16,434	34	23,089	653	21,013	919
April	11,403	13,617	16,617	39	22,788	727	20,488	922
May	11,691	14,275	17,223	53	22,552	773	19,574	988
June	11,794	14,503	18,207	68	22,968	843	19,452	1,023
July	12,102	14,634	18,900	75	22,785	886	19,389	1,089
August	12,256	14,788	19,346	81	22,538	917	18,928	1,093
September	12,251	14,815	19,091	206	22,186	943	18,088	1,069
October	12,316	14,995	20,076	424	21,856	938	18,175	1,052
November	12,481	15,055	20,953	570	22,337	904	18,319	1,024
December	12,771	15,371	21,239	605	22,393	903	16,794	989
Average	**11,908**	**14,264**	**18,352**	**185**	**22,577**	**797**	**19,550**	**1,006**

NOTE.—No female wage-earners were reported prior to 1942.

Table 204.—Capacities of Canadian Copper Smelting and Refining Works, 1944 (*)

Company	Blast Furnaces		Reverberatories		Converters
	Number	Annual capacity—tons of ore and concentrates	Number	Annual capacity—tons of ore and concentrates	Number
Falconbridge Nickel Mines, Ltd.	2	480,000			3
Hudson Bay Mining & Smelting Co. Ltd.			1	675,000	3
Noranda Mines, Ltd.			2	1,300,000	5
International Nickel Co. of Canada, Ltd.—					
Copper Cliff	2	430,000	9	3,500,000	20
Coniston	4	950,000			5
Electrolytic Copper Refineries—		Annual Capacity—Short tons			
		1944			
Canadian Copper Refiners, Ltd.		112,000			
International Nickel Co. of Canada, Ltd.		168,000			

(*) American Bureau of Metal Statistics.

Table 205.—Lead Smelting Capacity of Canada, 1944

Company	Number of blast furnaces	Annual capacity tons of charge
Consolidated Mining & Smelting Company of Canada, Limited, Trail, B.C.	5	700,000

Table 206.—Capacity of Electrolytic Zinc Plants in Canada, 1944

Company	Estimated annual capacity for cathode zinc
	short tons
Consolidated Mining & Smelting Company of Canada, Ltd.	180,000
Hudson Bay Mining & Smelting Co., Ltd.	57,500

Aluminum Company of Canada Ltd.—The ore treatment plant of the company, located at Arvida, Quebec, was in continuous operation throughout 1944. This plant produces concentrates from which metallic aluminum is recovered. The crude bauxite ore employed in the production of these concentrates is imported. During the year under review the company produced primary aluminum ingot at each of its five reduction plants located at Arvida, Shawinigan Falls, La Tuque, Isle Maligne and Beauharnois, all situated in the province of Quebec. Production of primary ingot in 1944 totalled 924,130,162 pounds compared with the all-time high record of 991,499,296 pounds in 1943. The company reported that during the five war years ending December 31, 1944, only 6 per cent of Canadian production was consumed in Canada, while the United Kingdom was the largest buyer, having purchased approximately 55 per cent of production. The United States was second with approximately 32 per cent of the total. Russia took 4·3 per cent, and Australia 1·2 per cent; other United Nations absorbed the remaining 1·5 per cent.

Noranda Mines Ltd.—During 1944 the smelter treated 1,048,438 tons of ore, concentrate and slag, including 339,820 tons of custom ores and concentrates, and produced 117,171,962 pounds of anodes. After deducting the copper, gold and silver which were recovered from slags received from various shippers, the estimated production of new metals was 113,086,814 pounds of fine copper, 246,990 ounces of gold, and 1,373,482 ounces of silver. The estimated recovery from Horne mine ore and concentrate was 56,580,845 pounds of copper, 196,402 ounces of gold, and 508,126 ounces of silver.

During the year under review, the concentrator treated 1,055,473 tons of ore from the Horne mine, from which 203,833 tons of copper-gold concentrate were produced and sent to the smelter. The cyanide mill treated 217,267 tons of pyrite from the flotation circuit tailing, from which 16,586 ounces of gold were recovered; 187,485 tons of pyrite were recovered from the cyanide mill tailing and sold to chemical plants. For the first two years of the war the company was able to maintain a normal working force, but early in 1942 began to lose workmen at a faster rate than they could be replaced. The working force continued to decline and by June, 1944, the average number of mine employees working had dropped to 525, which necessitated a further reduction of about 10 per cent in ore production. In November and December there were small increases in the average number of employees working and the company hopes that the trend has been reversed and that there will be a gradual return of mine workers in 1945.

The contract between the company and the British Ministry of Supply, under which all the company's copper production over and above Canadian requirements was sold to His Majesty's Government since the commencement of the war in September, 1939, was terminated on January 1, 1945.

Canadian Copper Refiners Ltd.—The refinery of the company located at Montreal East, Quebec, was operated throughout 1944. Production during the year amounted to 103,000 tons of copper; 396,000 ounces of gold; 3,380.000 ounces of silver and 235,000 pounds of selenium. A new copper sulphate plant was being constructed early in 1945.

International Nickel Company of Canada Ltd.—The annual report of the company for 1944 states:

"Throughout the year 1944 our chief objective continued to be the production of sufficient strategic metals to meet the full war demands of the United Nations. This was attained notwithstanding that the output of nickel was lower than in 1943 due to continued labour shortage and to the use of inexperienced labour. These unfavourable factors also had the effect of increasing the production costs. With sufficient man-power, our plants are equipped for record production. The total number of employees at the year end was 21,881 comparable with 22,205 at December 31, 1943.

"Sales of nickel in all forms, derived from our own mine production, amounted to 250,212,561 pounds, a decrease of 15,176,762 pounds from 1943; our sales together with the volume refined for others, totalled 285,238,333 pounds. Sales of copper in all forms, derived from our own mine production, amounted to 269,006,131 pounds, comparable with 265,487,525 in 1943; our sales, together with the volume refined for others, totalled 314,684,817 pounds. Sales of gold and silver were 61,838 ounces and 1,784,633 ounces respectively and of selenium and tellurium 85,519 pounds and 7,087 pounds respectively.

"On September 19, 1944 an armistice agreement was entered into between Russia and Finland terminating hostilities. By the terms of the armistice the Petsamo district was ceded by Finland to the Soviet Government and the ownership of the nickel mines and installations passed to that government. The Government of Canada has informed us that a protocol to the armistice agreement was signed in Moscow on October 8, 1944, by the Canadian and United Kingdom ambassadors and a representative of the Soviet Government whereby the Soviet Government has undertaken to pay $20,000,000 (U.S. currency) to the Canadian Government as full and final compensation to the company and its subsidiary, The Mond Nickel Company Limited. . . ."

Falconbridge Nickel Mines Ltd.—The company reported as follows:

"During the year, ore dressing plant, mill and smelter have operated practically without interruption and with no particular changes or additions in equipment or changes in mode of operations. The metal losses have been the lowest since the start of the company. The regularity of operations has been somewhat hampered by difficult labour conditions and consequent occasional shortage of ore. For that reason, the production has not quite fulfilled expectations although larger than in any previous year. The Kristiansand plant in Norway is intact according to fairly recent information."

The company treated 830,254 tons of ore and produced 22,904·5 tons of matte containing 12,048·5 tons of nickel and 6,382·6 tons of copper. Metals recovered per ton treated were 29·02 pounds of nickel and 15·38 pounds of copper. Metallurgical losses per ton treated were 2·90 pounds of nickel and 2·49 pounds of copper. The indicated grade of ore hoisted was 1·59 per cent nickel and 0·89 per cent copper; the sampled grade of ore hoisted was 1·57 per cent nickel and 0·88 per cent copper. Matte produced by the company was refined by the International Nickel Company of Canada Ltd.

Deloro Smelting and Refining Co. Ltd.—The company's plant located at Deloro, Ontario, was in continuous operation throughout 1944. A relatively small tonnage of Ontario silver-cobalt ores was treated during the year under review. A considerable quantity of silver was recovered from these ores. Refined arsenic was produced from silver-cobalt ores and from crude arsenic received from a Quebec gold mine. The greater part of the company's output in 1944 represented cobalt oxide, cobalt metal, cobalt alloys and cobalt salts produced from foreign material treated in the Deloro plant. A small tonnage of silver-cobalt ores was shipped for export from the United States Government stock pile located at Deloro, Ontario.

Dominion Magnesium Ltd.—Magnesium metal in the form of ingots, alloys, etc., was produced by the company throughout 1944 at Haley, Ontario. The metal was recovered from crude dolomite rock quarried locally and the ferrosilicon process was employed. Operations at the plant were conducted by the company for the Dominion Government without fee or profit as a war effort and were under the direct supervision of the Department of Munitions and Supply.

Hudson Bay Mining & Smelting Co. Limited.—The annual report of the company stated:

"Operation of the copper smelter continued to be satisfactory and all available material was smelted. The tonnage of pay charge treated was somewhat less than in 1943 and amounted to 468,496 tons. Gold and silver production was lower than it has been for several years, but copper production was higher than in any year except 1943. The company smelted 408,554 tons of its own ores and concentrates and 59,034 tons of custom concentrates. After allowing for metals due on account of custom concentrates, the company shipped for its own account 145,441 ounces of gold, 2,017,443 ounces of silver, 86,481,746 pounds of copper and 136,299 pounds of selenium. In addition to smelting the usual custom concentrates from Sherritt Gordon Mines Limited the company treated copper concentrates shipped from Emergency Metals Limited during the latter half of the year.

"The tonnage of zinc concentrates treated during the year was the highest on record amounting to 161,314 tons from which 102,458,756 pounds of slab zinc were produced; there were produced 68,071 tons of zinc plant residue, which were added to stockpile, where there are now 531,000 tons in storage.

"In 1939 your company concluded contracts with the British Ministry of Supply covering substantially the exportable surplus of both its copper and zinc production. Effective January 31, 1945, the British Government terminated the copper contract, the zinc contract still remaining in effect. Previous to the war, the greater part of our copper and zinc production was sold in the British market, but to what extent this market will absorb our production in the post-war period is an open question. For the present, the United States Government is purchasing the exportable surplus of our copper production. Labour shortage restricted mine development and exploration work.

"The cadmium plant treated precipitates from the zinc purification plant and produced a total of 140,560 pounds of metallic cadmium, having an average purity of 99·9834 per cent.

"The average number of employees at Flin Flon during 1944 was 2,074 as compared with 2,217 in 1943; a total of 1,169 employees have joined the armed services since the start of the war. . . ."

The Consolidated Mining and Smelting Company of Canada Limited.—The company reported:

"The year 1944 was marked by labour shortages and labour unrest throughout the operations. This situation, together with increased and overdue development work and larger-scale backfilling operations, caused a substantial reduction in metal output. . . . Some improvement in costs and tonnages and particularly in regard to labour was evident towards the end of the year, and this improvement should continue through the early months of 1945. . . . Refined lead tonnage was 143,556 compared with 224,493 in 1943, and bar zinc production was 117,365 tons compared with 152,299 in 1943. The silver output was about 60 per cent of that in 1943. The antimony plant was shut down in September largely as a labour economy measure. Chemical and fertilizer operations broke all previous tonnage records. Sulphuric acid output in terms of 100 per cent acid was 331,718 tons against 269,394 in 1943, and the total fertilizer tonnage for the year was 327,232 compared with 272,503 in 1943. The lower tonnage of lead and zinc concentrates from Sullivan mine tended to reduce sulphuric acid production and it was necessary to ship and roast a large tonnage of Sullivan iron tailings to supply some of the acid required for fertilizer.

"Employees on the military rolls at the year end totalled 2,359; the number of employees, exclusive of those on military rolls, at the end of 1944 totalled 6,437.

"The company bears the full cost of employees' pensions, which are administered by the Pension Fund Society. At Trail, Local 380 of the International Union of Mine, Mill and Smelterworkers (C.I.O.) was certified as the bargaining representatives for the days pay workers on the 2nd June 1944, and negotiations were commenced, resulting in an agreement being signed in January 1945."

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

Production of coal in Canada in 1944 totalled 17,026,499 tons valued at $70,433,169, a decrease of 4·6 per cent from the 1943 production of 17,859,057 tons. Of the total production for the year, Alberta contributed 7,428,708 tons; Nova Scotia 5,745,671 tons; British Columbia 2,134,231 tons; Saskatchewan 1,372,766 tons, and New Brunswick 345,123 tons.

Exports of Canadian coal during 1944 amounted to 1,010,240 tons compared with 1,110,101 tons in 1943.

Imports of coal into Canada in 1944 totalled 28,926,925 tons, a slight increase over the 28,852,654 tons imported in the previous year. The coal imported during the year included 24,513,527 tons of bituminous coal and 4,194,716 tons of anthracite coal from the United States, and 218,511 tons of anthracite coal from Great Britain.

The average number of employees at coal mines in Canada during 1944 was 25,234 compared with 24,866 in 1943. Salaries and wages paid during the year totalled $55,020,537 compared with $47,291,919 in 1943. The 1944 wages include retroactive payments of the dollar a day wage increase which apply to the months of November and December 1943, but which were paid in 1944.

Coal made available for consumption in 1944 amounted to 44,943,184 tons, a decrease of 1·4 per cent from the tonnage made available in the previous year. These figures do not represent the quantity consumed during the year but are the actual tonnages of new coal made available for use, and are calculated by subtracting the exports from the production and adding the imports.

In addition to coal consumption, Canada's fuel requirements include coke, natural and artificial gas, fuel oil, wood and electricity, all of which are used for both industrial and domestic purposes.

Table 207.—Employees, Salaries and Wages in the Coal Mines of Canada, by Provinces, 1944

Province	Average number of employees					Salaries and wages		
	Salaried employees		Daily wage-earners		Total	Salaries	Wages	Total
	Male	Female	Surface	Underground				
						$	$	$
Nova Scotia	472	157	1,911	10,188	**12,728**	1,447,796	*28,226,186	**29,673,982**
New Brunswick	45	10	251	619	**925**	120,677	1,328,885	**1,449,562**
Manitoba	...	...	...	...	...	...	...	...
Saskatchewan	46	8	263	338	**655**	101,824	897,011	**998,835**
Alberta	646	62	2,088	5,577	**8,373**	1,716,624	15,517,427	**17,234,051**
British Columbia	234	31	743	1,907	**2,915**	707,684	4,956,423	**5,664,107**
Canada	**1,443**	**268**	**5,256**	**18,629**	**25,596**	**4,094,605**	**50,925,932**	**55,020,537**

* Includes retroactive payments of the dollar a day wage increase applying to the months of November and December 1943, but which were paid in 1944.

NOTE:—Table 208 was compiled from *monthly* returns of operators and show the average employment at coal mines. Salaried employees shown in Table 207 are compiled from *annual* returns and include 362 persons who are not employed in or about the mines and are not reported on the monthly returns.

Table 208.—Employment and Days' Work Done, by Months, at Coal Mines in Canada, 1944, with Comparative Totals for 1943

Month	Number of employees			Days' work done		
	Surface	Underground	Total	Surface	Underground	Total
January	6,636	21,071	**27,707**	154,351	454,929	**609,280**
February	6,380	20,677	**27,057**	143,535	428,215	**571,750**
March	6,094	20,120	**26,214**	149,251	452,437	**601,688**
April	5,845	19,098	**24,943**	129,780	385,674	**515,454**
May	5,839	18,514	**24,353**	138,456	394,628	**533,084**
June	5,838	18,207	**24,045**	136,894	392,832	**529,726**
July	5,891	17,727	**23,618**	131,353	360,124	**491,477**
August	6,026	17,674	**23,700**	144,385	402,916	**547,301**
September	5,961	18,461	**24,422**	139,545	398,885	**538,430**
October	6,013	18,757	**24.770**	141,452	416,909	**558,361**
November	6,210	19,779	**25,989**	147,144	438,847	**585,991**
December	6,271	19,684	**25,955**	140,351	401,132	**541,483**
Total for 1944	...	...	...	**1,696,497**	**4,927,528**	**6,624,025**
Total for 1943	...	...	...	**1,711,767**	**4,967,789**	**6,679,556**

Table 209.—Output of Coal in Canada, by Grades, 1918-1944

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	....	16,946,764	82,496,538
1921	96,964	330,690	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	10,263,409	16,478,131	59,875,091
1927	....	....	13,006,996	49,385,818	596,155	1,784,973	3,823,710	10,696,672	17,426,861	61,867,463
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	537,508	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	1,314,196	3,695,315	7,776,593	15,835,954	48,752,048
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
1944	....	....	11,776,439	54,906,592	729,427	2,537,002	4,520,633	12,989,575	17,026,499	70,433,169

* Not separately reported prior to 1923.

Table 210.—Output and Value of Coal in Canada, by Kinds and Provinces, 1943 and 1944

(Short tons)

Province	1943			1944		
	Number of mines	Quantity	Value	Number of mines	Quantity	Value
			$			$
NOVA SCOTIA (Bituminous)	40	6,103,085	27,121,861	37	5,745,671	30,728,535
NEW BRUNSWICK (Bituminous)	39	372,873	1,641,069	32	345,123	1,845,277
MANITOBA (Lignite)	1	999	2,964	....	....	....
SASKATCHEWAN (Lignite)	(*) 80	1,665,972	2,432,249	(*) 66	1,372,766	2,034,914
ALBERTA—						
Bituminous	14	3,469,893	10,942,203	14	3,551,414	13,323,274
Sub-bituminous	12	792,252	2,399,289	12	729,427	2,537,002
Lignite	159	3,414,581	10,689,194	158	3,147,867	10,954,661
Total	† 185	7,676,726	24,030,686	† 184	7,428,708	26,814,937
BRITISH COLUMBIA (Bituminous)	30	2,039,402	7,648,720	31	2,134,231	9,009,506
YUKON (Bituminous)	....	....	....	....	....	....
Canada—						
Bituminous	**123**	**11,985,253**	**47,353,853**	**114**	**11,776,439**	**54,906,592**
Sub-bituminous	**12**	**792,252**	**2,399,289**	**12**	**729,427**	**2,537,002**
Lignite	**240**	**5,081,552**	**13,124,407**	**224**	**4,520,633**	**12,989,575**
Total	**375**	**17,859,057**	**62,877,549**	**350**	**17,026,499**	**70,433,169**

(*) Exclusive of 19 small mines in operation during part of 1943 and 25 small mines operating during part of 1944.
†Exclusive of 19 small mines operated under special permits in 1943 and 19 small mines in 1944.

THE NATURAL GAS INDUSTRY

Production of natural gas in Canada during 1944 totalled 45,067,158 thousand cubic feet valued at $11,422,541, compared with 44,276,216 thousand cubic feet worth $13,159,418 in 1943. Of the 1944 output, 37,161,570 thousand cubic feet valued at $6,339,817 originated in the province of Alberta, 7,082,508 thousand cubic feet valued at $4,694,097 in Ontario and the balance in New Brunswick, Saskatchewan and Northwest Territories.

During the year under review, there were 211 firms reporting natural gas production from a total of 3,621 active wells. Employees numbered 1,810 and $2,885,654 were distributed in salaries and wages. The cost of fuel and electricity used totalled $188,003 and process supplies consumed amounted to $13,149.

The following information was abstracted from a report on Natural Gas in 1944 as prepared by the Bureau of Mines, Ottawa:

"Natural gas occurs in most provinces. It is produced commercially in abundance in Alberta and Ontario, and in smaller quantities in New Brunswick, Saskatchewan and Quebec.

"Natural gas occurs in sedimentary rocks, either in limestones, usually dolomitic and cavernous, or in sands and sandstones. The principal Canadian sources are in rocks of Palaeozoic age, the chief sources of supply being the Turner Valley field in Alberta, fields in Kent and Haldimand counties in Ontario, and the Stoney Creek field in New Brunswick. Natural gas is also produced in Alberta and Saskatchewan in considerable quantity from Cretaceous sandstones. The foregoing productive areas have been generally defined for some time. No outstanding new finds contributed to the production in 1944, but at the close of the year what appears to be an important discovery was made at Jumping Pound, 20 miles west of Calgary, in Alberta.

"In New Brunswick, the Stony Creek field continued to supply Moncton and Hillsborough and certain localities in Albert and Westmorland counties with natural gas. Three new wells were drilled, two were deepened, and four were abandoned. Total new production measured in terms of initial production amounted to 1,636 M cubic feet. The geophysical survey of 1943 was continued into 1944.

"In Quebec, natural gas is produced in small quantities at several shallow wells along the St. Lawrence River and is used locally.

"In Ontario, drilling was principally active in Haldimand county, where new wells were brought into production in Walpole, Oneida, and South Cayuga townships, and in Norfolk county, notably in Townsend township. These wells were mostly in proven territory. New ground was developed in Zone township, Kent county, where a number of producing wells were completed just north of the old Bothwell oilfield. Very little drilling in unproved areas occurred elsewhere and no results were recorded.

"In Saskatchewan, the eastern part of the Lloydminster field supplied the town of Lloydminster from 5 wells. In the Kamsack area 7 wells were drilled, 2 of which got production. Kamsack Gas and Oil Company replaced its 2-inch line with a 5-inch line, which was connected to 11 shallow wells. Three other small wells supplied the needs of farmers. Other wells were being drilled in both these areas. Geological and geophysical work was again being done and drilling was done in many localities.

"In Alberta, the Turner Valley field furnished fuel for the operations in the field itself; to the cities and districts of Calgary and Lethbridge; and raw material to the nitrogen plant in Calgary. For several years the drilling of gas wells in this field has been unnecessary, as the gas is largely derived from the production of petroleum in which the gas plays a vital role. The gas/oil ratio of many of these oil wells, particularly in the southern part of the field, where effective measures of conservation were applied too late in their life, has risen so much that in some cases they have had to be reclassified as gas wells, thus augmenting the reserve of gas.

Production of Alberta, by Fields (*)

—	1943	1944
	M cu. ft.	M cu. ft.
TURNER VALLEY—		
Shallow wells	45,789	42,840
Limestone gas wells	16,344,113	11,396,668
Limestone oil wells	27,850,290	29,947,394
Less gas repressured by British American Oil		9,374
	44,240,192	41,377,528
Foremost	298,782	38,228
Viking	1,742,686	1,858,585
Kinsella	4,582,218	5,172,263
Medicine Hat	2,998,155	3,227,006
Redcliff	682,158	822,282
Other fields	564,509	768,389
	55,108,700	53,264,281

(*) Information from Petroleum and Natural Gas Conservation Board.

"These figures are considerably larger than those of the Dominion Bureau of Statistics, which are for consumption only. Production, therefore, still remained much in excess of consumption, although the waste of gas in Turner Valley was further reduced by over 12 per cent. Ever since Royalite No. 4 well demonstrated the existence of a big gas field in Turner Valley the need for preventing this waste has been recognized, but technical and economic difficulties arose. Steady progress has been made in recent years, however. The Provincial Government, during the year, established the Natural Gas Utilities Board to put into effect recommendations made in the report of Thomas R. Weymouth in 1943. At the end of 1943, Madison Natural Gas Company was formed and this company, together with British American Oil Company, has been entrusted by the Board with the execution of the plan, which involves dismantling one of the existing natural gasoline plants and portioning the supply of gas among the remaining plants. It is hoped that when the scheme is fully working, the only gas wasted will be small quantities from oil wells producing intermittently. All gas produced and not required is to be returned underground either to the Turner Valley gas-cap or to the Bow Island field. Three wells are to be used as input wells in the south end of Turner Valley and four in the north. It is estimated that the scheme will add 60 per cent to the life of the field as a gas producer. The experiments in repressuring through Foundation well in the south end were discontinued at the beginning of the year and a start was made on the new scheme in December using the Carleton and Pacalta wells which were repressured 1 and 2 days respectively.

"Two important outlets exist for natural gas from Turner Valley, apart from its use as fuel. The plant of Alberta Nitrogen Company near Calgary, built by the Consolidated Mining and Smelting Company of Canada to make military explosives and using natural gas and electric power, was found to have a capacity in excess of the demand for explosives, and owing to a shortage of commercial fertilizer, this has resulted in its being used in part for the manufacture of fertilizers for home and foreign markets. The other outlet is as a source of iso-butane, which is processed in the alkylation plant together with butylene obtained from Imperial Oil and British American refineries. The iso-butane is recovered in the absorption plants with most of the normal butane, but the proportion of the latter is insufficient to render an isomerization plant economical and it goes into the motor gasoline.

"The gas fields at Viking, 80 miles southeast of Edmonton, and at Kinsella farther east, supply the Edmonton area, the Kinsella field being the principal source of supply. Two wells were completed in the field in 1944 and in December 17 wells were producing at Viking and 14 at Kinsella. In December 39 gas wells were producing in the Medicine Hat field and 13 in the Redcliff field."

Table 211.—Production of Natural Gas in Canada, by Provinces, 1935-1944

Year	New Brunswick		Ontario		Manitoba		Alberta	
	M cu. ft.	Value	M cu. ft.	Value	M cu. ft.	Value	M cu. ft.	Value
		$		$		$		$
1935	615,454	303,886	8,158,825	4,938,084	600	180	16,060,349	4,113,436
1936	606,246	298,819	10,006,743	6,052,294	600	180	17,407,820	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	22,513,660	4,915,821
1940	616,041	300,543	13,053,403	7,745,834	600	180	27,459,808	4,923,469
1941	653,542	317,437	11,828,703	7,140,130	....	....	30,905,440	5,175,364
1942	619,380	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
1944	702,464	341,636	7,082,508	4,694,097	....	....	37,161,570	6,339,817

Year	Saskatchewan		Northwest Territories		Canada	
	M cu. ft.	Value	M cu. ft.	Value	**M cu. ft.**	**Value**
		$		$		$
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	**33,444,791**	**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	106,168	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**
1944	119,116	46,656	1,500	335	**45,067,158**	**11,422,541**

Table 212.—Production (a) of Natural Gas in Canada, by Months, 1944

—	New Brunswick	Ontario	Saskatchewan	Alberta	**Canada**
	M cu. ft.	M cu. ft.	M cu. ft.	M cu. ft.	**M cu. ft.**
January	86,621	897,194	15,247	4,156,349	**5,155,411**
February	75,862	831,216	17,281	4,127,723	**5,052,082**
March	74,538	744,622	16,038	4,146,315	**4,981,513**
April	73,618	771,342	7,402	3,190,820	**4,043,182**
May	60,286	462,018	5,226	2,577,088	**3,104,618**
June	47,094	413,406	4,742	2,212,626	**2,677,868**
July	35,988	322,641	3,027	2,062,633	(b) **2,424,789**
August	27,819	318,023	4,149	2,043,271	(b) **2,393,762**
September	33,909	382,054	5,381	2,212,868	(b) **2,634,712**
October	48,580	469,557	7,576	2,527,982	**3,053,695**
November	68,554	656,026	14,973	3,658,539	**4,398,092**
December	69,595	814,409	18,074	4,245,356	**5,147,434**
Total	**702,464**	**7,082,508**	**119,116**	**37,161,570**	**45,067,158**

(a) Includes production from Fort Norman, Northwest Territories.

(b) Sales and consumption by producers.

Table 213.—Natural Gas Production in Ontario, by Fields, 1943 and 1944

County	Field	1943	1944
		M cu. ft.	M cu. ft.
Essex	Kingsville	28,732	52,949
Kent	Tilbury, Romney and Raleigh	2,445,565	2,108,473
	Declute	475,567	362,310
	Dover	220,133	181,211
	Chatham	313,231	336,852
	Zone	.....	277,920
Lambton	Dawn Oil Springs	1,102,072	685,845
Middlesex	Mosa	.....	.....
Oxford	South Norwich	3,730	1,065
	Brownsville (*)	51,718	37,391
Elgin	Bayham		
Elgin	Bayham	7,082	22,374
	Malahide	87,091	39,652
Norfolk	Norfolk	240,399	242,806
Lincoln Haldimand Wentworth	Lincoln Haldimand Wentworth	2,470,967	2,267,075
Welland	Welland	296,016	311,417
Brant	Onondaga, Brantford and Tuscarora	98,105	81,168
Prince Edward	Hallowell	.....	.....
Wells in surface drift	Harwich and Howard Tps.	14,000	14,000
Private wells		60,000	60,000
Total Produced		**7,914,408**	**7,082,508**

(*) Dereham Tp. 27,108 M cu. ft.; Bayham Tp. 10,283 M cu. ft.—1944
Dereham Tp. 36,710 M cu. ft.; Bayham Tp. 15,008 M cu. ft.—1943

Table 214.—Sales Only of Manufactured and Natural Gas in Canada, 1943 and 1944

—	1943			1944		
	Number of Customers	Quantity sold	Revenue from sales	Number of customers	Quantity sold	Revenue from sales
		M cu. ft.	$		M cu. ft.	$
MANUFACTURED GAS—						
Domestic	473,992	10,711,654	12,297,425	488,653	12,098,351	13,334,020
House heating	5,289	1,267,416	695,936	5,864	1,333,339	731,868
Industrial	3,138	5,543,653	3,091,942	3,236	5,786,717	3,435,914
Commercial	26,789	3,492,052	3,106,550	29,056	3,671,522	3,253,155
Miscellaneous	115	69,471	65,929	116	47,350	46,562
Total	**509,323**	**21,084,246**	**19,257,782**	**526,925**	**22,937,279**	**20,801,519**
NATURAL GAS—						
Domestic	182,650	14,480,386	7,048,029	186,269	14,565,801	7,081,369
Industrial	1,130	7,589,289	1,970,650	1,122	6,144,211	1,851,07[illegible]
Commercial	10,684	7,035,941	1,892,627	10,932	7,410,938	1,888,9[illegible]
Miscellaneous	509	564,635	41,297	506	1,062,106	47,8[illegible]
Total	**194,973**	**29,670,251**	**10,952,603**	**198,829**	**29,183,056**	**10,869,28[illegible]**
Total—All Gas	**704,296**	**50,754,497**	**30,210,385**	**725,754**	**52,120,335**	**31,670,804**

NOTE.—Sales figures represent sales by distributing companies to consumers. Amounts used by producers are not encluded.

Table 215.—Number of Gas Wells in Canada, by Provinces, 1942-1944

—		New Brunswick	Ontario	Manitoba	Saskat-chewan	Alberta	Canada
Productive wells at beginning of year	1942	40	3,277	.....	3	104	**3,424**
	1943	42	3,344	.....	3	108	**3,497**
	1944	43	3,346	.....	3	116	**3,508**
Number of productive wells drilled	1942	2	148	.....	.....	4	**154**
	1943	5	149	.....	.....	10	**164**
	1944	1	194	.....	.....	4	**199**
Number of dry wells drilled	1942	.....	144	.....	.....	.....	**144**
	1943	.....	105	.....	.....	.....	**105**
	1944	.....	116	.....	.....	.....	**116**
Number of wells abandoned	1942	.....	74	.....	.....	.....	**74**
	1943	4	117	.....	.....	2	**123**
	1944	4	193	.....	.....	1	**198**
Productive wells at end of year	1942	42	3,344	.....	3	108	**3,497**
	1943	43	3,346	.....	3	116	**3,508**
	1944	40	3,397	.....	3	119	**3,559**

Table 216.—Natural Gas Wells in Ontario by Townships, 1943 and 1944

Township	1943				1944			
	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
Aldborough							1	
Anderson								
Bayham	53	9			37	11		
Bertie	150		1	8	158	1	1	8
Beverly								1
Binbrook	40				40	10		
Brant				7	7			
Brantford	2				2			
Brooke							1	
Caistor	71	3	1	8	76	4		7
Camden Gore				1			3	1
Canboro	147	5		1	144	7		1
Cayuga North	191	12	5	21	195	12	7	17
Cayuga South	55		6	14	68	1	12	21
Charlotteville	13		3	2	15		1	
Chatham	20		1	1	21		3	4
Colchester								
Crowland	26				26	1		1
Culross								
Dawn	30	2	2	3	30	4	1	1
Delaware			1					
Delhi Village	3				3			
Dereham	18		1		6	6		
Dorchester North								
Dover	21	1			17	1		
Dunn	50	7	2		43	1		5
Dunwich								
Enniskillen	3				2	1		
Gainsboro	15	3			12	1		
Glanford	10				10	2		
Gosfield South	24				24			
Hallowell				1	1	15		
Harwich							1	
Hobson							1	
Houghton	2				4			
Humberstone	82	5			77	2	1	3
Kincardine								
Malahide	65	19	5		50	31	4	
Malden						1	2	
Marysburg						1		
Mersea	3				3			
Middleton	48	5			46	12	3	1
Mosa		1				1	1	
Moulton	97			8	105	6	2	4
Nassageya			1					
Norwich South	1		1		1			1
Nottawasaga			1			1	1	
Oneida	90	7	13	32	114	3	17	12
Onondaga	32	3			24	7		
Orford								
Oxford North								
Oxford West								
Port Dover Village	3				3			
Port Rowan	4				4			
Rainham	322	3	1	1	318	13	6	10
Raleigh	58		1		57	5	1	
Romney	141		1	1	139	3		
Sarnia								
Seneca	157	2			152	10	3	
Sherbrooke	18		1		14	3	1	2
Sombra			2					
Southwold								
Tilbury East	124		2	2	125	6		
Townsend	11		14	10	21		14	18
Tuscarora	73	6	3	3	70	1	4	
Wainfleet	32	1	5	2	34	4	1	9
Walpole	495	23	13	17	493	4	7	36
Walsingham North			2		8			
Walsingham South	23				14			
Westminster			3				2	
Willoughby	53				53	1		
Windham	21		2		21		2	1
Woodhouse	78		6	2	87		5	5
Yarmouth								
Zone			5	4	3		7	14
Private wells	300				300			11
Surface wells	69				69			
Total	**3,344**	**117**	**105**	**149**	**3,316**	**193**	**116**	**194**

Table 217.—Natural Gas Pipeline Mileage in Canada, 1943 and 1944

Province	Actual Miles of Mains				Miles of Equivalent 3" Mains			
	Gathering and transmission		Distribution		Gathering and transmission		Distribution	
	1943	1944	1943	1944	1943	1944	1943	1944
New Brunswick	20	20	65	65	36	36	73	73
Ontario	2,316	2,325	2,530	2,382	3,886	3,901	2,745	2,578
Saskatchewan	....	....	6	6	....	....	4	4
Alberta	697	692	628	626	2,261	2,250	1,178	1,184
Canada	**3,033**	**3,037**	**3,229**	**3,079**	**6,183**	**6,187**	**4,000**	**3,839**

Table 218.—Principal Statistics of the Natural Gas Industry in Canada, 1944

—		New Brunswick and Saskatchewan	Ontario	Alberta	Canada
Number of firms		3	186	22	211
Number of wells		44	3,458	119	3,621
Number of employees—On salary		24	666	298	988
On wages		56	568	198	822
Total		80	1,234	496	1,810
Salaries and wages—Salaries	$	42,978	1,082,262	619,273	1,744,513
Wages	$	87,174	728,709	325,258	1,141,141
Total	$	130,152	1,810,971	944,531	2,885,654
Selling value of products (gross)	$	407,376	4,694,097	4,670,884	9,772,357
Cost of fuel and electricity	$	13,988	133,987	40,028	188,003
Process supplies used	$	1,200	10,949	1,000	13,149
Selling value of products (net)	$	392,188	4,549,161	4,629,856	9,571,205

NOTE.—The small estimated production of natural gas in Northwest Territories represents the quantity used by one producer—no general statistics relating to its use are available.

Table 219.—Employees, Salaries and Wages in the Natural Gas Industry in Canada, by Provinces, 1943 and 1944

Province	Average number of employees				Salaries and wages		
	Salaried employees		Wage-earners	Total	Salaries	Wages	Total
	Male	Female					
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**
1944							
New Brunswick	9	10	56	**75**	37,311	87,174	**124,485**
Ontario	516	150	568	**1,234**	1,082,262	728,709	**1,810,971**
Saskatchewan	4	1	....	**5**	5,667	....	**5,667**
Alberta	237	61	198	**496**	619,273	325,258	**944,531**
Canada	**766**	**222**	**822**	**1,810**	**1,744,513**	**1,141,141**	**2,885,654**

Table 220.—Wage-Earners, by Months, 1943 and 1944 (On the last work-day of each month)

Month	1943			1944		
	Male	Female	Total	Male	Female	Total
January	678	14	**692**	685	12	**697**
February	678	10	**688**	681	14	**695**
March	675	15	**690**	678	12	**690**
April	687	15	**702**	709	13	**722**
May	784	14	**798**	761	13	**774**
June	862	16	**878**	830	16	**846**
July	945	19	**964**	945	13	**958**
August	932	18	**950**	958	13	**971**
September	898	20	**918**	927	14	**941**
October	824	21	**845**	896	12	**908**
November	776	19	**795**	819	10	**829**
December	708	16	**724**	724	11	**735**
Average	**883**	**16**	**899**	**808**	**14**	**822**

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 1944 totalled 10,099,404 barrels valued at $15,429,900 compared with 10,052,302 barrels worth $16,470,417 in 1943. Of the 1944 output, 8,727,366 barrels originated in Alberta; 1,223,675 barrels in Northwest Territories; 125,067 barrels in Ontario and 23,296 barrels in New Brunswick. The net value of producers' sales of crude petroleum in Canada during 1944 was estimated at $14,575,563.

The industry in 1944 provided employment for 2,547 persons and distributed $5,814,676 in salaries and wages; fuel and electricity used during the year totalled $1,000,484 and the cost of process supplies consumed amounted to $242,311. Firms active in 1944 numbered 224 and wells under operation totalled 2,264. The footage drilled, under contract, for petroleum in 1944 amounted to 330,411 feet, of which 12,410 feet were completed by cable drilling, 2,000 feet by diamond drilling, and 316,001 feet by rotary drills. Included in the total footage drilled by contractors were 312,424 feet in Alberta; 10,305 in Saskatchewan; 4,289 in Ontario, and 3,393 in Nova Scotia. In addition to the drilling completed by contractors, there was a considerable footage drilled by oil companies with their own personnel and equipment.

The following is an excerpt from a review on Petroleum in 1944 as prepared by the Bureau of Mines, Ottawa:

"Crude petroleum is produced in Canada from wells in Alberta, the Northwest Territories, Ontario and New Brunswick. The total production in 1944 was in excess of 10,000,000 barrels, 89 per cent of which came from Alberta. The Turner Valley field in that province contributed 82·5 per cent of the total Canadian output as compared with 95 per cent in 1943. This percentage decrease can be traced partly to more than a twofold increase from other fields in Alberta, and partly to a marked increase in production in the Norman field, Northwest Territories. By far the greater part of Canada's requirements of crude petroleum is imported.

"In 1944 there was a record amount of exploration and drilling in Alberta and Saskatchewan in search of new sources of petroleum. No discoveries of oil were made in Saskatchewan, but in Alberta several new producers were added to the list.

"The Rundle (Madison) limestone of Palaeozoic age is the source of almost the entire production of petroleum in the Turner Valley field. Until June, 1936, production in the field came almost entirely from the wells in the gas cap and was termed "naphtha", an unstable natural gasoline. Since then, however, development has been diverted toward the western deep-lying belt of the limestone, the existence of which had already been indicated by marginal wells. Production comes from the same porous horizons that yield the naphtha in the gas cap, and the gravity of the oil increases progressively down the dip slope from 45° A.P.I. to 38° A.P.I., beyond which lies edge water. (By way of explanation it should be noted that the specific gravity of a heavy crude oil is about 10° A.P.I.; thus, as the specific gravity decreases, the degrees A.P.I. increase. The letters A.P.I. following the degrees mean that the specific gravity is measured in terms of the American Petroleum Institute scale).

"In 1944 drilling in Turner Valley was largely in the central part of the field, which had formerly attracted little attention owing to its supposed indifferent yield. There was a steady development of the northern section of the field. In the central region drilling was encouraged by financial aid from Wartime Oils, Limited, a Crown company, formed in 1943, which lends money to the operators on the basis of a small royalty and low interest, to be repaid out of production. Twenty producing wells were completed under this scheme in 1944, three of which were better than average producers. Twenty-one other wells were also completed in Turner Valley, two of which are near the southern end and fourteen are north of Sheep River. Neither the northern nor the southern limit of the field has been fully defined as yet by drilling.

"Activities in the northern end of Turner Valley were stimulated through the finding of oil in wells on the east side at depths below the known water level on the west side. All wells flow naturally, and, with one exception that turned out to be a water flow, those that have ceased to be oil wells have passed into the category of gas wells.

"The pipe-line charge for pumping oil from Turner Valley to the Imperial Oil Refinery at Calgary was reduced on May 1, 1944, from 9½ cents a barrel to 7½ cents, thus bringing the price of 41° A.P.I. crude up to $1.68 a barrel, in tanks at the well. The differential of 2 cents per degree A.P.I. above and below 41° A.P.I. remained unchanged.

"South of Conrad on the Canadian Pacific Railway an oil of 25·4° A.P.I. gravity was discovered in the Ellis sand at 3,050 feet. This area is 7 miles west of the old Skiff field, where heavier oil was struck in 1927. The old Red Coulee field 7 miles west of Coutts on the International boundary, which produced 329,000 barrels in the past 15 years, was abandoned in 1944.

"Extensive test drilling, usually following geological and geophysical surveys, was continued on the southern plains of Alberta. Results of special interest were obtained at a well in the Princess field, 120 miles east of Calgary. First developed in 1939, this well yielded a total of 30,000 barrels of 27° A.P.I. oil in 1941 and 1942 from just above the Palaeozoic rocks. Production proved difficult, however, owing to high pressure gas and to water. The well was 'spudded in' the latter part of July, 1944, and rich lubricating oil was encountered at 3,983 feet in the Jefferson lime of Middle Devonian. It was completed in September and produced over 12,000 barrels by the end of the year. It is the first discovery of Devonian oil in commercial quantity in the plains of Alberta.

"A number of test wells were being drilled along the Foothills from near the International boundary to Folding Mountain near Jasper. Near Lundbreck a hole had reached a depth of 9,857 feet, probably a world's record for cable tools. A hole in the Wildcat Hills west of Calgary was abandoned at 11,155 feet, after striking water in the Rundle limestone; another at Coalspur had reached 10,355 feet and was still being deepened. A third well started at Ram River after No. 2 had obtained a small production from the Devonian limestone had reached a depth of over 5,000 feet.

"The most notable event in the Foothills, however, was the striking, in December, at Jumping Pound, 20 miles west of Calgary, of wet gas comparable to that of the Turner Valley field. This well, a sequel to that drilled to 12,056 feet towards the close of 1943, which struck salt water in the Rundle and was abandoned, reached the limestone at 9,618 feet and a porous zone from 9,636 to 9,860 feet. This zone is believed to correspond to the lower porous zone of Turner Valley. The flow of gas was large and the liquid product ranged from a crude resembling that found in Turner Valley to water-white naphtha. Full testing was not possible before the close of the year.

"The total footage drilled in Alberta was 597,828 compared with 487,923 in 1943.

"A photographic aerial reconnaissance of the Foothills, begun late in July as a joint project of a number of large interests, was intended to cover 9,000 square miles from the International boundary, omitting areas already covered by the Geological Survey of Canada. Many geological and several geophysical parties were also active in Alberta during 1944.

"Prospecting for oil in Saskatchewan continued to be active and the structural and deep test drilling proceeded in association with widespread geological and geophysical surveys. The deep tests at Wilcox, Radville, and Buffalo failed to find gas or oil in commercial quantity, and two other holes were started, one near Elbow, and the other at Swift Current. Three wells, that were drilled south of Unity, had shows of oil, and two of them were completed as gas wells. Several holes were being drilled near Lloydminster, and drilling was done at Yorkton, Torch River, Kisby, Simpson, Maple Creek, and Dysart.

"Although the drilling of wells under the Canol project in the Northwest Territories was discontinued, exploratory drilling was maintained by Imperial Oil, Limited. At the end of 1944 there were 58 wells in the Norman field producing or capable of producing oil, 54 of which were drilled as part of the Canol project. The size of the field as determined by the drilling is 5,000 acres, and recoverable reserves are estimated to range from 30 million to 60 million barrels. The productive formation, a reef limestone, is reached at depths of 1,050 to 1,150 feet in the shallower wells on the right bank of the Mackenzie River, and at 1,706 feet in one of the wells on Bear Island.

"In Ontario, most of the production was again obtained from the Petrolia, Oil Springs, Bothwell, and Mosa fields, with lesser amounts from West Dover, Warwick, Dunwick, Thamesville, and several other townships. Drilling in Kent county was extended into Lake Erie.

"On Gaspé Peninsula, Quebec, no further drilling was done in No. 1 well of Continental Petroleums, Limited. In its No. 2 well, 4½ miles to the west, drilling had reached a depth of over 2,000 feet.

"In Prince Edward Island the deep test well that was started from a pier in Hillsborough Bay in 1943 had reached a depth of 11,868 feet.

"In New Brunswick the geophysical work in the Stoney Creek area was continued. A large acreage was being held in the province for prospecting.

"In Nova Scotia two wells in the Mabou area, Cape Breton, were abandoned; and a well at Kennetcook in the Windsor area had reached a depth of 3,000 feet.

"Production in the Turner Valley field in Alberta came from a total of 257 oil wells and from 49 gas wells. Most of the output is crude oil obtained from the oil wells, and there is a small output of naphtha from gas wells. Considerable natural gasoline is recovered from the gas treated in absorption plants.

"Outside Turner Valley, 11 fields in Alberta were producing or were capable of producing in 1944, the largest of these being the Vermilion field 120 miles east of Edmonton.

"Production in the Vermilion field, Alberta, in 1944 was 150 per cent greater than in 1943. This increase can be traced partly to the completion of the new plant, which, by an electrical method, removes the water and salt from the oil. The treated oil is used as a fuel in the locomotives of the Canadian National Railway. Nineteen wells were brought into production in the field in 1944. Farther east, at Lloydminster, on the border of Saskatchewan, a plant was built to treat a somewhat similar crude.

"In the Taber field in the southern part of Alberta, the productive area was further outlined and 3 or 4 miles to the west another pool appears to have been discovered. The oil has a gravity of 19° A.P.I. and is virtually free from water. Its flash point is too low for direct use as fuel and it is shipped partly by tank car to Calgary, and partly by truck to local refineries. From July to the end of 1944 more than 24,000 barrels were produced from two wells at Conrad, 20 miles south of the Taber field, and the oil was shipped to Regina.

"Delivery of crude from the Norman field in the Northwest Territories to the refinery at Whitehorse, Yukon, was started on April 16 and on April 30 the refinery went into operation. Its throughput capacity is 3,500 barrels of crude a day, and its products were 100 octane gasoline, motor gasoline, fuel gasoline, Diesel X fuel oil, and road oil. The refinery, like the pipe-line and the Canol wells, was an undertaking of purely military character. The throughput capacity and the products of the refinery at Norman remained the same as in 1943. The price of ethyl gasoline at Norman was reduced to 35 cents a gallon, and that of aviation gasoline to 68 cents.

"Canada in 1944 imported 57,041,285 barrels of crude petroleum for refining, compared with imports of 49,700,143 barrels in 1943. This represented much the greater part of the total value of imports of petroleum and its products in the two years, the total for 1944 being $100,997,763 as compared with $94,843,848 in 1943. In 1943 the United States supplied 81 per cent of the imports of crude oil; Venezuela, 10·8 per cent; and Colombia, 8·2 per cent. In 1944, however, the United States supplied only 60·4 per cent; whereas Venezuela supplied 21·2 per cent, and Colombia, 17·2. The remainder came from Ecuador and the Dutch West Indies.

"Exports of petroleum and its products from Canada in 1944 were valued at $12,117,533, as compared with $8,652,465 in 1943 and with $848,558 in 1939."

THE CANOL PROJECT, 1945

(Lands, Parks and Forests Branch, Department of Mines & Resources, Ottawa)

Production of crude petroleum in the Northwest Territories showed a sharp decline following suspension of activities associated with the Canol Project. On March 8, 1945, the United States Government ordered its agent, Imperial Oil, Limited, to discontinue all drilling and production on Canol account. The pumping of crude oil through the Canol pipeline from Norman Wells to Whitehorse, Y.T., and operation of the refinery at Whitehorse were discontinued about April 1, 1945. The Canol Project agreement was officially terminated on May 3, 1945.

A considerable quantity of crude petroleum and refined products in storage at Norman Wells, the property of the United States Government, was still on hand when the Canol Project ended. These refined products and crude stock were turned back to Imperial Oil, Limited. As a result, there was no necessity to operate the Norman Wells refinery until the late summer of 1945. The production of crude oil was also limited to a quantity sufficient to supply gas for the domestic requirements of the Norman Wells camp.

A total of 63 wells was drilled in the vicinity of Norman Wells under the Canol Project. Of these 60 were commercial producers. These wells were in addition to four pre-Canol wells developed by Imperial Oil, Limited, prior to 1942. In addition, four wildcat wells were drilled for Canol Project some distance from the proven field in an attempt to discover new pools, but were abandoned as dry holes.

Total oil production for the period in which the Canol Project operated—May, 1942 to March 8, 1945—was 1,858,447 barrels. Prior to 1942 a total of 118,895 barrels had been produced. Production for the period March 9, 1945 to August 31, 1945 was 33,947 barrels. The latest estimate of the recoverable reserve of the Norman oilfield, made in 1945, is 36,250,000 barrels.

Table 221.—Production of Crude Petroleum in Canada, by Provinces, 1935-1944

Year	New Brunswick		Ontario		Alberta		Northwest Territories		Canada	
	Barrels	Value $	Barrels	Value $	Barrels	Value $	Barrels	Value $	**Barrels**	**Value $**
1935	12,954	18,230	165,041	346,156	1,263,510	3,102,227	5,115	25,575	**1,446,620**	**3,192,188**
1936	17,112	24,075	165,495	350,767	1,312,368	3,019,930	5,399	26,995	**1,500,374**	**3,421,767**
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	187,644	397,078	8,362,203	10,694,394	18,633	37,265	**(*)8,590,978**	**11,160,213**
1941	31,359	44,102	160,238	337,760	9,918,577	13,985,905	23,664	47,328	**10,133,838**	**14,115,096**
1942	28,089	39,467	143,845	306,242	10,117,073	15,514,665	75,789	108,477	**10,361,796**	**15,968,851**
1943	24,530	34,342	132,492	311,356	9,601,530	15,724,518	293,750	400,201	**10,052,302**	**16,170,417**
1944	23,296	32,832	125,067	296,420	8,727,366	14,468,061	1,223,675	632,587	**10,099,401**	**15,429,900**

(*) Includes 331 barrels at $256 in Saskatchewan.

Table 222.—Production of Crude Petroleum in Canada, by Months, 1944

(Barrel = 35 Imperial Gallons)

Month	(*) New Brunswick	Ontario	Alberta (*)	(*) Northwest Territories	Canada 1944	Canada 1943
	Barrels	Barrels	Barrels	Barrels	**Barrels**	**Barrels**
January	1,836	10,394	759,676	59,606	**831,512**	**856,361**
February	1,689	11,712	703,067	71,789	**788,257**	**775,985**
March	2,009	10,209	752,690	106,538	**871,446**	**856,649**
April	1,844	9,453	712,382	114,331	**838,010**	**832,765**
May	2,078	12,250	733,713	104,294	**852,335**	**868,321**
June	1,925	10,980	695,158	110,615	**818,678**	**821,869**
July	1,881	11,192	725,198	68,071	**806,342**	**843,127**
August	1,854	9,831	744,964	70,954	**827,603**	**853,531**
September	1,815	11,148	713,353	125,947	**852,263**	**823,054**
October	2,266	10,556	730,851	134,409	**878,082**	**855,009**
November	2,194	9,612	715,272	128,674	**855,752**	**829,559**
December	1,905	7,730	741,042	128,447	**879,124**	**836,072**
Total	**23,296**	**125,067**	**8,727,366**	**1,223,675**	**10,099,401**	**10,052,302**

(*) These figures include total output each month.

Table 223.—Production of Crude Petroleum in Canada, 1943 and 1944

—	1943		1944	
	Barrels	Total value $	Barrels	Total value $
NEW BRUNSWICK	24,530	34,342	23,296	32,832
ONTARIO—				
Petrolia and Enniskillen	45,308	105,300	41,433	96,853
Oil Springs	27,270	66,811	28,537	70,774
Moore Township	332	772	133	311
Sarnia Township	305	709	268	626
Plympton Township	26	60	27	63
Bothwell Township and Thamesville	25,908	60,212	24,966	58,360
West Dover, Romney, Raleigh, and Tilbury East	9,177	21,328	7,642	17,864
Onondaga	11	26	7	16
Mosa Township	16,327	37,945	15,585	36,421
Dunwich	1,422	3,305	1,728	4,0[illegible]
Dawn and Euphemia	439	1,020	257	[illegible]
Warwick, Metcalfe, and Adelaide Townships	5,967	13,868	4,484	10,4[illegible]
Total Ontario	132,492	311,356	125,067	296,42[illegible]
SASKATCHEWAN	.....	.....	.....	.....
ALBERTA—				
Turner Valley	9,452,697	15,124,315	8,326,314	13,322,102
Red Coulee	8,928	9,107	3,835	4,755
Wainwright-Ribstone (heavy crude) } Taber-Moose Dome }	139,905	591,096	397,217	1,141,204
Total Alberta	9,601,530	15,724,518	8,727,366	14,468,061
NORTHWEST TERRITORIES	293,750	400,201	1,223,675	632,587
Canada	**10,052,302**	**16,170,417**	**10,099,401**	**15,429,900**

Table 224.—Petroleum Wells in Canada, by Provinces, 1942-1944

—		New Brunswick	Ontario	Alberta	Northwest Territories	Canada
Productive wells at beginning of year	1942	20	1,956	274	3	**2,253**
	1943	21	1,852	305	20	**2,198**
	1944	22	1,728	365	26	**2,141**
Number of productive wells drilled	1942	1	13	45	17	**76**
	1943	1	1	66	9	**77**
	1944	1	6	81	32	**120**
Number of wells abandoned	1942	....	54	14	....	**68**
	1943	....	144	6	3	**153**
	1944	....	47	19	1	**67**
Number of dry wells drilled	1942	....	13	21	....	**34**
	1943	....	17	19	1	**37**
	1944	....	18	41	....	**59**
Number of productive wells in operation at end of year	1942	21	1,852	305	20	**2,198**
	1943	22	1,728	365	26	**2,141**
	1944	23	1,690	426	57	**2,196**

Table 225.—Imports Into Canada of Petroleum, Asphalt and Their Products, 1943 and 1944

Item		1943		1944	
		Quantity	Value	Quantity	Value
			$		$
Asphaltum or asphalt, solid or not	cwt.	149,657	291,186	121,064	318,308
Oil, imported by miners or mining companies, for the concentration of ores or metals	gal.	68,473	46,759	83,192	54,249
Crude petroleum for refining, 0·8155 specific gravity (42·0 A.P.I.) or heavier at 60° Fah.	M gal.	1,739,505	66,305,137	1,996,445	71,934,216
Crude petroleum for refining, lighter than 0·8155 specific gravity (42·0 A.P.I.) at 60° Fah.	gal.	....	....	2,295	97
Crude petroleum, n.o.p.	gal.	1,877,930	78,649	227,218	9,105
Fuel oil, ex-warehoused, for ships' stores	gal.	27,816,694	906,568	23,215,553	1,030,184
Coal oil and kerosene lighter than 0·8236 specific gravity at 60° Fah. n.o.p.	gal.	10,692,591	673,080	8,890,511	581,669
Engine distillate 0·8017 specific gravity or heavier at 60° Fah.	gal.	596,503	41,939	474,253	33,965
Gasoline, lighter than 0·8236 specific gravity at 60° Fah.	gal.	70,500,782	10,032,231	67,498,115	11,415,619
Natural casinghead, compression or absorption gasoline lighter than 0·6690 specific gravity (80·0 A.P.I.) at 60° Fah. when imported by refiners of crude petroleum for blending with gasoline wholly produced in Canada	gal.	27,004,010	1,906,482	23,902,460	1,771,836
Lubricating oils, composed wholly or in part of petroleum and costing less than 25 cents per gallon	gal.	8,098,301	1,431,157	7,475,273	1,300,413
Lubricating oils n.o.p.	gal.	5,383,999	2,977,951	6,217,714	3,131,929
All other oils n.o.p.	gal.	384,534	462,299	1,713,954	987,065
Imports of petroleum n.o.p., 0·8236 specific gravity (40·3 A.P.I.) or heavier at 60° Fah.	gal.	53,570,321	2,066,407	63,323,016	2,561,065
Petroleum greases and lubricating greases n.o.p.	lb.	10,291,447	687,555	10,516,483	669,316
Refined petroleum jellies and oils for toilet, medicinal, edible or similar purposes		....	498,071	....	460,419
Paraffin wax	lb.	20,743,199	1,309,089	17,564,432	1,142,062
Paraffin wax candles	lb.	116,089	25,441	138,468	34,300
Products of petroleum n.o.p., lighter than 0·8236 specific gravity at 60° Fah.	gal.	1,184,055	157,411	1,300,046	157,944
Liquefied petroleum gases		....	191,228	....	342,648

Table 226.—Exports of Petroleum and Its Products From Canada, 1943 and 1944

Item		1943		1944	
		Quantity	Value	Quantity	Value
			$		$
Petroleum, crude	gal.	....	....	....	....
Oil, coal and kerosene, refined	gal.	1,004,659	115,484	1,036,227	117,666
Gasoline and naphtha	gal.	16,316,270	3,119,194	22,817,385	5,706,320
Fuel oil	gal.	54,687,171	3,681,177	46,794,915	2,927,303
Lubricating oil (from January 1, 1944)	gal.	....	....	697,710	213,706
Oil, mineral, n.o.p. (including lubricating oil prior to 1944)	gal.	2,200,684	429,941	465,790	83,268
Wax, mineral	cwt.	48	575	1,145	8,411

Table 227.—Principal Statistics Relating to Production of Crude Petroleum, 1944 (a)

—		Ontario	Alberta	Northwest Territories	Canada
Number of firms		111	112	1	**224**
Number of active wells (b)		1,690	492	59	(c) **2,264**
Number of employees—On salary		17	616	246	**879**
On wages		142	1,284	242	**1,668**
Total		159	1,900	488	**2,547**
Salaries and wages—Salaries	$	20,279	1,312,073	718,059	**2,050,411**
Wages	$	94,350	2,810,085	859,830	**3,764,265**
Total	$	114,629	4,122,158	1,577,889	**5,814,676**
Selling value of products (gross)	$	296,420	14,889,351	632,587	**15,818,358**
Cost of fuel and electricity	$	30,455	970,029	...	**1,000,484**
Cost of process supplies used	$	6,492	195,819	40,000	**242,311**
Selling value of products (net)	$	259,473	13,723,503	592,587	**14,575,563**

(a) Data for New Brunswick are included in the Natural Gas Industry.

(b) Includes wells still drilling and dry wells completed in year specified.

(c) Includes 23 in New Brunswick.

Table 228.—Employees, Salaries and Wages in the Petroleum Industry in Canada, by Provinces, (*) 1943 and 1944

Province	Average number of employees				Salaries and wages		
	Salaried employees		Wage-earners	Total	Salaries	Wages	Total
	Male	Female					
					$	$	$
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**
1944							
Ontario	14	3	142	159	20,279	94,350	114,629
Alberta	469	147	1,284	1,900	1,312,073	2,810,085	4,122,158
Canada†	**641**	**238**	**1,668**	**2,547**	**2,050,411**	**3,764,265**	**5,814,676**

(*) Data for New Brunswick are included in the Natural Gas Industry.

† Data for Northwest Territories included with Canada.

Table 229.—Wage-Earners, by Months, 1943 and 1944 (Number on Pay-roll on the Last Work Day of Each Month)

Month	1943			1944		
	Male	Female	Total	Male	Female	Total
January	1,442	6	**1,448**	1,680	15	**1,695**
February	1,439	7	**1,446**	1,629	15	**1,644**
March	1,508	8	**1,516**	1,582	15	**1,597**
April	1,519	8	**1,527**	1,587	17	**1,604**
May	1,606	9	**1,615**	1,664	17	**1,681**
June	1,624	8	**1,632**	1,678	17	**1,695**
July	1,845	10	**1,855**	1,737	22	**1,759**
August	1,925	10	**1,935**	1,687	22	**1,709**
September	1,879	13	**1,892**	1,585	21	**1,606**
October	1,943	21	**1,964**	1,503	23	**1,526**
November	1,981	23	**2,004**	1,538	22	**1,560**
December	1,931	24	**1,955**	1,470	21	**1,491**
Average	**1,736**	**12**	**1,748**	**1,646**	**22**	**1,668**

OIL SHALE

(Bureau of Mines, Ottawa)

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.

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.

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.

A large amount of investigational work has been carried out by the Bureau of Mines, Ottawa, including 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.

In 1942, the Mines and Geology Branch, Department of Mines and Resources, Ottawa, drilled some of the oil shale deposits in New Brunswick to determine their possibilities as a source of oil and lubricants under war conditions. A total of 43 holes were drilled in oil shale deposits in the Rosevale area and in the vicinity of Taylor Village, New Brunswick; 36 holes were also drilled in deposits at Albert Mines, New Brunswick. The conclusion was reached after assaying more than 3,300 samples, that the over-all grade of the shales in the areas mentioned is too low to be of economic interest even under present conditions.

Owing to the depletion of petroleum reserves, interest has been renewed in oil shale in the United States. It is announced that the U.S. Bureau of Mines is building an oil shale research and development laboratory at the University of Wyoming at Laramie. A site has also been selected, in Colorado, for an oil shale demonstration plant to cost $1,500,000.

(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-two refineries and 16 blending plants, or a total of 48 works, reported under this category in 1944 and the aggregate value of production was $210,547,416, an increase of 13 per cent over the 1943 total of $187,106,054.

Output figures for 1944 included $209,125,332 for petroleum refineries and $1,422,084 for concerns engaged in blending oils and greases, against corresponding totals in 1943 of $185,830,862 and $1,140,133 respectively. The principal statistics for each of these groups and for the industry as a whole are tabulated below and the detailed figures for each division are recorded separately in the succeeding pages of this report.

Table 230.—Materials Used in Petroleum Products Industry, 1943 and 1944

Material	Unit of measure	1943 Quantity	1943 Cost at works	1944 Quantity	1944 Cost at works
			$		$
Crude oil (under 60° A.P.I.) in its natural state, from Canadian wells	Imp. gal.	322,873,457	17,371,041	287,359,621	16,061,249
Absorption gasoline, etc., from Canadian wells (run to stills)	Imp. gal.	14,197,217	891,721	13,176,450	796,167
Crude oil, in its natural state, imported, (run to stills)—					
(a) From United States	Imp. gal.	1,443,428,128	91,367,996	1,162,235,098	73,210,333
(b) From Other Countries	Imp. gal.	303,062,252	18,203,645	820,436,701	50,612,8[illegible]
Crude oil, not in its natural state (run to stills)	Imp. gal.	491,855	73,487	...	...
Benzol for blending	Imp. gal.	2,674,901	382,248	3,650,151	548,758
Phenol	pound	557,559	82,103	892,069	126,539
Sulphuric acid, 66° Be	pound	40,683,213	462,617	42,768,370	461,306
Sulphur	pound	94,432	2,360	102,090	2,628
Caustic soda	pound	6,218,934	178,163	8,331,182	223,316
Soda ash	pound	398,557	9,377	480,416	11,335
Litharge	pound	305,045	23,582	369,981	30,346
Fullers' earth, bentonite and other clays	pound	25,390,653	601,283	27,993,850	653,741
Compounding materials	...	...	287,571	...	353,699
Tetraethyl fluid	c.c.	1,752,403,904	4,024,703	1,393,917,796	3,311,309
Blending stocks for aviation gasoline	Imp. gal.	7,925,244	2,061,939	14,997,331	4,760,116
Other materials	...	...	800,930	...	896,425
Shipping containers	...	...	667,259	...	609,244
Total	...	...	**137,492,025**	...	**152,687,371**
Lubricating oils and greases	...	...	667,859	...	871,293
Grand Total	...	...	**138,159,884**	...	**153,558,664**

Table 231.—Products Made in Petroleum Products Industry, 1943 and 1944

Product	Unit of measure	1943 Quantity	1943 Gross selling value at works	1944 Quantity	1944 Gross selling value at works
Made for Sale—			$		$
Gasoline(1)—Straight run—Aviation	Imp. gal.	118,866,138	23,250,266	106,179,849	20,824,870
Standard	Imp. gal.	273,228,417	31,567,666	361,781,250	42,181,182
By cracking(2)—Aviation	Imp. gal.	1,641,220	290,331	1,083,600	159,525
Standard	Imp. gal.	475,323,338	54,884,836	501,611,868	59,577,615
Stove oil (40°—42·5° A.P.I.)	Imp. gal.	27,628,033	1,689,781	28,437,386	1,730,572
Gas and light fuel oil (20°-40° A.P.I., except diesel)	Imp. gal.	131,731,939	7,986,051	117,459,777	6,902,795
Diesel fuel oil (all fuel oil sold under this name)	Imp. gal.	113,610,054	6,425,857	91,905,867	5,087,576
Residual fuel oil (10°-20° A.P.I.	Imp. gal.	536,980,450	25,754,878	561,755,157	26,899,271
Tractor and engine distillate	Imp. gal.	39,433,111	3,926,571	42,125,587	4,016,904
V.M. and P. or solvent naphtha	Imp. gal.	24,842,055	2,870,943	27,542,328	3,301,325
Kerosene	Imp. gal.	29,014,580	3,091,665	28,108,877	3,261,941
Lubricating oil	Imp. gal.	39,651,627	8,671,595	46,450,828	10,814,700
Lubricating grease	pound	21,411,920	1,216,548	19,853,223	869,580
Asphalt	Imp. gal.	45,879,562	3,792,572	62,909,214	5,419,257
Petroleum coke	ton	78,166	567,482	71,158	507,106
Other products(3)	...	...	2,606,815	...	9,400,632
Total—Made for Sale	...	...	**178,593,857**	...	**200,954,911**
Made for Own Use—					
Gasoline—Straight run	Imp. gal.	151,221	41,780	267,342	46,682
By cracking process	Imp. gal.	77,903	9,120	17,263	2,667
Stove oil	Imp. gal.	1,017	52	1,075	53
Gas and light fuel oil (20°-40° A.P.I.)	Imp. gal.	47,781	3,111	45,223	2,982
Diesel fuel oil	Imp. gal.	107,178	6,103	116,372	6,476
Residual fuel oil (10°-20° A.P.I.)	Imp. gal.	83,543,453	3,996,747	101,424,680	4,609,437
Tractor and engine distillate	Imp. gal.	...	...	245	19
Kerosene	Imp. gal.	182,622	18,510	68,236	7,707
Lubricating oil	Imp. gal.	92,198	20,182	117,341	26,575
Asphalt	Imp. gal.	27,997	2,137	213,197	17,570
Petroleum coke	ton	7,146	49,355	1,651	10,997
Still gas	M cu. ft.	8,385,106	2,953,760	9,107,488	3,103,500
Other products	...	...	271,207	...	245,756
Total—Made for Own Use	...	...	**7,372,064**	...	**8,170,421**
Greases, lubricating	pound	1,103,187	172,642	1,252,890	187,240
Oils, lubricating	gallon	1,295,122	860,879	1,201,271	1,080,979
Soaps and soap powders	...	...	34,368	...	40,449
All other products	...	...	72,244	...	113,416
Total	...	...	**1,140,133**	...	**1,422,084**
Grand Total	...	...	**187,106,054**	...	**210,547,416**

(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 1944 totalled 419,265 short tons valued at $20,619,516 compared with 467,196 tons worth $24,409,416 in 1943. The mineral in 1944 came, as in recent years, entirely from deposits located in the province of Quebec.

There were nine firms engaged in asbestos mining during 1944; employees numbered 4,050 and salaries and wages paid were reported at $6,401,185. Fuel and electricity consumed were valued at $1,636,031 and $1,166,707 were expended for explosives, drill steel and other process supplies. The value of new equipment and plant purchased during the year under review totalled $294,889 and the industry paid $3,950,331 in taxes in 1944. Total sales of asbestos during 1944 included 1,547 short tons of crude material valued at $621,956; 190,233 tons of fibres worth $14,305,966 and 231,389 tons of shorts at $5,691,594.

Exports of Canadian asbestos in 1944 included 1,541 short tons of crude valued at $649,564; 181,668 tons of milled fibres worth $13,634,772; asbestos waste, refuse and shorts, 212,728 tons at $5,361,358, and asbestos manufactures, $184,189. Imports of various asbestos products were appraised at $1,977,516.

The following information is from a report "Asbestos in 1944" as prepared by the Bureau of Mines, Ottawa:

"Asbestos of commerce consists mostly of the three varieties known as chrysotile, amosite, and crocidolite or blue asbestos, chrysotile being by far the most important and most widely used. Three other varieties, namely fibrous actinolite, fibrous tremolite, and anthophyllite, have only a limited field of usefulness.

"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.

"Small deposits of chrysotile asbestos are known in other parts of Quebec and also in Ontario and British Columbia, and several of them have been worked from time to time. The asbestos from some of these deposits has a very low content of iron and is entirely free from magnesite, and should be suitable for use in making insulation for electrical machinery.

"No amosite or crocidolite has 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 is suitable for use in acid filters and for other purposes where long harsh fibres are required. Small trial shipments for testing for this use were made from a property near Calabogie, Ontario, and from another near Val d'Or, Quebec, in 1944.

"Production has been continuous from the Thetford area since 1878 and reserves of asbestos-bearing rock are huge. 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 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.

"The asbestos-bearing rock is mined in open pits and underground. The block-caving method of underground mining is coming into general use. This method was put into operation at the King mine of Asbestos Corporation in 1934. Johnson's Company is now using the same method, and Bell Asbestos Mines and Canadian Johns-Manville are sinking shafts preparatory to recovering rock by block-caving operations.

"**Uses, Prices and Outlook.**—Asbestos is used for a great variety of purposes, the principal products being: cloth, brake linings, clutch facings, packings, insulation, mill-board, siding, shingles, roofing, tile, and pipes.

"Prices throughout 1944 remained the same as in 1943. F.O.B. Quebec mines, in U.S. funds, tax and bags included, they were as follows: No. 1 crude, $650 to $750 per ton; No. 2 crude, $165 to $385; spinning fibres $124 to $233; magnesia insulation and compressed sheet fibres $124 to $146.50; shingle fibres $62.50 to $85; paper fibres $44 to $49; cement stock $28.50 to $33; floats, $19.50 to $21; shorts $14.50 to $26.50 per ton.

"The post-war outlook for the asbestos industry appears to be good. Throughout the war Canadian producers were able to sell their entire output in spite of the loss of overseas markets, and with the coming of peace these overseas markets will again be open to Canadian fibre. Development of new asbestos products has been rapid in recent years. Of particular significance are the developments in asbestos-cement products which require the short grades of fibre, the marketing of which formerly constituted a problem. In 1944 an asbestos fabric reinforced with glass fibre was developed which has greater strength than the straight asbestos cloth and is being used for covering."

Table 232.—Sales and Shipments (*) of Canadian Asbestos, 1942-1944

—	1942		1943		1944	
	Tons	$	Tons	$	Tons	$
Crudes	2,889	1,233,184	2,016	888,099	1,547	621,956
Fibres	199,829	15,339,128	217,889	16,071,843	190,233	14,305,966
Shorts	236,741	6,090,971	247,291	6,209,563	227,485	5,691,594
Total	**439,459**	**22,663,283**	**467,196**	**23,169,505**	**419,265**	**20,619,516**
Sand, gravel, and stone (waste rock only) (a)	8,090	7,925	6,914	6,745	4,521	3,539

—	1942	1943	1944
Quantity of rock mined ... tons	8,233,516	7,929,471	7,778,805
Quantity of rock milled ... tons	6,795,459	6,828,532	6,587,740
Value of containers ... $	(b)	1,233,166	1,213,321

(*) All from the province of Quebec unless otherwise noted; values include cost of containers.
(a) This production is included under the sand and gravel industry.
(b) Data not available.

Table 233.—Principal Statistics of the Asbestos Industry in Canada, 1942-1944

—		1942	1943	1944
Number of firms		8	9	9
Capital employed	$	18,741,364	20,831,427	(e)
Number of employees—On salaries (c)		329	345	354
On wages		3,420	3,499	3,696
Total		3,749	3,844	4,050
Salaries and wages—Salaries	$	731,836	772,455	805,330
Wages	$	4,567,618	4,804,279	5,595,855
Total	$	5,299,454	5,576,734	6,401,185
Selling value of products (a)	$	22,671,208	24,409,416	21,830,376
Cost of fuel and electricity (purchased)	$	1,646,291	1,625,450	1,635,829
Cost of process supplies (b)	$	2,747,682	1,651,260	1,160,909
Cost of containers	$	(d)	1,233,166	1,213,321
Net value of sales	$	18,277,235	19,899,540	17,820,317

(a) Includes value of sand and gravel.
(b) Explosives, drill steel, etc.
(c) In 1942 includes 60 females, 91 in 1943 and 87 in 1944.
(d) Not reported separately.
(e) Not recorded in 1944.

Table 234.—Sales and Shipments of Asbestos, 1927-1944

Year	Tons	$	Year	Tons	$
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
1935	210,467	7,054,614	1944	419,265	20,619,516

Table 235.—Consumption of Asbestos in Specified Canadian Industries, 1943 and 1944

Industry		1943		1944	
		Quantity	Cost at works	Quantity	Cost at works
			$		$
Boilers, tanks and engines		(*)	28,983	(*)	51,485
Asbestos Products—					
Fibre	ton	11,536	548,706	10,748	499,610
Other forms	ton	....	227,487	494	226,325
Roofing paper	ton	823	18,275	865	23,152
Cotton goods, n.e.s.	pound	10,768	607	4,425	247

(*) Not available.

Table 236.—Imports Into Canada and Exports of Asbestos, 1943 and 1944

—	1943		1944	
	Tons	$	Tons	$
IMPORTS				
Asbestos clutch facings for automobiles, motor vehicles and chassis	xxx	347,844	xxx	350,779
Asbestos brake linings for automobiles, motor vehicles and chassis	xxx	405,220	xxx	523,171
Asbestos brake linings and clutch facings, n.o.p.	xxx	37,439	xxx	39,919
Asbestos in any form other than crude, and all manufactures of, n.o.p.	xxx	1,368,216	xxx	963,387
Asbestos packing	140	146,443	112	100,260
Total	**xxx**	**2,305,162**	**xxx**	**1,977,516**
EXPORTS				
Asbestos (crude)	1,990	859,511	1,541	649,564
Asbestos milled fibres	210,837	15,673,920	181,668	13,634,772
Asbestos waste, refuse and shorts	230,172	5,848,031	212,728	5,301,358
Asbestos manufactures, including asbestos roofing	xxx	139,209	xxx	184,189
Total	**xxx**	**22,520,680**	**xxx**	**19,829,883**

Table 237.—Taxes Paid by Asbestos Mining Industry in Calendar Years 1943 and 1944

—	1943	1944
	$	$
Dominion Income Tax, including tax on non-operating revenue	1,172,891	2,205,452
Dominion Excess Profits Tax	2,719,858	1,108,470
PROVINCIAL TAXES—		
Mining taxes paid on net profits from production, including portion paid to municipality	452,710	453,440
Corporation Income Tax where levied in addition to Mining Tax	....	....
Taxes paid on capital and places of business	30	40
Acreage Taxes	218	348
Total Provincial	**452,958**	**453,828**
MUNICIPAL TAXES—		
Based on property valuation	165,997	182,581
Based on non-operating revenue	....	....
Total Municipal	**165,997**	**182,581**
Grand Total Taxes Paid	**4,511,704**	**3,950,331**

Table 238.—Certain Expenditures Made by the Asbestos Mining Industry, 1942-1944

—	1942	1943	1944
	$	$	$
Workmen's compensation	161,888	292,970	305,290
Unemployment insurance	61,833	63,629	63,917
Aggregate cost of all supplies purchased	3,503,085	3,420,456	3,271,141
Aggregate cost of plant and equipment purchased	440,542	300,738	294,889
Cost of buildings, machinery and equipment erected or installed during the year	(*)	(*)	553,273

(*) Data not recorded.

Table 239.—Wage-Earners Employed, by Months, in the Asbestos Mining Industry in Canada, 1941-1944

Month	1941	1942	1943	1944				
				Mine			Mill	
				Surface		Underground		
	Total	Total	Total	Male	Female	Male	Male	Female
January	3,072	3,366	3,469	1,403	36	535	1,714	2
February	3,148	3,343	3,481	1,370	37	536	1,700	2
March	3,194	3,335	3,523	1,358	35	545	1,722	2
April	3,138	3,362	3,525	1,355	35	527	1,732	2
May	3,198	3,380	3,507	1,417	37	526	1,728	2
June	3,290	3,377	3,518	1,462	31	489	1,728	2
July	3,554	3,480	3,518	1,488	36	472	1,709	2
August	3,640	3,483	3,513	1,507	40	473	1,716	2
September	3,806	3,510	3,525	1,457	40	452	1,721	2
October	3,821	3,532	3,535	1,473	23	480	1,731	2
November	3,756	3,532	3,497	1,544	32	501	1,730	2
December	3,740	3,323	3,388	1,407	31	496	1,701	2
Average	**3,446**	**3,420**	**3,499**	**1,438**	**34**	**503**	**1,719**	**2**

Table 240.—Materials Used in the Asbestos Products Industry, 1943 and 1944

Material	Unit of measure	1943		1944	
		Quantity	Cost at works	Quantity	Cost at works
			$		$
Asbestos fibre	lb.	23,071,434	548,706	21,495,240	499,610
Asbestos cloth	lb.	67,938	32,727	54,381	25,069
Asbestos paper, corrugated and plain	lb.	562,516	28,542	498,743	24,398
Asbestos sheets and strips	lb.	29,904	18,926	43,678	24,256
Asbestos yarn	lb.	325,940	147,292	328,803	152,602
Cotton cloth and yarn	....	....	156,373	....	144,955
Rubber and rubber sheets	lb.	75,194	25,679	76,730	22,344
Containers and packing material	....	....	107,586	....	80,577
All other materials	....	....	1,358,414	....	1,307,476
Total	....	....	**2,424,245**	....	**2,281,287**

Table 241.—Products Manufactured in the Asbestos Products Industry, 1943 and 1944

Product	Unit of measure	1943		1944	
		Quantity	Cost at works	Quantity	Cost at works
			$		$
Asbestos brake linings—Moulded	ft.	4,157,728	1,326,839	5,062,416	1,523,789
Other	ft.	1,826,829	458,828	1,422,221	392,659
Asbestos boiler and pipe covering	ft.	5,137,846	801,017	4,308,439	665,074
Asbestos clutch facings	No.	....	179,781	....	258,184
Asbestos gaskets	lb.	....	31,636	....	46,749
Asbestos packings of all kinds	lb.	487,798	224,937	....	203,884
All other products (*)	....	....	2,221,700	....	1,670,246
Total	....	....	**5,244,738**	....	**4,760,585**

(*) 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 1944 the gross value of production by the industry, and comprising the value of feldspar, quartz and nepheline-syenite sold, totalled $2,104,030 compared with corresponding values of $2,138,229 in 1943 and $1,998,996 in 1942. In 1944 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 1944 totalled 41; employees numbered 529; salaries and wages amounted to $772,385 and the value of fuel, electricity and process supplies consumed aggregated $407,901. The net value of all products sold in 1944 was estimated at $1,636,093 compared with $1,681,377 in 1943.

FELDSPAR

Production (producers' sales) of feldspar, crude and ground, during 1944 totalled 23,509 short tons valued at $227,632 compared with 23,858 short tons worth $237,771 in 1943. Of the 1944 output 17,842 tons worth $177,271 were shipped from Quebec properties and 5,667 tons valued at $50,361 from quarries in Ontario. The following information is from a recent report prepared by the Bureau of Mines, Ottawa:

"Most of the feldspar mined in Canada is of high-potash grade, though some operators also ship small amounts of soda spar. The latter type is rather uncommon as large deposits, but is sometimes encountered as zonal bodies along the walls of potash feldspar pegmatites. Canada has large reserves of feldspar, and production could be increased to meet any likely demand.

"There were no important new developments in 1944, and production continued at about the same level as during the preceding four-year period. As in former years about half the output went to the domestic market, and the other half was exported to the United States.

"In recent years, the entire production of feldspar has come from adjacent sections of western Quebec and eastern Ontario, in the general Ottawa region. Until 1942, mine output was about equally divided between the two provinces, but in that year Quebec gained a substantial lead and has since supplied 70 to 80 per cent of the total. In 1944, there were eight major producing mines, five in Quebec, and three in Ontario.

"In Quebec, most of the production came from three properties operated by Canadian Flint and Spar Company in Derry and Buckingham townships, in the Lièvre River section, and in Templeton township, all in Papineau county. The only other important producer was United Mining Industries, Limited, operating two properties in Buckingham and West Portland townships, respectively, in the same area. Both of these companies shipped a small tonnage of dental spar in addition to their regular ceramic grade.

"In Ontario the bulk of the output came from operations of Bathurst Feldspar Mines, in Bathurst township, Lanark county; and Madawaska Feldspar Company, Keystone Contractors, Limited, and Canspar Mines, Limited, in Murchison township, Nipissing District. Keystone Contractors worked its property until midyear, when it was taken over by Canspar Mines, a subsidiary of Lapa Cadillac Gold Mines, Limited.

"Feldspar for domestic use was ground in mills operated by the following:

Canadian Flint and Spar Company, Buckingham, Quebec.

Frontenac Floor and Wall Tile Company, Kingston, Ontario.

Bon Ami, Limited, 13719 Notre Dame Street East, Montreal, Quebec.

"The first two companies ground material mainly for ceramic purposes; the Bon Ami product is employed solely in cleanser compounds. Production of ground feldspar in 1944 totalled 10,902 tons, compared with 12,290 tons in 1943.

"World production of crude feldspar in 1937, the latest year for which complete statistics are available, totalled about half a million tons, of which the United States furnished over 50 per cent. In 1941, production in that country achieved a record of 338,860 long tons, valued at $1,519,456, but declined slightly in subsequent years, the estimate for 1944 being 325,000 tons. The leading producing States are North Carolina, South Dakota, New Hampshire, Colorado, and Virginia. The production of ground spar in the United States in 1944 was about the same as in 1943, when shipments totalled 335,810 short tons. In 1937, Canada was fifth on the list of world producers, following Sweden, Norway, and Czechoslovakia.

"Domestic requirements for feldspar are relatively small, and a considerable part of the annual output of crude spar is exported to grinding mills in the United States. In 1943, domestic consumption of ground feldspar was 13,178 tons, distribution by industries being: cleansers, 45 per cent; pottery, 22 per cent; glass, 20 per cent; enamel, 13 per cent.

"All of the feldspar used in industry consists of ground material, usually prepared either in mills run in conjunction with mining operations or in merchant mills supplied from independent mines. Some manufacturers of ceramic products mine or buy crude spar and grind it for their own use. By far the greater part of the production (over 95 per cent in the United States in 1943) is employed for ceramic purposes, including pottery, glass, and enamelware. The remainder is used mainly in scouring soaps and cleansers, and for bonding of fired abrasive wheels and other shapes. Some coarsely crushed spar, usually made from impure waste or quarry fines, is sold for stucco dash, artificial stone, chicken grit, etc.

"Most of the feldspar used is of the high-potash type, but a certain amount of high-soda spar also is in demand for blending purposes and for use in low-fired enamels and glazes. Practically all colours of feldspar are equally acceptable for ceramic uses, but for cleanser purposes, pale shades of white to buff are demanded. Nepheline-syenite and aplite (an impure feldspathic rock) are to some extent competitive with feldspar for certain ceramic uses, notably in the glass trade.

"Until recently, the universal practice has been that all of the feldspar supplied to grinding mills has consisted of crude lump produced by picking and cobbing methods. As a result of threatened shortages in the eastern United States attention has been given in the past few years to the milling and concentrating of sub-grade rock to fill grinders' requirements. The Golding-Keene Company installed a concentrator at Keene, New Hampshire, a few years ago, and in 1943 a 30-ton pilot mill was placed in operation at Erwin, Tennessee, by Consolidated Feldspar Corporation. In 1944, the same company started construction of a 200-ton mill at Kona, North Carolina, which is expected to come into production early in 1945. All the above mills employ flotation methods. Recently, also, there has been a small recovery of by-product feldspar from American mills engaged in concentrating the lithium mineral spodumene from pegmatite, and at Monterey, California, the Del Monte Properties Company lowers the feldspar content of its glass sand by flotation.

"Prices of Canadian crude feldspar in 1944 ranged from $6 to $7.50 a ton, according to grade, f.o.b. rail for export or shipment to domestic mills. Selected crude dental grade sold for $45 to $53 a ton in carload lots, for United States sale. Domestic ground spar was quoted at $12.50 a ton for granular glass grade, and $16.50 to $20 for 200-mesh pottery grades, all in carload lots, f.o.b. mill.

"On crude feldspar entering the United States there is a duty of 25 cents a long ton. The duty on ground feldspar is 15 per cent ad valorem.

Table 242.—Production of Feldspar, Crude and Ground, in Canada, by Provinces, 1930-1944

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	8,409	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	17,190	176,222	6,659	61,549	....	....
1944	17,842	177,271	5,667	50,361	....	....

Table 243.—Feldspar Consumed in Specified Canadian Industries, 1942, 1943 and 1944

Industries	1942		1943		1944	
	Tons	$	Tons	$	Tons	$
Abrasive products	119	4,113	117	6,776	75	2,260
Imported clay products	2,799	62,525	2,352	50,794	2,325	50,237
Soaps and cleaning preparations	4,249	43,904	12,733	63,283	15,383	35,423
Iron and steel products	....	....	509	10,824	529	10,814
Glass	2,874	45,231	2,598	41,454	2,382	34,612
Enamelling materials	331	4,965	265	3,840	377	5,655

NEPHELINE-SYENITE

Producers' sales of nepheline-syenite in 1944 were valued at $217,989 compared with $292,010 in 1943. 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 1944" 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, chiefly 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 in the ceramic industries, particularly in the glass trade.

"Canada and Russia are the only countries that are known to produce nepheline-syenite on a commercial scale. Canadian reserves are large, and production can be increased greatly if necessary.

"The developed occurrences of nepheline-syenite in Canada are confined to Ontario, where deposits have been worked in Peterborough, Hastings, and Haliburton counties. The large operation of American Nepheline Corporation at Blue Mountain, near Lakefield, in Peterborough county, has accounted for most of the output and has been the only producer since 1942. Prior to that year small tonnages were produced intermittently from deposits near Bancroft, in Hastings county, and near Gooderham, in Haliburton county, and the material was 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.

"Very large tonnages of nepheline-syenite are milled in Russia for the recovery of the contained phosphate (apatite), with the production of by-product nephelite. Deposits of commercial grade are reported to occur in British India, but have not as yet been developed. A number of occurrences are known in the United States, but most of the material contains too much inseparable, finely divided iron to be suitable for use in higher grade ceramic products.

"Nepheline-syenite is essentially a substitute for feldspar and 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 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, semi-vitreous ware, sanitary and electrical porcelain, floor and wall tile, and structural clay products, as well as 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. For ceramic use the crude 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.

"Because of its relatively high alumina content, nepheline-syenite has attracted attention as a possible source of pure alumina for the production of aluminium, to replace bauxite, and commercial methods of treatment have been worked out. At present however, the process is being used on other more adaptable raw materials.

"Glass-grade nepheline-syenite for sale in Canada remained at $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 l.c.l. American prices also remained unchanged at $12 for glass grade, and $15.50 for ceramic grade, all bulk, in carload lots, f.o.b. Rochester, New York. Crude nepheline syenite enters the United States free of duty, provided that total imports of crude and ground material do not exceed 50,000 long tons in any calendar year. The duty on ground material is 15 per cent ad valorem."

Table 244.—Production of Nepheline-Syenite in Canada*, 1936-1944

Year	Quantity	Value	Year	Quantity	Value
		$			$
1936	(a)	(b) 37,426	1941	(a)	227,583
1937	(a)	121,481	1942	(a)	246,893
1938	(a)	142,737	1943	(a)	292,010
1939	(a)	140,148	1944	(a)	217,989
1940	(a)	117,849			

(*) 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, 5,630 tons valued at $93,528 in 1943 and 7,285 tons valued at $130,383 in 1944.

Table 245.—Imports and Exports of Feldspar and Nepheline-Syenite, 1943-1944

—	1943		1944	
	Tons	$	Tons	$
Imports—				
Feldspar, crude	....	....	....	....
Feldspar, ground	526	866	546	658
Exports—				
Feldspar	12,724	96,453	13,081	102,918
Nepheline-syenite	36,240	129,826	35,310	123,905

QUARTZ (SILICA)

The production of natural silica or quartz in Canada during 1944 totalled 1,740,262 short tons valued at $1,658,409 compared with 1,776,749 tons at $1,608,448 in 1943. 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 1944 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 1944 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 1944 consisted of quartz shipped to the Trail smelter from the Bailey deposits located in the Greenwood mining district.

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 246.—Production in Canada of Quartz, 1943 and 1944

—	1943		1944	
	Short tons	Value	Short tons	Value
		$		$
Production (*) (Shipments)—				
Nova Scotia	9,486	16,126	10,100	27,350
Quebec	214,959	605,916	236,091	639,429
Ontario	1,350,640	852,196	1,326,288	868,389
Saskatchewan	163,102	57,086	143,101	50,085
British Columbia	38,562	77,124	24,682	73,156
Canada	**1,776,749**	**1,608,448**	**1,740,262**	**1,658,409**

(*) Includes both crude and crushed quartz, crushed sandstone and quartzite, and natural silica sands.

Table 247.—Production (*) (Use) of Natural Low-Grade Silica Sand and Silica Gravel as Non-Ferrous Smelter Flux, 1942-1944

—	1942		1943		1944	
	Tons	$	Tons	$	Tons	$
Ontario	644,529	225,585	(†) 666,452	233,258	(†) 608,403	212,840
Saskatchewan	155,699	54,495	163,102	57,086	143,101	50,085
Canada	**800,228**	**280,080**	**829,554**	**290,344**	**751,504**	**262,925**

(*) Included in totals shown in Tables 246 and 248.
(†) Exclusive of low cost quartzite used in smelting nickel-copper ores.

Table 248.—Production of Quartz (Silica) in Canada, 1929-1944

Year	Ton	$	Year	Ton	$
1929	265,949	561,527	1937 (*)	1,377,448	1,129,011
1930	226,200	418,127	1938 (*)	1,380,011	961,617
1931	195,724	303,158	1939 (*)	1,582,935	1,100,214
1932	189,132	276,147	1940 (*)	1,858,302	1,203,527
1933	185,783	297,820	1941 (*)	2,052,878	1,366,187
1934	272,563	482,265	1942 (*)	1,738,174	1,538,162
1935	233,002	424,882	1943 (*)	1,776,749	1,608,448
1936 (*)	1,046,649	597,781	1944 (*)	1,740,262	1,658,409

(*) Complete data for production of this material in Ontario previous to 1936 are not available.

Prices—United States (August, 1945)—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 piezoelectrical and optical use command premium. (Engineering and Mining Journal's "Metal and Mineral Markets"— New York).

The following information was obtained from the annual report "Silica in 1944" as prepared by the Bureau of Mines, Ottawa:

"The demand for high-grade silica sand was steady and large quantities are still imported. Silica sand for the manufacture of glass and silicate of soda has to be of a high degree of purity and uniformity, and Canadian producers must adhere rigidly to specifications and must guarantee regularity of shipments in order to take advantage of these markets. The use of Canadian sand for sandblasting is increasing.

"Silica sand is generally prepared from a friable sandstone by crushing, washing, drying, and screening to recover different grades of material according to the use for which it is required. In the manufacture of glass, for instance, the material should range between 20 and 100 mesh.

Silica sand may also be obtained from naturally occurring sands, the required grade being recovered by screening. In special cases it can be prepared from a friable quartz and from vein quartz.

"Silica, known as "potters' flint" for use in the ceramic industry must be 150 mesh or finer, whereas in the paint industry, air-floated material 250 mesh or finer is required.

"In the use of silica as a flux, smelter operators endeavour to obtain their material from the nearest possible source, and in many cases use a siliceous ore containing recoverable amounts of the precious metals. The silica requirements for the manufacture of ferrosilicon and silica brick depend upon the market for the finished products.

"Quartz, quartzite, or sandstone, in sizes from ½ inch to 6 inches is used in the manufacture of ferrosilicon and pure silicon, and quartz and quartzite are used also as a smelter flux. For silica brick, quartzite is crushed to about 8 mesh. Some quartz is also crushed to make silica sand.

"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 location of a deposit with respect to markets is of great importance. The largest markets for silica are in 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. West of Winnipeg the needs of silica are met almost entirely by imported material."

Table 249.—Consumption of Quartz, Silica Sand, Etc., in Canada, by Industries, According to Census of Industry Reports, 1943 and 1944

Industry	1943 (*)		1944 (*)	
	Quantity	Cost at works	Quantity	Cost at works
	Short tons	$	Short tons	$
Silica sand and silica (including ground quartz)—				
Soaps and cleaning preparations	3,640	128,981	4,563	129,696
Acids and salts	39,406	145,366	18,019	107,804
Paints	1,388	45,075	1,767	61,367
Refractories	1,021	10,240	1,053	10,223
Roofing paper	2,135	21,015	4,307	27,480
Abrasives (silica sand)	89,022	511,649	73,771	428,317
Abrasives (quartz)	175	5,410	268	8,046
Glass	132,992	870,454	131,987	866,696
Enamelling materials	253	3,795	400	6,000
Products from imported clays	3,597	54,812	3,441	55,627
Foundry facings and supplies	62	609	76	679
Non-ferrous smelters (†)	868,116	367,468	776,186	336,182
Steel industry (silica sand)	116,374	868,316	89,707	646,841
Ferro-alloys (quartzite)	188,636	526,676	151,649	451,050
Total Accounted for	**1,446,817**	**3,559,866**	**1,257,194**	**3,136,008**

Note.—Consumption values are costs at works.

(†) The quantities reported under this industry contain low-grade natural siliceous 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 250.—Imports of Silica Into Canada, 1943-1944

Kind	1943		1944	
	Quantity	$	Quantity	$
Ground flint stone ... ton	884	17,617	1,481	30,487
Ganister ... ton	484	3,970	346	2,463
Silica sand for manufacturing ... ton	509,043	1,011,117	457,602	914,390
Silex or crystallized quartz ... ton	11,411	945,967	8,774	530,200
Silica fire brick	....	847,456	....	713,538

Note.—Exports of silica are not classified separately as such in Canadian Trade Reports; exports of quartzite from Canada in 1944 totalled 126,608 short tons valued at $260,181 compared with 68,555 tons worth $124,345 in 1943.

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 aeroplane. Brazil remained at the close of 1944 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 1944; however, The Quartz Crystals Mining Company of Canada 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 second World War.

Table 251.—Principal Statistics of the Feldspar and Quartz Mining Industry, 1943 and 1944

—		Ontario (b) (c) 1943	Ontario (b) (c) 1944	Quebec 1943	Quebec 1944
Number of firms (a)		19	22	16	19
Capital employed	$	1,632,379	(d)	1,262,752	(d)
Number of employees—On salary		41	34	27	26
On wages		227	231	240	238
Total		268	265	267	264
Salaries and wages—Salaries	$	69,702	61,742	49,001	36,518
Wages	$	324,248	334,729	325,248	339,396
Total	$	393,950	396,471	374,249	375,914
Selling value of products (gross)	$	1,356,091	1,287,330	782,138	816,700
Cost of fuel and purchased electricity	$	61,648	78,687	72,599	87,814
Cost of process supplies, freight and containers	$	234,759	182,661	87,846	118,775
Net value of sales	$	1,059,684	1,025,982	621,693	610,111

(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.
(c) In 1943 includes 1 firm in Nova Scotia, 1 in British Columbia and 1 in Saskatchewan, and in 1944, 2 in Nova Scotia, 2 in British Columbia and 1 in Saskatchewan.
(d) Data not recorded in 1944.

Table 252.—Number of Wage-Earners on Pay Roll, by Months, 1943 and 1944

Month	1943 Totals	1944 Quebec Surface Male	1944 Quebec Underground	1944 Quebec Mill Male	1944 Ontario Surface Male	1944 Ontario Surface Female	1944 Ontario Underground	1944 Ontario Mill Male	1944 Ontario Mill Female	1944 Canada (*) Total
January	**422**	187	....	80	94	2	14	26	1	**450**
February	**450**	225	....	82	95	2	13	25	1	**444**
March	**438**	221	....	77	154	2	15	26	1	**497**
April	**418**	161	....	78	167	2	15	27	1	**452**
May	**474**	129	....	73	184	2	34	38	1	**475**
June	**503**	150	....	73	184	3	33	37	1	**506**
July	**485**	137	....	73	167	3	33	36	1	**476**
August	**506**	154	....	71	180	3	35	38	1	**509**
September	**520**	144	....	74	171	3	33	40	1	**492**
October	**488**	149	....	74	159	3	43	38	1	**493**
November	**479**	141	....	76	150	3	42	31	1	**470**
December	**416**	121	....	74	100	2	15	34	1	**361**

(*) Includes a few employees in some months in Nova Scotia and British Columbia.

THE GYPSUM INDUSTRY

(1) Primary Production—The Gypsum Mining and Quarrying Industry

Production (producers' sales and producers' consumption) of gypsum in Canada during 1944 totalled 596,164 short tons valued at $1,511,978 compared with 446,848 short tons worth $1,381,468 in 1943. 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.

Of the 1944 output, Nova Scotia properties contributed 401,284 tons valued at $489,932; New Brunswick 42,040 tons at $200,748; Ontario 90,288 tons at $348,873; Manitoba 38,330 tons at $368,498, and British Columbia 24,222 tons worth $103,927.

The quantity of crude mineral mined in 1944 included 12,250 tons of anhydrite and 524,106 tons of gypsum. Crude gypsum calcined in primary or quarry plants in 1944 totalled 194,748 tons.

In 1944 the firms reporting primary production numbered 12. Some of the Canadian gypsum mining companies restrict 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.

Exports from the Dominion in 1944 included 386,949 short tons of crude gypsum valued at $434,123 and 443 short tons of plaster of paris or wall plaster appraised at $9,262. Imports included 560 short tons of gypsum valued at $17,223 and 1,550 short tons of plaster of paris and wall plaster worth $65,180.

During 1944 the primary industry provided employment for 328 persons and distributed $490,872 in salaries and wages. The value of fuel, purchased electricity and process supplies consumed during 1944 totalled $387,941 and the net value of production was estimated at $1,124,037.

Complete data relating to world production of gypsum have not been available since 1938; the principal gypsum producing countries in that year were the United States, Germany, France, United Kingdom, Canada, Egypt, Latvia, Australia, Argentina, Russia and Japan.

The following information is from a report—Gypsum in 1944—as prepared by the Bureau of Mines, Ottawa:

"The materials produced are the hydrous calcium sulphate commonly known as gypsum, the partly dehydrated material known as plaster of paris or wall plaster, and the anhydrous calcium sulphate known as anhydrite. Nova Scotia is the chief producer of gypsum in Canada and is followed by Ontario, New Brunswick, Manitoba and British Columbia.

"A large tonnage of by-product gypsum is obtained from the production of phosphate fertilizers at the plant of Consolidated Mining and Smelting Company at Tadanac, B.C., and efforts to find an outlet for this material are being continued. A new gypsum mill and wall board plant is being constructed at Calgary, Alta. by Western Gypsum Products Ltd. and gypsum mined at Maynook, B.C. will be used in this plant.

"Consumption of gypsum in Canada in the gypsum products industries, including wall board, and hard wall plasters is approximately 180,000 tons a year, mostly as calcined gypsum. The Canadian cement industry consumes annually approximately 50,000 tons of crude gypsum.

"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. 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 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.

"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.

"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 1944."

Table 253.—Production in Canada of Gypsum, 1943 and 1944

—	1943		1944	
	Quantity	Value	Quantity	Value
	tons	$	tons	$
SHIPMENTS BY GRADES—				
Crude (a)—Lump or mine run	9,277	18,632	26,726	38,499
Crushed	276,498	403,406	398,142	463,677
Fine ground	719	6,070	5,508	16,244
Calcined gypsum, sold and used (b)	160,354	953,360	165,788	993,558
Total	**446,848**	**1,381,468**	**596,164**	**1,511,978**
SHIPMENTS BY PROVINCES—				
Nova Scotia	255,736	368,639	401,284	489,932
New Brunswick	36,263	148,315	42,040	200,748
Ontario	92,448	335,637	90,288	348,873
Manitoba	37,989	380,529	38,330	368,498
British Columbia	24,412	148,348	24,222	103,927
Total	**446,848**	**1,381,468**	**596,164**	**1,511,978**
Total gypsum mined and quarried (a)	430,822	....	536,356	....
Total gypsum calcined (b)	201,168	....	194,748	....

(a) Includes some anhydrite quarried in Nova Scotia.
(b) Does not include gypsum calcined in manufacturing plants located in Montreal and Calgary, but includes calcine used in manufacturing plants operated in direct or close conjunction with the mines—the value of calcine used is its value as a process material.

Table 254.—Production (Sales) of Crude and Calcined Gypsum in Canada, 1935-1944

Year	Tons	Value	Year	Tons	Value
		$			$
1935	541,864	932,203	1940	1,448,788	2,065,933
1936	833,822	1,278,971	1941	1,593,406	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
1939	1,421,934	1,935,127	1944	596,164	1,511,978

Table 255.—Consumption of Gypsum in Canadian Cement Industry, 1933-1944

Year	Tons	Year	Tons
1933	13,319	1939	31,492
1934	19,172	1940	38,903
1935	21,611	1941	49,031
1936	25,447	1942	49,816
1937	33,691	1943	47,034
1938	31,975	1944	42,672

Table 256.—Imports and Exports of Gypsum, 1943 and 1944

—	1943		1944	
	Quantity	Value	Quantity	Value
	tons	$	tons	$
Imports—				
Gypsum, crude (sulphate of lime)	5,000	12,490	560	17,223
Gypsum, ground, not calcined	490	16,828		
Plaster of paris and wall plaster	1,202	47,532	1,550	65,180
Total	....	**76,850**	....	**82,403**
Exports—				
Gypsum or plaster, crude	185,210	213,022	386,949	434,123
Plaster of paris, wall plaster	478	8,844	443	9,262
Gypsum, ground	....	....	....	....
Total	....	**221,866**	....	**443,385**

Table 257.—Principal Statistics of the Gypsum Mining Industry in Canada, 1940-1944

—		Nova Scotia	New Brunswick Ontario, Manitoba, British Columbia	Total Canada
Number of firms—				
1940		6	3(a)	**9**
1941		6	2(a)	**8**
1942		5	2(b)	**7**
1943		4	2(b)	**6**
1944		5	3(b)	**8**
Number of employees—				
On salary—				
1940		33	24	**57**
1941		34	14	**48**
1942		28	27	**55**
1943		19	32	**51**
1944		22	14	**36**
On wages—				
1940		389	248	**637**
1941		328	272	**600**
1942		201	254	**455**
1943		99	288	**387**
1944		122	170	**292**
Salaries and wages—				
Salaries—				
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**
1944	$	46,783	34,962	**81,745**
Wages—				
1940	$	369,090	237,154	**606,244**
1941	$	338,356	315,717	**654,073**
1942	$	231,431	319,712	**551,143**
1943	$	94,588	406,475	**501,063**
1944	$	167,603	241,524	**409,127**
Fuel and electricity cost—				
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**
1944	$	27,941	120,802	**148,743**

Table 257.—Principal Statistics of the Gypsum Mining Industry in Canada, 1940-1944
—Concluded

—		Nova Scotia	New Brunswick Ontario, Manitoba, British Columbia	Total Canada
Value of process supplies used—				
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**
1944	$	60,283	178,915	**239,198**
Selling value of products (gross)—				
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**
1944	$	489,932	1,022,046	**1,511,978**

(a) In addition, 2 companies also operated in Nova Scotia.
(b) In addition, 1 company also operated in Nova Scotia.

Table 258.—Number of Wage-Earners on Payroll or Time Record on the Last Day of Each Month or Nearest Work Day, 1942-1944

Month	1942		1943		1944				
					Mine			Mill	
	Mine	Mill	Mine	Mill	Surface		Underground (*)	Male	Female
					Male	Female			
January	194	173	152	151	66	....	84	73	....
February	210	184	162	147	67	....	82	68	....
March	266	201	166	157	80	1	80	86	....
April	270	215	177	152	113	1	74	92	....
May	336	224	181	165	133	1	78	100	....
June	331	240	197	170	135	1	75	110	....
July	345	226	217	182	134	1	74	108	....
August	338	227	244	179	144	1	75	113	....
September	268	184	236	199	164	1	68	128	....
October	188	169	236	198	160	1	71	118	....
November	191	166	259	199	101	1	79	108	....
December	157	141	268	190	84	1	78	82	....

(*) 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 $5,077,477 during 1944. This output was 6 per cent under the 1943 total of $5,417,045. The main products were gypsum wallboard, gypsum hardwall plaster, gypsum tile and gypsum blocks.

The average number of employees in these works in 1944 was 569, to whom $856,261 were paid in salaries and wages. Expenditures for fuel and electricity amounted to $297,606 and materials used in manufacturing processes cost $2,659,683.

Table 259.—Materials Used in the Gypsum Products Industry, 1943 and 1944

Material	Unit of measure	1943 Quantity	1943 Cost at works	1944 Quantity	1944 Cost at works
			$		$
Gypsum, crude	ton	20,742	78,460	26,683	212,813
Gypsum, calcined (plaster of paris)	ton	149,885	705,541	165,750	993,385
Paper	ton	14,240	868,457	15,089	999,201
Starch or paste	ton	499	31,488	678	50,391
Hair	ton	75	18,036	66	17,468
Retarder	ton	203	18,045	224	19,374
Sawdust and shavings	ton	165	2,259	246	3,105
Containers, etc.			108,587		101,244
All other materials			420,561		262,702
Total			**2,251,434**		**2,659,683**

Table 260.—Output of the Gypsum Products Industry, 1943 and 1944

Product	Unit of measure	1943 Quantity	1943 Selling value at works	1944 Quantity	1944 Selling value at works
			$		$
Gypsum wallboard	sq. ft.	192,185,195	4,317,946	179,239,550	3,814,067
Gypsum hard wall plasters	ton	39,883	501,104	65,580	864,115
All other products (*)			597,995		399,295
Total			**5,417,045**		**5,077,477**

(*) Includes gypsum tile and blocks, etc.

IRON OXIDES (OCHRE) MINING INDUSTRY

Production (producer's sales) in Canada of ochreous iron oxides during 1944 totalled 8,599 short tons valued at $150,250 compared with 8,401 short tons worth $135,893 in 1943. The output in these years included the mineral in both the crude and refined state. Of the 1944 shipments, 8,117 short tons valued at $142,050 were made from deposits located in the province of Quebec and 482 short tons worth $8,200 from a property in British Columbia.

Employees reported by the 6 firms comprising the industry in 1944 totalled 55 and salaries and wages paid amounted to $49,876. Fuel and electricity used totalled $19,115 while the cost of explosives and other process supplies consumed was recorded at $6,700. The longest period of mining operations as reported by any single operator in 1944 was from May 10 to December 17.

The following information relating to Canadian ochreous 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 the past, deposits in Quebec were operated near Ste. Anne de Beaupre, Montmorency county; in Lynch township, Labelle county; and at St. Raymond, Portneuf county.

"In British Columbia, there has been a small production since 1923 of iron oxide from Alta Lake, New Westminster district, and from oxide beds in the Windermere district. The oxide is used chiefly for gas purification.

"In Alberta and Saskatchewan, several deposits of ochre are known, some of which have commercial possibilities, but they are difficult of access and the market is limited and they have received little active attention. The most promising known deposit in Saskatchewan is located at Loon Lake, 32 miles from St. Walburg (station on C.N.R. line) and 77 miles northwest of North Battleford. These occurrences are being investigated by the Saskatchewan Department of Natural Resources. 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.

"Sherwin-Williams Company of Canada operated its deposits and plants at Red Mill, Champlain county, Quebec, and a few miles east of Trois Rivières. It is the only Canadian producer of calcined iron oxides, the others marketing only air-dried products. Its calcined and air-floated mineral products produced to rigid specifications are in use in the war industries. This plant, which produces most of the Canadian iron oxide was operated at capacity throughout 1944.

"Several small deposits are worked intermittently at Almaville, St. Louis, and St. Adelphe in Champlain county, and at Les Forges, and near Pointe-du-Lac, St. Maurice county.

"Most of the higher grade oxides, ochres, and umbers used in the paint trades were formerly imported from Europe, and prior to the war some of the cheaper grades of European oxides even competed with the domestic products, as they do not require calcining to produce the desired colour.

"The consumption of iron oxide by the illuminating gas industry in 1943 (figures for 1944 not available) was 6,568 tons, and the amount consumed in the paint industry was 2,321 tons.

"The Canadian price of red iron oxide, as given by Canadian Chemistry and Process Industries, remained at 2 to 7 cents a pound throughout 1944."

Table 261.—Production (Sales) in Canada of Iron Oxides, 1943 and 1944

—	1943		1944	
	Quantity	Value	Quantity	Value
		$		$
Quebec (*)	7,998	131,057	8,117	142,050
British Columbia	403	4,836	482	8,200
Total	**8,401**	**135,893**	**8,599**	**150,250**

(*) Includes crude and refined grades.

Table 262.—Production of Iron Oxides in Canada, 1927-1944

Year	Quantity	Value	Year	Quantity	Value
	Short tons	$		Short tons	$
1927	6,125	103,536	1936	5,854	69,630
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	1944	8,599	150,250

The production of iron oxides in Canada since the first recording of statistics in 1886 to the end of 1944 totalled 333,713 short tons valued at $3,559,703.

Table 263.—Consumption of Iron Oxides in Specified Canadian Industries, 1935-1944

Year	Coke and Gas		Paints, Pigments and Varnishes			
			Iron Oxide Pigments		Ochres, Siennas and Umbers	
	Quantity	Value	Quantity	Value	Quantity	Value
	Tons (a)	$	Tons	$	Tons	$
1935	3,701	46,204	990	77,758	504	56,219
1936	(b)	41,291	733	67,850	634	65,819
1937	(b)	40,414	890	81,709	566	49,082
1938	(b)	41,013	822	70,736	487	41,062
1939	(b)	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	6,568	45,946	2,321	222,858	440	68,425
1944	9,194	71,545	2,614	212,234	648	69,092

(a) Oxide and purifying materials.
(b) Data not available.

Table 264.—Principal Statistics of the Natural Iron Oxides Industry in Canada, 1942-1944

—		1942	1943	1944
Number of firms		(d) 5	(d) 5	(d) 6
Capital employed	$	194,541	254,891	(a)
Number of employees—On salaries		(e) 6	(b) 7	(c) 8
On wages		41	40	47
Total		47	47	55
Salaries and wages—Salaries	$	9,174	10,293	11,416
Wages	$	35,114	36,261	38,460
Total	$	44,288	46,554	49,876
Selling value of products (gross)	$	151,653	135,893	150,250
Cost of fuel and purchased electricity	$	20,835	19,438	19,115
Cost of process supplies	$	5,780	7,590	6,700
Freight	$	....	....	11,670
Selling value of products (net)	$	125,038	108,865	112,765

(a) Not compiled.
(b) Three females.
(c) Four females.
(d) Four producing in Quebec and one in British Columbia.
(e) Two females.

Table 265.—Wage-Earners(*) Employed, by Months, 1943 and 1944

Month	Number 1943 Mine	1943 Mill	1944 Mine	1944 Mill	Month	Number 1943 Mine	1943 Mill	1944 Mine	1944 Mill
January	....	31	....	33	July	32	24	24	30
February	....	31	....	30	August	36	21	30	31
March	....	31	....	35	September	27	22	31	31
April	....	31	....	38	October	9	23	23	31
May	9	22	13	28	November	6	26	12	35
June	20	23	18	30	December	7	25	9	33

(*) No underground work and no female wage-earners.

Table 266.—Imports and Exports of Iron Oxides, 1943 and 1944

—	1943		1944	
	Quantity	Value	Quantity	Value
	tons	$	tons	$
IMPORTS—				
Ochres, ochrey earths, siennas and umbers	1,125	76,644	1,431	70,168
Oxides, fireproofs, rough stuff, fillers and colours, dry, n.o.p.	3,134	964,147	2,859	1,040,206
EXPORTS—				
Pigments, n.o.p. (exclusive of white lead)	82	13,393	627	121,622
Iron oxides	1,831	131,830	2,026	120,327

THE MICA MINING INDUSTRY

Canadian production (primary shipments) of mica (all grades) in 1944 totalled 6,684,846 pounds valued at $841,026 compared with 8,050,692 pounds worth $553,856 in 1943. The value of the 1944 production established an all-time high record in the Canadian mica mining industry. Of the total output in 1944, mines in the province of Quebec contributed 2,274,634 pounds valued at $178,899 and Ontario deposits 3,486,212 pounds worth $646,745; shipments from mines in British Columbia amounted to 924,000 pounds worth $15,382. Comprising the total 1944 output for the Dominion were 275,946 pounds of muscovite (white) mica valued at $579,134 and 6,408,900 pounds of phlogopite or amber worth $261,892.

The number of Canadian primary mica producers reporting commercial shipments in 1944 totalled 68 and $359,797 were distributed in salaries and wages to 400 employees. The total net value of shipments was estimated at $784,402.

Table 267.—Mica Production (Primary Sales) in Canada, by Classes, 1943 and 1944

Grade	1943		1944	
	Pounds	Total value f.o.b. shipping point	Pounds	Total value f.o.b. shipping point
		$		$
Rough, mine-run or rifted	1,429,365	54,450	314,878	22,733
Mica sold for mechanical splitting	190,209	26,048	427,426	62,842
Splittings	73,691	53,820	44,350	32,123
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	5,381,779	66,167
Trimmed mica	291,876	356,328	516,413	657,161
Total mica shipments	**8,050,692**	**553,856**	**6,684,846**	**841,026**
Varieties: Phlogopite mica (amber)	7,498,578	309,803	6,408,900	261,892
Muscovite mica (white)	552,114	244,053	275,946	579,134
Total mica shipments	**8,050,692**	**553,856**	**6,684,846**	**841,026**

Table 268.—Production (Sales) of Mica in Canada, by Provinces and Varieties, 1944

Province	Phlogopite		Muscovite		Total	
	Pounds	$	Pounds	$	**Pounds**	$
Quebec	2,272,531	177,526	2,103	1,373	**2,274,634**	**178,899**
Ontario	3,212,369	68,984	273,843	577,761	**3,486,212**	**646,745**
British Columbia (*)	924,000	15,382	.....	.....	**924,000**	**15,382**
Total Canada	**6,408,900**	**261,892**	**275,946**	**579,134**	**6,684,846**	**841,026**

(*) Variety uncertain.

Table 269.—Production (*) of Mica in Canada, 1933-1944

Year	Short tons	$	Year	Short tons	$
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
1938	519	80,989	1944	3,342	841,026

(*) Sales.

The total value of mica produced in Canada from the first official recording of mica statistics in 1886 to the end of 1944 amounted to $10,192,552.

Table 270.—Imports and Exports of Mica, 1943 and 1944

—	1943		1944	
	Pounds	Value	Pounds	Value
		$		$
IMPORTS—				
Mica and manufactures of, n.o.p.	....	220,356	....	185,986
Vermiculite, crude	....	18,482	....	21,166
EXPORTS—				
Mica, rough and trimmed (a)	863,100	422,710	....	....
Mica, scrap and waste	4,279,500	34,660	4,879,200	36,072
Mica splittings	65,900	47,108	75,800	56,211
Mica manufactures (c)	....	16,540	....	994
Mica, rough, untrimmed	....	....	955,600	133,149
Mica, trimmed (b)	....	....	282,100	572,541
Mica, ground, (b)	....	....	600,900	18,340
Total mica exports	....	**521,018**	....	**817,307**

(a) To December 31, 1943.
(b) From January 1, 1944.
(c) Included mica ground prior to 1944.

Table 271.—Consumption of Mica in Canada, by Industries, as Reported to the Annual Census of Industry, 1943 and 1944

—	1943		1944	
	Quantity	Cost at works	Quantity	Cost at works
	tons	$	tons	$
In electrical apparatus industry	145	324,919	164	396,978
In rubber industry	111	12,314	117	14,011
In roofing (*)	395	23,160	702	36,260
In mica manufacturing industry	36	41,050	....	....
Total accounted for	....	**401,443**	....	**447,249**

(*) Includes mica used in manufacture of wall paper.

The following information is taken from a report "Mica in 1944" as prepared by the Bureau of Mines, Ottawa:

"Canada is one of the two leading world sources of phlogopite, or amber mica, the other most important producer being Madagascar. Numerous occurrences of muscovite, or white mica, also are known in Canada, but only since the discovery in 1942 of exceptionally rich deposits in the Eau Claire area, Ontario, has there been a substantial production of this variety. Preliminary figures indicate that in 1944 the value of muscovite shipments from this field amounted to about 70 per cent of the total Canadian production of all classes and qualities of mica, and exceeded the entire value of the country's output in 1943. In 1943, also, the deposits furnished about 8 per cent of the total Canadian and American production of strategic muscovite, supply of which was drawn from many hundreds of mines.

"Although Canada has a substantial export trade in sheet mica, it also imports considerable quantities of muscovite splittings, block, and manufactured mica, the value of which in 1944 was $185,986.

"The general supply situation in respect to mica of all classes showed a considerable and progressive improvement during 1944, particularly in reference to strategic qualities of muscovite and phlogopite required for capacitor and aviation spark plug use.

"In 1942, Colonial Mica Corporation, the United States Government mica purchasing agency, was empowered to extend its muscovite buying program to Canada. It established a special schedule of prices, entered into contracts, and in 1943 opened a Canadian office at North Bay, Ontario, and appointed a resident agent. During 1944, Colonial extended assistance to Canadian producers of both strategic-quality muscovite and phlogopite in the form of loans of drill-compressor units and other equipment on a rental basis, and similar assistance was also given mica operators by the Department of Mines and Resources, Ottawa, in 1943 and 1944. Colonial terminated its Canadian buying program on December 31, 1944, leaving producers of all types and qualities of mica free to sell in the open market.

"Of technical interest was the development in 1943 of improved instruments for readily determining the power factor and the electrical conductivity of sheet mica. Appraisal solely by visual means caused the rejection of important amounts of sound mica. The new instruments are, respectively, the direct-reading Q-meter and the point-electrode conductivity tester, both developed by the Bell Telephone Laboratories. They are not intended to supplant visual inspection, but by their use it is expected that important amounts of mica of a quality hitherto rejected on account of appearance will become available for capacitor and other more exacting electrical needs. Instruments of the above type are now available in the Bureau of Mines, Ottawa, for the testing of mica samples.

"Most of the phlogopite mined in Canada has come from a belt of pyroxenite rocks that extends from Kingston to Ottawa, in Ontario, and thence northward into Quebec, between the Gatineau and Lièvre Rivers. The productive belt is from 60 to 70 miles wide and about 200 miles long. Scattered, outlying mica deposits occur also in Pontiac and Argenteuil counties, Quebec, and as far east as Quebec City; and in Ontario, similar deposits have been mined to the west in Hastings and Haliburton counties.

"In Quebec, the Nellis mine at Cantley, in Hull township, and the Phosphate King mine, in Templeton township, both of which are operated by Blackburn Bros., Blackburn Building, Ottawa, continued to be the chief sources of production in that province. Consideration was being given by New Calumet Mines, Limited, to the possibility of recovering a marketable flake mica product from mill tailings at this company's lead-zinc property on Calumet Island, Pontiac county. It is estimated that about 10 tons a day of plus 65-mesh mica can be recovered by screening the tailings discharge from 450 tons of ore milled. Tests were run in the Bureau of Mines, Ottawa, to remove impurities from the crude tailings by tabling, followed by wet-grinding in a ball mill. Samples of the resulting 200-mesh product were submitted to various consuming industries, but no decision was made by the company in regard to entering into production.

"In Ontario, the chief operator in 1944 continued to be Kingston Mica Mining Company, with mine near Godfrey, in Bedford Township, Frontenac county. The output of this property is exported in the form of rifted rough sheet to the United States for trimming and punch use, and is of special heat-resistant, spark plug quality. Canadian deposits yielding this class of phlogopite are comparatively few, the chief other sources being the Ericson mine, in Denholm township, Quebec, and a property at Petit Pré, near Quebec City. The last-named mine has been idle since 1942.

"At mid-year, operations were undertaken by Sydenham Mining Company to unwater and reopen the old Lacey mine of the General Electric Company, near Sydenham, in Frontenac county. Assistance for this work, in the form of a loan of equipment, was given by Colonial Mica Corporation. Considerable progress was made, and several consignments of rough, mine-run mica were shipped to the United States for trimming and punch use.

"In 1944, Micaspar Industries, Limited of Hamilton did some work on the old Richardson mine, in Loughborough township, and erected a small grinding plant. The plant was operated for only a short time, producing a few tons of ground mica, part of which was made from scrap off the property and part from purchased muscovite waste.

"Muscovite, the occurrence of which in commercial sheet form is confined to granite pegmatite dykes, is far more widely distributed in Canada than phlogopite, and deposits are known in many sections of Quebec and Ontario, as well as in Manitoba and British Columbia, and in the Baffin Island section of the Eastern Arctic. Spasmodic attempts at development of certain of these occurrences have been made, but it was not until the discovery in 1942 of deposits in the Eau Claire region that serious production of muscovite was undertaken.

Following the original discovery of the Eau Claire deposits on what is now the Purdy Company's property, several groups of claims were staked on adjacent ground by various syndicates, but none of these contain encouraging amounts of mica, and the quality, in general, is too low for profitable mining.

"In Quebec, there are deposits of ruby muscovite mica of strategic quality in Petain township, Abitibi county, and in Bergeronnes township, Saguenay county, the production from which has been small.

"In British Columbia, production consists only of schist or other micaceous rock, the sources of the output in 1944 being a deposit near Oliver, operated by R. C. McKay, and a deposit in the Albreda area that was opened by George Campbell. A number of pegmatitic occurrences of sheet muscovite are known in British Columbia, most of which lie in the Tête Jaune, Big Bend, and Fort Grahame areas. Small quantities of mica were taken from some of these deposits years ago, but for the most part the occurrences lie at high altitudes, above timber line, and they could be worked only for brief periods during the summer months.

"Ontario and Quebec continued to furnish practically all of the mica production, comprising sheet or block, splittings, ground, and scrap. The output in Ontario declined about 18 per cent in quantity, but increased nearly 110 per cent in value, while the output in Quebec decreased 50 per cent in quantity and 35 per cent in value. The above percentages of quantity, however, do not afford a true index of the sheet mica industry, since they include a large amount of scrap or waste sold for grinding use. For example, over 70 per cent of the total quantity of mica exported in 1944 was grinding scrap, having only 4 per cent of the total export value. In addition, nearly 9 per cent of the exports comprised ground mica having 2 per cent of the value.

"As a large part of the output is exported, export figures afford a fair index of the industry by types of products. The total quantity of mica exported amounted to 6,793,600 pounds valued at $816,313. About 14 per cent of the exports by quantity, and 17 per cent by value, was rough phlogopite that was shipped to the United States and Mexico for trimming, splitting, or punching; 5 per cent by quantity, and 70 per cent by value, was trimmed block muscovite and phlogopite; 1 per cent by quantity, and 7 per cent by value, was phlogopite splittings; and 9 per cent by quantity, and 2 per cent by value, was ground phlogopite.

"Scrap mica, which was all consigned to American grinding plants, comprised 71 per cent of the quantity, and 4 per cent of the value. About 28 per cent of the exports of scrap was muscovite, having 34 per cent of the declared value, and 72 per cent was phlogopite, with 66 per cent of the value. Most of the scrap phlogopite is shipped to United States Mica Manufacturing Company, East Rutherford, New Jersey, and Forest Park, Chicago. In 1944, most of the scrap muscovite from the Purdy mine was shipped to Concord Mica Corporation, Concord, New Hampshire. Average calculated unit value of the muscovite scrap was $17.75 per ton, and of the phlogopite scrap, $12.80 per ton.

"About 500,000 pounds of the rough phlogopite, valued at nearly $85,000, that was exported, comprised small sizes and was mostly recovered from old waste dumps. It was shipped to the United States for making heavy, random-thickness splittings by mechanical means.

"Sheet mica exported in the form of rough, mine-run material, trimmed block, and splittings, amounted to 1,313,500 pounds valued at $761,901. Of this, 80 per cent by quantity and 90 per cent by value was consigned to the United States; 6 per cent by both quantity and value went to the United Kingdom; and 13 per cent by quantity and 3 per cent by value was shipped to Mexico for making into splittings.

"In general, Canadian phlogopite deposits tend to be of an erratic, impersistent, and pockety character, and this factor makes underground mining difficult and expensive and for the most part precludes any sustained, systematic attempt to develop ore-bodies. Only in comparatively few instances have workings been carried to depths greater than 100 feet, a great part of the production having been derived from a large number of small, scattered, and intermittently operated surface pits. Reserves, however, are probably sufficient to maintain output at present levels for a considerable period.

"The larger producers of phlogopite operate their own mica shops, and sell direct to the trade, but a substantial volume of business is done also by dealers who purchase small lots of mine-run or trimmed block from small operators and grade, trim, or split the material for sale. Most of the splitting work is farmed out in small rural communities and is done on a piece-work basis.

"Madagascar, the other chief source of phlogopite, started to produce on an important scale around 1920, and since then has had an annual output of sheet mica about equal to that of Canada. Ceylon, Korea, Tanganyika, and Portuguese East Africa have also furnished small amounts of phlogopite, and a few years ago development of deposits in Mexico was commenced. Recently, the discovery of occurrences in the Northern Territory of Australia was reported.

"Muscovite mica is widely distributed, and many countries produce small quantities. India has long been the chief source of supply, and production there since 1942 has exceeded all previous records. Indian "ruby" muscovite, obtained from Bihar Province, is the world standard for exacting electrical uses, particularly for magneto and radio condenser films. India also supplies green muscovite, which is produced in Madras. In 1942 and 1943, the United States obtained about 70 per cent of its imports of strategic mica from India, where more than 100,000 persons were employed in the industry.

"Brazil also produces muscovite of ruby quality, and is second to India as a source of supply. Brazilian mica exports in 1943 totalled $1\frac{3}{4}$ million pounds.

"The United States holds third position as a producer of muscovite, the chief producing States being North Carolina, South Dakota, New Hampshire, and Connecticut. American production has increased substantially during the present war, largely as a result of assistance furnished to operators by the Government, coupled with enhanced prices offered for official purchase.

"Mica possesses a combination of properties that make it of outstanding value as an insulating material in all forms of electrical equipment and appliances, and almost the entire production of sheet muscovite and phlogopite is used in the electrical industry.

"Vermiculite, a variety of mica which has the unique property of swelling enormously into exceedingly light-weight, accordion-like form when heated, 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. In the form of loose-fill, it is a valuable insulator in the walls and roofs of dwellings, industrial buildings, furnaces, ovens, and refrigerators, in which fields it competes with rock and glass wool. Combined with various bonding materials, it is fabricated into pipe covering, insulating blocks, plasters, tiles, and structural roof slabs, and it is also widely employed as a light-weight aggregate in concrete, including cast slabs for pre-fabricated houses. Such slabs are also being used for the decks, roofs, and fire-walls of ships and buildings subject to bombing attack. Plastic insulation made with vermiculite is used as a heat insulator on the outside of boilers and refinery columns, and as a sound-proofing agent in automobiles and aircraft.

"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.

Prices: "**Phlogopite.**—Dealers' quotations for the various trade sizes in 1944 were approximately as shown below, according to quality as based on colour, hardness, and splitting properties:

Knife-trimmed Block or Sheet

Size, Inches	Per Pound
1 x 1 and 1 x 2	$0·35 to $0·50
1 x 3	0·50 to 0·60
2 x 3	0·70 to 0·80
2 x 4	0·95 to 1·00
3 x 5	1·50 to 2·00
4 x 6	1·75 to 2·50
5 x 8	2·75 to 3·25

Splittings

Size, Inches	Per Pound
1 x 1	$0·75
1 x 2	0·85

(Splittings prices in U.S. funds)

"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, had an average declared value of $12.80 per short ton, in carload lots.

"**Muscovite.**—Most of the small domestic consumption of muscovite is in the form of splittings for micanite manufacture, prepared films for condensers, and punched disks, segments, and washers, nearly all 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 1943 remained in effect throughout 1944 and was as follows, quotations being in Canadian funds, f.o.b. shipping point:

Size of Grade	No. 1 Quality	No. 2 Quality	No. 3 Quality
inches	$	$	$
1 x 1	1·54	0·66	0·33
$1\frac{1}{4}$ x $1\frac{1}{4}$	2·09	0·88	0·44
$1\frac{1}{2}$ 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.

"The above schedule of sizes was set up specifically to meet Canadian conditions, more especially the output of the Purdy mine, and does not conform to any regular trade standards. With the termination of Colonial Mica Corporation's buying program in Canada on December 31, 1944, Purdy Mica Mines went over to the Indian standard system of grading, and established a new scale of prices for subsequent sales.

"Montana cleaned and screened crude vermiculite was quoted in 1944 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 averaged $75 to $80 a ton f.o.b. plant. Value of sales in the United States in 1943 is estimated at about $3,250,000."

Table 272.—Principal Statistics of the Mica Mining Industry in Canada, 1943 and 1944

—		1943	1944		
		Canada (*)	Quebec	Ontario	**Canada(*)**
Number of firms or operators		(b) 78	49	19	(a) 70
Capital employed	$	458,402	(c)	(c)	(c)
Number of employees—On salary		39	6	16	22
On wages		391	138	240	378
Total		430	144	256	400
Salaries and wages—Salaries	$	57,307	8,328	31,259	39,587
Wages	$	300,685	115,094	205,116	320,210
Total	$	357,992	123,422	236,375	359,797
Selling value of products (gross)	$	553,856	178,899	646,745	841,026
Cost of fuel and electricity	$	24,757	14,627	8,959	23,586
Cost of process supplies used	$	29,638	20,928	12,110	33,038
Selling value of products (net)	$	499,461	143,344	625,676	784,402

(*) 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 1944.
(a) Includes 68 producing.
(b) Includes 71 producing.
(c) Not recorded in 1944.

Table 273.—Number of Wage-Earners on Payroll or Time Record on the Last Day of Each Month or Nearest Work Day, 1943 and 1944

Month	1943				1944			
	Mine		Shop(*)		Mine		Shop(*)	
	Surface	Underground	Male	Female	Surface	Underground	Male	Female
January	94	40	55	68	72	55	65	241
February	84	39	53	85	(†) 77	63	65	228
March	100	36	72	103	(†) 75	70	64	210
April	107	33	79	113	(†) 72	75	59	202
May	114	29	61	106	(†) 71	64	64	160
June	163	29	80	122	73	72	65	155
July	156	23	66	159	78	79	65	151
August	138	27	64	157	66	74	57	186
September	132	35	56	133	64	72	48	179
October	129	37	62	267	69	68	41	128
November	102	31	64	312	73	63	38	90
December	104	30	60	282	76	60	32	79
Average	**130**	**33**	**69**	**159**	**80**	**68**	**59**	**171**

(*) Includes outside workers.
(†) Includes one female.

PEAT INDUSTRY

The Canadian peat industry comprises both firms producing peat as a fuel and peat moss and humus for various other purposes. During 1944 production of peat fuel totalled 644 short tons valued at $5,397 compared with 782 tons worth $7,000 in 1943. Of the 1944 output 444 tons valued at $3,597 originated in the province of Quebec and 200 tons at $1,800 in Ontario.

Commercial production (shipments) of peat moss in Canada during 1944 totalled 80,446 short tons valued at $1,869,553 (less cost of containers but including resale of purchased moss) compared with an output of 64,360 tons worth $1,461,422 in 1943. Included in the 1944 production were 2,000 tons from New Brunswick bogs, 19,033 tons from Quebec, 12,491 tons from Ontario, 1,128 tons from Manitoba and 45,794 tons from British Columbia. Total Canadian production of moss in 1944, according to grade, were 27,558 tons valued at $559,000 for horticultural use; 204 tons at $5,164 as insulation; 40,739 tons worth $1,005,045 as poultry and stable litter; 8,972 tons at $250,480 for metallurgical purposes and 2,973 tons valued at $49,864 unspecified. Included in the tonnage classified as unspecified was a considerable quantity of humus utilized in the manufacture of fertilizer and as a soil conditioner. It is estimated that the total shipments as reported for 1944 contained resales of purchased moss approximating 17,446 tons worth $315,553. Products were marketed in the form of bales, bags, pads and fertilizer manufactures. The value of packing material or containers totalled $288,426. Canadian moss sold for metallurgical purposes was used 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 39 in 1944 compared with 44 in 1943. In 1944 the industry distributed $1,154,009 in salaries and wages to 1,183 employees, 167 of whom were females. The net value of production was estimated at $1,780,000 as against $1,384,770 in 1943 and $1,031,211 in 1942.

The following information relating to peat is from a report prepared by the Bureau of Mines, Ottawa:—

"Peat is the name given to the material produced by the incomplete decomposition of vegetable matter either in water or in the presence of water, under such conditions that 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 and generally speaking, occurs in two distinct forms—humified, or fuel peat, and unhumified, or moss peat.

"Peat moss is the dead moss of the sphagnum plant. Its chief value lies in its ability to absorb and hold up to 25 times its own weight of liquids and gases. It is used as a bedding litter for animals and as a filler for fertilizers. Because of its elasticity and low heat conductivity, it is also used for insulating and sound-proofing and as a packing material.

"The Canadian production of peat moss is practically all exported to the United States for use as horticultural moss, poultry and stable litter.

"Large quantitites of peat were produced in Denmark, Sewden, Holland, Germany, and Russia prior to the war, but no recent production figures are available.

"Price of peat moss varies from $17.00 to $42.50 per ton according to location; the average price for the Canadian production in 1944 being about $24.50 per ton.

"Small amounts of peat fuel have been produced intermittently in Ontario and Quebec. In 1944, machine peat fuel was produced by four operators in Quebec. The total production in Canada was 644 tons valued at $5,397, the greater part of which came from the property at St. Bonaventure, Yamaska county, Quebec. In Ontario a small amount of peat fuel was made at Gads Hill near Stratford."

Table 274.—Principal Statistics of the Peat Industry in Canada, 1943 and 1944

—		1943	1944
Number of firms		(a) 44	(b) 39
Number of plants or bogs		44	39
Capital employed	$	2,477,287	(c)
Number of employees—On salary		64	73
On wages		948	1,110
Total		1,012	1,183
Salaries and wages—Salaries	$	119,156	145,653
Wages	$	881,192	1,008,356
Total	$	1,000,348	1,154,009
Selling value of products (gross)	$	1,692,444	2,163,376
Cost of fuel and electricity	$	35,118	48,423
Process supplies used	$	48,534	46,527
Cost of containers or packing	$	224,022	288,426
Selling value of products (net)	$	1,384,770	1,780,000

(a) Includes 12 producing fuel.
(b) Includes 6 producing fuel.
(c) Data not collected in 1944.

Table 275.—Number of Firms, Employees, Salaries and Wages, and Peat (Moss and Fuel) Sold or Used, by Provinces, 1943 and 1944

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 — As fuel	Production: Tons of peat sold or used — Moss	Production: Value (gross)
			$	$			$ (**)
1943—							
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 (a)	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**	(b) **782**	**64,360**	**1,692,444**
1944—							
Quebec	18	282	235,848	118,094	444	19,033	363,321
Ontario	6	173	169,017	65,769	200	12,491	146,620
Manitoba (c)	3	129	90,802	41,320	....	3,128	105,878
British Columbia	12	599	658,342	158,193	....	45,794	1,259,131
Canada	**39**	**1,183**	**1,154,009**	**383,376**	(d) **644**	**80,446**	**1,874,950**

(a) Contains data for 2 firms in New Brunswick and 1 in Alberta.
(b) Includes 112 tons used by producer.
(**) Includes cost of containers.
(c) Includes 2 firms in New Brunswick.
(d) Includes 38 tons used by producer.

Table 276.—Wage-Earners, by Months, 1942, 1943 and 1944

Month	1942 Total	1943 Total	1944 Bog Male	1944 Bog Female	1944 Dressing Plant Male	1944 Dressing Plant Female
January	**761**	**737**	254	16	250	36
February	**862**	**733**	289	19	218	41
March	**850**	**696**	285	14	262	31
April	**881**	**582**	330	6	243	16
May	**1,038**	**842**	751	74	234	33
June	**1,405**	**1,275**	1,338	437	231	13
July	**2,775**	**1,349**	1,787	504	252	32
August	**2,297**	**1,570**	1,370	246	264	26
September	**1,212**	**1,212**	807	79	325	30
October	**1,110**	**838**	543	11	290	20
November	**950**	**801**	428	2	258	20
December	**784**	**557**	299	2	243	34

Table 277.—Peat Fuel Produced in Canada, 1928-1944

Year	Short 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
1944	644	5,397

NOTE.—For information of a technical nature, please refer to report No. 614 "Facts About Peat" issued by the Bureau of Mines, Ottawa.

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Table 278.—Production (Shipments) of Peat Fuel and Peat Moss in Canada, by Uses and Provinces, 1943 and 1944

Province	Fuel		Moss											
			Horticulture		Insulation		Poultry and stable litter		Metallurgy		Other uses		**Total Moss**	
	Tons	$	Tons	$	Tons	$	Tons	$	Tons	$	Tons	$	**Tons**	**$ (*)**
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	2,264	78,138	....	....	....	....	**3,087**	**101,112**
British Columbia	....	....	8,850	209,877	....	....	13,799	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**
1944														
Quebec	444	3,597	6,318	118,128	204	5,164	12,457	231,081	....	....	54	5,351	**19,033**	**359,724**
Ontario	200	1,800	7,432	64,847	....	....	2,399	57,338	....	....	2,660	22,635	**12,491**	**144,820**
Manitoba and New Brunswick	....	....	978	35,359	....	....	2,112	69,688	....	....	38	831	**3,128**	**105,878**
British Columbia	....	....	12,830	340,666	....	....	23,771	646,938	8,972	250,480	221	21,047	**45,794**	**1,259,131**
Total	**644**	**5,397**	**27,558**	**559,000**	**204**	**5,164**	**40,739**	**1,005,045**	**8,972**	**250,480**	**2,973**	**49,864**	**†80,446**	**1,869,553**

(*) Less cost of containers which were valued at $224,022 in 1943 and $288,426 in 1944.

NOTE.—Data relating to exports of peat moss from Canada were not shown separately in Canadian trade reports prior to 1944; exports of peat moss during 1944 totalled 63,944 short tons valued at $2,105,370.

(†) The total of sales for 1944 are not exactly comparable with those for 1943 as the data shown for 1944 are excessively high due to certain duplication arising from the inclusion, in some instances in B.C. producers' reports, of quantities of moss purchased during the year from other moss producers. It is estimated that Canadian sales in 1944, less resale of purchased moss, totalled 63,000 tons valued at $1,554,000.

Table 279.—Production of Peat Moss in Canada 1941-1944

Year	Short Tons	$
1941	14,345	390,509
1942	28,520	658,771
1943	64,360	1,461,422
1944	(†) 80,446	1,869,553

Prior to 1941 data relating to production of peat moss were included with those of manufactures.

Note.—The weight of peat moss shipped varies greatly depending on the moisture content. Weight is used as a unit of measure of production (shipments) owing to the fact that Canadian moss is shipped in various forms, including bales, bags, pads etc., and at present there is no general standardization in Canada as to size of these products. (†) See footnote to preceding table.

THE SALT INDUSTRY

Production of common salt or natural sodium chloride in Canada during 1944 totalled 695,217 short tons valued at $4,074,021 compared with 687,686 short tons worth $4,379,378 in 1943. The quantity produced in 1944 was the greatest ever realized by the Canadian salt industry and its value was only surpassed by that of 1943. The mineral in 1944 was produced in Nova Scotia, Ontario, Manitoba and Alberta, and of the total production Ontario contributed 603,806 short tons or 86·9 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 of rock salt deposits.

Of the total salt produced in 1944, there were 370,199 short tons or 53 per cent consumed directly by the producers in the manufacture of caustic soda and other chemicals. Producers' sales of other salt in 1944 included 93,776 short tons of table and dairy grades; 172,275 short tons of common fine, and 55,476 short tons of common coarse. The balance, as shipped by the producers, consisted of various grades, including salt for agriculture and for highway maintenance.

The number of Canadian firms reporting primary salt production in 1944 totalled 8 and plants numbered 9. Employees numbered 710, including 119 females. Salaries and wages amounted to $1,302,143; $652,126 were expended for fuel and electricity, and $134,235 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 close of 1944 totalled 11,476,121 short tons valued at $66,367,860. Statistics relating to world production of salt have not been available since 1938. In that year the world production was estimated at 32,000,000 long tons, of which the British Empire contributed 5,200,000 long tons.

Canadian exports of salt in 1944 totalled 3,182 short tons valued at $80,672; imports during the same period amounted to 147,282 short tons worth $847,057.

The following information pertaining to recent developments in the salt industry 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. . . . To obtain further information on this structure the Nova Scotia Department of Mines undertook a drilling campaign in 1943. The results of the drilling gave ample evidence of huge deposits of salt in the district. Maritime Industries Limited, a subsidiary of Standard Chemical Company, Limited, was organized early in 1945 to establish a plant near Amherst for the production of salt from the salt beds in this area.

"Lion Oil Refining Company, of Arkansas State, U.S.A., did some drilling for oil during the summer of 1944 near Mabou, Inverness county, Cape Breton, Nova Scotia. One hole drilled about 7,000 feet proved the existence of several beds of rock salt. The company holds a large acreage in Inverness county and was carrying on geological investigations in this area.

"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. . . . There are many millions of tons of salt in this basin available for future development.

"An important discovery of salt was made in 1945, 14 miles south of Vermilion, Alberta. The strike was made at a depth of 3,400 feet, and the bed has a thickness of 400 feet. The Waterways salt bed is at a depth of 700 feet with a thickness of 200 feet. Natural gas, which is available at Vermilion, will prove of importance in the development of this new bed."

According to Canadian Chemistry and Process Industries (Toronto), prices for the several grades of salt were as follows in 1944: specially purified (99·9 per cent NaCl) 94 cents per 100 pound lot; industrial fine, in bulk car lots f.o.b. plant, \$6.53 per ton; and industrial coarse \$10.63 per ton.

Table 280.—Production of Salt in Canada, by Grades, 1943 and 1944

—	1943			1944		
	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	100,562	99,706	1,823,446	94,478	93,776	1,847,320
Common, fine	164,658	167,547	1,074,229	173,564	172,275	1,124,148
Common, coarse	68,106	70,883	451,462	55,969	55,476	479,056
Highway salt	269	269	(*) 1,468	293	293	(*) 2,124
Land salt	132	157	1,223	108	98	826
Other grades	3,044	2,979	43,208	2,980	3,100	45,052
Brine for chemical works (salt equivalent sold or used)(†)	346,145	346,145	984,342	(*) 370,199	370,199	(*) 575,495
Total	**682,916**	**687,686**	**4,379,378**	**697,591**	**695,217**	**4,074,021**
Value of containers	....	....	809,250	....	....	712,063
Grand Total	....	....	**5,188,628**	....	....	**4,786,084**

(*) Value partly estimated.
(†) Including dry salt used by producers for manufacture of chemicals.

Table 281.—Production of Salt, by Provinces(*), 1932-1944

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	47,865	216,401	407,701	1,539,599	3,391	43,465	....	....
1938	44,950	194,759	388,130	1,657,140	2,929	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	2,512,166	13,051	115,367	16,617	260,905
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
1944	38,809	281,482	603,806	2,906,117	27,267	488,776	25,335	397,646

(*) In addition, Saskatchewan produced 231 tons valued at \$4,510 in 1933, 452 tons at \$8,703 in 1934, and 101 tons at \$2,046 in 1935.

Table 282.—Salt Produced for Chemical Purposes(*), 1928-1944

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	1937	205,149	45
1929	168,327	51	1938	170,938	39
1930	114,737	42	1939	187,958	44
1931	97,958	38	1940	224,009	48
1932	96,242	37	1941	258,711	46
1933	104,740	37	1942	327,548	50
1934	124,132	39	1943	346,145	50
1935	145,433	40	1944	370,199	53
1936	165,882	42			

(*) Used in the manufacture of chemicals by producers of salt.

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 byproduct by this company.

Table 283.—Production in Canada, Imports, Exports and Consumption of Salt, 1943 and 1944

—	1943		1944	
	Tons	Value	Tons	Value
		$		$
Production	687,686	4,379,378	695,217	4,074,021
Imports—				
Salt, for the use of the sea or gulf fisheries	21,037	161,255	31,458	173,123
Salt, in bulk, n.o.p.	47,687	245,913	91,358	461,953
Salt, n.o.p., in bags, barrels, etc.	16,064	181,940	24,466	211,981
Total	**84,788**	**589,108**	**147,282**	**847,057**
Exports	8,061	118,174	3,182	80,672
Apparent consumption of salt	764,413	4,850,312	839,317	4,840,406

Table 284.—Available Statistics on Consumption of Salt, in Specified Canadian Industries, 1943 and 1944 (*)

Industry	1943		1944	
	Quantity used	Cost at works	Quantity used	Cost at works
	Pounds	$	Pounds	$
Fish canning and curing (factories only)	48,349,100	528,320	46,592,800	536,865
Slaughtering and meat packing	120,899,226	859,676	138,042,530	943,941
Acids, alkalies and salts—Brine (salt content) and dry salt	756,465,273	933,623	677,551,896	926,845
Soaps and cleaning preparations	3,864,220	19,203	3,591,531	20,858
Dyeing, cleaning and laundry work	6,234,358	56,024	6,915,387	63,612
Dyeing and finishing of textiles	7,611,943	33,834	3,405,703	18,901
Artificial ice	549,990	4,516	687,200	5,419
Abrasives—Artificial	820,000	4,793	686,000	3,858
Waterworks	4,821,900	(a)	(b) 5,000,000	(a)
Leather tanneries	16,859,409	88,867	18,178,471	98,314
Pulp and paper mills	28,546,000	136,642	30,458,000	150,030
Stock and poultry foods	13,386,000	106,991	22,516,000	182,653
Bread and other bakery products	16,978,891	199,602	16,956,443	208,371
Fruit and vegetable preparations	11,599,260	83,370	18,166,054	128,640
Biscuits, confectionery, etc.	2,158,560	23,103	2,207,959	22,352
Foods, breakfast	3,024,751	18,821	1,654,457	14,185
Sausage and sausage casings	612,884	9,097	608,466	8,784
Ice cream industry	393,817	9,806	306,095	2,278
Breweries	701,867	6,744	800,790	6,894
Malt and malt products	305,185	1,729	331,830	1,963
Macaroni, vermicelli, etc.	136,203	1,447	96,572	1,059
Ice cream cones	8,460	78	8,132	58
Foods, miscellaneous, including coffee, tea, etc.	4,110,262	43,447	4,575,569	48,210
Butter and cheese	....	239,184	....	223,729
Starch and glucose	553,268	2,633	475,245	2,291
Animal oils and fats	428,000	2,184	340,000	1,723
Condensed milk	....	330	....	297
Cheese processed	299,809	5,339	270,467	4,037

(*) In addition, large quantities of salt are used on highways.
(a) Data not available.
(b) Estimated.

Table 285.—Principal Statistics of the Salt Industry in Canada, 1942-1944

—		1942	1943	1944
Number of firms (*)		9	9	9
Capital employed	$	5,687,511	5,490,594	(†)
Number of employees—On salary		134	135	146
On wages		541	547	564
Total		675	682	710
Salaries and wages—Salaries	$	337,050	366,555	397,113
Wages	$	777,524	856,454	905,030
Total	$	1,114,574	1,223,009	1,302,143
Selling value of products (gross)	$	4,604,003	5,188,628	4,786,084
Cost of purchased process materials	$	133,783	134,272	134,235
Cost of fuel and electricity	$	536,649	596,252	652,126
Value of containers	$	748,816	809,250	712,063
Net value of sales	$	3,184,755	3,648,854	3,287,660

(*) 6 in Ontario; 1 in Nova Scotia; 1 in Manitoba; 1 in Alberta.
(†) Data not available.

Table 286.—Wage-Earners, by Months, 1940-1944 (On last day of each month or nearest work day)

Month	1940	1941	1942	1943	1944 Male Surface	1944 Male Under-ground	1944 Female Surface
January	431	428	515	545	470	30	61
February	439	435	526	535	468	28	59
March	442	449	516	543	459	30	57
April	463	484	522	537	455	30	61
May	490	516	539	534	467	31	58
June	477	543	560	542	484	32	58
July	493	558	565	562	480	29	57
August	503	564	548	566	479	30	57
September	490	565	548	539	481	28	56
October	483	574	542	541	479	29	64
November	402	563	569	551	486	31	65
December	396	556	545	560	485	30	55
Average	**466**	**520**	**541**	**547**	**474**	**30**	**60**

POTASH

Complete statistics relating to world production of potash are not available 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 287.—Potash Salts Used in the Manufacture of Canadian Mixed Fertilizers, 1943 and 1944

—	1943 Tons	1943 Cost at works	1944 Tons	1944 Cost at works
		$		$
Nitrate of potash	....	....	16	1,198
Kainite and potash manure salts	23,753	447,619	17,735	415,722
Muriate of potash	51,500	1,969,055	52,863	2,080,766
Sulphate of potash	5,480	248,702	5,850	252,521

Table 288.—Sales of Potash Salts for Fertilizer Purposes, Other Than for the Manufacture of Mixed Fertilizers, Years Ended June 30, 1943 and 1944

—	1943	1944
	(short tons)	
Muriate of potash	5,376	4,924
Sulphate of potash	99	148

—	1943		1944	
		$		$
Imports—				
Kainite and German potash salts and German mineral potash.cwt.	423,091	148,203	351,434	133,527
Potash, muriate of, crude.cwt.	1,040,175	1,336,144	1,321,909	1,657,758
Potash sulphate of, crude.cwt.	88,218	159,549	87,380	158,164
Total potash and potassium compounds n.o.p.pound	6,796,047	636,654	6,175,771	640,024

TALC AND SOAPSTONE INDUSTRY

The value of crude and refined talc and soapstone sold by Canadian producers of these minerals totalled $357,249 in 1944 compared with $266,685 in 1943. Mine shipments of soapstone and talc reported in 1944 by operators in the province of Quebec amounted to 19,013 short tons valued at $204,127. Production of the higher grades of talc in Canada is confined chiefly to the province of Ontario, and in 1944 shipments totalling 13,584 tons worth $153,122 were made entirely from a deposit located near Madoc, Hastings county. In British Columbia, crude talc imported from the United States is treated in a mill at Vancouver. Canadian Wartime Metals Corporation discontinued operations on February 29, 1944 at its Lava Talc project located at the Red Mountain and Gold Dollar claims in the Golden mining division of British Columbia; approximately seven tons of sawn talc blocks were shipped to the United States for experimental purposes.

Imports of talc or soapstone into Canada during 1944 totalled 6,094 short tons valued at $130,603; this came entirely from the United States. Exports of talc from Canada in 1944 amounted to 11,920 short tons worth $157,178.

During 1944 there were 6 firms reported as active in the industry, 4 in the province of Quebec, 1 in Ontario and 1 in British Columbia. Employees numbered 113 and $133,883 were distributed in salaries and wages. Fuel and purchased electricity consumed were appraised at $27,642 and the cost of explosives and other process supplies used was reported at $40,523. The net value of sales in 1944 was estimated at $289,084 compared with $208,654 in 1943.

The following information is from a report prepared by the Bureau of Mines, Ottawa:

"Ontario supplies all of the prime white powdered talc produced, Quebec furnishing off-colour ground talc (in part made from soapstone waste), sawn dimension soapstone, and talc crayons. In recent years, the total output of ground talc of all grades has been about equally divided between these two provinces, with annual shipments averaging between 12,000 anfd 15,000 tons each.

"Canada is self-sufficient in respect to most of the grades of ground talc needed for its industrial requirements, and there is a considerable surplus for export. It also produces most of the sawn dimension soapstone and talc crayons used, but is dependent on imports, obtained mainly from the United States, for certain special qualities of ground talc demanded by the ceramic, paint, and cosmetic trades. Imports of such talc in 1942 and 1943 amounted to approximately one-third of the total domestic consumption of about 15,000 tons.

"Following the outbreak of war, a substantial demand for Canadian talc developed in the British market, to supply deficiencies caused by the cutting off of imports from France, Italy and

Norway. In 1943, all forms of talc, soapstone, and pyrophyllite were placed under strict control and allocation by the British Government, with all purchases and imports to be made for Ministry of Supply account.

"In Ontario, all the output comes from the Madoc area, in Hastings county, where production commenced some 40 years ago.

"In Quebec, 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 comes from the Thetford Mines area.

"Owing to the critical need for additional sources of massive, steatitic talc, investigations were made during 1943 and 1944 by Wartime Metals Corporation, a Crown company, of an occurrence of such material near Red Earth Creek in Kootenay Park, British Columbia, but it was decided that the recovery of usable material was too low to justify further work.

Samples of yellow steatite from a deposit at the base of Mt. Whymper, several miles south of the above occurrence, were forwarded to the United States for test, but the material proved to be too badly flawed to be usable.

"Ground talc has a wide variety of uses, but much the greater part of the output is employed in the paint, roofing, paper, rubber, and ceramic industries. It is used, also, in foundry facings, bleaching fillers for textiles, cosmetics and pharmaceuticals, soaps and cleansers, insecticides, polishes, plastics, and for rice polishing. Talc is also reported to be of value as a fertilizer.

"Ceramic uses for talc have shown the most noteworthy increase, and it is now a standard ingredient in floor and wall tile, electrical and other porcelains, porcelain enamels, dinnerware bodies, and refractories. For rubber, talc is employed mainly for the dusting of moulds and finished products. It is of value, also, as a body-reinforcing ingredient, to impart toughness and to increase tensile strength, particularly in cable insulation.

"The Canadian consumption of ground talc in 1943, as reported by users, totalled 17,201 tons, distribution, by industries, being as follows: paints, 34 per cent; roofing products, 23 per cent; rubber, 11 per cent; pulp and paper, 9 per cent; cosmetic and pharmaceutical preparations, 7 per cent; insecticides, 5 per cent; soaps and cleansers, 3 per cent; miscellaneous, 8 per cent. Consumption of soapstone furnace blocks by Canadian pulp and paper mills in the same year was 1,076 tons, equivalent to 11,956 cubic feet.

"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 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 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.

"Soapstone, a soft greenish rock containing a high percentage of talc, is used extensively in the form of sawn blocks and bricks for lining the alkali recovery furnaces and kilns of kraft pulp and paper mills. It is also used for brick and slab liners for fireboxes, and ovens, and for switchboard panels, laboratory benches, etc. Considerable quantities of soapstone quarry and sawing waste are ground and marketed as low-grade talc to the rubber, roofing, foundry, and other trades.

"Compact, massive talc, sawn into square pencils and slices, is an important material for steelmakers' crayons. Recent shortages of suitable raw material have led to the introduction of extruded crayons compounded of ground talc with a suitable binder.

"Ground talc has a wide price range. 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 users 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 roofing, rubber, and paper use, sold in 1944 for \$8 to \$11.75 a ton, according to fineness. White talc from Madoc, Ontario, was quoted at \$8 to \$10 for the coarser grades, \$12 to \$18 for finer mesh sizes, and \$44 for minus 400-mesh material.

"Canadian ground talc or soapstone exported to the United States is dutiable at 17½ per cent ad valorem on material valued at not over \$14 a long ton, and at 35 per cent on material valued at over \$14 a ton. The duty on crude material is one-quarter cent a pound, whereas cut soapstone or talc, in the form of bricks, crayons, blanks, etc., is dutiable at one cent a pound. Talc, ground or unground, enters Canada under the British Preferential tariff at 15 per cent ad valorem, and under the Intermediate and General tariff at 25 per cent; imports from the United States are dutiable at 20 per cent.

"**Pyrophyllite.**—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. 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.

"Commerical deposits are relatively scarce. Most of the recorded world production comes from North Carolina, where the industry has expanded rapidly in recent years. Sales of pyrophyllite in the United States in 1944 comprised 5,683 tons of crude valued at \$52,343, and 60,560 tons of ground valued at \$504,739, a total of 66,243 tons valued at \$557,082. A new important use for the mineral is as a carrier in DDT personnel insecticidal dusts, and in agricultural insecticides generally.

"In Canada, some rather low-grade, sericitic pyrophyllite occurs at Kyuqot Sound on the west coast of Vancouver Island. A small quantity was shipped from these deposits about 30 years ago for use in refractories and cleanser products.

"Important deposits are known in Newfoundland, and are owned and operated by Industrial Minerals Company of Newfoundland Limited, Box 435, St. John's, which shipped about 500 tons of ground material in 1942 and 1943. In 1944, shipments declined to 140 tons.

"In 1944, pyrophyllite was quoted at \$10 to \$13 a ton, f.o.b. North Carolina mills, for 200-mesh and 325-mesh material, respectively.

Table 289.—Production (Sales) in Canada of Talc and Soapstone(†), 1942-1944

—	1942		1943		1944	
	Quantity	Value	Quantity	Value	Quantity	Value
	tons	\$	tons	\$	tons	\$
Soapstone (Quebec) (*)	14,369	136,529	14,204	135,469	19,013	204,127
Talc (Ontario)	15,499	174,295	11,959	131,216	13,584	153,122
Total Canada	**29,868**	**310,824**	**26,163**	**266,685**	**32,597**	**357,249**

(*) Shipments by some firms usually include a considerable quantity of material classified as talc.
(†) Includes both crude and milled grades.

Table 290.—Production of Talc and Soapstone in Canada, 1930-1944

Year	Value	Year	Value
	$		$
1930	186,216	1938	144,848
1931	157,083	1939	170,066
1932	159,038	1940	229,639
1933	190,836	1941	360,809
1934	180,777	1942	310,824
1935	171,532	1943	266,685
1936	177,270	1944	357,249
1937	163,814		

Production of talc and soapstone in Canada from 1886 to the end of 1944 totalled 610,429 short tons valued at $5,752,039. The largest annual tonnage produced during these years was 34,632 in 1941, also, the greatest annual value was $360,809 in 1941.

Table 291.—Consumption of Talc in Canada, by Industries, as Reported in the Annual Census of Manufactures, 1943 and 1944

Industry	1943		1944	
	Short tons	Cost at works	Short tons	Cost at work
		$		$
Rubber industry	1,839	34,243	2,507	46,780
Electrical apparatus	356	9,891	200	5,273
Paints	6,601	174,757	6,212	201,236
Soaps and cleansing preparations	550	10,556	608	16,238
Toilet preparations	565	24,868	1,451	80,566
Polishes	25	496	17	408
Products from imported clays	354	5,586	535	8,564
Prepared roofing	3,859	42,519	4,629	51,204
Pulp and paper	1,469	25,178	5,202	96,395

Table 292.—Imports and Exports of Talc, 1943 and 1944

—	1943		1944	
	Pounds	$	Pounds	$
IMPORTS—				
Talc or soapstone	12,899,800	130,813	12,187,100	130,603
EXPORTS—				
Talc	22,729,200	146,516	23,840,000	157,178

Table 293.—Prinicpal Statistics of the Talc and Soapstone Industry, in Canada, 1942-1944

—		1942	1943	1944
Number of firms		(a) 10	(b) 8	(c) 6
Capital employed	$	567,665	576,691	(d)
Number of employees—On salary		8	10	14
On wages		107	80	99
Total		115	90	113
Salaries and wages—Salaries	$	22,729	23,794	29,532
Wages	$	90,872	77,925	104,351
Total	$	113,601	101,719	133,883
Selling value of products (Gross)	$	310,824	266,685	357,249
Cost of fuel and purchased electricity	$	25,905	24,104	27,642
Cost of explosives and other process supplies	$	33,208	33,927	40,523
Selling value of products (net)	$	251,711	208,654	289,084

(a) 7 firms in Quebec and 3 in Ontario; data for 1 firm in Quebec, other than sales not available.
(b) 5 firms in Quebec, 2 in Ontario and 1 in British Columbia.
(c) 4 firms in Quebec, 1 in Ontario and 1 in British Columbia.
(d) Data not collected in 1944.

Table 294.—Wage-Earners(*), by Months, 1943 and 1944

Month	Total 1943	1944		
		Surface	Under-ground	Mill
January	84	47	22	21
February	80	41	25	21
March	76	46	20	24
April	71	66	19	21
May	76	47	18	25
June	78	74	18	26
July	68	60	16	26
August	77	59	18	25
September	75	49	15	34
October	79	52	15	31
November	93	55	17	33
December	88	35	14	36

(*) 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 Industrial or Non-Metallic Minerals Industry. Minerals or primary mineral products produced (or deposits developed) by this industry during 1944 included barite, brucite, diatomite, fluorspar, graphite, grindstones, magnesitic-dolomite (crude and refined), mineral waters, phosphate, silica brick, sodium carbonate and sodium sulphate. 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 1944 was 50; employees numbered 865 and salaries and wages paid amounted to $1,500,250. The cost of fuel, purchased electricity, containers and process supplies used during the year was reported at $1,188,860, and the gross value of production totalled $3,986,579 compared with $3,476,707 in 1943.

"**Barite.**—Production of barite in Canada in 1944 was nearly five times greater than in 1943, the previous record year, and exceeded by a considerable margin the entire output from 1885 to the end of 1943. Sales by primary producers comprised both crude ore and ground material.

"For the first time in years crude barite was in demand for export. Shortages in the United States of crude lump for barium chemicals and lithopone, and of drilling, glass, and pigment grades, served to direct attention to Canada as a source of supply. The shortages were first in evidence in 1943 and were accentuated throughout 1944 by increased military demands for barite for use in camouflage paints and by the labour scarcity. As a result, contracts were negotiated by the U.S. War Production Board in 1944 for shipments of 60,000 tons of Nova Scotia barite to American consumers, 50,000 tons of which was to be crude ore and 10.000 tons ground material, the order to be completed by February, 1945. A substantial domestic market for crude ore also developed for use as permanent ballast in maintenance ships being built in West Coast yards, and nearly 12,000 tons was supplied for this purpose. Most of the ground barite produced was exported for use in oil well drilling in Trinidad, Venezuela, and other South American countries. In April, the U.S. War Production Board placed barite in the group of minerals the supply of which was insufficient to satisfy war plus essential industrial demands, and it was moved up into Group I and continued there for the remainder of the year.

"For the past several years the production of barite in Canada has been confined to Nova Scotia and British Columbia, the source of supply in Nova Scotia being the deposit of Canadian Industrial Minerals, Limited, at Walton, in Hants county. In British Columbia, output in 1944 came from a property at Parson, 25 miles south of Golden, that was operated by R. A. Thrall.

"The fluorspar ores of the Madoc area, Ontario, and of a deposit at Lake Ainslie in Nova Scotia, contain important amounts of barite. The latter deposit was operated in 1942 and 1943 and a small tonnage of hand-picked barite has been stockpiled. Tests by the Bureau of Mines, Ottawa, on ores from the Madoc and Lake Ainslie areas indicate the possibility of recovering a marketable barite product from them by flotation. Canadian Industrial Minerals, Limited did some exploratory work on the Lake Ainslie property in 1944, and on another barite deposit near Brookfield, Colchester county, Nova Scotia, under option agreements.

"World production of barite prior to the war was close to 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.

"Crude lump barite is used in the manufacture of lithopone, an important white pigment and filler material, and in a wide range of barium chemicals. For these trades, barite is required to contain 95 to 96 per cent $BaSO_4$, and not more than 3 per cent SiO_2 and 1 per cent Fe_2O_3. The ore should be furnished crushed to 1½-inch size. There is little manufacture of the above products in Canada, but they are produced on a large scale in the United States, where, in 1944, 34 per cent of the total barite used was employed for such purposes.

"For most other industrial uses barite is employed in finely ground form, 325 mesh being the general specification. The material should be of good white colour, the best grades being obtained by wet-grinding, bleaching with acid, and water-floating. Some off-colour material is used for less exacting purposes. Content of $BaSO_4$ is usually required to be not less than 95 per cent. Chief uses for ground barite are as a heavy, inert filler or loader in rubber, asbestos products, paper, linoleum and oilcloth, textiles, leather, and plastics. It is one of the leading pigments and extenders in paints, and in recent years has become of increasing importance as a heavy weighting medium in oil-well drilling muds, to overcome gas pressures. Colour is immaterial in barite for the last-named use, the requirements for which are a minimum specific gravity of 4·25 (corresponding to a $BaSO_4$ content of 93 per cent) and absence of soluble salts. The glass trade also uses considerable barite as a batch fluxing ingredient for moulded flint glass. For this purpose, it should contain not less than 96 per cent $BaSO_4$, under 3 per cent moisture, and not more than 0·4 per cent iron oxide (Fe_2O_3), with a fineness in the range of 20 to 190 mesh.

"Consumption of ground and crushed barite in Canada in 1943, as reported by users, was 3,732 tons, distributed among the following trades: paint, 2,760 tons; rubber, 434 tons; glass, 290 tons; linoleum, 109 tons; wallpaper, 15 tons; miscellaneous, 124 tons. Shipments from Canadian mines for domestic use totalled 2,569 tons, which, plus imports of 1,686 tons, and less changes in consumers' stocks of 203 tons, showed an apparent total consumption of 4,052 tons.

"Distribution of the 510,000 tons of primary barite consumed in 1944 in the United States was as follows: oil-well drilling, 54 per cent; barium chemicals and lithopone, 34 per cent; fillers, loaders, and pigments, 7 per cent; glass, 5 per cent.

"Barium carbonate is the principal intermediate salt used in the manufacture of other barium chemicals. It is also employed to prevent the unsightly white efflorescence ("scumming") in bricks and other heavy clay products, and for case-hardening of steel. Important military uses for it, and for the nitrate, are in making green flares, tracers, incendiary bombs, shell primers, etc. Blanc fixe, or precipitated barium sulphate, is used in white paints, rubber, linoleum, and oilcloth. Barium chloride is used to purify salt brines for the manufacture of chlorine and sodium hydroxide; in making coatings for photographic paper; as a flux in the production of magnesium alloys; as an extender in titanium pigments; in colour lakes; in finishing white leather; and in the purification of beet sugar. Barium hydroxide, also, is used in the refining of sugar and of animal or vegetable oils; and the peroxide, in making hydrogen peroxide.

"Barium metal has only limited industrial applications. It is used as a wire coating to remove traces of gas in radio, vacuum, and thermionic tubes, and to coat steel balls in the rotating anodes of X-ray tubes. Alloys of barium with lead and calcium ("Frary" metal) are used for bearings; and nickel-barium alloys for corrosion-resistant sparkplug electrodes. Nickel coated with barium oxide can replace tungsten to advantage for the cathodes of the smaller types of electron tubes, giving a high yield of electrons per watt of heating energy.

"Of interest is the announcement made in 1944 by the Laprairie Company, 906 University Tower Building, Montreal, of a method of employing the intermediate compound, barium sulphide or "black ash", made by roasting barite with coal, as a substitute for barium carbonate to prevent scumming in bricks. The black ash is introduced into the pugging water in solution, and is stated to be three times as effective as the same weight of carbonate.

"Canadian quotations in 1944 for crude barite remained unchanged at around $7 per short ton, f.o.b. mines. Domestic ground white barite for pigment and filler use sold at $32 to $40 per ton, f.o.b. works, according to quality, whereas prime white imported was quoted at $50, and off-colour at $46. Ground off-colour domestic averaged around $12.80 per short ton, f.o.b. Atlantic port.

"In the United States, Georgia crude was quoted at $8.50 to $9 per long ton, f.o.b. mines. Missouri crude, which in the first quarter sold at $6.75 to $7.50, according to grade, rose to $8.25 to $8.50 in the latter part of the year. In the American market, crude barite is usually sold on a penalty-premium basis, a content of 95 per cent $BaSO_4$ and 1 per cent Fe_2O_3 being considered standard. A premium or penalty of 25 cents per short ton is set for each per cent of barium sulphate above or below 95 percent, and a similar premium or penalty for each 0·1 per cent of Fe_2O_3 below or above 1 per cent.

"The United States imposes a duty of $4 per ton on crude barite, and $7.50 per ton on ground or otherwise manufactured material. Barite enters Canada free under the British preferential tariff: imports from other countries pay 25 per cent ad valorem.

"Witherite (natural barium carbonate) is the only other barium mineral of commerce. Commercial deposits are rare and no occurrences of economic interest are known in Canada. Most of the world supply is derived from England." (Bureau of Mines, Ottawa)

Table 295.—Production of Barite in Canada, 1913-1944

Year	Short tons	$	Year	Short tons	$
1913	641	5,410	1927	56	1,268
1914	612	6,169	1928	127	2,847
1915	550	6,875	1929	105	2,341
1916	1,368	19,393	1930	66	1,484
1917	3,490	54,027	1931	16	363
1918	640	10,165	1932	...	...
1919	468	8,154	1933	20	60
1920	751	22,983	1939	323	3,639
1921	270	9,567	1940	338	4,819
1922	289	9,537	1941	6,890	74,416
1923	409	8,548	1942	19,667	188,144
1924	151	3,308	1943	24,474	279,253
1925	95	2,259	1944	118,719	1,023,696
1926	100	2,307			

Table 296.—Barite and Blanc Fixe Used by the Canadian Paints, Pigments and Varnishes Industry in Canada, 1931-1944

Year	Barite		Blanc Fixe (*)	
	Pounds	$	Pounds	$
1931	2,304,119	39,361	146,025	12,915
1932	2,064,303	35,138	23,353	817
1933	2,062,957	33,578	47,703	1,471
1934	2,393,330	44,690	93,918	2,481
1935	2,308,628	43,702	141,975	4,223
1936	2,533,275	41,687	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	49,059	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
1944	3,942,037	90,485	182,690	10,068

(*) Artificial barium sulphate.

Table 297.—Imports and Exports of Barite and Specified Commodities, 1943 and 1944

—	1943		1944	
	Pounds	$	Pounds	$
IMPORTS—				
Blanc fixe	345,536	16,694	549,220	22,686
Lithopone	17,754,879	857,507	18,999,905	932,787
Barite	3,372,500	43,239	3,648,600	47,913
EXPORTS—				
Barite	Data not shown separately in Trade Reports			

"**Corundum.**—As a result of circumstances arising from the war, there was a revival of activity in the production of corundum in Canada in 1944. It was the first recorded output of the mineral in the Dominion since 1921, and the five car lots of concentrate produced were obtained from the treatment of tailings at the Craigmont property in Renfrew county, Ontario. The concentrate was shipped to American Abrasive Company's plant in Westfield, Massachusetts, for grinding and for the preparation of fine powders and flour. Wartime Metals Corporation, of Montreal arranged to treat the tailings at the request of the United States Government, which has been encountering difficulties in obtaining supplies from the Transvaal in South Africa in sufficient quantities to meet the requirements. The 125,000 tons of tailings available at the Craigmont property are estimated to have a corundum content of about 3 per cent. A 200-ton gravity mill equipped with a magnetic separator was erected by Wartime Metals Corporation, close to the site of the old Craig mill early in 1944 and shipments of concentrate to Westfield were commenced in the autumn of that year.

"Corundum (Al_2O_3), the oxide of aluminium, usually occurs as bronze-coloured barrel-shaped crystals. It is fairly heavy, and has a hardness (Mohs' scale) of 9, being the hardest known mineral next to diamond (hardness 10).

"All of the Canadian production of corundum has come from a corundum-bearing belt of nepheline syenite that passes in a northeast direction throughout the southeast, northern, and central parts respectively, of Haliburton, Hastings, and Renfrew counties in Ontario, and about 82 per cent of the total output to date has come from the Craigmont property, the chief source of the remainder being the Burgess deposits, about 5 miles to the west. The belt is about 100 miles long and 6 miles wide and is the most northerly of three belts of syenites in which corundum is known to occur. The middle belt is in Methuen and Burleigh townships, Peterborough county, and the southern belt, 65 miles to the east, is in Frontenac county. A deposit of corundum in the French River area northeast of Georgian Bay was prospected in 1943, the results of which work indicated that the corundum content is much below commercial grade.

"As noted above, Canada produced a few carloads of corundum in 1944, but from 1901 when production was commenced until about 1915 the Dominion was the leading producer of the mineral, and from 1901 to 1918 inclusive, a total of 370,000 tons of ore was treated. From this, 19,000 tons of concentrate valued at $2,024,000 was shipped. The ore came mainly from numerous open cuts on the present Craigmont property, some of which are over 600 feet long and 250 feet wide. The workings, known as the Craig and Klondike cuts, are on the south and west slopes of Robillard Mountain. During the early part of this continuous period of operation the ore milled had a corundum content of 10 per cent, but that milled near the end of the operations had a content of only 4 per cent. A total of about 26,000 tons of mill tailings was re-treated during 1920 and 1921, from which 600 tons of concentrate valued at $80,500 was shipped.

"Canada imported only a small quantity of corundum in 1944. The imports included a small amount of flour corundum that was prepared at Westfield, Mass. Certain physical and structural qualities of the minute grains of natural corundum make it preferable to those of the artificial abrasive for the purposes for which it is used.

"Most of the world production of the mineral during the past 25 years has come from the Transvaal, Union of South Africa, from which an output of from 4,000 to 7,000 tons a year has been obtained since 1940, though production has been declining since 1942, the peak year. All of the output is exported, mainly to the United States. Production from Russia in recent years is said to have been large, but no statistics are available. Production from India and Madagascar has been intermittent. In the United States there was no production of corundum in 1944, but the erection of a mill is planned on a deposit in Gallatin county, Montana, from which a small annual output was maintained between 1902 and 1905. During 1943 and 1944 a careful re-examination was made of the known corundum deposits in the United States, most of which were last worked 40 to 50 years ago. As a result of these investigations some corundum was produced near Clover in South Carolina in 1943, but operations were discontinued in the same year.

"In the Transvaal, most of the output has been in the form of "Crystal" that occurs as loose crystals of corundum in shallow alluvial deposits or "paddocks" that are formed by the disintegration of corundiferos rock. The crystals are mined intermittently, mainly from small open cuts, by a large number of "diggers", and are washed on screens that are revolved by hanu. The deposits are small and are unevenly distributed over a wide area in the Zoutpansberg and Pietersburg districts of northern and eastern Transvaal. In the spring of 1944 a modernly equipped mill was erected at Pietersburg for the concentration of reef corundum, or plumasite, that occurs in veins of feldspathic dykes, somewhat similar to the Craigmont deposit in Canada. The mill is in steady production and the concentrate is exported.

"Until recently, corundum was used chiefly for the abrasive grit in grinding wheels required for special types of work. At present, however, most of the corundum used in the United States, which is by far the leading consumer, is in the form of very fine powder or flour for use in the grinding and polishing of high precision leases for naval and military optical instruments. The coarse corundum grain is used mainly in the manufacture of wheels for snagging the forgings and castings for tanks and other military equipment.

"Canadian concentrates should have a corundum content of at least 65 per cent, and preferably 70 per cent, or higher, and they should be as free as possible of magnetic material. South African corundum is marketed in the United States in accordance with Government (Transvaal) grading regulations, based on the alumina content and on screen-sized limits.

"The aforementioned "crystal" corundum of the Transvaal is produced at a much lower cost than it would be possible to produce corundum from any of the deposits on the North American continent. Apparently, however, supplies of this "crystal" corundum are becoming exhausted, or the widely scattered deposits are difficult to operate on an efficient basis. In any event, nearly 30 per cent of the total output of corundum from South Africa in 1944 was in the form of concentrate obtained from the treatment of reef corundum, or plumasite, whereas "crystal" corundum accounted for only 40 per cent of the output as compared with more than 90 per cent in 1940. If this is indicative of an eventual changeover to the production of concentrate the prospects for the successful development of Canadian deposits will be enhanced. In the post war years, however, natural corundum will again be in competition with artificial abrasives, the civilian uses of which are now restricted. Canadian output of corundum in 1944 totalled 173 tons valued at $17,830; this came entirely from Renfrew county, Ontario." (Bureau of Mines, Ottawa.)

Diamonds.—Diamonds are not produced in Canada and requirements for stones in the Dominion are supplied entirely by imports. In 1944 imports of black diamonds and bort for borers were appraised at $1,721,416 compared with $1,631,019 in 1943. Imports of unset white diamonds in 1944 were valued at $2,073,098 as against $1,407,044 in the preceding year.

The following information is from a review on Diamonds in 1944 as published (April 1945) by the Mining Journal, London:

"It is too early as yet to form any useful opinion as to the extent of world production of diamonds, but it is already sufficiently manifest that the downward trend from 1940 to 1943 was halted last year, and perhaps substantially reversed, consequent on the request of the United Nations to the Belgian Congo to double its output of crushing bort, and the reported shipments of over 10,000,000 carats last year. Although this will depend chiefly on the output of the big African producers, one feature of 1944 was the reports of larger production from other sources. For the first time the U.S.S.R. was reported to be in production, Tanganyika was found to be producing on a larger scale, whilst new deposits were reported from Goiaz and Mato Grosso in Brazil. The Japanese, too, are probably exploiting the small deposits in North Borneo to their fullest extent. . . . The tremendous increase in the use of the diamond for industrial purposes has received a very great impetus because of the war, but, as its unequalled advantages have been so widely appreciated in engineering of many kinds, it is unlikely that there will ever be a return to the position where the diamond is predominantly used for gem purposes only. Industrial diamonds have continued to be made available to the United Nations at a very low level by Diamond Corporation, the cheapest crushing bort actually being reduced to 2s 6d. a carat; at first sights in 1945 held in Kimberley, according to the Diamond News, prices were advanced by 5 per cent in some classes, and by 10 per cent in others.

Table 298.—World Production and Sales of Diamonds, 1937-1944

Year	Production	Sales	
	Metric carats	£ Sterling	
1937	9,614,024	9,151,205	
1938	11,619,971	3,673,934	
1939	12,485,318	5,865,000	
1940	14,289,525	6,144,314	
1941	9,088,014	7,414,420	Industrials .... 2,000,000 Cuttables 5,550,000
1942	9,258,734	10,694,671	Industrials .... 4,240,000 Cuttables 6,250,000
1943	8,140,000	20,500,000	Industrials .... 5,000,000 Cuttables 15,500,000
1944	15,000,000	17,000,000 (estimate)	

"**Diatomite.**—Production of diatomite in Canada has been insignificant and almost all the requirements are imported. Although deposits are numerous and widespread, they are, with few exceptions, small and the material is not suitable as a filter-aid, until recently the principal use. Owing, however, to the use of diatomite as a fertilizer dusting agent, a recent development, Canadian consumption in 1944 was more than double that of 1943, and tests are under way to determine the suitability of Canadian material for this new use.

"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 (geologically) fresh water origin, which is the most common in Canada, usually occurs as a grey or brown mud or peat, whereas the diatomite of Tertiary age is in dry and compact beds, and is very light in weight and whi§ to cream in colour.

"There are more than 400 known deposits of diatomite in Canada. These deposits are in the swamps and in the lake bottoms of northern Nova Scotia; in southern New Brunswick; in the Muskoka district, Ontario; and in various localities in British Columbia. The Tertiary fresh water deposits near Quesnel in the Cariboo district, British Columbia, are by far the largest known in Canada. They extend for many miles along the Fraser River, are compact, and up to 40 feet thick. At Digby Neck, Nova Scotia, is the largest known recent fresh water (swamp) deposit in Canada. All of the Canadian production of diatomite since 1939 has come from these and from the Fraser River localities, the two producers being G. Wightman, who operates the deposit at Digby Neck, and L. T. Fairey, of Vancouver, who has been obtaining his output from Lot 1122, on the west bank of the Fraser River, north of Quesnel. There has been no activity of consequence on the deposits in the Muskoka area for some time.

"Production in 1944 was 39 tons; and sales 13 tons valued at $437, compared with sales of 98 tons valued at $3,331 in 1943. Imports into Canada were 11,664 tons valued at $335,939, of which 73 per cent came from California, 23 per cent from Washington, and 4 per cent from Oregon. In 1943, imports were 5,623 tons valued at $184,012. Consumption in Canada was approximately 11,680 tons compared with about 5,700 tons in 1943.

"Prior to the war diatomite was produced in about 30 countries, and at present the United States, with about 20 operators, is by far the largest producer, having increased its output in 1944 to nearly 160,000 tons.

"Until recently between 70 and 80 per cent of the diatomite consumed in Canada was used in the form of filter-aids, mainly in the refining of cane sugar, but in 1944 only about 38 per cent was so used, and over 54 per cent was consumed as a dusting agent in ammonium nitrate fertilizers that are made for the Government by three companies, one in Welland, Ontario, one in Calgary, Alberta, and the other in Trail, British Columbia. The diatomite thus used is highly porous and when added to the nitrate it absorbs moisture which prevents it from caking and ensures even spreading. Specifications call for uncalcined material of 325 mesh and less than 5 per cent moisture. The remainder of the diatomite consumed was used chiefly for insulation and as a filler in the paint, chemical, paper, rubber, soap, and textile industries, and in silver polish bases.

"Amongst war uses are: for blocks and pipe insulation in combination with asbestos in the naval construction program; in fireproof structural sheets for minimizing fire hazards on warships; in pressure filters for the filtration of potable water; and in paints for army equipment.

"Indications are that not more than 25 per cent of the calcined material produced from the best-quality Canadian deposit so far discovered can be made into an efficient filter-aid that can compete with the imported product. Thus, the future for Canadian production appears to depend upon whether the tests being made by the British Columbia Department of Mines will prove that the diatomite in the vicinity of Quesnel can be used as a dusting agent in ammonium nitrate fertilizer. Consumption for this purpose in 1944 was 6,315 tons, and all of the requirements are at present being imported from a deposit near Kittitas, Washington. Production of this fertilizer for use in Europe is expected to increase. No other known deposit in Canada contains the type of diatomite that would meet the specification calling for uncalcined material.

"The price of diatomite used in Canada for insulation varies from $25 to $40 per ton, for filtration from $26 to $75 per ton; for fertilizer grades, $28 to $42 per ton; for material suitable for polishes the price for small lots ranged 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 299.—Production of Diatomite in Canada, 1928-1944

Year	Short tons	$	Year	Short tons	$
1928	368	8,960	1937	643	18,606
1929	429	10,330	1938	398	13,842
1930	554	13,247	1939	301	10,388
1931	1,610	32,789	1940	248	7,957
1932	1,496	29,509	1941	344	9,935
1933	1,789	36,648	1942	365	9,088
1934	1,372	54,910	1943	98	3,331
1935	823	33,140	1944	13	437
1936	615	13,650			

Table 300.—Consumption of Infusorial Earth by the Canadian Sugar Refining Industry, 1932-1944

Year	Pounds	Value	Year	Pounds	Value
		$			$
1932	2,577,585	73,309	1939	4,819,811	105,711
1933	2,507,469	70,191	1940	4,984,362	112,369
1934	2,562,552	69,116	1941	5,343,131	138,973
1935	4,307,142	96,560	1942	3,007,180	75,295
1936	4,375,999	98,954	1943	3,451,142	89,075
1937	4,586,786	95,532	1944	4,375,201	115,053
1938	4,908,597	101,473			

"**Fluorspar.**—Commercial deposits of fluorspar in Canada occur only in a few areas, and 55 per cent of the total output of 96,000 tons to the end of 1944 was obtained from the Madoc area, Hastings county, Ontario, and 44 per cent from British Columbia. In general, mining of fluorspar has been intermittent and on a small scale, with periods of greater activity during the first world war and the present war. At no time, however, has production been sufficient to meet domestic requirements, and Canada depends largely upon imports to meet the needs of industry. Indicating Canada's dependence on foreign sources of supply, in the 5-year period 1940-1944 reported consumption of fluorspar, largely for military purposes, totalled 227,484 tons. Of this, only 34,296 tons (13 per cent) was derived from domestic mines, 219,171 tons (87 per cent) being imported. In 1944, about 85 per cent of the tonnage imported was obtained from Newfoundland, 14 per cent came from the United States, and the remainder from Mexico.

"To assist in meeting war shortages, the Dominion Government in 1942 initiated a program of assistance to fluorspar producers by means of loans (under arrangements involving the advisory supervision of operations), diamond drilling, geological examination of properties, and in other ways. Of the total output, amounting to almost 25,000 tons in the three years ended 1944, nearly 72 per cent was produced by four operators who were assisted under this program. Most of the mine shipments have comprised material considerably below standard metallurgical specifications and have consisted of screened fines sweetened with clean, picked lump. Average grade of such combined product has ranged from 60 to 65 per cent CaF_2, calcite and barite being the chief impurities. A number of milling tests were run in the laboratories of the Bureau of Mines, Ottawa, in 1944 on trial shipments from various properties in an effort to reduce the objectionably high barite content of most Canadian fluorspar ores.

"Most of the domestic supply of fluorspar during the present war has come from the Madoc area, Ontario, where the mineral has been mined intermittently for about 40 years. Since 1939, most of the output has come from the Noyes, Perry, Keene, Wallbridge, Blakeley, Rogers, and Bailey mines. The Rogers mine, last actively operated in 1914, was reopened late in 1943, when operations at the Perry mine were abandoned. On the Bailey property a new vein was opened up in August, 1944, following the cessation of operations at the Keene mine.

"The fluorspar bodies in the Madoc area consist of a series of impersistent shallow veins that fill fractures in limestone, and the vein zone extends for several miles adjacent to a major fault. At a few mines the veins extend downward into underlying granite. Much of the ore consists of an interbanded association of fluorspar, calcite, and barite, which presents serious concentrating difficulties.

"Some interest has been shown in recent years in fluorspar occurrences in the Wilberforce-Harcourt district, Haliburton county, about 50 miles north of Madoc, where diamond drilling and some surface work were done on several properties in 1943. The ore is an intimate mixture of fluorspar and calcite. It usually also contains considerable apatite, and some mica and other silicate minerals. The work did not disclose any important ore-bodies, and there was little further activity in 1944. W. E. Clark (Tops Mining Syndicate) produced a few tons of high-grade picked spar from his holdings near Harcourt.

"In the latter part of 1944 a deposit of fluorspar, essentially similar in character to that of the Haliburton area, was discovered near Cobden, in Renfrew county. The property is owned by Eric Johnston, of Cobden. Some surface work was done by Dominion Magnesium, Limited to determine whether the deposit might supply the fluorspar requirements of the company's magnesium plant at nearby Haley, but no report on the results is available.

"Scattered occurrences of fluorspar are known in Quebec, but a few of these appear to be of economic importance. In 1943 and 1944, some work was done by Twin Valley Prospecting Syndicate, of Ottawa, on fluorspar showing near Sand Creek, north of Otter Lake, Pontiac county. About 20 tons of clean, picked spar was shipped in 1944 to the plant of Dominion Magnesium, Haley, Ontario. Grade is reported to have run 92 to 98 per cent CaF_2. This represents the first recorded production of fluorspar in the province.

"In Nova Scotia, there is considerable fluorspar in some of the barite veins near Trout River, Inverness county, where work was done in 1942 and 1943 on the MacKay property. In 1944 the Provincial Department of Mines continued a program of diamond drilling and geological investigation on the property, which was also examined and sampled by Canadian Industrial Minerals, Limited. A shipment of the ore was sent to the Bureau of Mines, Ottawa, to determine whether recovery can be made of fluorspar and barite products.

"In British Columbia, Consolidated Mining and Smelting Company operated a large deposit of fluorspar between 1919 and 1929 at its Rock Candy mine, near Grand Forks, and produced about 70,000 tons of ore, from which 42,000 tons of concentrate was recovered. The mine has since been idle and there has been no further production of fluorspar in the province. In the latter part of 1942, interest developed in a fluorspar occurrence near Birch Island, North Thomson River, where drilling operations have been undertaken by Globe Investment Company, 11 King Street West, Toronto. The deposit consists of a fine-grained, intimate mixture of fluorspar, celestite, and feldspar, with considerable pyrite. Preliminary results of tests on trial shipments by the Bureau of Mines, Ottawa, indicate that the ore is amenable to flotation.

"Canada produced 6,924 tons of fluorspar valued at $217,701 in 1944, compared with 11,210 tons valued at $318,424 in 1943.

"Imports were 37,101 tons valued at $840,309, compared with 77,436 tons valued at $1,738,669 in 1943. Most of the material came from Newfoundland, and was consigned to Arvida, Quebec, for use in the production of aluminium.

"In 1944, the six following producers, all in the Madoc area reported shipments: Reliance Fluorspar Mining Syndicate (Rogers mine); Millwood Fluorspar Mines (Keene and Bailey mines); Charles Stoklosar (Blakeley mine); Bassett Fluorspar Mining Syndicate (Lee Junior mine); Detomac Mines (McIlroy mine); and Fluoroc Mines (Howard mine). Nearly 60 per cent of the total output from the above seven mines came from the Rogers property, 14 per cent from the Bailey, 10 per cent from the Keene, and 9 per cent from the Blakeley. The Reliance, Millwood, and Fluoroc were Government-assisted projects.

"Production of fluorspar from the Madoc area during the five years 1940 to 1944, inclusive, amounted to about 32,000 tons, or 94 per cent of the total domestic output.

"World production of fluorspar prior to the war averaged about 500,000 short tons annually, of which the United States and Germany supplied about 75 per cent. The remainder came mainly from Russia, the United Kingdom, Newfoundland, France, Korea, Italy, and the Union of South Africa.

"The United Kingdom is the leading Empire source of fluorspar. Newfoundland, which is next on the list, has large reserves and has greatly expanded shipments in recent years.

"Consumption of fluorspar in Canada in 1944 was 56,900 tons, of which 60 per cent was used by non-ferrous smelters including aluminium and magnesium plants; 33 per cent by the steel trade; and 5 per cent by the heavy chemicals industry.

"Fluorspar has a variety of industrial uses, in most of which it serves as a powerful fluxing agent. The steel industry is by far the largest consumer. In basic open-hearth and electric furnace charges, fluorspar is an essential ingredient, imparting fluidity to the slag and permitting the use of larger quantities of lime, the agent most effective in removing sulphur, phosphorus, and other impurities. About 6 pounds of spar is required per ton of steel made in the open-hearth, and 20 pounds per ton for that made in the electric furnace. Fluorspar is used in small amounts in numerous other metallurgical industries, including foundries and various metal-refining operations. A small addition of fluorspar is made to the ferrosilicon-calcined dolomite briquettes used in the production of magnesium by the Pidgeon process, where it serves as a catalyst and improves recovery.

"The next largest use for the mineral is in the manufacture of hydrofluoric acid, which is used mainly in making artificial cryolite and aluminium fluoride for the aluminium industry. The anhydrous acid is used in making organic ("Freon") refrigerants, a recently expanded use for which as an aerosol insecticide carrier in the newly developed "mosquito bombs" is of timely interest in view of the highly effective use that is being made of these "bombs" against malarial mosquitoes in the Pacific war theatre. The acid is being used to an increasing extent as an improved catalyst, in place of sulphuric acid, for the alkylation of olefins in the production of 100-octane aviation gasoline. Next in importance is the use of fluorspar as a fluxing and opacifying ingredient in glass and enamels.

"Standard fluxing gravel or lump grade for metallurgical use is usually sold on a specification of a minimum 85 per cent CaF_2, and not over 5 per cent silica or 0·3 per cent sulphur. It should not contain more than 15 per cent of fines. Owing to recent shortages, however, sales in the United States are being made on the basis of 78 per cent CaF_2, with a minimum of 55 'effective units', and up to 1 per cent sulphur. Effective units are computed as being CaF_2 percentage less 2½ times the silica content. Canadian shipments have been running much below even this reduced standard, and in some cases consumers sweeten the material with higher grade imported spar.

"Glass and enamel grades call for not less than 95 per cent CaF_2, with a maximum of 2½ to 3 per cent SiO_2 and 0·12 per cent 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 SiO_2. Like the ceramic grade, it must be in powder form, and most of the material supplied to the acid and ceramic trades is a flotation concentrate.

"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 a 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 a 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 maximum prices in the Illinois-Kentucky field were revised in July, 1943, there was no change in the above arrangement in 1944 as a result of the increases.

"In 1942, fluorspar was placed on the list of minerals requiring a permit for exportation from Canada, but this restriction was withdrawn, effective April 1, 1944, in respect to shipments to the United States and to any part of the British Empire.

"The duty on metallurgical grade fluorspar entering the United States is \$5·625 a ton, and on acid and ceramic grades, \$3.75 a ton. There is no duty on fluorspar imported into Canada." (Bureau of Mines, Ottawa.)

Table 301.—Production of Fluorspar in Canada, 1924-1944

Year	Short tons	$	Year	Short tons	$
1924	76	1,343	1936	75	900
1925	3,886	19,234	1937	150	2,550
1926–1928	....	....	1938	217	3,906
1929	17,870	268,120	1939	240	4,995
1930	80	1,240	1940	4,454	59,317
1931	40	620	1941	5,534	97,767
1932	32	464	1942	6,199	146,039
1933	73	1,064	1943	11,210	318,424
1934	150	2,100	1944	6,924	217,701
1935	75	900			

Table 302.—Consumption of Fluorspar in Canada, by Uses, as Reported to the Annual Census of Industry, 1943 and 1944

Industry	1943		1944	
	Quantity	Cost at works	Quantity	Cost at works
	tons	$	tons	$
Steel furnaces	20,790	715,991	20,024	692,104
Chemicals (acids, alkalies and salts)	41,409	1,320,106	35,477	1,019,624
Glass	273	13,360	376	20,776
Ferro-alloys	1,407	37,802	104	3,514
Enamelling and glazing	74	2,960	116	4,649
Total accounted for	**63,953**	**2,090,219**	**56,097**	**1,740,658**

Table 303.—Imports of Fluorspar Into Canada, 1929-1944

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	1,738,669
1936	11,194	95,268	1944	37,100	840,309

Table 304.—Fluorspar Mining in Canada, 1943 and 1944(*)

—		1943	1944
Active firms	No.	10	10
Employees—On salary	No.	12	11
Wage-earners	No.	85	67
Total	**No.**	**97**	**78**
Salaries and wages—Salaries	$	17,084	17,237
Wages	$	113,201	85,094
Total	$	**130,285**	**102,331**
Gross value of production	$	318,424	217,701
Cost of fuel and electricity	$	20,145	14,869
Process supplies used	$	13,370	10,148
Net value of production	$	284,909	192,684

(*) Data included in Tables 331 to 334.

"**Garnet.**—Niagara Garnet Company shipped about 100 tons of garnet rock to a small mill at Sturgeon Falls, Ontario, from a deposit in Dana township, concession III, lots 1 and 2, 4 miles north of River Valley Station (41 miles northwest of North Bay). About 10 tons of ore from this rock was treated, and 3 tons of concentrate valued at $90 was shipped to the company's head office in Niagara Falls, New York, for further treatment.

"Canada Garnet, Limited mined a few tons at its property south of Labelle, 100 miles north of Montreal, and shipped a car lot to the Quebec Bureau of Mines' treatment plant at Val d'Or, where 2 tons of concentrate was made. Samples were sent to foundries for sandblasting tests. Tests were made by the Bureau of Mines, Ottawa, on concentrate submitted by the company to determine the efficiency of the garnet for sandblasting on metal and stone, compared with that of silica sand and artificial abrasives in general use. Results did not indicate any advantage in its use.

"A. G. Chew, of Sudbury, prospected a garnet zone in Loughrin township, concession IV, lot 14, about 24 miles east of Sudbury, and shipped 4 tons of ore to the United States for experimental purposes.

"About 85 per cent of the world output of garnet comes from the United States, mainly from North Creek, New York, and the product is regarded as the world standard abrasive garnet. Production in 1944 dropped over 20 per cent below the 1943 output of 5,935 tons, valued at $429,120.

"Garnet, crushed and suitably graded as to size, is used for making abrasive-coated papers and cloth, which in turn are used mainly in the wood-working (hard woods) and to a lesser extent in the shoe leather industries. The specifications for garnet for this use are somewhat exacting. Few, if any, of the hundred or more garnet deposits so far examined in Canada fulfil all of the requirements. Minor uses for garnet are for sandblasting; for surfacing plate glass, and garnet superfine (flour) grades are now being used as a partial substitute for corundum flour used for opitcal lens polishing.

"Canadian consumption of garnet grain suitable for "sandpaper" manufacture is less than 200 tons annually and none is at present commercially used for sandblasting. Competition from the artificial abrasives (silicon carbide and oxide of alumina) is a serious factor in the marketing of garnet.

"Prices of ungraded concentrate suitable for sandpaper range from $60 to $85 a ton." (Bureau of Mines, Ottawa.)

"**Graphite.**—Production of graphite in Canada in 1944 continued to be confined to the old-established Black Donald mine near Calabogie, in Renfrew county, Ontario, which produces a variety of grades of mill products for different industrial uses.

"There were no important changes in the general graphite situation in 1944. Supply for Allied Nations' requirements maintained the over-all improvement shown in the previous year, and the concern felt in the earlier stages of the war over possible shortages, particularly of crucible grades, was much less in evidence.

"Flake graphite is widely distributed in many parts of the Canadian Precambrian Shield, chiefly in gneisses and crystalline limestones. Production has been confined to adjacent sections of western Quebec and eastern Ontario, in the general Ottawa region. Occurrences of flake graphite are known also in Manitoba and British Columbia, but so far these have attracted little interest. Bodies of amorphous graphite occur near Saint John, New Brunswick, and were worked on a small scale many years ago.

"In 1942, Frobisher Exploration Company (a subsidiary of Ventures, Limited) undertook a geological investigation of the Black Donald property and conducted a diamond-drilling program, as a result of which a substantial tonnage of new ore was located. Frobisher Exploration took over the property in 1943, and has since been operating it under the name of Black Donald Graphite, Limited. A new power plant on the Madawaska River was completed at the end of 1943 to replace the old one washed out earlier in the year, and various additions and changes were made in the mill circuit.

"Canadian production of graphite in the form of finished mill products totalled 1,582 tons valued at $171,166, with sales valued at about $125,000. Output consisted mainly of foundry grades, but included also some 300 tons of high-grade lubricating flake. In 1943, production was 1,903 tons valued at $197,431.

"Exports of milled and finished concentrates were 576 tons valued at $87,774, compared with 611 tons valued at $80,961 in 1943. Most of the material went to the United States.

"Imports of unmanufactured graphite, most of which was Mexican amorphous, were valued at $48,095; of manufactured, at $261,205; and of graphite crucibles, at $128,738. These values compare with $23,773, $286,583, and $191,296, respectively, in 1943.

"Artificial graphite is made in Canada by Electro-Metallurgical Company of Canada, Welland, Ontario, and by Exolon Company, Thorold, Ontario. These companies export part of their production to the United States.

"Prior to the war, world production of natural graphite of all types, and including flake, crystalline (plumbago), and amorphous, averaged about 140,000 short tons a year. Madagascar, Germany, Austria, and Czechoslovakia were the principal sources of flake; Ceylon, of plumbago; and Mexico and Korea, of amorphous.

"The United States and Canada possess important graphite reserves, but are deficient in the types of graphite required for the most exacting uses, notably for crucible manufacture. Deposits are comparatively low grade for the most part, and production costs are high. Consequently, the United States depends, for most of its requirements of high-grade graphite, on imports of flake from Madagascar and of plumbago from Ceylon. Production of all types and grades in the United States in 1943 totalled just under 10,000 tons.

"In 1943, shipments of graphite from Ceylon amounted to 20,501 tons, a decline of 25 per cent from the 1942 figure. For the past several years all graphite from Ceylon and Madagascar has been purchased by the British Ministry of Supply, under allocation agreement with the United States Government for Allied Nations' use.

"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. Important quantities, mostly amorphous or artificial, are used in dry batteries, electrodes, and commutator brushes.

"The flake of the Black Donald deposit is too small for crucible use, but the products made are high in carbon and are well suited for lubricants, packings, polishes, and foundry requirements, for which purposes most of the output is sold. Prepared facings for the domestic foundry trade also are made.

"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 plumbago from Ceylon. The battery trade uses mainly Mexican amorphous; and paint requirements are filled largely by low-grade amorphous and flake. American imports of Canadian graphite are used in foundry facings, lubricants, and pencils.

"In general, a No. 1 crucible flake should be coarser than 50-mesh, with about 40 per cent standing on a 35-mesh screen and 40 per cent on a 28-mesh screen. Carbon content should be 85 per cent, or over.

"Trade quotations showed little change in 1944 from those of the previous year. All Ceylon and Madagascar graphite continued to be purchased and sold to consumers at fixed prices by Metals Reserve Company, which also had set prices on United States flake.

"The duty on graphite entering the United States under the general tariff is 5 per cent ad valorem on natural amorphous and artificial grades, and 15 per cent on crystalline lump, chip, and dust grades. The Canadian tariff is as follows: graphite, not ground or otherwise manufactured, British, free; intermediate (including the United States), 7½ per cent ad valorem; general, 10 per cent; on ground and manufactures of, including foundry facings, but not crucibles, British, 15 per cent; intermediate, 22½ per cent; general, 25 per cent.

"Exports of Canadian graphite and graphite products have been subject to special export licence since January, 1941." (Bureau of Mines, Ottawa)

Table 305.—Mine Production (Sales) of Graphite in Canada, 1931-1944

Year	Short tons	$	Year	Short tons	$
1931	548	32,149	1938	(*)	41,590
1932	340	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	1944	1,582	179,457

(*) Not available for publication.

Table 306.—Consumption of Graphite or Plumbago in Canada, by Industries, as Reported to the Census of Industry, 1943 and 1944

Industry	1943		1944	
	Quantity	Cost at works	Quantity	Cost at works
	Short tons	$	Short tons	$
Paints and varnishes	94	9,837	75	9,198
Polishes	57	6,525	51	6,635
Foundries	606	72,150	793	96,280
Acids and salts	167	45,654	147	48,194
Prepared foundry facings	202	19,789	278	20,734
Total accounted for	**1,126**	**153,955**	**1,344**	**181,041**

"**Grindstones, Pulpstones, and Scythestones.**—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.

"No pulpstones or scythestones were produced in 1944, but 225 tons of grindstones valued at $12,000 were shipped by the Read Stone Company, Sackville, from quarries near Stonehaven on the Bay of Chaleur, northern New Brunswick. In 1943 that company produced about 162 tons of grindstones and 2 tons of scythestones having a total value of $6,225.

"Pulpstones were last produced in 1937 by the J. A. and C. H. McDonald Company from Gabriola Island, near Nanaimo on Vancouver Island, British Columbia. 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 650 of these stones are in use and in stock in the various Canadian pulp mills. The imported natural pulpstones come mainly from West Virginia." (Bureau of Mines, Ottawa.)

The following were imported into Canada during 1944: grinding wheels $389,818; grinding stones $69,682; 578 grindstones, 36 inches or over $59,211 and 672 grindstones, n.o.p. $2,098.

Table 307.—Production of Grindstones, Pulpstones and Scythestones in Canada, 1931-1944

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	1944	225	12,000

Table 308.—Production of Natural Abrasive Stones, by Kinds, 1943 and 1944

—	Pulpstones		Sharpening Stones		Grindstones	
	Tons	$	Tons	$	Tons	$
1943						
Nova Scotia	....	....	....	....	....	....
New Brunswick	....	....	2	225	162	6,000
Canada	....	....	**2**	**225**	**162**	**6,000**
1944						
Nova Scotia	....	....	....	....	....	....
New Brunswick	....	....	....	....	225	12,000
Canada	....	....	....	....	**225**	**12,000**

Table 309.—Consumption of Pulpstones by the Canadian Pulp and Paper Industry, 1931-1944

Year	Number for 2 ft. wood	Value	Number for 2·5 ft. wood	Value	Number for 4 ft. wood	Value
		$		$		$
1931	226	72,585	225	71,760	285	337,580
1932	210	65,450	139	46,436	222	249,373
1933	321	98,475	95	31,945	199	223,635
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
1944	187	89,133	57	34,865	76	193,396

Kyanite.—Kyanite is usually a rock-forming mineral, and only rarely does it occur in large mono-mineralic masses as segregations in quartz-kyanite gneiss or schist. The mineral occurs in Nyasaland, British East Africa and Western Australia.

Consumption of the sillimanite-group minerals increased in the United States in 1941. Shipments of United States kyanite by five firms rose to 8,335 short tons valued at $175,581; imports of British India kyanite also increased in 1941, receipts during the first nine months amounting to 6,211 short tons, having a foreign market value of $81,356. The metallurgical industries account for about 50 per cent of the total kyanite refractories used in the United States.

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, September, 1945, quoted kyanite, per ton f.o.b. point of shipment, crude, $19; 35 mesh, $37.50; glass grade $40 nominal.

Table 310.—Materials Used in Manufacturing, 1943 and 1944

Material	Unit of measure	1943		1944	
		Quantity	Cost at works	Quantity	Cost at works
			$		$
Bauxite and pure alumina	ton	227,662	5,902,898	194,348	4,902,034
Coal (not for fuel)—					
For fused alumina	ton	245	1,614	308	2,247
For silicon carbide	ton	8,019	60,343	5,303	41,771
Coke (not for fuel)—					
For fused alumina:					
Petroleum coke	ton	2,303	17,631	2,054	13,785
Other coke	ton	12,140	71,914	2,707	15,445
For silicon carbide:					
Petroleum coke	ton	37,008	606,044	34,722	514,057
Other coke	ton	21,138	298,513	14,738	208,236
For other uses:					
Other coke	ton	....	....	2,395	30,460
Electrodes	ton	4,279	520,236	3,318	403,660
Feldspar	ton	117	5,776	75	2,260
Iron borings	ton	20,889	283,311	19,991	269,409
Salt	ton	410	4,793	343	3,858
Sawdust	ton	12,766	44,223	12,706	44,836
Silica sand	ton	89,022	511,649	73,771	428,317
Artificial abrasive grains—					
For re-treatment only:					
Fused alumina	ton	7,296	224,056	6,286	198,381
Silicon carbide	ton	209	6,442	207	12,600
For wheels, paper, etc.—					
Fused alumina	ton	4,106	826,967	3,300	600,168
Silicon carbide	ton	1,543	298,675	1,069	250,132
Natural abrasive grains—					
Garnet	lb.	343,929	29,768	393,572	34,546
Emery	lb.	308,548	19,982	312,458	17,904
Quartz or flint	lb.	349,340	5,410	536,373	8,046
Other	lb.	76,545	5,608	65,357	6,535
Bonding and bushing materials—					
Clay bonds	lb.	1,152,171	55,907	986,308	41,919
Silicate (quantity in equivalent solid form)	lb.	....	2,799	7,793	934
Elastic mixture	lb.	12,291	3,221	11,047	3,095
Bakelite and synthetic resins	lb.	365,704	123,057	285,491	80,768
Lead for bushings	lb.	107,341	5,978	103,567	5,647
Cotton cloth	....	....	340,709	....	317,201
Kraft paper	....	....	21,425	....	15,717
Containers and packing material	....	....	114,823	....	84,692
All other materials	....	....	1,168,151	....	1,217,583
Total	....	....	**11,581,923**	....	**9,926,243**

Table 311.—Products Manufactured, 1943 and 1944

Product	1943		1944	
	Short tons	Selling value at works	Short tons	Selling value at works
		$		$
Crude silicon carbide	51,281	6,846,087	47,100	5,499,628
Crude fused alumina	190,727	20,543,657	168,098	17,768,484
Silicon carbide firesand, etc.	229	14,336	167	10,135
Abrasive wheels and segments	....	5,114,962	....	3,321,873
Sharpening stones and files	....	303,913	....	197,186
Ferrosilicon	15,860	240,430	14,585	223,473
Other products (*)	....	3,546,543	....	3,044,334
Total	....	**36,609,928**	....	**30,065,113**

(*) 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.

"**Lithium Minerals.**—Amblygonite, spodumene, and lepidolite are the chief lithium minerals of commerce: their ores contain, respectively, about 8, 6 and 4 per cent of lithium oxide. Spodumene is in greatest supply, and is the base raw material for the manufacture of many lithium salts, lithium metal, and alloys. Amblygonite has similar uses, but is scarcer and more expensive. Lepidolite, or lithia mica, is employed mainly in the natural state as a batch ingredient in glass. The occurrence of all three minerals is confined to pegmatite dykes of a definite type, which usually have a localized, regional distribution and often carry, also, important amounts of beryl and tantalite-columbite. In some cases, such dykes have been worked for the recovery of all of these minerals.

"There has been no recorded production of lithium minerals in Canada since 1937, when 32 tons of amblygonite and spodumene valued at about $1,700 was shipped, and little if any lithium ore is known to be used or required for any purpose in the Dominion. Thus, an outside market would have to be found for any production. Considerable development work has been done in recent years, however, on deposits in the Pointe du Bois area in southeastern Manitoba; and in the three years ended 1944 increased interest was shown in the commercial possibilities of lithium deposits in other sections of that province, though activities have been confined to exploratory drilling. Some attention has been given, also, to lithium-bearing deposits in the Yellowknife-Beaulieu area in the Northwest Territories.

"Lithium ores and compounds early became of strategic importance in the present war, and to conserve supply for defence needs the United States Government placed both under allocation control in 1942. Government assistance also was given to the establishment of two spodumene mills, one in North Carolina, and the other in South Dakota. These measures resulted in a considerable easing of the general supply situation in 1944.

"Total production in Canada during the active period 1925 to 1937, inclusive, is estimated at about 250 tons, and comprised lepidolite, spodumene, and amblygonite. Most of the material was exported to the United States.

"The United States and Southwest Africa have been the two leading producers of lithium ores in recent years, with the former probably supplying well over 50 per cent of the annual total, and possessing the largest reserves. Production consists mainly of spodumene and amblygonite, and in the United States has come chiefly from the Black Hills region in South Dakota. An additional important source of lithia in the United States is lithium-sodium phosphate, recovered from the brine of Searle's Lake, at Trona, California, which at present furnishes nearly 50 per cent of the total American lithia production. Shipments of lithium ores and compounds in the United States in 1944 reached an all-time high of 13,319 tons, a 63 per cent increase over the previous year.

"There are no plants in Canada for the chemical treatment of lithium ores. Most of the world production marketed prior to the war was treated by a few large chemical firms specializing in the business, the principal plants being in the United States, Great Britain, Germany, and France. Such firms usually purchased their requirements under individual contract, and there has thus been little in the way of an open market, price quotations given in trade journals being merely nominal. Some of the larger consumers own and operate their own mines.

"Prices of lithium minerals in 1944 showed little change from those of the previous year. Amblygonite, 8 to 9 per cent Li_2O, was quoted at $40 to $50 per ton; spodumene, 6 per cent grade, at $5 to $6 per unit for mill concentrates; and lepidolite, 3 per cent Li_2O at $25 per ton, all f.o.b. mines. Lithium metal was unchanged at $15 per pound.

"**Magnesitic Dolomite and Brucite.**—Magnesite is found in Quebec and British Columbia. In Quebec the magnesite occurs intimately associated with dolomite and the rock is properly termed 'magnesitic dolomite.' It is quarried at Kilmar and at Harrington East, Argenteuil county, and is processed for use as refractory materials.

"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. A number of other deposits of magnesite are known in British Columbia and Yukon, but either because of their limited extent or distance 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 of them 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 Quebec. By a process developed in the Bureau of Mines laboratories, Ottawa, these brucite granules are recovered in the form of magnesia of a high degree of purity, and hydrated lime is obtained as a co-product in a plant near Wakefield. The deposits are the largest known in the world.

"In 1944 the value of products made from magnesitic dolomite and brucite was $1,139,281, compared with $1,260,056 in 1943.

"Exports of basic refractory materials made from magnesite and brucite in 1944 amounted to 1,013 tons valued at $31,583, compared with 9,006 tons valued at $110,976 in 1943.

"Imports of magnesia products in 1944 had a value of $1,513,902 and consisted of the following items: dead-burned and caustic-calcined magnesite, $466,314; magnesite brick, $718,481; magnesia, $219,116; magnesia pipe covering, $71,138; and magnesium carbonate, $38,853. In 1943 the total value of these products was $1,746,060.

"Products from magnesitic dolomite include dead-burned or grain material, bricks and shapes (burned and unburned), caustic-calcined magnesitic dolomite, and finely ground refractory cements.

"The magnesia obtained from brucitic limestone is in granular condition. The greater part of the production is dead-burned and made into the same types of refractory products as is the magnesitic dolomite, but important quantities are also marketed in the lightly calcined state for use as an ingredient in chemical fertilizers, and also for making paper.

"Products made in Canada from imported magnesite and magnesia include fused magnesia (artificial periclase), optical periclase, and '85 per cent magnesia' pipe covering.

"Prices of calcined magnesite in 1944, f.o.b. Montreal or Toronto, as quoted by Canadian Chemistry and Process Industries, were $70 to $90 a ton.

"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 the production of magnesium. It is the basis for a number of magnesium salts and has many minor uses.

"Brucite is much less common than magnesite and the only deposits being worked commercially are in Canada and the United States. The magnesia obtained by calcining brucite can be used for the same purposes as that obtained from magnesite and it slso has some special uses.

"Dolomite and sea-water compete with magnesite and brucite as sources of magnesia products. Dolomite, in addition to its use as a refractory material, has long been the principal source of basic magnesium carbonate and pure magnesium oxide, and in recent years it has become a source of magnesium metal.

"Sea-water has become an important source of magnesia in England and the United States for use in making magnesium and for various industrial and pharmaceutical purposes." (Bureau of Mines, Ottawa.)

Table 312.—Production of Magnesitic Dolomite (Calcined) in Canada, 1931-1944

Year	Tons	Value	Year	Tons	Value
		$			$
1931	11,411	295,579	1938	(a)	(c) 420,261
1932	(a)	262,860	1939	(a)	474,418
1933	(a)	360,128	1940	(a)	897,016
1934	(a)	382,927	1941	(a)	831,041
1935	(a)	486,084	1942	(a)	(b)1,059,374
1936	(a)	768,742	1943	(a)	1,260,056
1937	(a)	677,207	1944	(a)	1,139,281

(a) Not available for publication.
(b) 1942 and following years include the value of brucite shipped.
(c) Represents value of magnesite (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 1944 values are not entirely comparable with those for preceding years.

Table 313.—Magnesite and Dolomite Used in the Canadian Primary Iron and Steel Industry, 1931-1944

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	123,420	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	19,427	744,716
1944	8,516	125,990	77,085	189,774	18,665	740,450

(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 314.—Calcined Magnesite Used by the Artificial Abrasives and Abrasive Products Industry in Canada, 1933-1944

Year	Tons	Value	Year	Tons	Value
		$			$
1933	(*)	16,430	1939	121	7,735
1934	104	6,370	1940	302	19,331
1935	40	2,448	1941	809	77,508
1936	418	25,256	1942	398	58,648
1937	484	29,242	1943	150	12,164
1938	...	...	1944	771	102,591

(*) Information not available.

"**Magnesium Sulphate.**—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. Experimental shipments have been made also 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, now owned by Ashcroft Salts Company, Limited, had a capacity of 10 tons of salt a day. 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 two lakes south of Wiseton contain brines high in magnesium sulphate, and Muskiki Lake, just north of Dana, contains brine high in magnesium and sodium sulphates, which at certain times of the year crystallizes into a bedded deposit with layers of both salts.

"There was no production of magnesium sulphate in Canada in 1943 and 1944. In 1942 the production was 1,140 tons valued at $38,760.

"Imports of magnesium sulphate in 1944 were 2,684 tons valued at $108,795, compared with 3,379 tons valued at $137,372 in 1943. The imports were mainly from the United States.

"In the chemical industries, Epsom salt has many uses. It is employed for tanning and in dyeing, and for 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 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 to $65 per short ton in bags, whereas the B.P. material was quoted at $3.60 per barrel throughout the years 1943 and 1944.

"When magnesium sulphate is not being made in Canada, imports are dutiable at the rate of 17½ per cent, otherwise the duty is 20 per cent. The tariff on the material entering the United States is ¾ cent per pound, or $15 per ton." (Bureau of Mines, Ottawa.)

Table 315.—Production of Natural Magnesium Sulphate in Canada(*), 1935-1944

Year	Tons	Value	Year	Tons	Value
		$			$
1935	340	7,965	1940	.....	.....
1936	654	13,712	1941	265	7,343
1937	727	14,456	1942	1,140	38,760
1938	470	9,400	1943	.....	.....
1939	550	9,900	1944	.....	.....

(*) Produced entirely in British Columbia.

Table 316.—Magnesium Sulphate Used in Canadian Pharmaceutical Preparations and in Tanning, 1935-1944

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
1944	1,123,482	46,886	1,863,100	53,566

Mineral Waters.—Shipments of natural mineral waters from Canadian springs in 1944 totalled 156,150 gallons valued at $88,918 compared with 139,611 gallons worth $67,541 in 1943.

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. François 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 15 in 1944, of which 12 were located in the province of Quebec and 3 in Ontario.

Table 317.—Shipments of Natural Mineral Waters from Canadian Springs, 1931-1944

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
1944	148,965	88,113	7,185	805	156,150	88,918

Table 318.—Sales of Natural Mineral Waters (*) by the Canadian Aerated Waters Industry, 1930-1944

Year	$	Year	$
1930	178,348	1938	105,872
1931	140,730	1939	95,531
1932	92,066	1940	89,013
1933	77,125	1941	104,364
1934	52,113	1942	125,157
1935	45,100	1943	117,214
1936	63,687	1944	180,160
1937	102,648		

(*) Whether fortified or not.

"**Phosphate.**—All of the small output of phosphate in Canada consists of apatite, a common associate of the phlogopite mica mined in the Precambrian crystalline pyroxenites of southwestern Quebec and eastern Ontario. Apatite was mined on a considerable scale prior to 1900, but since then a large part of the comparatively small output has represented by-product material derived from operations for mica. During the present war there has been a slight renewal of interest in mining for straight apatite, and small tonnages have been produced from several of the larger old mines in Quebec that have been reopened. The largest output from these recent operations was obtained in 1941, when a total of 2,500 tons was produced. Though small, this tonnage exceeded the production in any other year since 1900. Total production since the inception of mining in 1870 is estimated at about 350,000 tons. Although there are probably substantial reserves of apatite in the above region, the deposits tend to be erratic and pockety, and are incapable of supplying more than a small fraction of the domestic requirements.

"In Quebec, most of the apatite has come from mines in territory contiguous to the Lièvre River in Papineau county, and mainly from Buckingham, Portland, Bowman, and Templeton townships.

"In Ontario, the apatite-bearing belt extends in a southwesterly direction through the Rideau Lakes section, chiefly in Lanark, Leeds, and Frontenac counties. Ontario Phosphate Company conducted a diamond-drilling program in 1944 on the old MacLaren property, in Bedford township, near Westport, sank a 3-compartment shaft to a depth of 175 feet, and opened a level at 150 feet, to tap ore indicated by drilling. In August, the company was reorganized as Ontario Phosphate Industries, Limited (Temple Building, Toronto).

"The sedimentary phosphate rock which occurs along the Rocky Mountains divide, notably in the Crowsnest area, is rather low grade and is not considered to be of present economic interest.

"Shipments of apatite in 1944 totalled 482 tons valued at $6,716, compared with 1,451 tons valued at $18,385 in 1943. Practically all of the production came from a property in Bowman township, operated by Robert Bigelow; the old High Rock mine in West Portland township, operated by O. C. Cote; and the old Phosphate King mine in Templeton township, operated by Blackburn Bros.; all of these properties being in Quebec. 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 phophorus compounds. Canadian Refractories, Ltd., Kilmar, Quebec, also purchases small tonnages.

"Production of superphosphate by eastern Canadian plants in 1944 is estimated to have reached nearly 200,000 tons, or over double the pre-war output. This quantity supplied about 60 per cent of the domestic demand and the remainder was imported, mainly from the United States.

"Imports of sedimentary phosphate rock totalled 388,247 tons valued at $1,710,378, compared with 260,846 tons valued at $1,085,080 in 1943. Most of the material came from Florida and Montana. Imports included, also, a small tonnage of rock brought in ballast from Morocco, and a shipment of low-fluorine phosphate from Curacao, imported by the Feeds Administration for use in stock feeds.

"By far the greater part of the world production consists of sedimentary rock, of which the United States is the leading producer, its output in 1944 being estimated at about 5½ million tons.

"Most of the phosphate mined throughout the world is used for the manufacture of fertilizers. Ordinary superphosphate is the chief product made, but triple superphosphate, ammonium phosphate, and other compounds are produced on an important scale.

"Phosphate rock is the sole commercial source of phosphorus. As the element, and as a component in a wide variety of salts and compounds, phosphorus is used extensively in many industries.

"Actual consumption of phosphate rock in Canada in 1943, as reported by users, was 277,979 tons, of which 81 per cent went to the fertilizer trade, and 18 per cent into the production of phosphorus and phosphorus compounds. All of the fertilizer rock is used in three superphosphate plants of Canadian Industries Limited, located at Beloeil, Quebec; Hamilton, Ontario; and New Westminster, British Columbia; and in the plant of Consolidated Mining and Smelting Company, Trail, British Columbia.

"Cost of American-produced phosphate rock of 75 per cent grade, laid down at eastern Canadian points, in 1944 ranged from $14 to $19 per long ton. The price paid for Canadian apatite was $16 per short ton, for material of 80 per cent grade, with a penalty or premium of 20 cents per unit below or above that figure.

"Phosphate rock enters Canada duty free. Superphosphate, for use as fertilizer in the condition imported, is free under the British preferential tariff, but under the intermediate tariff, pays 7½ per cent ad valorem, and under the general tariff, 10 per cent. Under the United States-Canada Trade Agreement of 1938, superphosphate imports from the United States are dutiable at 5 per cent, provided that no restrictions are placed by the United States Government on exports of either crude phosphate rock or superphosphate. Superphosphate intended for blending with other fertilizer ingredients, however, enters Canada free under all tariffs." (Bureau of Mines, Ottawa.)

Table 319.—Production of Phosphate in Canada, 1929-1944

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	1944	482	6,716

Table 320.—Phosphate Rock and Superphosphate Used in the Manufacture of Canadian Fertilizers, 1931-1944

Year	Superphosphate		Phosphate Rock	
	Short tons	$	Short tons	$
1931	51,639	595,780	48,373	395,547
1932	36,005	366,462	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
1944	231,184	3,805,659	337,632	3,817,626

Silica Sand.—The production of silica brick in Canada during 1944 totalled 3,997 M valued at $312,092 compared with 4,165 M worth $295,505 in 1943. 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 these firms are processed from crushed silica rock and are utilized in furnace construction and repairs.

Table 321.—Production of Silica Brick in Canada, 1928-1944

Year	M	$	Year	M	$
1928	3,224	155,502	1937	3,744	181,126
1929	3,951	173,581	1938	1,788	100,403
1930	2,418	97,379	1939	2,493	124,807
1931	900	35,746	1940	3,438	182,786
1932	93	4,304	1941	4,111	238,433
1933	636	23,185	1942 (*)	4,273	263,006
1934	2,528	85,945	1943	4,165	295,505
1935	2,461	96,194	1944	3,997	312,092
1936	2,393	97,285			

(*) Largest annual output.

The value of silica brick imported into Canada in 1944 totalled $713,538 compared with $847,456 in 1943. Imports in 1944 came entirely from the United States.

"**Sodium Carbonate (Natural)**.—Deposits of natural sodium carbonate, in the form of 'Natron' (sodium carbonate with 10 molecules of water) and also of brine, occur in a number of 'lakes' throughout the central part of British Columbia, chiefly in the Clinton mining division, about 20 miles northwest of Clinton, and in the neighbourhood of Kamloops.

"These deposits are far from the main eastern Canadian markets for sodium carbonate, and production is restricted to the requirements of consumers within economic rail-haul. Over the period since 1921, output from several of the deposits has been small and intermittent, amounting to 44 tons valued at $484 in 1944, compared with 468 tons valued at $5,148 in 1943, and shipped to Vancouver for soap manufacture.

"Eastern Canadian consumers of soda ash obtain their supplies from chemically prepared material made from salt by the Solvay or ammonia process in Ontario and the United States.

"Imports of soda ash or barilla in 1944 were 20,141 tons valued at $583,653, compared with 70,557 tons valued at $1,213,818 in 1943.

"Sodium carbonate, or soda ash, has many industrial uses, notably 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. Technological advances are continuing to increase the consumption of soda ash in the glass industry. Another major use of sodium carbonate is in the production of sodium hydroxide or caustic soda. A recent development is its use in the manufacture of 'synthetic salt cake' (anhydrous sodium sulphate). Substantial quantities of soda ash are also used in the smelting of iron ores.

"The special wartime demands of new munitions plants, of expansion in aluminium production, of increased utilization of low-graded ores, and of the higher operating schedules of the major consuming industries have contributed to a greatly increased consumption of soda ash during the war. The total Canadian consumption amounted to 89,400 tons in 1942, the latest year for which figures are available. The 1944 consumption appears to have been somewhat lower.

Table 322.—Production of Sodium Carbonate (Natural) in Canada, 1931-1944

Year	Tons	$	Year	Tons	$
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
1937	286	2,574	1944	44	484

Table 323.—Consumption of Soda Ash (Sodium Carbonate) in Specified Canadian Industries, 1943 and 1944

—	1943		1944	
	Tons	Value	Tons	Value
		$		$
Chemical and allied products (acids, salts, explosives, soaps, etc.)	27,770	769,619	30,905	865,067
Manufacture of non-metallic minerals (including coke, gas, petroleum and glass)	46,801	1,266,581	49,093	1,249,243
Pulp and paper industry	3,465	117,941	4,393	153,535
Dyeing, cleaning, etc.	519	28,988	543	29,146
Textiles	346	13,294	208	8,007
Sugar refinery	174	8,257	114	5,125

The price of "soda ash" in 1944, as quoted in Canadian Chemistry and Process Industries, was $2.00 per bag of 100 pounds throughout the year.

"**Sodium Sulphate** (**Natural**).—Sodium sulphate occurs as crystals or in the form of highly concentrated brines in many lakes throughout Western Canada. Hydrated sodium sulphate, known as Glauber's salt, and anhydrous sodium sulphate, known to the trade as 'salt cake', are produced in Canada.

"Production has been mainly from Saskatchewan. A small tonnage of crude has been harvested intermittently in Alberta for local consumption as cattle lick, although sodium sulphate is the chief salt in a number of salt deposits in that province. Undeveloped deep-seated beds of sodium sulphate occur in southern New Brunswick.

"The production of natural sodium sulphate in 1944 amounted to 102,421 tons valued at $987,842, compared with 107,121 tons valued at $1,025,151 in 1943. The decrease is attributed to the shortage of labour. 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.

"Production in 1944 was entirely from Saskatchewan. The principal producers were: Natural Sodium Products, Limited, with plants at Bishopric and Hardene; Horseshoe Lake Mining Company, Ormiston; Midwest Chemical Company, Palo; and Sybouts Sodium Sulphate Company, Gladmar; all of which are in Saskatchewan. Small tonnages were also produced from several other properties.

"Natural Sodium Products' plant at Bishopric operated throughout the year and has a capacity of about 500 tons a day. The company also operated up to April, 1944, the deposit at Alsask Lake or Hardene where a 250-ton plant has been in operation since 1942. Midwest Chemicals, Limited, of Palo, with property at the central portion of Whiteshore Lake, operated throughout the year. Horseshoe Lake Mining Company operated, throughout 1944, its plant at Ormiston. Sybouts Sodium Sulphate Company operated its dehydrating plant at Sybouts Lake, 9 miles south of Gladmar. Chaplin Sodium Sulphate, Ltd., formed to develop Lake Chaplin sodium sulphate deposits. Dr. D. C. Hart of Regina, who has been operating a test plant, produced in a small way at Cabri and Snake Hole Lakes.

"Investigations of the sodium sulphate deposits in 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. These deposits were described in Report No. 646, issued in 1926 and entitled 'Sodium Sulphate Deposits in Western Canada'.

"Complete figures for the world production of sodium sulphate were not available and it is difficult to compare the returns from different countries as the production comes from chemical plants and natural deposits. Germany, prior to the war, was probably the largest producer of sodium sulphate, and Canada was among the first ten producers. Canada is, however, one of the largest producers of sodium sulphate from natural deposits.

"Export figures of sodium sulphate are not available. Shipments from the deposits in Western Canada to the United States have shown a marked increase since the commencement of the war. Imports of sodium sulphate, including Glauber's salt (hydrated sodium sulphate), salt cake (anhydrous sodium sulphate) and nitre cake (sodium bisulphate), in 1944 were 22,044 tons valued at $242,095, compared with 13,231 tons valued at $191,283 in 1943.

"A discovery made in New Brunswick during 1937 may yet prove of importance as a source of sodium sulphate. New Brunswick Gas and Oilfields, Limited, in drilling for gas at Weldon, has proved large thicknesses of rock salt (sodium chloride). Two holes drilled 3,500 feet apart, from which cores were obtained, show the presence of a bed of glauberite ($Na_2SO_4CaSO_4$) from 60 to 100 feet thick, mostly overlying the rock salt. The sodium sulphate content of this bed ranges from 25 to 30 per cent. Glauberite and sodium chloride are present in other holes drilled in 1939, thus further extending the salts basin. Many millions of tons of sodium sulphate seem to be indicated in this deposit, the boundaries of which have not been fully determined. The Bureau of Mines, Ottawa, did much research work on the material recovered in these cores, and indicated a method of recovery of the sodium sulphate. Further detailed work is required to determine the commercial possibilities of the deposit.

"The material from Western Canada is shipped to the Pacific coast of Canada and the United States; east to Ontario, Quebec and the Maritimes; and south to the middle western States and to Louisiana.

"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 (70,100 tons in 1942), glass, dye, and textile industries and to a smaller extent for medicinal purposes and for tanning. It is also used extensively (21,500 tons in 1942) in the form of nitre cake in the smelting of nickel-copper ores for the separation of these two metals.

"The price for natural anhydrous sodium sulphate from the deposits in Western Canada ranges from $9 to $10 per short ton f.o.b. plant. The delivered price is considerably higher owing to the high freight rates to the consuming plants, which are mostly in Eastern Canada." (Bureau of Mines, Ottawa.)

Table 324.—Production of Natural Sodium Sulphate (*) in Canada, 1930-1944

Year	Short tons	$	Year	Short tons	$
1930	31,571	293,847	1938	63,009	553,307
1931	44,957	421,097	1939	71,485	628,151
1932	22,466	271,736	1940	94,266	829,589
1933	50,080	485,416	1941	115,608	931,554
1934	66,821	587,986	1942	131,258	1,079,692
1935	44,817	343,764	1943	107,121	1,025,151
1936	75,598	552,681	1944	102,421	987,842
1937	79,804	617,548			

(*) 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 325.—Sodium Sulphate or Salt Cake Used in Specified Canadian Industries, 1932-1944

Year	Textile Industry		Medicinal and pharmaceutical industry		Acids, alkalies and salts industry (*)		Wood-pulp	
	Tons	Value	Tons	Value	Tons	Value	Tons	Value
		$		$		$		$
1932	.....	.....	.....	.....	94	1,811	24,301	489,343
1933	.....	.....	39	4,879	9,968	146,201	29,563	580,251
1934	.....	.....	51	7,278	26,075	268,576	34,559	655,905
1935	.....	.....	59	4,617	22,485	316,734	35,350	642,801
1936	.....	.....	27	2,546	7,220	102,176	41,524	711,635
1937	.....	.....	29	2,234	8,006	113,054	50,584	884,437
1938	323	8,419	21	1,593	3,412	48,486	33,213	588,217
1939	401	11,636	24	1,940	11	314	40,685	722,178
1940	522	13,607	21	1,820	14	416	53,540	904,875
1941	884	25,390	34	3,073	10	326	61,679	1,133,625
1942	860	24,831	40	4,626	107	2,040	70,078	1,303,461
1943	734	21,039	38	4,142	120	1,868	67,292	1,306,215
1944	597	20,916	29	5,230	934	19,617	70,954	1,387,467

(*) Sodium sulphate used direct in smelting of nickel-copper ores included only for years 1933-1935 inclusive; in 1944 this consumption totalled 37,097 tons compared with 33,885 tons in 1943.

Table 326.— (*) Principal Statistics of Sodium Sulphate Mining Industry, 1943 and 1944

—		1943	1944
Active firms	No.	5	5
Producing plants	No.	6	6
Salaried employees	No.	15	17
Wage-earners	No.	177	141
Total Employees	**No.**	**192**	**158**
Salaries	$	30,653	31,007
Wages	$	243,643	232,997
Total Salaries and Wages	**$**	**274,296**	**264,004**
Gross value of production	$	1,025,151	987,842
Cost of fuel and electricity	$	342,566	253,043
Cost of process supplies	$	61,231	39,722
Net Value of Production	**$**	**621,354**	**695,077**

(*) Data included with those shown in Tables 331 to 334.

Strontium Minerals.—There was no commercial production of strontium minerals in Canada during recent years. In 1941, 27 tons of celestite valued at $280 were 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, analysing 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, 1945—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.

"**Sulphur (Including Pyrites).**—Deposits of native sulphur of commercial grade have not been found in Canada, but sulphur occurs in combination with copper, lead, zinc, nickel, or iron in many base metal sulphide ore-bodies in various parts of the country. In the smelting of these ores sulphur dioxide gas is produced, but prior to 1925 this gas was a total waste as no facilities were available for the recovery from it of sulphur, or sulphur compounds. In practice this gas can be used directly for the manufacture of sulphuric acid, the production of liquid sulphur dioxide, or for the production of elemental sulphur. Sulphur used in the making of sulphuric acid is recovered from salvaged smelter gas in Ontario and British Columbia. Sulphuric acid is also made from pyrites by Nichols Chemical Company at its plants in Quebec, Ontario, and British Columbia.

"International Nickel Company's sulphuric acid plant at Copper Cliff, Ontario, which was erected in 1930, employs the contact process in the manufacture of acid from converter gas for the recovery of portions of its smelter gases. A plant has been in operation since 1925 at the Coniston smelter of the same company. These plants have been enlarged during the war and were operated at capacity during 1944. A plant using the contact process was erected in 1929 at Trail, British Columbia, by Consolidated Mining and Smelting Company.

"The high-grade sulphuric acid produced in the plant at Copper Cliff is marketed in several industries, and the acid made in the Trail plant is used chiefly for the manufacture of fertilizers. This plant commenced producing elemental sulphur from the smelter gases in 1936. This operation was continued until July, 1943, when the demand for sulphuric acid for fertilizer manufacture became so great that the production of elemental sulphur had to be discontinued. The lower tonnage of lead and zinc concentrates from the Sullivan mine at Kimberley tended to reduce sulphuric acid production in 1944, and it was necessary to ship and roast a large tonnage of Sullivan iron tailings to supply some of the acid required for fertilizers. Chemical and fertilizer production in 1944 broke all previous records. Sulphuric acid output in terms of 100 per cent acid was 331,700 tons, and fertilizer output was 327,200 tons.

"No plant in Canada is producing liquid sulphur dioxide from smelter gases, although this has been done experimentally.

"In British Columbia, part of the large output of pyrites from the Britannia mine at Britannia Beach was consigned to the acid plant of Nichols Chemical Company at Barnet, British Columbia, and part was exported to plants in the United States. A considerable tonnage of pyrites from previous years' operations has accumulated at Britannia Beach and is awaiting more favourable market conditions.

"In Quebec, at the plant of Noranda Mines, Limited, pyrites concentrate, a by-product of the milling of copper-gold ores, was marketed for the manufacture of acid used partly by the chemical industry and partly in the manufacture of pulp and paper by the sulphite process. Sulphuric acid is produced by Nichols Chemical Company at its plants at Valleyfield, Quebec, at Sulphide, Ontario, and at Barnet, British Columbia. The company obtains its sulphur from the roasting of pyrites.

"Iron pyrites concentrate is also produced in Quebec by Waite-Amulet Mines Limited, and in 1944 a relatively small tonnage of pyrites was also shipped from an old stock pile located at the Aldermac mine in Beauchastel township.

"Exports were: pyrites (sulphur content) 90,836 tons valued at $353,441, compared with 104,509 tons valued at $409,597 in 1943; sulphuric acid 18,960 tons valued at $269,133, compared with 31,414 tons valued at $481,749 in 1943. No exports of elemental sulphur are recorded.

"Imports of sulphur in all forms (crude, brimstone, etc.) were 235,955 tons valued at $3,875,649, compared with 218,527 tons valued at $3,524,006 in 1943. Imports of sulphuric acid were 190 tons valued at $24,542, compared with 220 tons valued at $28,095 in 1943.

"World production of elemental sulphur is estimated by the U.S. 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 sulphite pulp (211,500 tons in 1942) and for use in the making of artificial silk. It is used to a large extent also in the manufacture of sulphuric acid, explosives, and rubber, and in the production of fertilizers.

"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. With the construction of new sulphuric plants in Canada and the United States the consumption of sulphur was increased gradually throughout the war period.

"According to 'Metal and Mineral Markets', New York, the price of sulphur in 1944 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 is used in the making of sulphate pulp by E. B. Eddy Company, Hull, and by St. Lawrence Paper Mills Company, Trois Rivières, Quebec. A considerable tonnage is used in the making of sulphuric acid at the chemical plants of Nichols Chemical Company at Valleyfield, Quebec, Sulphide, Ontario, and Barnet, British Columbia.

"There is apparently no standard price in Canada for sulphur in pyrites. Most contracts are believed to be based on a price of 5 cents (or better) per unit (22.4 pounds) of sulphur per long ton, f.o.b. cars at point of production." (Bureau of Mines, Ottawa.)

Table 327.—Production of Sulphur (*) in Canada for Years Specified

Year	Tons	$	Year	Tons	$
1886	(a) 42,906	193,077	1928	(b) 38,589	321,033
1896	13,823	101,155	1929	42,781	350,843
1906	17,525	169,990	1930	37,730	314,835
1913	65,012	521,181	1931	50,107	429,557
1914	93,609	744,508	1932	53,172	470,014
1915	116,157	985,190	1933	57,373	510,299
1916	116,975	1,084,095	1934	51,537	515,502
1917	155,453	1,610,762	1935	67,446	634,235
1918	154,269	1,705,219	1936	122,132	1,033,055
1919	65,674	522,704	1937	130,913	1,154,992
1920	67,608	719,110	1938	112,395	1,044,817
1921	12,213	116,326	1939	211,278	1,668,025
1922	6,900	74,303	1940	170,630	1,298,018
1923	11,073	113,020	1941	260,023	1,702,786
1924	9,742	95,620	1942	303,714	1,994,891
1925	7,587	58,899	1943	257,515	1,753,425
1926	8,975	63,899	1944	248,088	1,755,739
1927	25,229	198,388			

(*) Sulphur in iron pyrites shipped plus sulphur recovered from non-ferrous smelter gases.
(a) Tonnage of pyrites shipped.
(b) 1928–1944 includes sulphur recovered from smelter gas.

Table 328.—Production in Canada of Pyrites with Sulphur Content, including Sulphur Contained in Sulphuric Acid, Etc., Made From Smelter Gases, 1942-1944

—	Pyrites (*)			Smelter gas		Total sulphur	
	Sales	Sulphur content		Sulphur content		Tons	Value
	Tons	Tons	Value	Tons	Value		
			$		$		$
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**
1944							
Quebec	240,370	116,887	453,501	....	....	116,887	453,501
Ontario	....	....	....	17,876	178,760	17,876	178,760
British Columbia	9,701	4,886	39,088	108,439	1,084,390	113,325	1,123,478
Canada	**250,071**	**121,773**	**492,589**	**126,315**	**1,263,150**	**248,088**	**1,755,739**

(*) Recovered from copper ore deposits.
(†) Includes any elemental sulphur and sulphur in sulphuric acid and direct ammonium sulphate.

Table 329.—Consumption of Sulphur by Specified Canadian Industries, 1940-1943

Industry	1942		1943		1944	
	Tons	$	Tons	$	Tons	$
Wood-pulp	211,466	5,687,331	206,766	5,739,113	195,203	5,435,481
Petroleum refining	31	1,561	47	2,360	51	2,628
Acids, alkalies and salts	65,056	1,694,232	69,236	1,866,322	123,283	1,828,479
Matches	80	4,119	76	3,997	75	4,097
Explosives	2,057	57,631	1,806	55,717	....	....
Insecticides	1,293	50,310	1,246	34,449	1,228	37,769
Adhesives	89	3,087	93	2,847	70	2,058
Chemicals, miscellaneous	½	27	7	393	7	790
Rubber	1,728	93,042	1,412	76,032	1,259	68,842
Sugar	142	7,411	104	4,913	108	5,078
Fruit and vegetable preparations	130	10,685	215	15,610	156	11,198
Other industries (*)	287	12,248	272	11,466	240	10,272

(*) Starch and glucose, dyeing and finishing of textiles.

Imports into Canada of sulphur and brimstone totalled 235,955 short tons valued at $3,875,649 in 1944. The sulphur content of iron pyrites exported from Canada in 1944 totalled 90,836 short tons appraised at $353,441.

"**Volcanic Dust.**—Volcanic dust (pumicite or pumice dust) is 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. In many instances the dust has been washed down from higher levels and redeposited by the agency of waters, in which case the beds are stratified and mixed with foreign substances. It consists of aluminium silicate (80 to 90 per cent) and of oxides and silicates or iron, sodium, magnesium, calcium, etc.

"Deposits of volcanic dust are found in Saskatchewan, Alberta, and British Columbia. There has been intermittent production from Waldeck, near Swift Current, and at Rockglen, 125 miles southeast of Swift Current, in Saskatchewan, and from near Williams Lake in British Columbia. There was no production in 1944, but in 1943 about 60 tons were shipped from the Rockglen deposit for insulation purposes.

"Imports are grouped with a number of similar products (pumice, pumice stone, lava, and calcareous tufa), the value of which totalled $27,880 in 1944. Most of the pumice dust was used in scouring powders.

"The United States is the world's largest consumer of volcanic dust and pumice and has an annual output of over 125,000 tons. Consumption is mainly for scouring and cleansing compounds and as a concrete admixture and concrete aggregate. Minor uses are for insulation, glass bevelling, polishing aluminium, in the manufacture of fire-proof walls, building tiles, and as glazes in ceramics." (Bureau of Mines, Ottawa.)

Prices are not quoted, but in the United States sales values in 1944 for cleansing and scouring were about $7.50 per ton; for acoustic plaster $27, for concrete admixture and aggregate, $1.25 per ton.

In 1945 pumice stone per pound f.o.b. New York or Chicago, in barrels, powdered 2½ cents to 4½ cents; lump 5 to 7½ cents. Tripoli per ton, burlap bags, paper liners, minimum carload 30 tons, f.o.b. Missouri, 4 mesh, rose and cream coloured $14.50; 110 mesh $16; air floated 200 mesh $26. (Bureau of Mines, Ottawa.)

Table 330.—Production of Miscellaneous Non-Metallic Minerals in Canada, 1943 and 1944

Item	Unit of measure	1943		1944	
		Quantity	Value	Quantity	Value
			$		$
Barite	ton	24,474	279,253	118,719	1,023,696
Corundum	ton	.....	.....	173	17,830
Diatomite	ton	98	3,331	13	437
Fluorspar	ton	11,210	318,424	6,924	217,701
Garnets (schist)	ton	.....	.....	3	125
Graphite	ton	1,903	197,431	1,582	179,457
Grindstones (b)	ton	164	6,225	225	12,000
Magnesitic dolomite (c)	.....	.....	1,260,056	.....	1,139,281
Mineral waters	Imp. gal.	139,611	67,541	156,150	88,918
Phosphate (a)	ton	1,451	18,385	482	6,716
Silica brick	M	4,165	295,505	3,997	312,092
Sodium carbonate	ton	468	5,148	44	484
Sodium sulphate	ton	107,121	1,025,151	102,421	987,842
Volcanic dust	ton	50	257	.....	.....
Total (Gross)	.....	.....	**3,476,707**	.....	**3,986,579**
Sulphur production (*)	ton	257,515	1,753,425	248,088	1,755,739

(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, Que.
(*) 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 331.—Principal Statistics Relating to Miscellaneous Non-Metal Mining Industries in Canada, 1943 and 1944

—		1943	1944
Number of plants		54	52
Capital employed	$	3,522,842	....
Number of employees—On salary		84	116
On wages		827	749
Total		**911**	**865**
Salaries and wages—Salaries	$	155,593	240,499
Wages	$	1,207,933	1,259,751
Total	$	**1,363,526**	**1,500,250**
Selling value of products (gross)	$	3,476,707	3,986,579
Cost of fuel and electricity	$	823,347	706,929
Cost of process supplies used	$	382,648	462,999
Cost of containers	$	2,475	18,932
Selling value of products (net)	$	2,268,237	3,986,579

Table 332.—Wage-Earners, by Months, in the Miscellaneous Non-Metal Mining Industries in Canada, 1940-1944

Month	1940	1941	1942	1943	1944				
					Mine			Mill	
					Surface		Underground	Male	Female
					Male	Female			
January	352	451	561	835	154	2	64	470	....
February	352	463	594	798	142	2	66	437	....
March	392	452	600	822	144	2	62	471	....
April	359	473	622	810	178	2	47	432	....
May	482	559	639	838	264	2	61	460	....
June	472	682	827	879	288	3	63	464	....
July	548	667	789	849	283	4	63	483	....
August	517	696	819	869	266	4	69	453	....
September	604	695	770	860	254	3	55	426	....
October	614	718	789	781	258	3	55	490	....
November	581	659	803	809	246	7	53	505	....
December	451	603	759	711	170	1	34	479	....
Average	**480**	**601**	**723**	**827**	**222**	5	**58**	**464**	....

Table 333.—Hours Worked Per Week by Wage-Earners, 1944 (In one week of month of highest employment)

Hours worked per week		Number of Wage-earners	
		Male	Female
30 hours or less		60	....
31–43 hours		84	1
44 hours		16	....
45–47 hours		27	....
48 hours		194	....
49–50 hours		43	....
51–54 hours		87	....
55 hours		58	....
56–64 hours		215	....
65 hours and over		177	....
Total		**961**	**1**
Total wages paid in selected week	$	**30,431**	**26**

Table 334.—Fuel and Electricity Used in the Miscellaneous Non-Metal Mining Industries in Canada, 1943 and 1944

Kind	Unit of measure	1943		1944	
		Quantity	Cost	Quantity	Cost
			$		$
Bituminous coal—Canadian	ton	21,248	104,183	13,511	70,231
Imported	ton	31,637	281,454	30,531	281,254
Anthracite—From the United States	ton	11	195	20	336
Other	ton	3	35	....	....
Lignite coal	ton	18,839	59,488	21,334	65,667
Coke	ton	....	....	7	86
Gasoline	Imp. gal.	167,998	48,116	128,206	31,934
Kerosene or coal oil	Imp. gal.	1,745	355	814	164
Fuel oil and diesel oil	Imp. gal.	2,590,358	220,049	1,813,508	107,531
Wood (cords of 128 cubic feet)	cord	2,379	9,570	3,737	23,336
Gas—Manufactured	M cu. ft.	114,213	11,707	217,314	32,032
Natural	M cu. ft.	....	....	....	....
Other	....	....	....	....	....
Electricity purchased	K.W.H.	8,782,586	88,195	9,578,007	94,358
Total	....	....	**823,347**	....	**706,929**
Electricity generated for own use	K.W.H.	2,699,998	....	6,497,349	....

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 value of these materials produced in Canada during 1944 totalled $42,984,937 compared with $42,010,254 in 1943. Of the 1944 output, Ontario contributed $15,716,361 and Quebec $14,597,540 or 36·6 per cent and 34 per cent respectively. In order of importance, lesser amounts were also produced in British Columbia, Manitoba, Alberta, New Brunswick and Nova Scotia.

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 335.—Gross Value of Clay Products and Other Structural Materials Produced in Canada, by Provinces, 1939-1944

Province	1939	1940†	1941	1942	1943	1944
	$	$	$	$	$	$
Nova Scotia	1,829,207	1,855,771	1,330,888	1,980,912	1,597,791	1,081,805
New Brunswick	1,911,041	936,161	1,145,412	1,305,343	911,121	1,644,047
Quebec	12,319,773	15,001,749	16,631,657	17,723,293	15,863,115	15,085,337
Ontario	12,856,694	16,636,844	18,652,999	16,557,804	15,414,525	16,088,455
Manitoba	1,646,797	2,600,304	2,197,095	2,317,633	2,402,647	2,648,430
Saskatchewan	556,973	906,181	631,732	707,123	932,412	864,082
Alberta	1,947,453	2,971,550	2,626,277	2,836,160	2,752,839	3,149,234
British Columbia	2,314,821	2,795,389	3,416,996	3,5[illegible]4,405	3,246,623	3,573,857
Canada—Gross Value	**35,382,759**	**43,703,949**	**46,633,056**	**46,992,973**	**43,121,073**	**44,135,247**
Net value	**29,628,817**	**34,893,571**	**35,865,916**	**35,334,369**	**32,464,633**	**32,916,190**

(†) Includes value of cement containers 1940 to 1944.

NOTE: For statistics relating to employment, etc., in these combined industries see totals in Tables 27 and 28, Chapter I.

Table 336.—Value of Construction Contracts Awarded, by Provinces, 1939-1944

(MacLean Building Reports Ltd.)

Province	1939	1940	1941	1942	1943	1944
	$	$	$	$	$	$
Maritimes	16,146,300	21,142,100	36,736,400	26,305,500	14,875,400	19,713,100
Quebec	62,846,600	96,326,300	154,541,200	92,235,500	61,816,700	89,884,800
Ontario	82,605,500	146,806,100	145,598,600	108,679,500	83,025,300	111,741,800
Manitoba	5,374,400	28,003,700	11,701,600	13,914,300	10,083,900	12,906,400
Saskatchewan	3,246,100	12,566,700	11,098,700	5,480,200	3,970,000	5,677,600
Alberta	5,234,900	23,940,100	15,598,800	14,401,100	18,529,300	19,501,900
British Columbia	11,724,700	17,224,800	18,716,000	20,578,000	13,803,300	32,536,200
Canada	**187,178,500**	**346,009,800**	**393,991,300**	**281,594,100**	**206,103,900**	**291,961,800**

Table 337.—Total Value of Work Performed in Canada by General and Trade Contractors (including Subcontractors), Municipalities, Harbour Commissions, Provincial and Dominion Government Departments 1937 to 1944

(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
1944	449,838,059

Table 338.—Types of Canadian Construction 1941-1944

(Construction Branch, Dominion Bureau of Statistics)

*Type of Construction	1941	1942	1943	1944
	$	$	$	$
Total Value of Construction	639,750,624	635,649,570	572,426,551	449,838,059
Building Construction	374,491,173	351,774,680	301,884,888	220,299,940
Residential	87,586,340	76,346,090	63,684,367	83,927,360
Insitutional	15,174,464	14,246,025	13,148,233	21,005,720
Commercial	41,157,146	30,638,095	26,439,561	29,233,965
Industrial (includes factories, warehouses, mine buildings, etc.)	177,698,268	159,346,630	140,396,554	71,131,759
Other (includes armouries, barracks, hangars, etc.)	52,874,955	71,197,840	58,216,173	15,001,136
Engineering, Harbours, Rivers, etc.	200,656,038	217,279,062	203,527,830	153,123,802
Streets, highways, etc.	68,358,529	59,619,536	66,582,959	68,387,994
Bridges, watermains, sewers, dams, reservoirs, etc.	40,490,145	34,044,730	30,256,377	22,020,560
Electric stations and transmission lines	37,090,038	60,697,808	30,843,814	19,919,488
Docks, wharves, piers, etc.	6,475,872	10,099,471	10,282,332	5,819,364
Other engineering (includes landing fields, parks, canals, dredging, pile driving, etc.)	48,241,454	52,817,517	65,562,348	36,982,396
Building Trades (Jobbing)	64,603,413	66,595,828	67,013,833	76,414,317

* 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 339.—The following table gives the total value of construction contracts awarded in Canada from 1925 to 1944, 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 (1939=100) (d)
	$			
1925	297,973,000	75·8	102·9	99·8
1926	372,947,900	100·0	100·0	100·9
1927	418,951,600	108·7	96·1	105·0
1928	472,032,600	112·0	97·4	108·7
1929	576,651,800	135·3	99·0	115·8
1930	456,999,600	134·3	90·8	119·1
1931	315,482,000	104·3	81·9	114·7
1932	132,872,400	54·1	77·2	104·5
1933	97,289,800	38·5	78·3	92·5
1934	125,811,500	47·8	82·5	90·7
1935	160,305,000	55·4	81·2	93·6
1936	162,588,000	55·4	85·3	94·2
1937	224,056,700	60·1	94·4	96·9
1938	187,277,900	60·1	89·1	99·2
1939	187,178,500	62·1	89·7	100·0
1940	346,009,800	83·5	95·6	104·5
1941	393,991,300	139·5	107·3	111·6
1942	281,594,100	157·9	115·2	118·6
1943	206,103,900	160·3	121·2	127·7
1944	291,961,800	95·3	127·3	129·6

(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.

Table 340.—Production of Structural Steel Shapes and Certain Other Materials in Canada, 1942 1943

	Unit	1942		1943	
			$		$
Structural steel shapes (sales)	tons	191,319	10,540,658	151,674	8,802,273
Lumber	M. ft.b.m.	4,935,145	149,854,527	4,363,575	151,899,684
Lath (wood)	M	181,994	737,874	114,029	554,278
Shingles (wood)	squares	3,720,482	13,191,084	2,565,752	10,020,804
Shingles (asphalt)	squares	708,706	3,492,603	864,188	4,202,891
Insulating board (rigid ½″)	M. sq. ft.	138,038	4,179,747	140,626	4,505,113
Gypsum wall board	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
Other gypsum products	....	....	298,181	....	597,995
Cement brick	....	....	42,434	....	97,034
Cement hollow blocks, etc.	....	....	908,882	....	722,213
Artificial stone (cement)	....	....	173,106	....	170,914
Cinder blocks	M	....	210,402	1,819	164,535
Sand-lime brick	M	12,472	169,716	9,088	123,268
Rock wool	....	....	1,417,258	....	1,707,501

THE CEMENT MANUFACTURING INDUSTRY

Producers' sales of Portland cement in 1944, as reported by the Canadian cement industry' totalled 7,190,851 barrels (350 pounds each) valued at $11,621,372 compared with 7,302,289 barrels worth $11,599,033 in 1943. Of the 1944 sales 3,249.302 barrels were produced in Quebec plants; 1,863,210 barrels in Ontario; 865,756 barrels in Manitoba; 699,989 barrels in Alberta and 512,594 barrels in British Columbia. Imports into Canada of finished Portland cement, other than in cement manufactures, totalled 14,004 barrels valued at $76,838 in 1944; exports of cement in the same period amounted to 210,449 barrels worth $377,434. The high and low Canadian producers' prices per barrel in 1944 were, respectively, $2.70 and $1.25.

The following tonnages of primary materials of mineral origin were used during 1944 in the manufacture of the final product: Limestone, 1,865,597; clay, 173,728; shale, 74,303; gypsum, 42,672; silica sand, 23,942 and iron oxides, 3,924.

The number of firms reporting commercial production of Portland cement in Canada during 1944 was 3 and the plants in operation numbered 8. The industry distributed $2,254,775 in salaries and wages to 1,207 employees. The total value of fuel and electricity used during the year under review amounted to $3,197,955, of which $2,366,396 were expended for coal and $786,765 for purchased electricity. Process supplies consumed, including chemicals, explosives, drill steel, gypsum, silica sand, purchased limestone, etc., were valued at $2,566,432; included in this total were $1,025,369 covering the cost of containers.

Portland cement, the principal raw materials for which are limestone and clay, is manufactured in five provinces of Canada. In addition to the standard of 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.

Complete data relating to world production of cement have not been available for some years.

The following information was supplied by the British Columbia Cement Company Limited:

"The B.C. Cement Company, Limited, after six years of wartime production, during which period heavier demands were made on the company than ever before, are now engaged in a very large and extensive renovation programme at their Bamberton plant, which will include the purchase of a new and modern kiln, and entire new coal grinding system, and a change in raw materials. Very substantial capital expenditures are planned for increased capacity and the entire plant will be modernized within the next two or three years."

In 1944 Canada Cement Company, Limited operated plants at Hull and Montreal East in Quebec; at Port Colborne and Belleville in Ontario; at Fort Whyte, Manitoba; and at Exshaw, Alberta. St. Mary's Cement Company, Limited operated a plant at St. Mary's, Ontario, Medusa Products Company of Canada, Limited has a plant at Paris, Ontario, making white cement, cement paints, etc., from imported clinker. British Columbia Cement Company operates at Bamberton, British Columbia. The total rated daily capacity of all plants is about 37,000 barrels (a barrel of cement weighs 350 pounds net).

Table 341.—Summary Statistics of Cement Production, Sales, Etc., in Canada, 1943 and 1944

—	1943		1944	
	Barrels (*)	Value	Barrels (*)	Value
		$		$
Output	8,025,113	....	7,601,007	....
Sold or used	7,302,289	11,599,033	7,190,851	11,621,372
Stocks on hand December 31	1,596,643	....	2,006,799	....
IMPORTS—				
Portland cement and hydraulic or water lime	18,577	83,975	14,004	76,838
Portland cement clinker (white)	6,778	13,861	9,872	21,130
Manufactures n.o.p.	....	27,723	....	21,128
EXPORTS—				
Portland cement	172,601	344,004	210,449	377,434
Apparent consumption	(a)7,148,265	....	(a)6,994,406	....

(*) 1 barrel = 350 pounds.
(a) Exclusive of clinker imported.

Table 342.—Production and Apparent Consumption of Cement in Canada, 1935-1944

Year	Sold or Used		Apparent Consumption
	Barrels	$	Barrels
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
1944	7,190,851	11,621,372	6,994,406

Table 343.—Producers' Sales of Cement in Canada, by Provinces, 1942-1944

Province	1942		1943		1944	
	Barrels	Value (*)	Barrels	Value (*)	Barrels	Value (*)
		$		$		$
Quebec	4,446,416	6,487,078	3,394,895	4,899,578	3,249,302	4,736,004
Ontario	2,784,782	3,998,294	1,972,009	2,872,732	1,863,210	2,730,381
Manitoba	654,855	1,374,498	793,913	1,503,416	865,756	1,698,567
Alberta	668,043	1,307,353	606,703	1,176,442	699,989	1,370,502
British Columbia	571,945	1,198,014	534,769	1,146,865	512,594	1,085,918
Canada	**9,126,041**	**14,365,237**	**7,302,289**	**11,599,033**	**7,190,851**	**11,621,372**

(*) Less value of containers.

Table 344.—Number and Capacity of Kilns in Canadian Cement Plants, 1933-1944

Year	Total kilns		Kilns in use during the year	
	Number	Total capacity barrels per 24 hours	Number	Total capacity barrels per 24 hours
1933	41	43,622	(*)	(*)
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
1944	19	33,250	15	30,150

(*) Data not recorded.

Table 345.—Specified Materials Used in Canadian Cement Plants, 1933-1944

Year	Shale	Limestone	Gypsum	Silica sand	Clay	Iron oxides (†)
	Tons	Tons	Tons	Tons	Tons	Tons
1933	(*)	616,364	13,319	(*)	(*)	(*)
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	30,408	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
1944 (c)	74,303	1,865,597	42,672	23,942	173,728	3,924

(*) 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.
(c) Value of these materials purchased in 1944 totalled $358,542.

Table 346.—Coal Used in Canadian Cement Plants, 1933-1944

Year	Canadian		Foreign	
	Tons	$	Tons	$
1933	48,905	236,947	46,955	229,399
1934	69,853	367,880	60,877	330,432
1935	78,477	433,347	53,338	291,741
1936	119,903	635,631	66,466	367,740
1937	145,791	760,766	90,925	513,417
1938	127,812	656,187	89,172	499,182
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
1944	108,292	731,706	219,802	1,634,690

Table 347.—Quantity and Value of Electricity Purchased by Canadian Cement Companies 1935-1944

Year	Kilowatt hours	$ (*)	Year	Kilowatt hours	$ (*)
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
1939	105,938,210	589,190	1944	137,259,162	786,765

(*) Includes service charges.

Table 348.—Principal Statistics of the Cement Manufacturing Industry in Canada, 1942-1944

—		1942	1943	1944
Number of firms		3	3	3
Number of plants		8	8	8
Capital employed	$	51,121,894	50,438,932	(b)
Number of employees—On salary		89	91	92
On wages		1,152	1,118	1,115
Total		**1,241**	**1,209**	**1,207**
Salaries and wages—Salaries	$	200,779	215,137	229,490
Wages	$	1,858,558	1,939,081	2,025,285
Total	$	**2,059,337**	**2,154,218**	**2,254,775**
Selling value of products (Gross)	$	15,628,403	12,709,852	12,646,741
Cost of fuel and electricity	$	3,127,264	3,089,380	3,197,955
Cost of process supplies (a)	$	1,024,057	1,356,890	1,541,063
Value of containers	$	1,263,166	1,110,819	1,025,369
Net value of products sold	$	10,213,916	7,152,763	6,882,354

(a) Other than fuel and electricity.
(b) Not recorded in 1944.

Table 349.—Wage Earners on the Last Day of Each Month, or Nearest Representative Date, 1940-1944

Month	1940	1941	1942	1943	1944		
					Quarry	Mill	
					Male	Male	Female
January	736	1,051	1,078	1,098	136	903	12
February	711	1,058	1,092	1,113	138	915	11
March	795	1,084	1,111	1,113	139	930	11
April	974	1,169	1,148	1,110	140	940	43
May	1,021	1,177	1,141	1,068	157	917	64
June	1,041	1,219	1,182	1,145	141	896	69
July	1,046	1,221	1,212	1,165	162	941	73
August	1,052	1,177	1,193	1,175	151	936	75
September	1,111	1,197	1,188	1,147	157	895	66
October	1,146	1,158	1,149	1,126	161	911	65
November	1,100	1,145	1,175	1,089	145	927	59
December	923	1,124	1,128	1,059	136	908	45

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 wall tile, 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 134 plants operated in the domestic and imported clay products industries in Canada during 1944. These two industries provided employment for 3,488 persons during the year; their earnings totalled $4,996,111. The combined production in 1944 was valued at $11,421,990 compared with $10,993,609 in 1943.

1. PRODUCTION FROM DOMESTIC CLAYS

The gross value of Canadian producers' sales of domestic clays and products made from same totalled $6,997,425 in 1944 compared with $6,608,193 in 1943, and $13,904,643—the all-time high record established in 1929. Commercial production of domestic clay products in 1944 was reported from every province except Prince Edward Island; no output of these materials has as yet been officially recorded for the Yukon and Northwest Territories. Of the total value of sales in 1944, Ontario, Quebec and Alberta firms contributed $2,347,396, $1,881,791 and $1,143,577 respectively.

The number of firms reported as active in the Canadian domestic clay products industry during 1944 totalled 106; of these, 53 were located in Ontario, 14 in Quebec, 10 in Alberta, 11 in British Columbia and the remainder in Nova Scotia, New Brunswick, Manitoba and Saskatchewan. The industry provided employment for 2,247 persons and distributed $3,176,804 in salaries and wages. Fuel and electricity used in 1944 totalled $1,357,313 and chemicals and various other process supplies consumed were valued at $161,189.

Sales of building brick in 1944 totalled 154,785 M valued at $3,155,380 compared with 138,678 M at $2,808,764 in 1943. Sewer pipe shipments in 1944 amounted to $964,732; hollow blocks and floor tile $855,375; drain tile $425,725; pottery, including earthenware, $838,544; bentonite $163,848, and fireclay, firebrick and fireclay blocks $424,521.

Imports into Canada of clay and various clay products in 1944 were appraised at $12,636,557 compared with $13,446,817 in 1943. The value of clay products exported from Canada in 1944 was $525,852 as against $368,010 in the preceding year.

The following information is from a report "Clays and Clay Products, 1944" as prepared by the Bureau of Mines, Ottawa:

"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 are 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, firebrick and other refractory materials are manufactured from a high-grade moderately plastic fireclay that is extracted by underground mining from the clay beds in Sumas Mountain. Another plant at Claybank, Saskatchewan, utilizes the highly plastic refractory clays obtained by selective mining of the "White Mud" beds in the southern part of the province.

"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. Canadian Kaolin-Silica Products' property at Lac Remi, Quebec, which was operated chiefly for the production of high-grade silica sand, has been idle since the destruction of the plant by fire a few years ago.

"Several other deposits of kaolin have been discovered in Quebec in recent years, among these being a deposit at Thirtyone Mile Lake, near Point Comfort, Hull county; near Brebeuf; at Lake Labelle; and near Chateau Richer.

"Important deposits of high-grade, plastic, white-burning, and buff-burning clays occur on the Mattagami, Abitibi, and Missinaibi 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 efforts 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 has been 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 or the United States is used. 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 they have not been developed to any extent.

"Activated clays for oil bleaching are largely imported. The value of such clays imported into Canada by oil refineries in 1944 was $366,719, compared with $295,066 in 1943. 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 used in Canada for oil bleaching purposes."

Table 350.—Production (Total Sales) of Clay Products From Domestic Clays, 1935-1944

Year	$	Year	$
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
1939	5,151,236	1944	6,997,425

Table 351.—Production (Total Sales) of Clay Products, by Provinces, 1939-1944 (Gross Values)

Province	1939	1940	1941	1942	1943	1944
	$	$	$	$	$	$
Nova Scotia	339,952	490,543	529,435	618,441	478,571	402,694
New Brunswick	129,985	171,745	193,643	246,041	216,446	207,051
Quebec	1,274,776	1,546,246	1,944,358	1,741,297	1,504,428	1,881,791
Ontario	2,346,638	2,508,540	3,087,616	2,549,486	2,453,829	2,347,396
Manitoba	78,892	102,906	84,817	80,890	132,382	197,383
Saskatchewan	148,774	164,828	224,897	271,325	348,725	330,907
Alberta	461,079	838,856	952,144	1,013,497	978,649	1,143,577
British Columbia	371,140	520,883	558,426	560,746	495,163	486,626
Canada	**5,151,236**	**6,344,547**	**7,575,336**	**7,081,723**	**6,608,193**	**6,997,425**

Table 352.—Production (Sales) of Domestic Clay and Clay Products in Canada, 1943 and 1944

Product	Unit of measure	Sales or shipments			
		1943		1944	
		Quantity	$	Quantity	$
Clay—Bentonite	ton	(*)	117,047	(*)	163,848
Fireclay	ton	5,653	42,122	7,630	38,433
Kaolin	ton	93	1,531	424	5,758
Other clay	ton	20,638	101,036	18,801	92,002
Fireclay blocks and shapes	....	....	256,655	....	221,251
Firebrick	M	3,644	192,618	3,180	164,837
Brick—Soft mud process—Face	M	9,260	206,826	7,917	177,659
Common	M	14,195	209,508	14,182	214,336
Stiff mud process—Face	M	34,623	867,630	55,175	1,360,083
(wire cut) Common	M	51,000	829,365	44,451	742,437
Brick—Dry press—Face	M	10,504	256,362	13,990	337,715
Common	M	15,681	243,446	18,809	317,893
Fancy or ornamental brick (including special shapes, embossed and enamelled brick)	M	3,190	191,424	28	866
Sewer brick	M	225	4,203	233	4,391
Paving brick	M	151	8,967	321	18,793
Structural tile—					
Hollow blocks (including fireproofing and load-bearing tile)	ton	84,469	819,535	87,820	811,558
Roofing tile	....	....	827	....	....
Floor tile (quarries)	....	....	26,949	....	43,817
Drain tile	M	13,001	390,377	13,684	425,725
Sewer pipe (including copings, flue linings, conduits, etc.)	....	....	1,116,846	....	964,732
Pottery, glazed or unglazed (including coarse earthenware, sanitary ware, stoneware, flower pots, and all other pottery)	....	....	701,144	....	838,544
Other products	....	....	23,775	....	52,147
Total	....	....	**6,608,193**	....	**6,997,425**

(*) Not published.

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 1944 was 173,728 tons. Also consumed by the Canadian cement industry in 1944 were 74,303 tons of shale.

Table 353.—Production of Building Brick in Canada, 1935-1944

—		Soft mud process		Stiff mud process (wire cut)		Dry process		Fancy or ornamental brick	Sewer brick	Total	Average value per M (a)
		Face	Common	Face	Common	Face	Common				
											$
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**	15·47
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	**1,748,772**	15·11
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**	15·45
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	**2,341,413**	15·73
1939	M	10,927	26,652	45,993	51,114	12,263	17,790	68	217	**165,021**	
	$	182,376	372,116	941,696	692,224	242,518	236,597	4,601	4,506	**2,676,631**	16·22
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**	17·14
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**	18·00
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**	17·83
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	**2,808,761**	20·25
1944	M	7,917	14,182	55,175	44,451	13,990	18,809	28	233	**151,785**	
	$	177,659	214,336	1,360,083	742,437	337,715	317,893	866	4,391	**3,155,380**	20·38

(a) Based on shipments of all grades and the value per M should be interpreted as the value of pressed, common and other varieties 'en masse' and not the value of any one particular type of brick.

Table 354.—Production of Building Brick in Canada, Per Capita of Population, For Years Specified

Year	M per capita	Year	M per capita
1905	0·087	1937	0·014
1914	0·070	1938	0·013
1929	0·046	1939	0·015
1930	0·031	1940	0·017
1932	0·010	1941	0·018
1934	0·008	1942	0·014
1935	0·009	1943	0·012
1936	0·010	1944	0·013

Table 355.—Production (Sales) of Building Brick (*) in Canada, by Provinces, 1942-1944

Province	1942		1943		1944	
	M	$	M	$	M	$
Nova Scotia	7,086	129,679	6,411	108,963	5,987	96,411
New Brunswick	7,580	146,335	6,856	121,359	6,407	109,983
Quebec	61,300	1,067,253	52,428	976,370	65,103	1,303,666
Ontario	69,960	1,359,817	56,389	1,381,796	56,654	1,323,651
Manitoba	2,753	42,090	1,546	21,954	1,566	37,115
Saskatchewan	494	6,494	296	5,358	536	9,230
Alberta	13,991	145,379	12,026	130,534	15,590	197,940
British Columbia	6,153	123,328	2,726	62,430	2,942	77,384
Canada	**169,317**	**3,018,375**	**138,678**	**2,808,761**	**154,785**	**3,155,380**
Average value per M		$17·83		$20·25		$20·38

(*) Includes fancy and sewer brick.

Table 356.—Production of Paving Brick in Canada, 1935-1944

Year	Quantity	Value
	M	$
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
1944	321	18,793

Table 357.—Production of Sewer Pipe, Copings, Flue Linings, etc., in Canada, 1935-1944

Year	Value	Year	Value
	$		$
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
1939	813,208	1944	964,732

Table 358.—Production of Drain Tile in Canada, 1935-1944

Year	Quantity	Value	Year	Quantity	Value
	M	$		M	$
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
1939	14,361	353,973	1944	13,684	425,725

Table 359.—Value (†) of Drain Tile and Sewer Pipe Produced (Sales) in Canada From Domestic Clays, by Provinces, 1941-1944

Province	1941	1942	1943	1944
	$	$	$	$
Nova Scotia	336,450	351,053	233,757	165,106
New Brunswick	5,729	(*) 4,448	7,346	5,269
Quebec	210,390	230,128	209,832	206,338
Ontario	705,370	644,631	628,447	621,326
Manitoba	....	....	....	....
Saskatchewan	(*) 400	....	5,625	3,400
Alberta	334,318	343,141	281,008	253,679
British Columbia	163,096	148,179	141,208	135,339
Canada	**1,755,753**	**1,721,580**	**1,507,223**	**1,390,457**

(†) Includes value of copings, flue linings, etc.
(*) Drain tile only.

Table 360.—Value (*) of Drain Tile and Sewer Pipe Produced in Canada For Years Specified

Year	Value	Year	Value	Year	Value
	$		$		$
1914	1,470,839	1926	1,876,794	1937	1,089,180
1916	1,075,674	1928	2,370,698	1938	1,100,881
1918	1,199,114	1929	2,726,203	1939	1,167,181
1920	2,111,742	1931	1,837,213	1940	1,430,154
1922	2,173,733	1933	577,287	1941	1,755,753
1924	2,003,649	1935	686,895	1942	1,721,580

(*) Includes value of copings, flue linings, etc.

Table 361.—Production (Sales) of Fireclay Blocks and Shapes and Firebrick From Domestic Clays, by Provinces 1944

Province	Fireclay		Fireclay blocks and shapes	Firebrick	
	Short tons	$	$	M	$
Nova Scotia	2,919	10,711	270	3	147
New Brunswick	.....	.....	.....	.....	.....
Ontario	.....	.....	.....	.....	.....
Saskatchewan	948	9,133	194,824	.....	.....
British Columbia	3,763	18,589	26,157	3,177	164,690
Canada	**7,630**	**38,433**	**221,251**	**3,180**	**164,837**

Table 362.—Production (Sales) of Fireclay, Fireclay Blocks and Shapes, and Firebrick From Domestic Clay, 1935-1944

Year	Fireclay		Fireclay blocks and shapes	Firebrick	
	Short tons	$	$	M	$
1935	2,272	15,574	71,344	1,817	90,149
1936	2,437	17,639	65,171	2,548	118,923
1937	4,123	26,081	75,431	2,950	142,827
1938	2,344	17,243	73,512	2,213	113,581
1939	3,785	22,504	95,256	2,331	119,346
1940	4,881	30,564	85,127	3,167	165,525
1941	5,431	35,475	190,497	3,643	183,897
1942	5,601	40,722	210,246	3,816	197,830
1943	5,653	42,122	256,655	3,644	192,618
1944	7,630	38,433	221,251	3,180	164,837

Note.—Firebrick and fireclay blocks and shapes are made also from imported clays; see Table 377.

Table 363.—Production of Structural Tile in Canada, by Provinces, 1944

Province	Hollow blocks (*)		Roofing tile	Floor tile (Quarries)	
	Short tons	$	$	Sq. ft.	$
Nova Scotia	13,139	119,595	.....	.....	.....
New Brunswick	1,668	14,071	.....	.....	.....
Quebec	31,288	283,329	.....	.....	.....
Ontario	28,344	271,977	.....	212,805	43,817
Manitoba	.....	.....	.....	.....	.....
Saskatchewan	2,829	23,503	.....	.....	.....
Alberta	8,157	72,556	.....	.....	.....
British Columbia	2,395	26,527	.....	.....	.....
Canada	**87,820**	**811,558**	.....	**212,805**	**43,817**

(*) Including fireproofing and load-bearing tile.

Table 364.—Production of Structural Tile in Canada, 1935-1944

Year	Hollow blocks (*)		Roofing tile		Floor tile (Quarries)	
	Short tons	$	Number	$	Sq. ft.	$
1935	(†) 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	73,191	12,169
1938	70,648	591,416	150,504	5,196	100,958	15,330
1939	86,120	714,291	148,291	4,064	90,812	15,233
1940	105,073	788,478	41,772	1,839	.....	13,631
1941	117,530	1,063,120	.....	750	.....	21,349
1942	109,905	1,082,573	.....	32	.....	23,705
1943	84,469	819,535	.....	827	.....	26,949
1944	87,820	811,558	.....	.....	212,805	43,817

(*) Including fireproofing and load-bearing tile.
(†) In addition, there was produced $615 worth of ceramic tile.

Table 365.—Production (Sales) of Pottery From Domestic Clays For Years Specified

Year	Value	Year	Value
	$		$
1888	27,750	1931	257,125
1898	214,675	1932	244,861
1908	200,541	1933	202,500
1913	53,533	1934	223,733
1918	130,242	1935	220,711
1924	238,242	1936	218,402
1925	267,255	1937	232,209
1926	320,135	1938	235,890
1927	307,057	1939	(*) 282,712
1928	356,093	1940	474,452
1929	323,194	1941	502,212
1930	204,866		

(*) Includes value of sanitaryware.

Table 366.—Production (Sales) of Pottery From Domestic Clays, by Provinces, 1942, 1943 and 1944

Province	1942	1943	1944
	$	$	$
New Brunswick	51,699	68,058	75,288
Quebec	39,400	54,391	82,000
Ontario	75,700	63,600	60,000
Alberta	476,183	512,178	617,326
British Columbia	3,106	2,917	3,930
Canada	**646,088**	**701,144**	**838,544**

Table 367.—Production (Sales) of Bentonite and Kaolin in Canada, by Provinces, 1935-1944

Year	Bentonite								Kaolin (a)	
	Manitoba		Alberta		British Columbia		Canada			
	Tons	$	Tons	$	Tons	$	Tons	$	Tons	$
1935					41	781	41	781	170	1,520
1936					(b) 120	180	(b) 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	2	30
1942	660	38,800	956	5,404			1,616	44,204	408	6,130
1943		110,428		5,262		1,357	(c)	117,047	93	1,531
1944		160,268		2,076		1,504	(c)	163,848	424	5,758

(a) All from Quebec.
(b) Partly for experimental purposes.
(c) Quantity not available for publication.

BENTONITE IN 1944

(Bureau of Mines, Ottawa)

Bentonite, a type of clay derived from volcanic ash, is widely distributed in the Prairie Provinces, and occurs also in British Columbia. It has been produced intermittently on a small scale since around 1926, total output to the end of 1944 being estimated at about 15,000 tons. Of this, 48 per cent came from Manitoba, 46 per cent from Alberta, and 6 per cent from British Columbia. Small trial lots, not shown in statistical records, have also been produced in Saskatchewan.

Bentonites from different localities may vary rather widely in their nature and physical properties, and these determine the particular industrial uses of the material. Most Canadian bentonites are of the highly colloidal, swelling type, suitable for foundry use and for oil-well drilling. Manitoba, however, possesses deposits of non-swelling material that is of value for bleaching purposes in the natural state as well as being amenable to activation. It is also well suited for foundry use.

BENTONITE IN 1944 (Continued)

(Bureau of Mines, Ottawa)

Manitoba became the leading Canadian producer of bentonite in 1943 and retained that position in 1944, in which year it was the source of 85 per cent of the output. Twelve per cent of the 1944 production came from Alberta, and the remainder from British Columbia.

In Alberta, most of the production has come from Drumheller, in the Red Deer Valley area, where Gordon L. Kidd has been conducting operations since 1937. Aetna Coal Company, East Coulee, in the same region, also produces a small tonnage from its coal-mining operations. In southern Saskatchewan there are numerous occurrences of bentonite in the Willowbunch-St. Victor-Eastend region. Small trial shipments have been made from some of these, but so far there has been little active development. In southern British Columbia, bentonite occurs in beds up to 8 feet in thickness near Merritt and Princeton. Occasional small shipments have been made from the Princeton deposit, most of which have gone to Vancouver for grinding and local use.

Production of bentonite in Canada in 1944, including natural crude clay and activated material shipped by primary producers, was valued at $163,848 compared with $117,047 in 1943. Shipments totalled approximately 3,500 tons.

Manitoba's production, most of which was activated material, was valued at $160,268 in 1944, compared with $110,428 in 1943, and represented 98 per cent of the total value of output.

Bentonite is used chiefly as a bonding ingredient in foundry sands; for the bleaching, or decolorizing and filtering of mineral and vegetable oils and packing house products; and to control the viscosity of oil-well drilling muds. These three uses accounted for 85 per cent of the 480,000 tons produced in the United States in 1943, distribution being as follows: foundries, 38 per cent; bleaching, 33 per cent; drilling, 14 per cent. Most of the output of Pembina Mountain Clays, Limited, Winnipeg, is used in bleaching petroleum products, though sales are also made to linseed oil plants, packing houses, and to firms engaged in reclaiming crankcase oil.

The colloidal, or swelling type of bentonite has a wide range of minor uses. including fillers, concrete admixture, and for preventing seepage around dams, irrigation ditches, reservoirs, and structural foundations. It is used as an emulsifying agent in asphaltic and resinous compounds; in soaps and detergents; in various cosmetic and pharmaceutical preparations; as a suspending, spreading, and adhesive agent in horticultural sprays and insecticides; as a plasticizing ingredient in ceramic bodies, slips and glazes, and in plasters; to improve the flow and workability of concrete; in cement manufacture; and in the clarifying of wines, vinegar, etc.

The estimated consumption of bentonite in Canada in 1943, including both domestic and imported natural and activated material, totalled about 12,270 tons. Distribution, by industries, was as follows: bleaching of lubricating oils and gasoline, 49 per cent; steel, iron, and brass foundries, 39 per cent; polishes and cleansers, 7 per cent; pulp and paper, 2 per cent; miscellaneous, 3 per cent. In addition, 1,078 tons of crude bentonite were purchased from producers in Alberta for use in oil-well drilling in Turner Valley, making a total indicated consumption of 13,348 tons.

Prices in 1944 remained substantially unchanged. Wyoming standard 200-mesh bentonite, bagged, sold at $9.50 per ton, f.o.b. plant, and crushed at $7, in bulk. Special grades were quoted at $11 to $16.50. In 1943, the average unit value of production in the United States was $6.24 per ton, and $8.73 for the Wyoming field. Canadian trade journal quotations in 1944 for standard Wyoming-type clay were $27 to $30.

Alberta drilling bentonite was priced at $38 per ton, bagged, f.o.b. Calgary, and $40 in Turner Valley; in December, the price was reduced to $35, ex-Turner Valley. Crude sold at around $5 per ton, f.o.b. mine. Activated bentonite, for bleaching use, cost $66 to $68 per ton, in carload lots, delivered eastern Canadian points.

Table 368.—Fuller's Earth Used in Canada in the Manufacture of Soaps and Washing Compounds and in the Petroleum Products Industry, 1932-1944

Year	Petroleum Products Industry		Soaps and Washing Compounds	
	Pounds (*)	$	Pounds	$
1932	19,642,179	258,934	507,807	7,444
1933	22,811,655	314,515	588,434	8,501
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
1944	27,569,500	646,708	1,181,020	35,047

(*) Includes all clays.

Table 369.—China Clay (Kaolin) Used in the Manufacture of Paper in Canada, 1931-1944

Year	Tons	Value	Year	Tons	Value
		$			$
1931	11,484	173,660	1938	34,968	488,147
1932	14,432	205,068	1939	32,769	430,092
1933	20,048	267,014	1940	36,931	558,659
1934	27,550	357,280	1941	32,844	588,585
1935	33,766	422,584	1942	28,734	578,190
1936	39,165	520,121	1943	26,374	561,285
1937	41,738	578,223	1944	47,995	987,488

Table 370.—Clays and Earths Used in Canadian Rubber Goods Industry, 1934-1944

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
			1944	1,909	51,942

Table 371.—Firebrick and Fireclay Used in the Manufacture of Iron and Steel and Their Products in Canada, 1932-1944

Year	Cost at works	Year	Cost at works
	$		$
1932	212,419	1939	939,495
1933	216,014	1940	1,597,898
1934	289,932	1941	2,581,813
1935	581,269	1942	3,268,181
1936	779,014	1943	3,717,826
1937	1,058,787	1944	3,268,941
1938	838,012		

Table 372.—Production (Sales) in Canada of Clay Products made from Domestic Clays, by Months, 1944 and 1945

Month	Building brick		Structural tile		Drain tile		Sewer pipe	Fireclay blocks and shapes	Pottery (b)	Other clay products (c)	**Total**
	M	$	Ton	$	M	$	$	$	$	$	$
1944 (a)											
January	8,038	141,407	4,395	43,711	554	15,942	27,383	27,560	68,525	38,010	**362,538**
February	6,355	114,464	3,556	36,329	536	16,180	24,610	21,053	71,006	38,579	**322,221**
March	8,671	153,791	3,610	34,948	591	17,104	38,972	20,566	74,803	39,894	**380,078**
April	9,442	174,008	4,480	43,900	501	16,088	57,780	12,382	69,391	24,140	**397,689**
May	13,995	263,375	6,487	62,119	1,257	38,238	118,758	15,178	71,187	31,731	**600,586**
June	14,709	281,553	8,983	85,916	1,319	41,455	114,676	23,276	70,338	41,052	**658,266**
July	16,306	324,799	9,348	94,457	1,561	51,250	125,684	14,183	64,251	41,173	**715,797**
August	17,094	343,029	8,982	87,394	1,556	49,957	117,385	18,136	70,997	46,497	**733,395**
September	17,419	354,672	9,011	90,796	1,671	50,357	103,309	13,939	70,517	36,810	**720,400**
October	17,519	361,712	9,497	92,551	1,764	54,550	98,049	19,693	72,701	41,563	**740,819**
November	16,338	344,910	8,602	86,462	1,595	49,599	90,364	16,957	68,185	40,765	**697,242**
December	9,449	191,239	4,268	44,246	554	17,395	49,639	20,452	74,441	33,836	**431,238**
Total	**155,335**	**2,048,949**	**81,219**	**802,829**	**13,459**	**418,115**	**966,609**	**223,375**	**846,342**	**454,050**	**6,760,269**
1945											
January	8,154	183,389	5,377	52,023	149	5,938	47,126	20,243	69,768	29,648	**408,135**
February	10,372	198,584	3,599	37,042	171	5,906	31,091	17,880	74,691	33,530	**398,724**
March	12,697	259,460	6,624	69,682	650	20,256	64,317	20,860	74,151	38,955	**547,681**
April	12,697	259,976	6,709	68,345	744	25,718	100,432	13,166	66,135	38,942	**572,714**
May	13,799	302,807	8,208	92,878	1,108	38,901	113,541	16,000	76,201	41,330	**681,658**
June	15,188	345,007	8,323	92,040	1,434	47,777	110,353	25,251	71,658	46,208	**738,294**
July	18,066	398,067	8,947	94,913	1,332	47,477	126,525	15,410	49,131	43,250	**774,773**
August	18,241	413,405	8,800	95,289	1,522	56,635	112,639	21,120	69,983	45,431	**814,502**
September	19,226	436,678	9,644	102,000	1,448	56,283	96,639	25,500	62,276	49,948	**829,324**
October	21,170	485,364	11,131	119,697	1,622	61,939	121,026	17,394	90,139	57,483	**953,041**
November	19,322	445,339	9,443	99,665	1,532	56,517	123,632	23,015	104,458	53,070	**905,696**
December	14,983	348,725	6,387	69,140	794	30,795	87,546	14,919	86,471	43,157	**680,753**
Total	**183,915**	**4,076,801**	**93,192**	**992,714**	**12,506**	**454,142**	**1,134,866**	**230,758**	**895,062**	**520,952**	**8,305,295**

(a) Data not revised to agree with statistics shown elsewhere in this report.
(b) Includes flower pots, stoneware, artware, etc.
(c) Includes floor tile, firebrick, etc.

Table 373.—Principal Statistics of the Domestic Clay Products Industry in Canada, 1943 and 1944

—		1943	1944	1944
		Entire industry	Entire industry	Stoneware and pottery only
Number of plants		105	110	8
Capital employed	$	17,162,747	(†)	(†)
Number of employees—On salary		248	253	12
On wages		1,925	1,994	346
Total		**2,173**	**2,247**	**358**
Salaries and wages—Salaries	$	570,300	594,282	24,948
Wages	$	2,339,541	2,582,522	331,944
Total	$	**2,909,841**	**3,176,804**	**356,892**
Selling value of products (gross)	$	6,608,193	6,997,425	834,614
Cost of fuel and purchased electricity	$	1,157,471	1,357,313	33,402
Cost of process supplies	$	104,336	161,189	33,414
Net value of sales	$	5,346,386	5,478,923	767,798

(†) Data not collected in 1944.

Table 374.—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	10	4	129	1	**144**	39,920	144,226	**184,146**
New Brunswick	3	....	27	....	**30**	5,185	40,561	**45,746**
Quebec	47	10	476	23	**556**	129,636	712,960	**842,596**
Ontario	76	28	596	16	**716**	251,550	870,502	**1,122,052**
Manitoba	7	3	65	4	**79**	16,000	65,787	**81,787**
Saskatchewan	9	....	34	....	**43**	23,679	61,007	**84,686**
Alberta	29	9	314	164	**516**	86,519	466,169	**552,688**
British Columbia	14	4	145	....	**163**	41,793	221,310	**263,103**
Canada	**195**	**58**	**1,786**	**208**	**2,247**	**594,282**	**2,582,522**	**3,176,804**
INDUSTRY								
Brick and tile	189	52	1,622	26	**1,889**	569,334	2,250,578	**2,819,912**
Stoneware and pottery	6	6	164	182	**358**	24,948	331,944	**356,892**
Canada	**195**	**58**	**1,786**	**208**	**2,247**	**594,282**	**2,582,522**	**3,176,804**

(*) See note page 35.

Table 375.—Average Number of Wage-Earners, by Months, 1940-1944

Month	1940	1941	1942	1943	1944		
					Pit	Plant	
						Male	Female
January	1,190	1,907	1,966	1,692	91	1,427	183
February	1,051	1,792	1,811	1,663	88	1,405	198
March	1,287	1,871	1,829	1,708	88	1,455	196
April	1,739	2,427	2,106	1,750	101	1,587	197
May	2,647	3,250	2,382	1,898	146	1,761	200
June	3,143	3,369	2,570	2,072	153	1,827	214
July	3,191	3,281	2,588	2,167	161	1,843	217
August	3,027	3,070	2,560	2,169	172	1,748	215
September	2,812	2,869	2,389	2,101	163	1,735	212
October	2,530	2,628	2,326	2,021	153	1,732	208
November	2,300	2,424	2,218	1,909	134	1,654	211
December	2,151	2,153	1,920	1,830	102	1,588	210

Table 376.—Average Amount of Weekly Wages Paid Per Capita in Brick and Tile Plants, 1939-1944 (*)

Year	Male	Year	Male
	$		$
1939	19·29	1942	23·47
1940	20·19	1943	25·40
1941	22·15	1944	31·25

(*) During one week in month of highest employment; including overtime, etc.

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 1944 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 1944 and their output was valued at $4,424,565 against last year's total of $4,385,416 and the 1942 figure of $5,397,228. The average number of workers was 1,241 and payments for salaries and wages totalled $1,819,307. Fuel and electricity cost $310,155, and materials for use in manufacturing processes cost $979,998.

Table 377.—Products Made in the Imported Clay Products Industry, 1943 and 1944

Product	1943	1944
	Gross selling value at works	Gross selling value at works
	$	$
Firebrick and stove linings—Rigid	608,482	496,914
Plastic	254,523	236,068
High temperature cements	112,737	102,908
High tension porcelain insulators, china santiary 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)	3,409,674	3,588,675
Total	**4,385,416**	**4,424,565**

Table 378.—Materials Used in the Imported Clay Products Industry, 1943 and 1944

Material	1943		1944	
	Short tons	Total cost at works	Short tons	Total cost at works
		$		$
Imported clays—Ball clay	2,230	43,901	2,650	54,503
China clay	2,889	70,479	2,845	71,979
Fireclay	30,297	244,788	29,780	236,089
Sagger clay	812	13,828	669	12,220
Other imported clays	....	18,991	247	18,365
Canadian clays—Fireclay	12	300	40	840
Other clays	18	54	25	75
Feldspar	2,352	50,794	2,325	50,237
Silica and ground quartz	3,597	58,412	3,441	55,627
Talc	354	5,586	535	8,564
Other glazing materials	....	18,277	....	31,538
Insulator hardware	....	75,316	....	83,629
Shipping containers and packing materials	....	94,424	....	129,767
All other materials	....	234,704	....	226,565
Total	....	**929,854**	....	**979,998**

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; sagger 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, \$10.00 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.

(b) F.O.B. market at Toronto—"Canadian Chemistry & Process Industries"—Toronto, July, 1944 and June, 1943.

Table 379.—Imports Into Canada and Exports of Clay and Clay Products, 1943 and 1944

—	1943		1944	
	Quantity	$	Quantity	$
IMPORTS				
Building brick ....ton	1,192	17,403	3,972	47,968
Building blocks and fireproofing tile	....	22,354	....	22,802
Clays—China ....cwt.	674,008	392,651	1,150,410	615,279
Fire ....cwt.	1,668,888	320,809	1,524,626	289,581
Pipe ....cwt.	211,750	25,248	99,000	11,521
Other clays, n.o.p.	....	186,842	....	194,385
Zirconium silicate	....	15,146	....	16,302
Zirconium oxide	....	41,745	....	26,944
Drain tile, unglazed	....	1,417	....	....
Drain, sewer pipe and earthenware fittings therefor, chimney linings or vents, chimney tops or inverted blocks, glazed or unglazed, n.o.p.	....	2,958	....	12,027
Tiles or blocks of earthenware or stone prepared for mosaic flooring	....	23,680	....	64,904
Tiles, earthenware, for roofing purposes	....	254	....	4,522
Tiles, earthenware, n.o.p.	....	56,638	....	181,264
Insulators, electric, porcelain	....	241,335	....	194,136
Pottery, chinaware and earthenware, n.o.p.	....	4,371,530	....	4,789,478
Brick, fire, other, valued at 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.	....	70,129	....	38,164
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)	....	1,972,956	....	1,434,001
Firebrick, n.o.p.	....	1,661,129	....	1,227,598
Firebrick, chrome	....	256,993	....	437,980
Magnesite brick (fire)	....	1,111,754	....	718,481
Silica brick (containing not less than 90 per cent silica)	....	847,456	....	713,538
Paving brick ....ton	944	7,753	1,164	10,407
Artificial teeth, not mounted	....	768,425	....	814,014
Baths, bathtubs, basins, laundry tubs, etc., of earthenware, cement or clay, n.o.p.	....	359,978	....	104,729
Saggars	....	46,778	....	17,133
Crucibles, clay or sand	....	21,799	....	25,385
Other manufactures of clay, n.o.p.	....	259,697	....	207,530
Activated clay to refine oil	....	295,066	....	366,719
Grog for refractory materials ....ton	2,070	46,894	2,448	49,165
Total	....	**13,446,817**	....	**12,636,557**
EXPORTS				
Building brick ....M	1,711	30,305	1,955	36,652
Bricks, fire	....	....	....	157,107
Clay, manufactures of	....	221,104	....	(*) 39,373
Clays, unmanufactured ....cwt.	1,871	4,059	48,621	14,114
Earthenware	....	31,181	....	61,931
Porcelain insulators	....	81,361	....	216,675
Total	....	**368,010**	....	**525,852**

(*) Included fire brick prior to 1944.

LIME INDUSTRY

Production of quick and hydrated lime in Canada during 1944 totalled 885,142 short tons valued at $6,926,844 compared with the all-time high tonnage of 907,768 tons worth $6,832,992 in 1943. Comprising the 1944 production were 738,202 tons of quicklime valued at $5,948,079 and 146,940 tons of hydrated worth $978,765. During the year under review 700,708 tons of quicklime valued at $5,545,695 and 89,576 tons of hydrated lime valued at $413,573 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 1,571,451 tons of limestone were consumed in the production of lime in 1944. Lime was produced during 1944 in all Canadian provinces with the exception of Prince Edward Island and Saskatchewan; no commercial production of lime in the Territories has ever been officially reported. Of the total Canadian output of lime in 1944, Ontario plants produced 429,285 short tons or 48·5 per cent and Quebec 339,082 short tons or 38·3 per cent.

Imports of lime into Canada during 1944 totalled 6,698 short tons appraised at $34,917 compared with 9,077 short tons at $64,303 in 1943. Exports of lime from Canada in 1944 amounted to 15,451 short tons valued at $136,797 as against 15,391 tons worth $133,320 in the preceding year.

During 1944 the lime industry, comprising 38 firms, reported 42 plants as active and the distribution of $1,414,426 in salaries and wages to 815 employees. The cost of fuel and purchased electricity used amounted to $1,752,723 and the value of explosives, chemicals, drill steel and other process supplies consumed aggregated $168,886.

A report on lime for 1944, as prepared by the Bureau of Mines, Ottawa, contains the following information:

"Lime is manufactured in every province except Prince Edward Island, though the production in Saskatchewan is intermittent and small. Both high-calcium and dolomitic limes are produced in Nova Scotia, New Brunswick, Ontario, and Manitoba, but only high-calcium lime is made in Quebec, Alberta, and British Columbia. Ontario, the leading producer, supplies nearly one-half of the total output, Quebec being next with about 42 per cent.

"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, interest is being manifested in making lime from limestone deposits in the more northerly parts of the country.

"The demand for lime by war industries raised production above all previous records in 1943, and the decrease in output in 1944 was caused mainly by labour and fuel shortages and by the difficulty of getting replacement parts. Prior to the war a program of modernization was under way at most of the larger lime plants and this program will be proceeded with at an accelerated pace as soon as equipment becomes available.

"Prices of the various lime products vary over a wide range, depending upon the geographical position of the plants and upon difference in quality of the lime. No significant change occurred in prices of lime during 1944.

"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 are sold in air-tight, multi-wall paper bags. In these various forms lime has many 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 over 90 per cent of the present production is used in chemical processes.

"The post war outlook for the lime industry, because of its close connection with the rapidly expanding chemical and metallurgical industries, appears to be bright. New chemical uses for lime are continually appearing, and the demand for mason's lime, which has been small in recent years, should increase with the resumption of peacetime building activities."

Table 380.—Production of Lime in Canada, by Provinces, 1944, 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	......	......	111	3,328	......	**3,439**
	$	......	......	2,013	42,492	......	**44,505**
Masons' lime	ton	160	4,961	11,426	552	......	**17,099**
	$	1,070	92,580	101,295	6,556	......	**201,501**
Sand-lime brick	ton	......	1,892	3,319	......	......	**5,211**
	$	......	12,327	25,544	......	......	**37,871**
Agriculture	ton	......	54	316	......	......	**370**
	$	......	810	2,375	......	......	**3,185**
CHEMICAL—							
Smelters (non-ferrous)	ton	......	13,745	4,079	1,800	......	**19,624**
	$	......	98,552	28,268	14,450	......	**141,270**
Iron and steel furnaces (†)	ton	5,194	3,655	26,589	700	2,538	**38,676**
	$	66,663	34,105	191,936	5,600	19,289	**317,593**
Cyanide and flotation mills	ton	......	1,184	6,525	6,796	320	**14,825**
	$	......	8,586	48,376	64,078	2,432	**123,472**
Pulp and paper mills	ton	13,228	99,790	8,756	11,353	26,420	**159,547**
	$	142,045	776,546	65,049	86,931	245,680	**1,316,251**
Glass works	ton	......	......	14,680	52	......	**14,732**
	$	......	......	122,617	416	......	**123,033**
Sugar refineries	ton	167	10	3,566	8,901	30	**12,674**
	$	2,161	225	40,811	73,830	228	**117,255**
Tanneries	ton	4	1,229	3,294	......	......	**4,527**
	$	52	10,587	23,157	......	......	**33,796**
Fertilizer plants	ton	......	......	319	......	......	**319**
	$	......	......	1,854	......	......	**1,854**
Insecticide plants	ton	......	......	1,650	......	230	**1,880**
	$	......	......	7,551	......	1,748	**9,299**
Other chemical works	ton	177	121,273	306,231	3,855	2,368	**433,904**
	$	2,302	1,101,910	2,218,823	20,840	17,997	**3,361,872**
Uses unspecified	ton	1,650	2,823	817	1,193	4,892	**11,375**
	$	24,209	31,685	7,109	15,140	37,179	**115,322**
Total Quicklime	**ton**	**20,580**	**250,616**	**391,678**	**38,530**	**36,798**	**738,202**
	$	**238,502**	**2,167,913**	**2,886,778**	**330,333**	**324,553**	**5,948,079**
HYDRATED LIME							
Building trades—							
Finishing lime	ton	......	1,314	19,758	6,775	......	**27,847**
	$	......	15,032	245,898	104,234	......	**365,164**
Masons' lime	ton	330	5,564	6,946	......	......	**12,840**
	$	4,105	17,679	68,047	......	......	**89,831**
Sand-lime brick	ton	......	......	......	......	......	......
	$	......	......	......	......	......	......
Agriculture	ton	......	4,869	2,295	......	6,657	**13,821**
	$	......	14,080	24,254	......	46,473	**84,807**

Table 380.—Production of Lime in Canada, by Provinces, 1944, Showing Purposes For Which Used (*) or Sold—Concluded

—		Nova Scotia and New Brunswick	Quebec	Ontario	Manitoba and Alberta	British Columbia	Total Canada
HYDRATED LIME		(1 ton=2,000 pounds)					
CHEMICAL—							
Smelters (non-ferrous)	ton	....	66,140	60	60	295	**66,555**
	$	....	207,029	573	600	2,059	**210,261**
Iron and steel furnaces	ton	....	....	74	....	....	**74**
	$	....	....	768	....	....	**768**
Cyanide and flotation mills	ton	....	2,226	215	230	36	**2,707**
	$	....	5,435	2,308	2,300	251	**10,294**
Pulp and paper mills	ton	2,200	4,437	4,356	....	45	**11,038**
	$	27,368	43,814	42,924	....	314	**114,420**
Sugar refineries	ton	47	95	....	3,026	....	**3,168**
	$	585	973	....	21,372	....	**22,930**
Tanneries	ton	....	80	842	....	....	**922**
	$	....	740	8,817	....	....	**9,557**
Fertilizer plants	ton	....	....	680	....	....	**680**
	$	....	....	5,612	....	....	**5,612**
Insecticide plants	ton	....	....	238	....	54	**292**
	$	....	....	2,546	....	377	**2,923**
Other chemical works	ton	3	2,283	1,729	125	....	**4,140**
	$	44	17,286	18,228	1,250	....	**36,808**
Uses unspecified	ton	....	1,458	414	....	984	**2,856**
	$	....	14,097	4,424	....	6,869	**25,390**
Total Hydrated Lime	**ton**	**2,580**	**88,466**	**37,607**	**10,216**	**8,071**	**[illegible],940**
	$	**32,102**	**336,165**	**424,399**	**129,756**	**56,343**	**978,765**
Grand Total	**ton**	**23,160**	**339,082**	**429,285**	**48,746**	**44,869**	**885,142**
	$	**270,604**	**2,504,078**	**3,311,177**	**460,089**	**380,896**	**6,926,844**

(†) 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 885,142 tons of lime produced, 415,107 tons were consumed by the producers themselves. Of this amount, 257,999 tons of quicklime were consumed in Ontario plants; 120,618 tons of quicklime in Quebec plants, and the balance, 33,464 tons of quicklime and 3,026 tons of hydrated, in other provinces.

Table 381.—Production of Lime in Canada, 1931-1944

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	1944	470,035	415,107	6,926,844
1937	549,353	3,824,917				
1938	486,922	3,542,652				

(*) Separate data for Sold and Used not available until 1939.

Table 382.—Lime Sold or Used for Chemical and Other Purposes in Canada, 1931-1944

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	$
1931	213,782	1,469,434	18,055	167,885	65,726	595,550	47,222	531,[illegible]
1932	234,342	1,627,720	21,130	131,178	33,926	287,795	31,252	347,[illegible]
1933	207,463	1,496,271	28,347	168,675	60,464	459,451	27,266	307,[illegible]
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	44,671	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
1944	700,708	5,545,695	89,576	413,573	37,494	402,384	57,364	565,192

Table 383.—Imports Into Canada and Exports of Lime and Various Lime Compounds, 1943 and 1944

—	1943 Quantity	1943 Value	1944 Quantity	1944 Value
		$		$
Imports				
Lime.....cwt.	(*) 181,543	64,303	(*) 133,956	34,917
Calcium chloride in packages of not less than 25 pounds.....lb.	592,700	9,782		
Calcium chloride in packages of less than 25 pounds.....lb.	1,282	463	(a) 7,207,500	77,274
Calcium chloride, not in solution, for road treating purposes.....lb.	9,709,400	101,071		
Calcium arsenate.....lb.	9,664	665	.....	.....
Chloride of lime and hypochlorite of lime in packages not less than 25 pounds.....lb.	750,400	22,221		
Chloride of lime and hypochlorite of lime in packages of less than 25 pounds.....lb.	382	198	(b) 441,800	30,113
Calcium compounds, n.o.p.....lb.	.....	.....	1,475,903	120,763
Exports				
Building lime.....cwt.	7,601	3,936	484	675
Lime, n.o.p.....cwt.	300,121	129,384	308,532	136,122
Acetate of lime.....cwt.	92,808	288,420	98,070	320,650
Calcium compounds, n.o.p.....cwt.	2,149,602	6,102,504	1,733,833	5,708,752

(*) All from the United States.
(a) Calcium chloride.
(b) Chloride of lime.

Table 384.—Principal Statistics of the Lime Industry in Canada, 1943 and 1944

—	1943	1944
Number of firms.....	41	38
Number of plants.....	45	42
Capital employed.....$	4,607,651	(*)
Number of employees—On salary.....	99	102
On wages.....	799	713
Total.....	**898**	**815**
Salaries and wages—Salaries.....$	158,629	178,802
Wages.....$	1,249,764	1,235,624
Total.....$	**1,408,393**	**1,414,426**
Selling value of products (gross).....$	6,832,992	7,051,785
Cost of fuel and electricity.....$	1,747,012	1,752,723
Process supplies used.....$	177,470	168,886
Selling value of products (net).....$	4,908,510	5,005,235

(*) Data not collected.

Table 385.—Number of Firms, Employees, Salaries and Wages and Lime (Quick and Hydrated) Sold or Used, by Provinces, 1944

Province	Number of firms	Number of employees	Salaries and wages	Fuel electricity and process supplies used (†)	Production: Tons of lime, sold or used	Production: Value (gross)
			$	$		$
New Brunswick (*).....	4	91	142,793	93,310	23,160	277,242
Quebec.....	12	307	468,083	634,151	339,082	2,547,570
Ontario.....	12	210	432,577	984,401	429,285	3,379,127
Manitoba.....	4	85	110,733	135,501	29,894	307,993
Alberta.....	4	44	72,778	48,974	18,852	158,957
British Columbia.....	2	78	187,462	150,213	44,869	380,896
Canada.....	**38**	**815**	**1,414,426**	**2,046,550**	**885,142**	**7,051,785**

(*) Includes data relating to one firm in Nova Scotia.
(†) This item includes cost of containers as reported.

Table 386.—Number of Wage-Earners on Payroll or Time Record on the Last Day of Each Month or Nearest Work Day, 1942-1944

Month	1942 Quarry	1942 Kiln	1943 Quarry	1943 Kiln	1944 Quarry Male	1944 Quarry Female	1944 Kiln Male	1944 Kiln Female
January	285	628	322	519	242	....	469	....
February	297	619	309	501	237	....	486	....
March	314	647	275	503	248	....	498	....
April	311	640	310	509	235	....	495	....
May	318	643	281	525	237	....	486	....
June	331	637	274	529	232	....	477	....
July	327	633	266	517	242	....	468	....
August	307	604	275	506	222	....	447	....
September	299	587	260	515	229	....	453	....
October	261	631	261	541	215	....	491	....
November	271	614	261	540	237	....	486	....
December	272	590	245	507	224	....	432	....

THE SAND-LIME BRICK INDUSTRY, 1944

Three plants in Canada were engaged chiefly in making sand-lime building brick during 1944. One of these was located in Ontario, 1 in Quebec and 1 in Manitoba. Production, including some building blocks and insulating brick, was valued at $211,603, a slight decrease from the 1943 total of $213,247.

An average of 46 people were employed in these works in 1944 and they were paid $84,130 in salaries and wages. Expenditures for fuel and electricity amounted to $20,729 and for processing materials to $59,609.

Production of sand-lime brick amounted to 12,235 M valued at $171,594, a gain in both quantity and value from the output of 9,088 M brick at $123,263 in the previous year. Production of sand-lime building blocks increased to 235 M at $35,662 from 139 M at $22,365 in 1943.

Table 387.—Products Made, 1943 and 1944

—		1943 Quantity	1943 Selling value at works	1944 Quantity	1944 Selling value at works
			$		$
Sand-lime brick	M	9,088	123,268	12,235	171,594
Sand-lime building blocks	M	139	22,365	235	35,662
Other products (*)		....	67,614	....	4,347
Total		....	**213,247**	....	**211,603**

(*) Includes cement blocks, cinder blocks and insulating brick.

Table 388.—Materials Used in Manufacturing, 1943 and 1944

Material	Unit of measure	1943 Quantity	1943 Cost at works	1944 Quantity	1944 Cost at works
			$		$
Portland cement	brl.	4,482	8,678	....	....
Quicklime	ton	2,441	20,435	2,864	26,297
Sand and gravel	cu. yd.	18,990	26,955	27,525	32,251
Cinders	cu. yd.	6,000	4,500	....	....
Other materials	....	....	6,105	....	1,061
Total	....	....	**66,673**	....	**59,609**

SAND AND GRAVEL INDUSTRY

Commercial production of sand and gravel in Canada during 1944 totalled 28,399,986 short tons valued at $10,280,119 compared with 25,744,469 short tons worth $9,005,857 in 1943. 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 produced in these provinces in 1944 being, respectively, 8,541,400 and 9,529,803; in 1944 the quantity of material washed or screened at Canadian sand and gravel plants totalled 3,442,147 short tons as against 2,842,803 tons in 1943, and the quantity of bank or pit-run grades amounted to 24,957,839 short tons compared with 22,901,666 tons in the preceding year.

Of the total sand and gravel (mixed) output in 1944, there were 16,648,511 tons used for concrete, roads, etc., and 4,428,721 short tons as railroad ballast. In addition, there were produced 1,605,514 short tons of straight-run sand for building, concrete, etc.; 31,947 tons for moulding; 7,275 tons as core sand and 43,238 tons for other purposes. The quantity of crushed gravel produced during the year under review amounted to 2,627,358 short tons. Other sand used as mine fill in 1944 totalled 3,007,422 tons.

Firms (including individuals) reported as active in the Canadian sand and gravel industry numbered 1,541 in 1944; of these, 871 were located in Quebec, 605 in Ontario, 26 in British Columbia and lesser numbers in Nova Scotia, New Brunswick, Manitoba, Saskatchewan and Alberta. Employees were reported at 1,773; salaries and wages paid totalled $2,494,657; fuel, electricity and process supplies used aggregated $391,738 and the total net value of production was estimated at $9,888,381.

Canadian exports of sand and gravel totalled 291,942 short tons valued at $182,584 in 1944 compared with 382,319 tons worth $212,503 in 1943. Imports of sand and gravel in 1944 totalled 83,502 short tons valued at $57,775 as against 83,482 tons worth $53,377 in 1943.

Imports into Canada of silica sand for manufacturing totalled 457,603 short tons valued at $914,390 in 1944 compared with 509,043 tons worth $1,011,117 in 1943.

The annual report on sand and gravel for 1944 as prepared by the Bureau of Mines, Ottawa, contains the following information:—

"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.

"By far the greater part of the output of gravel and sand is used in road improvement, concrete works, and railway ballast. Gravel in particular has proved a good material in the building of all-weather roads at low cost and its use has steadily increased with the growth of motor traffic. A considerable tonnage of sand and gravel is used in the mines for refilling underground workings. Some mines use several thousand tons a day.

"Most of the gravel used for road work comes from pits worked for that purpose. Usually a portable or semi-portable plant is used to extract enough gravel to supply the immediate need, and then a sufficient reserve is built up, in the form of stockpiles, for two years' requirements. Gravel in road pits may remain unused for two years or more, and the amount of gravel produced from year to year thus fluctuates, depending upon the program of road construction and improvement. Gravel in railway pits may remain unused for several years. Part of the gravel used is crushed, screened, and in some cases even washed, and the proportion thus processed is increasing steadily. Some provincial highway departments have used crushed instead of pit-run gravel on their main highways for a number of years. Most of the large commercial plants are equipped for producing crushed gravel, a product that can compete with crushed stone.

"The amount of sand consumed follows the trend of building activity, as most of it is used in the building industry for concrete work, cement and lime mortar, or wall plaster. The sand must be free from dust, loam, organic matter, or clay and must contain only a little silt. It is usually obtainable from local deposits.

"Much sand is used also for moulding in foundries, filtering of water supply, and in making glass, all of which require special grades of sand.

"Prices of sand, gravel, and crushed stone in the four largest cities in Canada were as follows, at the end of 1943 and 1944. Prices, per ton or cubic yard, as indicated below, are for carlots, f.o.b. cars:

—	Montreal		Toronto		Winnipeg		Vancouver	
	per ton		per ton		per cu. yd.		per cu. yd.	
	1943	1944	1943	1944	1943	1944	1943	1944
	$	$	$	$	$	$	$	$
Sand	1·15	1·20	1·01	1·04	1·00	1·00	1·00	1·00
Gravel	1·10	1·10	1·55	1·55	1·00	1·00	1·00	1·00
Crushed stone	0·98	0·97	1·67	1·72	....	....	1·10	1·10

Table 389.—Production in Canada of Sand and Gravel, 1943 and 1944

—	Washed or screened	Bank or pit run	Total Value
	tons	tons	$
1943			
PRODUCTION (*)—			
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	81,697	3,755,414	712,110
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**
1944			
PRODUCTION (*)—			
Sand:			
Moulding sand	19,935	12,012	65,168
Building sand and sand for concrete, roadwork, etc.	1,289,094	316,420	743,191
Core sand	7,275	....	4,408
Mine filling	247	3,007,175	397,578
Other sand (including blast sands, engine sands, etc.)	7,781	35,457	14,353
Sand and Gravel:			
Sand and gravel for railway ballast	339,982	4,088,739	900,610
Sand and gravel for concrete, road-building, etc.	1,430,953	15,217,558	6,898,582
Crushed gravel	340,880	2,280,478	1,256,229
Total	3,442,147	24,957,839	**10,280,119**
Cost of fuel, electricity and process supplies used	....	....	**391,738**
Total net value	....	....	**9,888,381**

(*) 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 390.—Production of Sand for Building and Concrete, Roads, Etc., and Sand and Gravel for Railway Ballast and for Concrete, Roads, Etc., 1935-1944

Year	Sand		Sand and Gravel			
	For building, concrete, roads, etc. (*)		For railway ballast		For concrete, roads, etc.	
	tons	$	tons	$	tons	$
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	1,970,316	775,392	3,837,111	712,140	16,060,686	6,155,625
1944—						
Nova Scotia	....	....	137,859	22,259	678,902	309,671
New Brunswick	202	30	267,095	77,158	1,320,948	662,022
Quebec	710,067	268,043	1,010,779	198,084	5,142,041	1,055,912
Ontario	725,403	403,156	1,553,024	344,685	5,997,090	3,145,153
Manitoba	30,103	13,116	340,879	56,164	723,678	225,069
Saskatchewan	1,019	202	453,759	77,535	697,631	448,304
Alberta	7,078	7,965	381,658	62,461	409,464	225,793
British Columbia	131,642	50,679	283,668	62,264	1,678,757	826,658
Canada, 1944	**1,605,514**	**743,191**	**4,428,721**	**900,610**	**16,648,511**	**6,898,582**

(*) Exclusive of engine and other sands and mine fill.

Table 391.—Production of Moulding and Other Sand and Crushed Gravel, 1944

Province	Mine Fillings and other sands		Moulding sand		Core sand		Crushed gravel	
	tons	$	tons	$	tons	$	tons	$
Nova Scotia	....	....	1,063	3,960	....	....	94,146	75,151
New Brunswick	....	....	....	....	....	....	372,137	219,314
Quebec	2,444	849	....	....	5,800	2,030	1,670,269	615,938
Ontario	847,491	211,097	30,516	60,912	1,475	2,378	374,804	250,046
Manitoba	1,687	625	351	260	....	....	5,750	852
Saskatchewan	4,036	2,308	17	36	....	....	6,635	4,790
Alberta	15,765	2,956	....	....	....	....	19,559	28,976
British Columbia	2,179,237	194,096	....	....	....	....	84,058	61,162
Canada, 1944	**3,050,660**	**411,931**	**31,947**	**65,168**	**7,275**	**4,408**	**2,627,358**	**1,256,229**
Canada, 1943	**1,562,473**	**286,440**	**42,656**	**76,199**	**1,335**	**2,032**	**2,269,892**	**998,029**

Table 392.—Production of Washed and Screened and Pit Run Grades, 1944

Province	Washed or screened	Bank or pit run	Total Value
	tons	tons	$
Nova Scotia	117,617	794,353	411,041
New Brunswick	70,478	1,889,904	958,524
Quebec	517,779	8,023,621	2,140,856
Ontario	1,694,854	7,834,949	4,417,427
Manitoba	294,938	807,510	296,086
Saskatchewan	....	1,163,097	533,175
Alberta	59,048	774,476	328,151
British Columbia	687,433	3,669,929	1,194,859
Total	**3,442,147**	**24,957,839**	**10,280,119**

Table 393.—Production of Sand and Gravel in Canada, by Railway Operators, 1943 and 1944

Kind	1943		1944	
	Tons	Value	Tons	Value
Sand—		$		$
Moulding sand	330	990	....	....
Building sand and sand for concrete, roads, etc.	86,257	12,779	10,195	1,615
Other sand (including blast and engine sands)	57,811	10,053	30,088	7,748
Sand and gravel—				
Sand and gravel for railway ballast	3,578,115	604,202	3,815,167	650,213
Sand and gravel for concrete, roads, etc.	258,538	41,623	154,637	32,851
Crushed gravel	219,517	153,420	623,893	343,505
Total	**4,200,568**	**823,067**	**4,633,980**	**1,035,932**

Table 394.—Production of Sand and Gravel in Canada, by Operators, Other Than Railways, 1943 and 1944

Kind	1943			1944		
	Washed or screened	Bank or pit-run	Value	Washed or screened	Bank or pit-run	Value
Sand—	tons	tons	$	tons	tons	$
Moulding sand	28,013	14,313	75,209	19,935	12,012	65,168
Building sand and sand for concrete, roads, etc.	1,153,953	730,106	762,613	1,289,094	306,225	741,576
Core sand	1,335	....	2,032	7,275	....	4,408
Other sand (including blast and engine sands)	4,959	13,118	5,524	7,781	5,369	6,605
Sand and gravel—						
Sand and gravel for railway ballast	81,697	177,299	107,938	339,982	273,572	250,397
Sand and gravel for concrete, roads, etc.	1,247,057	14,555,091	6,114,002	1,430,953	15,062,921	6,865,731
Mine filling	118,838	1,367,747	270,863	247	3,007,175	397,578
Crushed gravel	206,951	1,843,424	844,609	346,880	1,656,585	912,724
Total	**2,842,803**	**18,701,098**	**8,182,790**	**3,442,147**	**20,323,859**	**9,244,187**

Table 395.—Employees, Salaries and Wages in the Sand and Gravel Industry, by Provinces 1944

Province	Average number of employees			Salaries and wages		
	Salaried Employees	Wage-earners	**Total**	Salaries	Wages	**Total**
				$	$	$
Nova Scotia	1	152	**153**	100	139,087	**139,187**
New Brunswick	2	259	**261**	2,320	230,649	**232,969**
Quebec	12	616	**628**	12,916	781,131	**794,047**
Ontario	41	289	**330**	74,335	494,722	**569,057**
Manitoba	16	148	**164**	43,881	269,453	**313,334**
Saskatchewan	1	16	**17**	3,080	49,563	**52,643**
Alberta	4	63	**67**	24,000	113,815	**137,815**
British Columbia	29	124	**153**	52,638	202,967	**255,605**
Canada	***106**	**†1,667**	**1,773**	**213,270**	**2,281,387**	**2,494,657**

* Includes 17 females. † Includes 5 females.

Table 396.—Average Number of Wage-Earners, by Months, 1940-1944

Month	1940	1941	1942	(a) 1943	(b) 1944
January	274	450	369	333	37[illegible]
February	268	440	434	358	37[illegible]
March	346	517	524	367	37[illegible]
April	629	815	782	665	556
May	3,275	4,400	3,796	3,310	2,492
June	8,182	8,493	5,352	5,155	5,536
July	11,504	8,023	4,787	5,753	3,953
August	11,526	7,225	3,183	4,247	2,412
September	8,644	3,421	1,835	2,870	1,468
October	3,372	2,570	1,142	2,095	711
November	886	764	954	714	636
December	628	412	528	480	499

(a) Average for year 2,227 males and 4 females.

(b) Average for year 1,662 males and 5 females.

Note.—This report does not include employment data relating to the production of sand and gravel in 1944 by railroads owing to the difficulty of separating statistics pertaining to part-time work conducted by railroad maintenance employees and work done by contractors. In 1944 the combined amount paid by railroads to contractors and wages paid railroad employees for the production of sand and gravel totalled $269,458.

Table 397.—Principal Statistics of the Sand and Gravel Industry in Canada (*) 1942-1944

—		1942	1943	1944
Number of firms		1,419	1,387	1,541
Capital employed	$	4,477,547	3,674,501	(†)
Number of employees—On salary		113	89	106
On wages		2,028	2,231	1,667
Total		**2,141**	**2,320**	**1,773**
Salaries and wages—Salaries	$	224,868	182,034	213,270
Wages	$	2,170,887	2,501,223	2,281,387
Total	$	**2,404,755**	**2,683,257**	**2,494,657**
Selling value of sand and gravel produced by railway companies (Gross)	$	844,829	823,067	1,035,932
Selling value of sand and gravel produced by other operators (Gross)	$	8,160,585	8,182,790	9,244,187
Total selling value of sand and gravel produced (Gross)	$	9,005,414	9,005,857	10,280,119
Cost of fuel and electricity	$	509,190	322,202	333,259
Cost of process supplies used	$	167,959	57,233	58,479
Total net value of production	$	**8,328,265**	**8,626,422**	**9,888,381**

(*) Includes data relating to sand production by dredgers and railways.
(†) Not reported in 1944.

MOULDING SAND (NATURAL BONDED) IN 1944

(Bureau of Mines, Ottawa)

Moulding sands are mixtures of sand and clay which, when moist, can be formed into moulds from which metal castings can be made. When suitable mixtures occur they are called natural bonded moulding sands. (Mechanically prepared moulding sand is made by the addition of bonding clay to silica).

In Canada, natural bonded moulding sands usually occur in shallow beds, sometimes of fairly uniform thickness over a considerable area, but in most cases of irregular thickness. These beds are always near the surface. The best natural bonded moulding sands are composed of fairly pure silica sand and plastic refractory clay. The clay bonding content varies approximately from 3 per cent to 30 per cent.

Every province except Prince Edward Island produces natural bonded moulding sand. At one time that province produced small quantities for local use. By far the greater part of the output, generally over 90 per cent, comes from the Niagara Peninsula in Ontario. Occasionally, new deposits have been opened up, mostly in Ontario and in the Prairie 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 (No. 768, French edition), "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.

The Canadian production in 1944 was 31,947 tons valued at $65,168, compared with 42,656 tons valued at $76,199 in 1943. Small quantities of moulding sands not tabulated in official records are produced in nearly all the provinces by foundrymen for their own use from nearby deposits, or by part-time operators such as farmers, for local foundries. Silica sands without clay bond, used mainly in steel foundries, are not included in the above production figures.

Imports are not recorded separately, but are mostly from the United States. They greatly exceed production. Moulding sands, core sands, and other sands and gravels enter Canada duty free.

Consumption of moulding sand, core sand, silica, and other foundry sands for nine basic Canadian industries in 1943 approximated 250,000 tons.

DIRECTORY OF FIRMS 1944

In the following pages the names and addresses of all the principal operators in the Canadian mining industry are given; also the location of the properties worked in 1944.

METAL MINING INDUSTRIES

The Alluvial Gold Mining Industry

NOTE.—(x) Active but not producing.

Name	Head or executive office address	Location
BRITISH COLUMBIA—		
Acorn Placer Group	Blewett	Nelson M.D.
B. and K. Placers	c/o W. E. North, Wells	Cariboo M.D.
Bride, Maurice	Atlin	Atlin M.D.
Browne, John W.	Atlin	Atlin M.D.
Browne, Haydale and Anderson	Atlin	Atlin M.D.
Brister, J. V. Company	Atlin	Atlin M.D.
Columbia Development Ltd.	Atlin	Atlin M.D.
Doody, James	Barkerville	Cariboo M.D.
Edwardson & Johnson	Atlin	Atlin M.D.
Ennerdale Placers	Van Wingle	Cariboo M.D.
Felker, J. J.	Van Winkle	Cariboo M.D.
Fisher and Loken	Atlin	Atlin M.D.
Fisher, N.S.	Atlin	Atlin M.D.
Fry, Thomas	Box 118, Quesnel	Cariboo M.D.
Fleury, J. T. A.	Wells	Cariboo M.D.
Gaensbauer and Piccolo	Atlin	Atlin M.D.
Gunn, J. J.	Wells	Cariboo M.D.
Haylnore, W.	Gold Bridge	Lillooet M.D.
Halverson, Gunnar	Barkerville	Cariboo M.D.
Hasbrouck, W. C.	Keithley Creek	Quesnel M.D.
Holm, A.	Barkerville	Cariboo M.D.
Huffman, Robert R.	Atlin	Atlin M.D.
Ivanic, Steve & Co.	Atlin	Atlin M.D.
Johnson, Konrad	Atlin	Atlin M.D.
Jones, D.	Courtenay	Vancouver Island
Lowhee Mining Co. Ltd.	605 Tacoma Bldg., Tacoma 2, Wash., U.S.A.	Cariboo M.D.
Melline, Fred	Jesmond	Clinton M.D.
Miller, James W.	Marysville	Fort Steele M.D.
Noland, V. L.	Atlin	Atlin M.D.
Noland, John W.	Atlin	Atlin M.D.
Ohman, Fred & Co.	Atlin	Atlin M.D.
Prpich, Tom	Atlin	Atlin M.D.
Reid, James A.	Box 34, Salmon Arm	Revelstoke M.D.
Risberg, Carl A.	Van Winkle	Cariboo M.D.
Swanson, O. H.	Atlin	Atlin M.D.
St. Eugene Mining Corp. Ltd.	Room 215, 602 W. Hastings St., Vancouver	Quesnel M.D.
Sunde, J. & Co.	Atlin	Atlin M.D.
Savery, W. H.	c/o W. E. North, Wells	Cariboo M.D.
Tabert, E.	Penny	Cariboo M.D.
Wilson, A. J.	Revelstoke	Kamloops M.D.
YUKON—		
Clear Creek Placers Ltd.	4556 University Way, Seattle 5, Wash., U.S.A.	Clear Creek
Lunde, V.	Mayo	Dublin Gulch
Middlecoff, E.	Mayo	Highet Creek
Numalake Mines Ltd (x)	25-King St. W., Toronto, Ont.	Scraggie Creek
Wilson and Townshend	Dawson	Last Chance Creek
Yukon Cons. Gold Corp. Ltd.	1010 Marine Bldg., Vancouver, B.C.	Various
Yukon Alluvial Golds Ltd. (x)	4556 University Way, Seattle 5, Wash. U.S.A.	Thistle and Barker Creeks

Principal Operators in the Canadian Auriferous Quartz Mining Industry

NOVA SCOTIA—		
Consolidated Mining & Smelting Co. of Canada Ltd.	215 St. James St. W., Montreal, Que.	Caribou Mines
Corwin Gold Mines Ltd. (x)	c/o J. A. Corman, 155 Riverside Drive, New York, N.Y.	Oldham
Queens Mines Ltd.	297 Agricola St., Halifax	Malaga
QUEBEC—		
Anglo-Rouyn Mines Ltd. (x)	Room 706, 100 Adelaide St. W., Toronto, Ont.	Rouyn
Annamaque Mines Ltd. (x)	Room 501, 67 Yonge St., Toronto, Ont.	Bourlamaque Tp.
Ansley Gold Mines Ltd. (x)	Room 1008, 330 Bay St., Toronto, Ont.	Pershing Tp.

DIRECTORY OF FIRMS—Continued

Principal Operators in the Canadian Auriferous Quartz Mining Industry—Continued

Note.—(x) Active but not producing.

Name	Head or executive office address	Location
Quebec—Continued		
Arken Gold Mines Ltd. (x)	26 Adelaide St. W., Toronto, Ont.	Louvicourt Tp.
Arntfield Mining Corp. Ltd. (x)	Arntfield	Beauchastel Tp.
Astoria Quebec Mines Ltd. (x)	70 St. Paul St., Quebec	Rouyn Tp.
Aubelle Mines Ltd. (x)	Room 710, 36 Toronto St., Toronto, Ont.	Guillet Tp.
Audley Gold Mines Ltd. (x)	Room 710, Excelsior Life Bldg., Toronto, Ont.	Blondeau Tp.
Aumaque Gold Mines Ltd. (x)	Room 710 Excelsior Life Bldg., Toronto, Ont.	Bourlamaque Tp.
Auterra Mines Ltd. (x)	Room 710 Excelsior Life Bldg., Toronto, Ont.	Guillet Tp.
Bagamac Mines Ltd. (x)	Oak Ridges, Ont.	Rouyn Tp.
Beattie Gold Mines (Quebec) Ltd.	25 King St. W., Toronto, Ont.	Duparquet Tp.
Beau Pete Gold Mines Ltd. (x)	Room 714, 320 Bay St., Toronto, Ont.	Beauchastel Tp.
Bell River Mines Ltd. (x)	Room 1701, 372 Bay St., Toronto, Ont.	Louvicourt Tp.
Bellehumeur Gold Mines Ltd. (x)	302 Bay St., Toronto, Ont.	Lorrainville
Bellemac Mud Lake Mines Ltd. (x)	60 King St. W., Toronto, Ont.	Guillet Tp.
Belleterre Quebec Mines Ltd.	Belleterre	Guillet Tp.
Bellezone Mines Ltd. (x)	80 Richmond St. W., Toronto, Ont.	Guillet Tp.
Bevcourt Gold Mines Ltd. (x)	1700 Royal Bank Bldg., Montreal	Louvicourt Tp.
Blairdon Gold Mines Ltd. (x)	Suite 318, 371 Bay St., Toronto, Ont.	Tiblemont Tp.
Blondor Quebec Mines Ltd. (x)	Suite 1008, 330 Bay St., Toronto, Ont.	Belleterre
Bluegrass Raymond Mines Ltd. (x)	Room 404, 200 Bay St., Toronto, Ont.	Vauquelin Tp.
Bonsecour Mines Ltd. (x)	307 Central Bldg., Toronto, Ont.	Carpentier Tp.
Brenmore Quebec Mines Ltd. (x)	355 St. James St. W., Montreal	Guillet Tp.
Bontera Mining Corp. Ltd. (x)	Room 204, 80 Richmond St. W., Toronto, Ont.	Blondor Tp.
Canadian Malartic Gold Mines Ltd.	25 King St. W., Toronto, Ont.	Malartic
Central Duparquet Mines Ltd. (x)	Duparquet	Duparquet Tp.
Cere, Gustave	Box 420, Val d'Or	Various
Citralam Malartic Mines Ltd. (x)	907 Victory Bldg., Toronto, Ont.	Vassan Tp.
Cluny Gold Mines Ltd. (x)	Room 504, 357 Bay St., Toronto, Ont.	Guillet Tp.
Columbiere Mines Ltd. (x)	Room 501, 67 Yonge St., Toronto, Ont.	Bourlamaque Tp.
Croinor Pershing Mines Ltd. (x)	Amos	Pershing Tp.
Croscourt Gold Mines Ltd. (x)	404 Temple Bldg., Toronto	Louvicourt, Tp.
Dinterre Gold Mines Ltd. (x)	Room 501, 67 Yonge St., Toronto, Ont.	Guillet Tp.
Dome Exploration Co. (Que.) Ltd. (x)	Bourlamaque	Various
Dominion Malartic Gold Mines Ltd. (x)	Room 16, 24 King St. W., Toronto, Ont.	Cadillac Tp.
Donalda Mines Ltd. (x)	414 St. James St. W., Montreal	Rouyn Tp.
Dunford Rouyn Mines Ltd. (x)	714, 320 Bay St., Toronto, Ont.	Rouyn Tp.
Donrand Mines Ltd. (x)	100 Adelaide St. W., Toronto, Ont.	Rouyn Tp.
Dubuisson Mines Ltd. (x)	516 Canada Cement Bldg., Montreal	Various
Dovercliffe Gold Mines Ltd. (x)	1104, 67 Yonge St., Toronto, Ont.	Rouyn Tp.
Dupresnoy Mines Ltd. (x)	Room 2810, 25 King St. W., Toronto, Ont.	Duprat Tp.
Donabelle Mines Ltd. (x)	301 Montreal Trust Bldg., Toronto, Ont.	Devlin Tp.
East Amphi Gold Mines Ltd. (x)	Malartic	Malartic Tp.
East Malartic Mines Ltd.	355 St. James St. W., Montreal	Norrie
Elder Gold Mines Ltd. (x)	Room 602, 11 King St. W., Toronto, Ont.	Duprat Tp.
East Sullivan Mines Ltd. (x)	1604 Aldred Bldg., Montreal	Bourlamaque Tp.
Eldona Gold Mines Ltd. (x)	330 Bay St., Toronto, Ont.	Rouyn Tp.
Flobec Gold Mines Ltd. (x)	372 Bay St., Toronto, Ont.	Guillet Tp.
Formaque Gold Mines Ltd. (x)	610 St. James St. W., Montreal	Bourlamaque Tp.
Francoeur Gold Mines Ltd.	941 Dominion Square Bldg., Montreal	Arntfield
Frobisher Exploration Co. Ltd. (x)	25 King St. W., Toronto, Ont.	Various
Garden Mines Ltd. (x)	Room 907, 80 Richmond St. W., Toronto, Ont.	Pershing Tp.
Girard Lake Mines Ltd. (x)	Suite 1008, 330 Bay St., Toronto, Ont.	Belleterre
Glidmac Mining Co. Ltd. (x)	Room 717, 132 St. James St. W., Montreal	Aiguebelle Tp.
Golden Valley Mines Ltd. (x)	80 Richmond St. W., Toronto, Ont.	Dasserat Tp.
Goldora Mines Ltd. (x)	Suite 1608, 80 King St. W., Toronto, Ont.	Bourlamaque Tp.
Goldvue Mines, Ltd. (x)	100 Adelaide St. W., Toronto	Amos
Harpers Malartic Gold Mines Ltd. (x)	Room 1405, 100 Adelaide St. W., Toronto, Ont.	Dubuisson
Harricana Gold Mines Inc. (x)	Room 209, 330 Bay St., Toronto, Ont.	Dubuisson Tp.
Heva Cadillac Gold Mines Ltd. (x)	Room 16, 24 King St. W., Toronto, Ont.	Joannes Tp.
Hosco Gold Mines Ltd. (x)	357 Bay St., Toronto, Ont.	Bousquet Tp.
Howey Gold Mines Ltd. (x)	244 Bay St., Toronto, Ont.	Rouyn Tp.
Hugh Malartic Mines Ltd. (x)	907 Victory Bldg., Toronto, Ont.	Malartic Tp.
Kenda Pershing Mines Ltd. (x)	Room 620, 12 Richmond St. E., Toronto, Ont.	Pershing Tp.
Kayrand Mining & Development Co. Ltd. (x)	Room 301, 215 St. James St. W., Montreal	Dalquier Tp.
Kenikonda Mining Corp. Ltd. (x)	Suite 414, 11 King St. W., Toronto, Ont.	Beauchastel Tp.
Kenojevis River Mines Ltd. (x)	Room 428, 67 Yonge St., Toronto, Ont.	Clericy Tp.
Lady Rouyn Mines Ltd. (x)	710 Northern Ontario Bldg., Toronto, Ont.	Joannes Tp.
Lake Expanse Gold Mines Ltd. (x)	Suite 1207, 67 Yonge St., Toronto, Ont.	Guillet Tp.
Lamaque Mining Co. Ltd.	Bourlamaque	Bourlamaque
LaPalartic Mines Ltd. (x)	Suite 1010, 100 Adelaide St. W., Toronto, Ont.	Malartic Tp.
Lapaska Mines Ltd. (x)	Suite 1010, 100 Adelaide St. W., Toronto, Ont.	Louvicourt Tp.
Lavalie Mines Ltd. (x)	Room 116, 85 Richmond St. W., Toronto, Ont.	Bourlamaque Tp.
Lochland Pershing Mines Ltd. (x)	Room 1001, Federal Bldg., Toronto, Ont.	Pershing Tp.
Louvicourt Goldfield Corp. (x)	1604 Aldred Bldg., Montreal	Louvicourt Tp.

DIRECTORY OF FIRMS—Continued

Principal Operators in the Canadian Auriferous Quartz Mining Industry—Continued

NOTE.—(x) Active but not producing.

Name	Head or executive office address	Location
QUEBEC—Concluded		
Louvore Gold Mines Ltd. (x)	Room 204, 80 Richmond St. W., Toronto, Ont.	Louvicourt Tp.
Macfort Gold Mines Ltd. (x)	67 Yonge St., Toronto, Ont.	Dasserat Tp.
Malartic Gold Fields Ltd.	355 St. James St. W., Montreal	Dubuisson Tp.
Malartic River Mines Ltd. (x)	Val d'Or	Malartic Tp.
Manterre Gold Mines Ltd. (x)	Suite 1010, 100 Adelaide St. W., Toronto, Ont.	Fairlie Tp.
Marbenor Malartic Mines Ltd. (x)	710 Excelsior Life Bldg., Toronto, Ont.	Dubuisson Tp.
Marlon Rouyn Gold Mines Ltd. (x)	Room 16, 24 King St. W., Toronto, Ont.	Rouyn Tp.
Mascot Malartic Mines Ltd. (x)	Room 1107, 330 Bay St., Toronto, Ont.	Fournier Tp.
McWatters Gold Mines Ltd.	Drawer 988, Haileybury, Ont.	Rouyn Tp.
Mic Mac Mines Ltd.	Box 290, Noranda	Bousquet Tp.
Montmagny Gold Mines Ltd. (x)	c/o J. W. Mackenzie, Arntfield	Rouyn Tp.
Mining Corp. of Canada Ltd. (x)	Suite 602, 350 Bay St., Toronto, Ont.	Various
Mylamaque Mines Ltd. (x)	Room 407, 67 Yonge St., Toronto, Ont.	Bourlamaque Tp.
New Bidlamaque Gold Mines Ltd. (x)	Room 714, 320 Bay St., Toronto, Ont.	Bourlamaque Tp.
New Malartic Gold Mines Ltd. (x)	516 Canada Cement Bldg., Montreal	Fournier Tp.
Norbenite Malartic Mines Ltd. (x)	330 Bay St., Toronto, Ont.	Malartic
Norgold Mines (1937) Ltd. (x)	Suite 1010, 100 Adelaide St. W., Toronto, Ont.	Louvicourt Tp.
Norseman Mines Ltd. (x)	80 Richmond St. W., Toronto, Ont.	Bourlamaque Tp.
North Belleterre Gold Mines Ltd. (x)	Room 907, 80 Richmond St. W., Toronto, Ont.	Devlin Tp.
North Malartic Gold Mines Ltd. (x)	Noranda	Malartic Tp.
Nortyne Gold Mines Ltd. (x)	907 Victory Bldg., Toronto, Ont.	Manneville Tp.
O'Brien Gold Mines Ltd.	Kewagama	Cadillac Tp.
Ortona Gold Mines Ltd. (x)	Room 812, 67 Yonge St., Toronto, Ont.	Belleterre
Pandora Limited (x)	Cadillac	Cadillac
Parmaque Mines Ltd. (x)	Room 710, 36 Toronto St., Toronto, Ont.	Bourlamaque Tp.
Parbec Malartic Gold Mines Ltd. (x)	Room 610, 67 Yonge St., Toronto, Ont.	Malartic Tp.
Pen Rey Gold Mines Ltd. (x)	Room 907, 80 Richmond St. W., Toronto,	Rouyn Tp.
Perron Gold Mines Ltd.	Perron	Pascalis Tp.
Pershing Manitou Gold Mines Ltd. (x)	132 St. James St. W., Montreal	Courville Tp.
Poulmaque Gold Mines Ltd. (x)	Box 666, Val d'Or	Bourlamaque Tp.
Powell Rouyn Gold Mines Ltd.	Box 200, Noranda	Rouyn Tp.
Paquin Gold Mines Ltd. (x)	Belleterre	Guillet Tp.
Quebec Ore Zone Ltd. (x)	Suite 2810, 25 King St. W., Toronto, Ont.	Joannes Tp.
Rambull Gold Mines Ltd. (x)	907 Victory Bldg., Toronto, Ont.	Figuery Tp.
Randona Quebec Gold Mines Ltd. (x)	Room 209, 330 Bay St., Toronto, Ont.	Dufresnoy Tp.
Raylartic Cons. Mines Ltd. (x)	Room 21, 33 Melinda St., Toronto, Ont.	Dasserat Tp.
Raymond Tiblemont Gold Mines Ltd. (x)	200 Bay St., Toronto, Ont.	Vaquelin Tp.
Rayon D'Or Mines Ltd. (x)	Room 803, 66 King St. W., Toronto, Ont.	Val d'Or
Rebago Rouyn Mines Ltd. (x)	710 Excelsior Life Bldg., Toronto	Rouyn Tp.
Regcourt Gold Mines Ltd. (x)	1700 Royal Bank Bldg., Montreal	Louvicourt Tp.
Renfort Gold Mines Ltd. (x)	1006 Concourse Bldg., Toronto, Ont.	Beauchastel Tp.
Revelartic Mines Ltd. (x)	Room 508, 11 King St. W., Toronto, Ont.	Cadillac Tp.
Roedor Mines Ltd. (x)	c/o L. C. Barlow, 199 Bay St., Toronto, Ont.	Dubuisson Tp.
Rochette Gold Mines Ltd. (x)	540 rue Boucher, Montreal	Louvay Tp.
Rouyn Merger Gold Mines Ltd. (x)	Room 603, Royal Bank Bldg., Toronto, Ont.	Rouyn Tp.
Scout Pershing Mines Ltd. (x)	907 Victory Bldg., Toronto, Ont.	Pershing Tp.
Senator Rouyn Ltd.	45a Main St., Hull	Rouyn Tp.
Seventh Malartic Mines Ltd. (x)	355 St. James St. W., Montreal	Dubuisson Tp.
Sigma Mines (Quebec) Ltd.	Bourlamaque	Bourlamaque Tp.
Siscoe Gold Mines Ltd.	907 Dominion Square Bldg., Montral	Siscoe
Sladen-Malartic Mines Ltd.	56 Sparks St., Ottawa, Ont.	Malartic
Stadacona Rouyn Mines Ltd.	10 St. James St. E., Montreal	Rouyn
Steeloy Mining Corp. Ltd.	Room 710, 80 King St. W., Toronto, Ont.	Preissac Tp.
Sullivan Cons. Mines Ltd.	1004 Aldred Bldg., Montreal	Dubuisson Tp.
Terrebonne Mines Ltd. (x)	Room 609, 68 Yonge St., Toronto, Ont.	Guillet Tp.
Thurbois Mines Ltd. (x)	201 Park Bldg., Windsor, Ont.	Destor Tp.
Torbec Mines Ltd. (x)	710 Excelsior Life Bldg., Toronto, Ont.	Guillet Tp.
Toburn Gold Mines Ltd. (x)	Royal Bank Bldg., Toronto, Ont.	Dasserat Tp.
Wakeko Mines Ltd. (x)	Suite 1207, 67 Yonge St., Toronto, Ont.	Beauchastel Tp.
Wasa Lake Gold Mines Ltd. (x)	1006 Concourse Bldg., Toronto, Ont.	Beauchastel Tp.
Wingait Gold Mines Ltd. (x)	Room 907, 80 Richmond St. W., Toronto, Ont.	Beauchastel Tp.
West Malartic Mines Ltd.	7000 Jeanne Mance St., Montreal	Cadillac Tp.
West Shore Malartic Gold Mines Ltd. (x)	Room 905, 407 McGill St., Montreal	Malartic Tp.
Wettring Gold Mines Ltd. (x)	Duparquet	Duparquet Tp.
Wiltsay Coghlan Mines (Que.) Ltd. (x)	Suite 1010, 100 Adelaide St. W., Toronto, Ont.	Rouyn Tp.
ONTARIO—		
Porcupine Area—		
Aunor Gold Mines Ltd.	1600 Royal Bank Bldg., Toronto	Timmins
Bonetal Gold Mines Ltd.	1705 Sterling Tower Bldg., Toronto	Pamour
Broulan Porcupine Mines Ltd.	1705 Sterling Tower Bldg., Toronto	Pamour
Buffalo Ankerite Gold Mines Ltd.	Box 533, South Porcupine	South Porcupine
Burley Porcupine Mines Ltd. (x)	907 Victory Bldg., Toronto	Whitney Tp.
Coniaurum Mines Ltd.	25 King St. W., Toronto	Schumacher
Delnite Mines Ltd.	Box 590, Timmins	Deloro Tp.
Dome Mines Ltd.	36 Toronto St., Toronto	South Porcupine
Hallnor Mines Ltd.	Pamour	Pamour

DIRECTORY OF FIRMS—Continued

Principal Operators in the Canadian Auriferous Quartz Mining Industry—Continued

NOTE.—(x) Active but not producing.

Name	Head or executive office address	Location
ONTARIO—Continued		
Porcupine Area—Concluded		
Hollinger Cons. Gold Mines Ltd. (Hollinger)	Timmins	Timmins
Hollinger Cons. Gold Mines Ltd. (Ross)	Timmins	Hislop Tp.
Hoyle Mining Co. Ltd.	Box 40, Haileybury	Whitney Tp.
Hugh-Pam Porcupine Mines Ltd. (x)	Room 601, 371 Bay St., Toronto	Whitney Tp.
Jasper Porcupine Mines Ltd. (x)	43 Colborne St., Toronto	Deloro Tp.
McIntyre Porcupine Mines Ltd.	Schumacher	Schumacher
Pamour Porcupine Mines Ltd.	Pamour	Pamour
Paymaster Cons. Mines Ltd.	Box 508, South Porcupine	Deloro and Tisdale Tps.
Preston East Dome Mines Ltd.	South Porcupine	South Porcupine
Troup Porcupine Mines Ltd. (x)	302 Sterling Tower, Toronto	Whitney Tp.
Twindyke Mines Ltd. (x)	Room 1412, 55 York St., Toronto	Rickard Tp.
Wilcarr Mines Ltd. (x)	80 King St. W., Toronto	Wilkie and Carr Tps.
Kirkland Lake Area—		
Belrosa Mines Ltd. (x)	1001 Federal Bldg., Toronto	Lebel Tp.
Bidgood Kirkland Gold Mines Ltd.	Box 850, Kirkland Lake	Lebel Tp.
Biroco Kirkland Mines Ltd. (x)	1705 Sterling Towers, Toronto	Lebel Tp.
Continental Kirkland Mines Ltd. (x)	1809 Royal Bank Bldg., Toronto	Lebel Tp.
Erin Kirkland Mines Ltd. (x)	Room 1104, 67 Yonge St., Toronto	Lebel Tp.
Kirkland Lake Gold Mining Co. Ltd.	Box 850, Chaput-Hughes	Teck Tp.
Kirgood Gold Mines Ltd. (x)	Room 502, 80 Richmond St. W., Toronto	Lebel Tp.
Lake Shore Mines Ltd.	Kirkland Lake	Teck Tp.
Macassa Mines Ltd.	85 Richmond St. W., Toronto	Kirkland Lake
Northland Mines Ltd. (x)	171 Yonge St., Toronto	Gauthier Tp.
Rocamsa Mines Ltd. (x)	1001 Federal Bldg., Toronto	Lebel Tp.
Scott Chibaugamau Mines Ltd. (x)	215 St. James St. W., Montreal, Que.	Gauthier Tp.
Sylvanite Gold Mines Ltd.	Box 670, Kirkland Lake	Teck Tp.
Teck Hughes Gold Mines Ltd.	Kirkland Lake	Kirkland Lake
Toburn Gold Mines Ltd.	1809 Royal Bank Bldg., Toronto	Kirkland Lake
Upper Canada Mines Ltd.	1001 Federal Bldg., Toronto	Gauthier Tp.
Wright-Hargreaves Mines Ltd.	Fort Erie	Kirkland Lake
Larder Lake Area—		
Anoki Gold Mines Ltd. (x)	1006 Concourse Bldg., Toronto	Gauthier Tp.
Armistice Gold Mines Ltd. (x)	Room 706, 100 Adelaide St. W., Toronto	McGarry Tp.
Chesterville Larder Lake Gold Mining Co. Ltd.	Suite 1104, 330 Bay St., Toronto	Kearns
Kentlake Gold Mines Ltd. (x)	32 Prospect Ave., Kirkland Lake	Gauthier
Kerr-Addison Gold Mines Ltd.	Room 1108, 80 King St. W., Toronto	McGarry Tp.
Largold Mining Co. Ltd. (x)	Room 204, 80 Richmond St. W., Toronto	McGarry Tp.
Mary Ann Mines Ltd. (x)	100 Adelaide St. W., Toronto	McVittie Tp.
Olivet Gold Mines Ltd. (x)	Room 313, 156 Yonge St., Toronto	Gauthier Tp.
Omega Gold Mines Ltd.	Larder Lake	McVittie Tp.
Pelangio-Larder Mines Ltd. (x)	32 Prospect Ave., Kirkland Lake	McGarry Tp.
Poona Gold Mines Ltd. (x)	Suite 210, 331 Bay St., Toronto	McVittie Tp.
Tovarich-Larder Gold Mines Ltd. (x)	Room 1701, 372 Bay St., Toronto	McVittie Tp.
Winchester Larder Mines Ltd. (x)	1101 Federal Bldg., Toronto	McGarry Tp.
Matachewan Area—		
Hollinger Cons. Gold Mines Ltd. (Young-Davidson)	Timmins	Powell Tp.
Laroma Midlothian Mines Ltd. (x)	372 Bay St., Toronto	Midlothian Tp.
Matachewan Cons. Mines Ltd.	25 King St. W., Toronto	Powell Tp.
Sudbury Area—		
Jerome Gold Mines Ltd. (x)	602, 350 Bay St., Toronto	Osway Tp.
Osway Gold Mines Ltd. (x)	708, 357 Bay St., Toronto	Osway Tp.
Thunder Bay Area—		
Birch Bay Gold Mines Ltd. (x)	603 Royal Bank Bldg., Toronto	Long Lake
Hard Rock Gold Mines Ltd.	Geraldton	Ashmore Tp.
Leitch Gold Mines Ltd.	Beardmore	Eva Tp.
Little Long Lac Gold Mines Ltd.	3100, 25 King St. W., Toronto	Errington Tp.
Lake Bearskin Mining Synd. (x)	606 Public Utilities Bldg., Port Arthur	Nezah
MacLeod-Cockshutt Gold Mines Ltd.	357 Bay St., Toronto	Geraldton
Marquette Long Lac Gold Mines Ltd. (x)	503, 357 Bay St., Toronto	Errington Tp.
Kenora and Rainy River Area—		
Classic Sturgeon Gold Mines Ltd. (x)	217 Bay St., Toronto	Savant Lake
Patricia District—		
Berens River Mines Ltd.	Favourable Lake	Favourable Lake
Carricona Mines Ltd. (x)	305-350 Bay St., Toronto	Red Lake
Central Patricia Gold Mines Ltd.	Central Patricia	Central Patricia
Cochenour Willans Gold Mines Ltd.	801 Dominion Bank Bldg., Toronto	McKenzie Island
Craibbe-Fletcher Gold Mines Ltd. (x)	Room 1, 26 Adelaide St. W., Toronto	Red Lake
Crowshore Patricia Gold Mines Ltd. (x)	171 Yonge St., Toronto	Pickle Crow
Campbell Red Lake Mines Ltd. (x)	Room 407, 67 Yonge St., Toronto	Balmer Tp.

DIRECTORY OF FIRMS—Continued

Principal Operators in the Canadian Auriferous Quartz Mining Industry—Concluded

(x) Active but not producing.

Name	Head or executive office address	Location
ONTARIO—Concluded		
Patricia District—Concluded		
Derlak Red Lake Gold Mines Ltd. (x)	1001 Federal Bldg., Toronto	Heyson Tp.
Dickenson Red Lake Mines Ltd. (x)	200 Bay St., Toronto	Balmer Tp.
Hasaga Gold Mines Ltd.	25 King St. W., Toronto	Red Lake
Madsen Red Lake Gold Mines Ltd.	67 Yonge St., Toronto	Madsen
McKenzie Red Lake Gold Mines Ltd.	19 Richmond St. W., Toronto	McKenzie Island
McMarmac Red Lake Gold Mines Ltd.	Room 803, 66 King St. W., Toronto	Dome Tp.
Mills Red Lake Mines Ltd. (x)	Room 712, 80 King St. W., Toronto	Red Lake
Pickle Crow Gold Mines Ltd.	Pickle Crow	Pickle Crow
Redaurum Red Lake Gold Mines Ltd. (x)	100 Adelaide St. W., Toronto	Red Lake
Russet Red Lake Gold Mines Ltd. (x)	24 King St. W., Toronto	Red Lake
Wilson Red Lake Gold Mines Ltd. (x)	Room 1116, 85 Richmond St. W., Toronto	Red Lake
MANITOBA—		
Goldbeam Mines Ltd. (x)	75 Summit Ave., Toronto, Ont.	Falcon Lake Dist.
Red Cloud Mining & Smelting Ltd. (x)	503 Huron & Erie Bldg., Winnipeg	Bear River Dist.
San Antonio Gold Mines Ltd.	237 Curry Bldg., Winnipeg	Rice Lake
SASKATCHEWAN—		
Newcor Mining & Refining Ltd. (x)	67 Yonge St., Toronto, Ont.	Douglas Lake
NORTHWEST TERRITORIES—		
Ace Yellowknife Mines Ltd. (x)	Room 907, 80 Richmond St. W., Toronto, Ont.	Yellowknife
Aurora Yellowknife Mines Ltd. (x)	Room 706, 100 Adelaide St. W., Toronto, Ont.	Yellowknife
Belle-Bry Yellowknife Mines Ltd. (x)	Room 706, 100 Adelaide St. W., Toronto, Ont.	Yellowknife
Cardinal Yellowknife Gold Mines Ltd. (x)	Room 501, 67 Yonge St., Toronto, Ont.	Yellowknife
Cons. Mining & Smelting Co. of Canada Ltd. (x)	Trail, B.C.	Yellowknife
Giant Yellowknife Gold Mines Ltd. (x)	25 King St. W., Toronto, Ont.	Yellowknife
Homer Yellowknife Mines Ltd. (x)	330 Bay St., Toronto, Ont.	Yellowknife
Lynx Yellowknife Gold Mines Ltd. (x)	25 King St. W., Toronto, Ont.	Yellowknife
Meewood Yellowknife Mines Ltd. (x)	611 Temple Bldg., Toronto, Ont.	Gordon Lake
Negus Mines Ltd.	410 Royal Bank Bldg., Toronto, Ont.	Yellowknife
Quebec Yellowknife Gold Mines Ltd. (x)	Room 717, 132 St. James St. W., Montreal, Que.	Duck Lake
Ranney Gold Mines Ltd. (x)	25 King St. W., Toronto, Ont.	Yellowknife
BRITISH COLUMBIA—		
Bralorne Mines Ltd.	555 Burrard St., Vancouver	Bralorne
B.R.X. Cons. Mines Ltd. (x)	Room 616, 475 Howe St., Vancouver	Bridge River
Cariboo Gold Quartz Mining Co. Ltd.	1007 Royal Bank Bldg., Vancouver	Wells
Cariboo Mines	Greenwood	Greenwood
Cons. Mining & Smelting Co. of Canada Ltd. (x)	Trail	Nanaimo and Nelson M.D.
Gem Gold Mines Ltd. (x)	1604 Royal Bank Bldg., Vancouver	Texada Island
Gold Belt Mining Co. Ltd. (x)	Room 616, 475 Howe St., Vancouver	Sheep Creek
Hankedahl, E. (Ymir)	Ymir	Ymir
Hedley Mascot Gold Mines Ltd.	908 Royal Bank Bldg., Vancouver	Hedley
Island Mountain Mines Co. Ltd.	Wells	Wells
I.X.L. Leasing Syndicate	Box 122, Rossland	Trail Creek M.D.
Kelowna Exploration Co. Ltd.	Hedley	Hedley
Kootenay Belle Gold Mines Ltd.	916 Stock Exchange Bldg., Vancouver	Sheep Creek
McArthur, W. E., and Son (Gold Finch)	Box 629, Greenwood	Greenwood
Penney, A. (Kalamalka)	Lavington	Vernon M.D.
Pioneer Gold Mines of B.C. Ltd.	607 Rogers Bldg., Vancouver	Pioneer Mine
Privateer Mine Ltd. (x)	Room 602, 475 Howe St., Vancouver	Zeballos
Second Relief Mine	Salmo	Salmo
Sheep Creek Gold Mines Ltd.	616 Stock Exchange Bldg., Vancouver	Sheep Creek
Silbak Premier Mines Ltd.	826 Pender St. W., Vancouver	Premier
Solovcoff, Fred. (Miracle)	Blewett	Nelson M.D.

Operators in Canadian Copper-Gold-Silver Mining Industry

QUEBEC—		
Aldermac Copper Corp. Ltd.	941 Dominion Square Bldg., Montreal	Beauchastel Tp. Ascot Tp.
Cons. Mining & Smelting Co. of Canada Ltd. (x)	215 St. James St. W., Montreal	Bourlamaque Tp.
Gan Copper Mines Ltd. (x)	293 Bay St., Toronto, Ont.	Beauchastel Tp.
Horne Fault Mines Ltd. (x)	Duparquet	Beauchastel Tp.
Lake Dufault Mines Ltd.	Duparquet	Dufresnoy Tp.
Letourneau, Joseph (x)	Disraeli	Stratford Tp.
Macdonald Mines Ltd. (x)	414 St. James St. W., Montreal	Dufresnoy
Noranda Mines Ltd.	1600 Royal Bank Bldg., Toronto, Ont.	Noranda

DIRECTORY OF FIRMS—Continued

Operators in Canadian Copper-Gold-Silver Mining Industry—Concluded

(x) Active but not producing.

Name	Head or executive office address	Location
Quebec—Concluded		
Normetal Mining Corp. Ltd.	Suite 602, 350 Bay St., Toronto, Ont.	Desmeloizes Tp.
Quemont Mining Corp. Ltd. (x)	Suite 602, 350 Bay St., Toronto, Ont.	Rouyn Tp.
Touton Mining & Exploration Co. Ltd. (x)	500 Place d'Armes, Montreal	Fabre Tp.
Vachon-Vachon Prospecting Soc. (x)	138 Cockburn St., Drummondville	Beauce Co.
Waite Amulet Mines Ltd.	Noranda	Duprat Tp. Dufresnoy Tp.
West Amulet Mines Ltd. (x)	Room 2810, 25 King St. W., Toronto	Duprat Tp.
Ontario—		
Bandolac Mining Co. Ltd. (x)	39 LaBelle Bldg., Windsor	L. Shebandowan Lake
Kam-Kotia Porcupine Mines Ltd.	Timmins	Robb Tp.
Lobanor Gold Mines Ltd. (x)	Room 318, 331 Bay St., Toronto	Shebandowan
Royalite Gold Synd.	c/o H. Goldman, 569 Church St., Toronto	Salter Tp.
Manitoba—		
Emergency Metals Ltd.	500 Royal Bank Bldg., Winnipeg	The Pas M.D.
Hudson Bay Mining & Smelting Co. Ltd.	500 Royal Bank Bldg., Winnipeg	The Pas M.D.
International Mining Corp. (x)	622 Federal Bldg., Toronto, Ont.	Various
Sherritt Gordon Mines Ltd.	Room 2810, 25 King St. W., Toronto, Ont.	Sherridon
Saskatchewan—		
Hudson Bay Mining & Smelting Co. Ltd.	500 Royal Bank Bldg., Winnipeg, Man.	The Pas Dist.
British Columbia—		
Britannia Mining & Smelting Co. Ltd.	Britannia Beach	Britannia Beach
Granby Cons. Mining, Smelting & Power Co. Ltd.	675 West Hastings St., Vancouver	Copper Mountain
Industrial Metals Mining Co. Ltd.	626 W. Pender St., Vancouver	Nanaimo M.D.
Wartime Metals Corp. (Twin J)	637 Craig St., Montreal, Que.	Duncan

Operators in Canadian Silver-Cobalt Mining Industry

Name of operator	Head office address	Location
Ontario—		
Augener Mines Ltd. (x)	Box 643, Cobalt	Coleman Tp.
Ausic Mining & Reduction Co. Ltd. (x) (Genesee & Silver Cliff)	Box 643, Cobalt	Coleman Tp.
Cross Lake Lease (O'Brien)	Box 390, Cobalt	Coleman Tp.
Cross Lake Lease (Miller Lake O'Brien)	Box 390, Cobalt	Haultain Tp.
Davis, Norman B. (Werner Lake)	512 Victoria Bldg., Ottawa	Kenora Dist.
McCready, W. E. (Hudson Bay)	Cobalt	Cobalt
Mercier, Raoul (Foster)	Box 547, Cobalt	Coleman Tp.
O'Shaughnessy, C. V. J. (O'Brien mill)	Box 319, Cobalt	Cobalt
Presse, Albert (Nipissing)	215 Lang St., Cobalt	Cobalt
Price, C. H. (Kerr Lake)	Cobalt	Kerr Lake
Silanco Mining & Smelting Corp. Ltd.	45 Richmond St. W., Toronto	Cobalt Dist.
Silco Mines Ltd. (x)	Suite 501, 67 Yonge St., Toronto	Gillies Limit
Sutherland, J. H. (Lawson)	Cobalt	Coleman Tp.

Note.—In addition to the names listed, there were some small shippers from whom official reports were unobtainable. Mine names shown in brackets.

Principal Operators in 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
Perras Hermas Synd. (Tetreault mine)	4 Notre Dame St. E., Montreal	Portneuf Co.
Siscoe Metals Ltd. (Tetreault mine)	907 Dominion Square Bldg., Montreal	Portneuf Co.
Ontario—		
Lake Geneva Mining Co. Ltd.	941 Dominion Square Bldg., Montreal, Que.	Hess Tp.
British Columbia—		
Base Metals Mining Corp. Ltd.	350 Bay St., Toronto 1, Ont.	Field
Comara Mining & Milling Co. Ltd. (x)	815 Queen St. W., Toronto, Ont.	Ferguson

DIRECTORY OF FIRMS—Continued

Principal Operators in the Canadian Silver-Lead-Zinc Mining Industry—Concluded

Name of operator	Head office address	Location of mine
BRITISH COLUMBIA—Concluded		
Cons. Mining & Smelting Co. of Can. Ltd.	Trail	Kimberley
Cons. Nicola Goldfields Ltd.	322-744 West Hastings St., Vancouver	Nicola M.D.
Doney, Ernest (Victor)	Box 414 New Denver	Slocan, M.D.
Highland Bell Ltd.	Creston	Beaverdell
Kootenay Bell Gold Mines Ltd. (a)	916 Stock Exchange Bldg., Vancouver	Retallack
Ottawa Mining & Milling Co.	Slocan	Springer Creek
Provindence Mine Synd.	Box 629 Greenwood	Greenwood
Sheep Creek Gold Mines Ltd.	616 Stock Exchange Bldg., Vancouver	Zincton
Wartime Metals Corp. (b)	637 Craig St. W., Montreal, Que.	Ainsworth
Western Exploration Co. Ltd.	Silverton	Kaslo M.D.
YUKON—		
Berry, A. F.	Mayo	Mayo
Brefalt & Fournier	Mayo	Mayo
Gordon & Bjonnes	Mayo	Mayo
Sinyard, C.	Mayo	Mayo
Treadwell Yukon Corp. (c)	1022 Crocker Bldg., San Francisco, Cal.	
Williamson & Buryer	Mayo	Mayo

(a) Retallack Mines project.
(b) Kootenay-Florence project.
(c) No operations; acted as shipping agent only.

The Nickel-Copper Mining, Smelting and Refining Industry in Canada

(*) Active but not producing.

ONTARIO—		
Falconbridge Nickel Mines, Ltd.	304 Bay St., Toronto	Falconbridge Tp.
Harlin Nickel Mines Ltd.	Room 503, 357 Bay St., Toronto	Porquis Jct.
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.
North Range Nickel Mines Ltd. (*)	Suite 501, 67 Yonge St., Toronto	Bowell Tp.

FIRMS IN THE MISCELLANEOUS METAL MINING INDUSTRY IN CANADA

(*) 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. (*)	Room 401, 100 Adelaide St. W., Toronto, Ont.	Renfrew Co., Ont.
Bismuth—		
Deloro Smelting & Refining Co. Ltd. (*)	900 Victoria Bldg., Ottawa, Ont.	Deloro, Ont.
Consolidated Mining & Smelting Company of Canada Ltd.	215 St. James St., Montreal, Que.	Trail, B.C.
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.

DIRECTORY OF FIRMS—Continued

FIRMS IN THE MISCELLANEOUS METAL MINING INDUSTRY IN CANADA—Concluded

(*) Active but not producing.

Name of firm and product	Head office address	Location of mine or plant
Chromite—		
Chrome Association	342 Notre Dame St., Black Lake, Que	Black Lake, Que.
Chromore Ltd	399 Notre Dame St., Thetford Mines, Que	Caleraine Twp., Que.
Chromite Ltd	404 Notre Dame St. W., Montreal Que	Cleveland Twp., Que.
Metivier, Willis B	Black Lake, Que	Caleraine Twp., Que.
Pare, Orel	Black Lake, Que	Caleraine Twp., Que.
Wartime Metals Corp. (Chromeraine Project)	637 Craig St. W., Montreal, Que	Caleraine Twp., Que.
Iron Ore—		
Goyette, A. E. (*)	4295 St. Hubert St., Montreal, Que	Arthabaska Co., Que.
Hollinger North Shore Exploration Co. Ltd. (*)	721 Royal Bank Bldg., Montreal, Que	N. E. Quebec, Que.
Labrador Mining & Exploration Co. Ltd. (*)	721 Royal Bank Bldg., Montreal, Que	Labrador, Que.
Titan Steel Corp	80 St. Peter St., Quebec	Moisie Bay, Que.
Algoma Ore Properties Ltd	Cornwall Bldg., Sault Ste. Marie, Ont	Algoma dist., Ont.
Michipicoten Iron Mines Ltd. (*)	25 King St. W., Toronto, Ont	Algoma dist., Ont.
Rebair Gold Mines Ltd. (*)	9 Adelaide St. E., Toronto, Ont	Atikokan, Ont.
Sarpedon Iron Mines Ltd. (*)	1101 Federal Bldg., Toronto, Ont	Rainy River dist., Ont.
Steep Rock Iron Mines Ltd	25 King St. W., Toronto, Ont	Rainy River dist., Ont.
Tomahawk Iron Mines Ltd. (*)	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. (*)	500 Royal Bank Bldg., Winnipeg, Man	Cat Lake, Man.
Lithium Corporation of Canda Ltd. (*)	403 Avenue Bldg., Winnipeg, Man	Bernic and Cat Lakes, Man.
Sherritt Gordon Mines Ltd. (*)	25 King St. W., Toronto, Ont	Crowduck Bay, Man. East Braintree, Man.
Magnesium—		
Consolidated Mining & Smelting Company of Canada Ltd. (*)	215 St. James St., Montreal, Que	Trail, B.C.
Dominion Magnesium Ltd	Room 1107, 67 Yonge St., Toronto, Ont	Haley, Ont.
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—		
Indian Molybdenum Ltd	Bourlamaque, Que	Preissac Twp., Que.
Quyon Molybdenite Co. Ltd	Quyon, Que	Quyon, Que.
Wartime Metals Corp. (LaCorne Project)	637 Craig St. W., Montreal, Que	Abitibi Co., Que.
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.
Thallium—		
Hudson Bay Mining & Smelting Co. Ltd	500 Royal Bank Bldg., Winnipeg, Man	Flin Flon, Man.
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.
Coulombe, J	71 Ave. Royal Monument, Quebec, Que	St. Urbain, Que.
Sinnck Ulmenite Co. Ltd	c/o C. N. Knowles & Co., 360 St. James St. W., Montreal, Que	Romaine River Dist. Que.
Tungsten Concentrates—		
B.C. War Metals Research Board (a)	University of British Columbia, Vancouver, B.C	Vancouver, B.C.
Hollinger Cons. Gold Mines Ltd	Timmins, Ont	Timmins, Ont.
Wartime Metals Corp. (Emerald Tungsten Project)	637 Craig St. W., Montreal, Que	Salmon, B.C.

(a) treated alluvial material from Yukon.

DIRECTORY OF FIRMS—Continued

Firms in the Canadian Non-Ferrous Smelting and Refining Industry

Name of firm	Head or executive office address	Location of plant
Quebec—		
Aluminum Company of Canada Ltd	1700 Sun Life Bldg., Montreal	Arvida, Shawinigan Falls, La Tuque, Isle Maligne, Beauharnois
Canadian Copper Refiners Ltd	1600 Royal Bank Bldg., Toronto, Ont	Montreal East
Noranda Mines Limited	1600 Royal Bank Bldg., Toronto, Ont	Noranda
Ontario—		
Deloro Smelting & Refining Co. Limited	Deloro	Deloro
Dominion Magnesium Ltd	67 Yonge St., Toronto	Haley
Eldorado Mining and Refining	80 King St. W., Toronto	Port Hope
Falconbridge Nickel Mines Ltd	304 Bay St., Toronto	Falconbridge
International Nickel Co. of Canada Limited	Copper Cliff	Copper Cliff, Coniston, Port Colborne
Manitoba—		
Hudson Bay Mining and Smelting Co. Limited	500 Royal Bank Bldg., Winnipeg	Flin Flon
British Columbia—		
Consolidated Mining & Smelting Co. of Canada Limited	Trail	Trail

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.
Campbell, A. J.	Inverness	Inverness.
Chestico	Port Hood	Inverness.
Cumberland Ry. & Coal Co.	Sydney	Cumberland.
Dominion Coal Co. Ltd.	Sydney	Cape Breton.
Doucet, S. J.	Inverness	Inverness.
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	Iverness.
Margaree Steamship Co.	Inverness	Iverness.
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.
Butler, Stanley	Newcastle Bridge	Queens.
Crawford, E. S.	Newcastle Bridge	Queens.
Evans, W. B.	Minto	Queens.
Flower, H. L.	Newcastle Creek	Queens.
Fearon, Bertrum	Beersville	Kent.
Girvan, H. H.	Jailletville	Kent.
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.
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	Area—
Anderson, Peter	Maxstone	Wood Mountain.
Anderson, Niels	Estevan	Souris.
Assels, Glen Alexander	Shaunavon	Shaunavon.
Banks, H.	Bienfait	Souris.
Banks, H.	Pinto	Souris.
Bealm, 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.
Blondeau, A.	Roche Percee	Souris.
Bouffard, Emile	Willow Bunch	Wood Mountain.
Bourquin & Sons, G.	Estevan	Souris.
Bourquin & Sons, L. E.	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—Concluded		Area—
Brown, Alton G.	Wideview	Wood Mountain.
Coats & Kingdon	Bienfait	Souris.
Culbert, Wesley	Minton	Wood Mountain.
Desjardin, F.	Willow Bunch	Wood Mountain.
Dovell, A. C.	Eastend	Shaunavon.
Dupuis, R.	Scout Lake	Wood Mountain.
Eastern Collieries of Bienfait	Estevan	Souris.
Eikemo & Peterson	Gladmar	Wood Mountain.
Emery, E. G.	Readlyn	Wood Mountain.
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.
Furuskjeg, A.	Minton	Wood Mountain.
Glombowski, Rudolph	Ardill	Wood Mountain.
Gosselin, Raymond	Willow Bunch	Wood Mountain.
Gosselin, C.	Dollard	Shaunavon.
Guse, L.	Bengough	Wood Mountain.
Havanah Collieries	Estevan	Souris.
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.
Lapointe, Louis	Buffalo Gap	Wood Mountain.
Larsen, Peter	Eastend	Shaunavon.
Leatherdale, D.	Gladmar	Wood Mountain.
Lebeck, A.	Buffalo Gap	Wood Mountain.
Lee, Austin M.	Big Beaver	Wood Mountain.
Lid, Bjarne	Minton	Wood Mountain.
Livingston, Kelly	Rockglen	Wood Mountain.
Man. & Sask. Coal Co. Ltd.	503 Ave. Bldg., Winnipeg, Manitoba	Souris.
Matheson & Uhrich	Pinto	Souris.
McCuaig, M.	Fife Lake	Wood Mountain.
McGillis, J. M.	Willow Bunch	Wood Mountain.
Morrison, Ray	Big Beaver	Wood Mountain.
Nordstrom, C.	Estevan	Souris.
North West Coal Co.	Bienfait	Souris.
Olson and Klyne	Estevan	Souris.
Olshanoski, J.	Estevan	Souris.
Osjust, Steve	Estevan	Souris.
Parkinson, Geo.	Estevan	Souris.
Pohl, Henry	Buffalo Gap	Wood Mountain.
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.
Scott, Ervin	Viceroy	Wood Mountain.
Slater, Dan	Bengough	Wood Mountain.
South Cambrian Ltd.	Pinto	Souris.
Southernwood, E.	Estevan	Souris.
Spirka & Novak	Shaunavon	Shaunavon.
Straza, D. J.	Wood Mountain	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.
Warren, Wm.	Fife Lake	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. Uhrich	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.
International Coal & Coke Co. Ltd.	Coleman	Crowsnest.

DIRECTORY OF FIRMS—Continued

Coal Mining Industry—Continued

Name	Address	Location
ALBERTA—Continued		
Bituminous—*Continued*		District—
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.
Sub-bituminous—		
Ainsley, B.	5717-3rd St. S.W. Calgary	Morley.
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.
Banner Coals Ltd.	Edmonton	Edmonton.
Barrell, W.	Ardley	Ardley.
Beverly Coal Co. Ltd.	Beverly	Edmonton.
Big Valley Coal Co.	Big Valley	Big Valley.
Birnwel Coal Ltd.	Calgary	Brooks.
Bish Bros.	Forestburg	Castor.
Blackfoot Indian Agency	Gleichen	Gleichen.
Black Nugget Coal Co. Ltd.	Dodds	Tofield.
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.
Burnstad, S. H.	Ohaton	Camrose.
Bush Mines Ltd.	Edmonton	Edmonton.
Buxton, Arthur	Lonira	Whitecourt.
Campkin, R. & Sons	Lousana	Big Valley.
Camrose Collieries Ltd.	Camrose	Camrose.
Camarta, John	Cardiff	Edmonton.
Castle Coal Co.	Wayne	Drumheller.
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 (Regal Coal Co. Ltd.)	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.
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.
Forsyth & Arnold	Lethbridge	Lethbridge.
Foye, E. B.	Drumheller	Drumheller.
Fraser, Alec	Carmangay	Champion.
Fridel and Opalinski (Pine Creek Coal Co.)	R.R. 3, S. Edmonton	Edmonton.
Gainford Coal Co.	Gainford	Pembina.
Gill, Peter	Thorsby	Wetaskiwin.
Great West Coal Co.	10117—100A St. Edmonton	Edmonton.
Gunderson Brick & Coal Co. Ltd.	Redcliff	Redcliff.

DIRECTORY OF FIRMS—Continued

Coal Mining Industry—Continued

Name	Address	Location
ALBERTA—Continued		
Lignite—*Continued*		District—
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.
Inland Coal Co.	Three Hills	Carbon.
Ironside, T.G.	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.
Maple Leaf Minerals Ltd.	Drumheller	Drumheller.
Marshall, John W.	Donalda	Castor.
Musciangelo, John	Delia	Sheerness.
McGaw, A. M. S.	Champion	Champion.
McKinlay & Son, James	Huxley	Big Valley.
McMillan, Alex	Rosebud	Gleichen.
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.
Morel, M. E.	Ghost Pine Creek	Carbon.
Mueller, J. J.	Masinasin	Milk River.
Muney, H. C.	Foreman	Castor.
Munro & Son, S.S.	Ardley	Ardley.
Murray Collieries Ltd.	East Coulee	Drumheller.
Newcastle Collieries Ltd.	Drumheller	Drumheller.
New Royal View Mine	Lethbridge	Lethbridge.
Nimko, K.	S. Edmonton	Edmonton.
North Point Coal Co.	Thorhild	Rochester.
Nottal & Davidson	Three Hills	Carbon.
O'Brien and Davis	Halkirk	Castor.
Oliver, E.	Taber	Taber.
Opalinski & Sinoski	S. Edmonton	Edmonton.
Ottewell 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.
Pritchard, R. F.	Blue Ridge	Whitecourt.
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.

DIRECTORY OF FIRMS—Continued

Coal Mining Industry—Concluded

Name	Address	Location
ALBERTA—Concluded		
Lignite—Concluded		District—
Schlender, Otto	Trochu	Carbon.
Schnepf, Karl	Rosebud	Gleichen.
Sheerness Coal Co. Ltd.	Sheerness	Sheerness.
Shute & Partners	Dinant	Camrose.
Sinoski, Mike	S. Edmonton	Edmonton.
Sissons, J. W.	Alix	Ardley.
Skauge & Bailey	Gadsby	Castor.
Smith, Howard	Edmonton	Edmonton.
Sorken, A.	Killam	Castor.
Sovereign Coal Co. Ltd.	Wayne	Drumheller.
Spencer & Dolphin	Carbon	Carbon.
Staite, A. E.	Trochu	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, T.	Heisler	Castor.
Stubbs, T. E.	Hanna	Sheerness.
Taylor, Thomas	Groton	Milk River.
Thorhild Coal Co.	Thorhild	Rochester.
Tofield Coal Co. Ltd.	Tofield	Tofield.
Twin City Coal Ltd.	S. Edmonton	Edmonton.
Tyrlik, John	Heisler	Castor.
Watson, Alex	Blue Ridge	Whitecourt.
Western Gem & Jewel Collieries Ltd.	Rosedale	Drumheller.
Western Ventures Ltd.	Lethbridge	Taber.
Whittaker, O. W.	Beynon	Drumheller.
Wilkinson & Strader	Halkirk	Castor.
Wilma Coal Co.	Edmonton	Pembina.
Wiltse, F. N.	Halkirk	Castor.
Wood & Larson	High Prairie	No Area.
Yellowknife Transport Co. Ltd.	10509-100th Ave., Edmonton	Edmonton.
BRITISH COLUMBIA—		
British Lands Ltd.	Kelowna	Inland.
Bulkley Valley Collieries Ltd.	Telkwa	Inland.
Canadian Collieries (Dunsmuir) Ltd.	Nanaimo	Island.
Cassidy Mines	Nanaimo	Island.
Chambers, R. H.	Nanaimo	Island.
Coldwater Colliery	Merritt	Inland.
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.
Hasler Creek Coal Co. Ltd.	Dawson Creek	Inland.
Hat Creek Coal Mines	Ashcroft	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.
Peace River Coal Mines Ltd.	Hudson Hope	Inland.
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.

Firms in the Natural Gas Industry in Canada

NOTE.—(a) Drilling only. (b) Distributing only. (c) Drilling and producing. (d) Pipe line company. (e) Using or selling gas from absorption plant.

Name	Address	Location—Field
NEW BRUNSWICK—		
Moncton Electricity and Gas Co. Ltd. (b)	700 Main St., Moncton.	
New Brunswick Gas & Oilfields Ltd.	Box 194, Moncton	Stoney Creek
ONTARIO—		
Achilles Oil & Gas Syndicate	67 Yonge St., Toronto	Woodhouse

DIRECTORY OF FIRMS—Continued

Firms in the Natural Gas Industry in Canada—Continued

Name	Address	Location—Field
ONTARIO—Continued		
Ajax Oil & Gas Co. Ltd.	371 Bay St., Toronto	Dover, Tuscarora and Middleton
Aloka Oil & Gas Co.	57 Queen St. W., Toronto	Dereham and Malahide
Amer-Can Oil & Gas Co.	215 King St. W., Chatham	Dover, Tilbury East and Walpole
Ashton, J. L. (a)	Chatham.	
Barnhart, Mrs. E.	Stevensville	Bertie
Bates, Norman	R.R. 1, Humberstone	Humberstone
Beachville Gas Syndicate (b)	Beachville.	
Beacon Natural Gas Syndicate	112 Locust St., Kitchener	Walpole
Beaver Oil & Gas Syndicate	67 Yonge St., Toronto	Walpole
Beaver Utilities Ltd. (b)	421 Richmond St., London.	
Beer, George	Binbrook	Binbrook
Belmont Gas Co. (b)	978 Church St., Windsor.	
Benn, A. S.	R.R. 1, Hagersville	Walpole
Beaner, K. W.	Fisherville	Rainham and Walpole
Bertie Gas & Oil Syndicate	Fisherville	Bertie and Willoughby
Binbrook Gas Co.	Binbrook	Binbrook
Bliss, Douglas E.	Tillsonburg	Middleton
Brindley & Harper	Dunnville	Brantford
Broadway Gas Syndicate	R.R. 3, Cayuga	Walpole and Cayuga North
Buck, C. S.	Port Rowan	Walsingham South
Burchell Gas Syndicate	R.R. 2, Listowel	Woodhouse and Raleigh
Canada Cement Co. Ltd.	Box 290, Montreal, Que.	Wainfleet
Canadian Natural Gas Syndicate	Simcoe	Bayham and Moulton
Canfield Gas Syndicate	206 Douglas Blvd., Windsor	Cayuga North
Canfield Natural Gas Co.	Dunnville	Cayuga North
Cartwright, S. E.	1972 Penobscot Bldg., Detroit, Mich., U.S.A.	Walpole
Central Ontario Gas & Oil Well Drilling Co. (a)	Toronto.	
Central Pipe Line Co. Ltd.	Chatham	Bayham, Houghton and Malahide
Central Seneca Gas Syndicate	R.R. 3, Cayuga	Seneca
City Gas Company of London (b)	London.	
Colbert, M. A.	18 Sun Life Bldg., Hamilton	Walpole
Coleman, J. A.	Wellandport	Gainsboro
Columbia Natural Gas & Oil Co. Ltd.	907 Pigott Bldg., Hamilton	Dunn
Coronation Gas Syndicate	Stevensville	Bertie
Culver, M. & Son (a)	Rainham Centre.	
Dain City Gas Syndicate	208 Burgar St., Welland	Bertie and Humberstone
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
Dominion Natural Gas Co. Ltd.	518 Jackson Bldg., Buffalo, N.Y. U.S.A.	Aldborough, Binbrook, Caistor, Canboro, Charlotteville, Delhi Village, Dunn, Glanford, Humberstone, Mersea, Middleton, Moulton, Cayuga North, North Walsingham, Oneida, Onondaga, Port Dover Village, Port Rowan, Rainham, Raleigh, Romney, Seneca, Sherbrooke, South Cayuga, South Walsingham, Tilbury East, Townsend, Wainfleet, Walpole, Windham, Woodhouse, North Dorchester, Malahide, Southwold, Yarmouth, South Norwich and West Oxford
Dorset Oil & Gas Syndicate	67 Yonge St., Toronto	Cayuga South
Drake & Walker	Walkerville	Malden
Dunn Natural Gas Co. Ltd.	81 St. Paul St., St. Catharines	Dunn and Sherbrooke
Dunnville-Detroit Gas Syndicate	206 Douglas Blvd., Windsor	Cayuga North
Economy Natural Gas Syndicate	25 Market Place, Stratford	Woodhouse
Elgin Prospecting Syndicate	Ridgeway	Humberstone
Elk Development Syndicate (c)	Cayuga South	Humberstone
Emerald Gas Syndicate	67 Yonge St., Toronto	Oneida
Emerson, Harry L. (c)	R.R. 1, Dunnville	Canboro, Moulton and Wainfleet
Emerson, Lloyd W. (a)	Wainfleet.	
Evans, Harry L. (a)	Tillsonburg.	
Featherstone, Roy	Caledonia	Oneida
Fisherville Gas Co.	Fisherville	Rainham
Fleet Aircraft Ltd.	Fort Erie	Bertie
Fletcher, Mrs. Eva	Glanford Station	Binbrook

DIRECTORY OF FIRMS—Continued

Firms in the Natural Gas Industry in Canada—Continued

Name	Address	Location—Field
ONTARIO—Continued		
Fonthill & Ridgeville Gas Co. Ltd. (b)	Box 511, Portland, Indiana, U.S.A.	
Frontier Gas Syndicate	Fisherville	Bertie
Gas Producers Syndicate	206 Douglas Blvd., Windsor	Raleigh
Gifford, Arthur & Son	R.R. 2, Cayuga	Cayuga South
Glenny, D.	R.R. 5, 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
Hoover, A. E. (a)	Selkirk.	
Hoover & Donald (a)	Selkirk.	
Houk Gas Syndicate	Dunnville	Moulton
House, C. C. (c)	Stevensville	Bertie
Hussey, Wm. J. (a)	Petrolia.	
Ideal Gas Syndicate	R.R. 2, Fisherville	Rainham
Ivy Drilling Co. (a)	Dunnville.	
Jackson, Percy L. (c)	Dunnville	Moulton, Canboro, Cayuga North, Walpole and Crowland
Jackson & Graff	Dunnville	Crowland
Jasperson, Bon	Kingsville	Gosfield South and Romney
Jenkins, Stanley S.	282 W. North St., Buffalo, N.Y., U.S.A.	Townsend and Bertie
Kent Gas Co.	36 Toronto St., Toronto	Walpole
Kerr, R.	York	Seneca
Kiser Bros. (a)	Chatham.	
Lake Erie Gas Syndicate	54 Hambly Ave., Toronto	Rainham
Lake Shore Gas & Oil Syndicate	Stevensville	Bertie
Lauer, D. G. (a)	Tillsonburg.	
Leamington, Town of (b)	Leamington.	
Lincoln Natural Gas Co. Ltd.	Fort Erie North	Canboro, Gainsboro, Wainfleet, Caistor and Moulton
Lindsay-McDougal Estate	279 St. George St., Toronto	Rainham
Little, R. W.	222 Humbercrest Blvd., Toronto	Walpole, Rainham, Onondaga and Brant
Locators Oils Ltd.	22 King St. W., Toronto	Cayuga South and Middleton
Lomac Gas Co.	Port Stanley	Bayham
Lymburner Bros. & Webber (c)	Dunnville	Cayuga North, Rainham and Walpole
Maple Leaf Gas Syndicate	Stevensville	Crowland and Humberstone
McCutcheon, T. J. (a)	Dunnville.	
McKechnie, S. (c)	Dunnville	Senaca, Walpole and Bayham
McLister, J. J. (a)	Dunnville.	
McMaster, W. R. (a)	Caledonia.	
Mehlenbacher, L. B.	R.R. 3, Cayuga	Senaca, Walpole and Cayuga North
Midfield Gas Corp. Ltd.	68 Yonge St., Toronto	Cayuga North and Oneida
Minor & Luck	Cheltenham	Sherbrooke
Mohawk Gas & Oil Syndicate Ltd.	421 Main St., Hamilton	Canboro, Oneida and Walpole
Monarch Gas & Oil Syndicate	Fisherville	Walpole, Dunn and Cayuga North
Morningstar, Roy	Stevensville	Bertie
Mott, G. L. & Associates (c)	Lynden	Beverly
Nagel, E. (a)	Stevensville.	
Nelles Corners Gas Co.	Hagersville	Rainham and Cayuga North
Niagara Gas Syndicate	Fisherville	Bertie
Niagara Natural Gas Co. Ltd.	24 Jarvis St., Fort Erie North	Moulton
Niece, Elmond	Dunnville	Sherbrooke
Norotto Gas Co. Ltd. (b)	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
Oil Springs Oil & Gas Co. Ltd. (b)	Oil Springs.	
Oxford Pipe Line Co. (b)	100 Adelaide St. W., Toronto.	
Patterson & Culver (c)	Dunnville	Oneida
Patterson, W. C., Gas Co. Ltd. (c)	Jamestown, N.Y., U.S.A.	Dunn, Walpole, Willoughby, Rainham, Cayuga North Crowland, Humberstone, Bayham, Dereham and Wainfleet
Peacock Point Gas & Oil Syndicate	Fisherville	Walpole
Perkins, J. E. (a)	Dunnville.	
Petrol Oil & Gas Co. Ltd.	414 Bay St., Toronto	Dover, Oneida, Onondaga and Tuscarora
Pine Ridge Gas Co. Ltd.	Port Stanley	Bayham
Port Colborne Welland Gas Co. (c)	Port Colborne	Onondaga, Oneida, Senaca and Cayuga North

DIRECTORY OF FIRMS—Continued

Firms in the Natural Gas Industry in Canada—Continued

Name	Address	Location—Field
ONTARIO—Concluded		
Povec Gas Syndicate	Tillsonburg	Canboro
Prairie Gas & Oil Co. Ltd	350 Bay St., Toronto	Dover
Provincial Gas Co. Ltd	Fort Erie North	Humberstone, Willoughby, Bertie and Crowland
Purcifer & Ferguson	Stevensville	Humberstone
Rainham Gas Syndicate	Cayuga	Rainham
Reicheld, F. W.	Jarvis	Walpole
Ricker, Arthur (c)	Canboro	Canboro
Riley, J. V.	162 Talbot St., Simcoe	Moulton
Rocks Mill Oil & Gas Syndicate	510 Huron & Erie Bldg., London	Norwich South
Romney Oil & Gas Co.	18 Toronto St., Toronto	Tilbury East, Romney and Wainfleet
Roth, F. and H. (c)	R.R. 9, Dunnville	Bertie and Dunn
Rowe, E. P. Estate	403 Atlas Bldg., 350 Bay St., Toronto	Bayham, Dover East, Middleton and Raleigh
Royal Gas Syndicate	Stevensville	Bertie
Salina Gas Co. Ltd	317 Queen St., Chatham	Tilbury East
Sandusk Gas Syndicate	Fisherville	Walpole
Sarnia Oil & Gas Co.	350 Bay St., Toronto	Enniskillen and Sarnia
Shank Bros. (a)	Rainham Centre.	
Sherk & Carrothers	Sherkston	Humberstone
Sherk & Learn	Sherkston	Humberstone
Sherk & Nagel	Stevensville	Bertie
Sherk, Perry M.	Sherkston	Humberstone
Shurr & Shank	R.R. 1, Jarvis	Rainham and Oneida
Sider, Andrew & Jesse	Stevensville	Bertie
Sider, Norman	Sherkston	Bertie and Humberstone
Smith & Eldo (c)	R.R. 1, Lowbanks	Moulton
South Norwich Gas & Oil Syndicate	Norwich	Norwich South
Sparton Gas & Oil Syndicate	67 Yonge St., Toronto	Cayuga South
Springvale Gas & Oil Co. Ltd.	Hagersville	Walpole
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.	Guelph	Walpole
Stevensville Natural Gas & Fuel Co.	Stevensville	Bertie
Stewart, Elgin	R.R. 3, Jarvis	Walplole
Stewart & Stewart	R.R. 3, Jarvis	Walpole
Storm & Stewart	R.R. 1, Sherkston	Humberstone
Stover, F. H., and Associates	330 Bay St., Toronto	Dover and Raleigh
Stromwell Gas Co.	Tillsonburg	Moulton
Stubble, H. H. (a)	Chatham.	
Sundy Gas Wells	Dunnville	Canboro
Superior Gas Syndicate	Fisherville	Rainham
Swayze & Nauman (a)	R.R. 5, Simcoe.	
Sweets Corners Gas Syndicate	Fisherville	Rainham
Swent, Wm. (a)	Rainham Centre	
Tanner, F. O.	135 General Motors Bldg., Detroit, Mich., U.S.A.	Cayuga North and Oneida
Till Gas Syndicate	Tillsonburg	Walpole
Tillsonburg (New) Oil & Gas Co. Ltd.	26 Adelaide St. W., Toronto	Middleton
Union Gas Co. of Canada Ltd.	Chatham	Romney, Tilbury East, Raleigh, Dover, Dawn, Camden Gore, Zone, Mosa, Dunn, Cayuga North, Rainham, Seneca, Cayuga South, Walpole, Oneida, Chatham, Malahide, Westminster, Harwich and Brooke
United Gas & Fuel Co. of Hamilton Ltd. (b)	82–84 King St. E., Hamilton.	
Victoria Gas Syndicate	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 and Cayuga North
Walter Gas Syndicate Ltd. (c)	Simcoe	Townsend, Walsingham South, Woodhouse, Middleton and Walpole
Welland County Gas Syndicate	Stevensville	Bertie
Wentworth Gas Co. Ltd. (b)	82–84 King St. W., 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
Willoughby Gas Syndicate	R.R. 1, Chippawa	Humberstone
Windham Plantation Tobacco Co.	Delhi	Windham
Wood, Ray	61 Inches Ave., Chatham	Mosa and Townsend
SASKATCHEWAN—		
Lloydminster Gas Co. Ltd.	Lloydminster	Lloydminster
Northern Utilities Ltd.	Lloydminster	Lloydminster

DIRECTORY OF FIRMS—Continued

Firms in the Natural Gas Industry in Canada—Concluded

Name	Address	Location—Field
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.	Box 672, 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.	902 Lancaster Bldg., Calgary	Turner Valley
Anglo Canadian Oil Co. Ltd.	902 Lancaster Bldg., Calgary	Turner Valley
Argus Royalties Ltd.	902 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
Baltac Oils Ltd.	200 Leeson-Lineham Block, Calgary	Turner Valley
Barsac Royalties Ltd.	303 Toronto General Trusts Bldg., Calgary	Turner Valley
Bow Island, Town of (b)	Bow Island.	
British American Oil Co. Ltd. (e)	Royal Bank Bldg., Toronto, Ont.	
British Colonial Oils Ltd.	1010 Lancaster Bldg., Calgary	Turner Valley
Calgary Power Co. Ltd.	244 St. James St., Montreal, Que.	Bassano
California Standard Co.	700 Lancaster Bldg., Calgary	Conrad and Princess
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
Coastal Oils Ltd.	232 Lougheed Bldg., Calgary	Turner Valley
D & D Royalties Ltd.	303 Toronto General Trusts Bldg., Calgary	Turner Valley
Department of National Defence	Traders Bldg., Calgary	Suffield
Dominion Glass Co. Ltd.	1111 Beaver Hall Hill, Montreal, Que.	Redcliff
East Crest Oil Co. Ltd.	212 Grain Exchange Bldg., Calgary	Turner Valley
Foothills Oil & Gas Co. Ltd.	604-606 Second St. W., Calgary	Turner Valley
Gas & Oil Refineries Ltd. (e)	301 Lancaster Bldg., Calgary.	
Gunderson Brick & Coal Co. Ltd.	Redcliff	Redcliff
Home Oil Co. Ltd.	226 Lougheed Bldg., Calgary	Turner Valley
Hudson's Bay Oil & Gas Co. Ltd.	79 Main St., Winnipeg, Man.	Viking
Inland Gas & Oil Co. Ltd.	36 Dominion Bank Chambers, Edmonton	Fabyan
Major Oil Investments Ltd.	407 Lancaster Bldg., Calgary	Turner Valley
Maple Leaf Milling Co. Ltd.	Dominion Bank Bldg., Toronto 2, Ont.	Medicine Hat
Maple Leaf Oil Co. Ltd.	608 Stock Exchange Bldg., Vancouver, B.C.	Wainwright
Medicine Hat, City of	Medicine Hat	Medicine Hat
Medicine Hat Brick & Tile Co. Ltd.	Box 100, Medicine Hat	Medicine Hat
Model Oils Ltd.	201 Lancaster Bldg., Calgary	Turner Valley
Northwestern Utilities Ltd.	10124, 104 St., Edmonton	Viking and Kinsella
Ogilvie Flour Mills Co. Ltd.	Medicine Hat	Medicine Hat
Oil Ventures Ltd.	501 Leeson-Lineham Bldg., Calgary	Turner Valley
Pacific Petroleums Ltd.	501 Leeson-Lineham Bldg., Calgary	Turner Valley
Redcliff Pressed Brick Co. Ltd.	Redcliff	Redcliff
Royalite Oil Co. Ltd.	604-606 Second St. W., Calgary	Turner Valley
Suffield Gas Supply	Suffield	Suffield
Sunset Oils Ltd.	302 Toronto General Trusts Bldg., Calgary	Turner Valley
Turner Valley Royalties Ltd.	232 Lougheed Bldg., Calgary	Turner Valley
Valley Gas Co. Ltd.	Turner Valley	Turner Valley
Vanalta Ltd.	618-744 West Hastings St., Vancouver, B.C.	Red Coulee
Wainwright Gas Co. Ltd. (b)	38 Dominion Bank Chambers, Edmonton.	
Welch, Nora M.	Suffield	Medicine Hat
Wetaskiwin, City of	Wetaskiwin	Wetaskiwin
York Oils Ltd.	501 Leeson-Lineham Block, Calgary	Turner Valley
NORTHWEST TERRITORIES—		
Imperial Oil Co. Ltd.	56 Church St., Toronto, Ont.	Fort Norman

Crude Oil Producers in Canada

Name	Address	Location—Field
NEW BRUNSWICK—		
New Brunswick Gas & Oilfields Ltd.	Moncton	Stoney Creek
ONTARIO (*)—		
Barnes, Amos	Petrolia	Petrolia and Enniskillen
Barnes, Henry	Oil Springs	Petrolia and Enniskillen
Beattie, James and John	Glencoe	Warwick
Brock, Thomas	Petrolia	Petrolia and Enniskillen
Byers Bros.	Oil Springs	Petrolia and Enniskillen
Cole, W. J.	Petrolia	Petrolia and Enniskillen
Collins, Matthew	Petrolia	Petrolia and Enniskillen
Corey Oil & Supply Co.	Petrolia	Petrolia and Enniskillen
Dennis, Lavina	Oil Springs	Petrolia and Enniskillen
Domestic Gas & Oil Co. Ltd.	Blyth	Bothwell
Dominion Petroleum Co.	Glencoe	Mosa
Donald, George	Oil Springs	Petrolia and Enniskillen
Eastern Trust Co.	Toronto	Dunwich
Edward, F. H.	Petrolia	Petrolia and Enniskillen
Fairbank, John H., Estate	Petrolia	Petrolia and Enniskillen

DIRECTORY OF FIRMS—Continued

Crude Oil Producers in Canada—Continued

Name	Address	Location—Field
ONTARIO—Concluded		
Fitzpatrick, P. H.	2230 Park Ave., Detroit, Mich., U.S.A.	Orford
Garinger, Arthur	Oil Springs	Petrolia and Enniskillen
Graff, George I.	25 Market Place, Stratford	Bothwell
Hamlin, F. G.	Petrolia	Petrolia and Enniskillen
Heal, Andrew A.	Watford	Warwick
High Grade Natural Gas Co.	215 King St., Chatham	Dover
Hillis, F. E.	Oil Springs	Petrolia and Enniskillen
Holmes, E. B. (†)	Bothwell	Bothwell
Howlett, F. W. & Sons	Petrolia	Petrolia and Enniskillen
Kells, E. E.	Petrolia	Petrolia and Enniskillen
Kelly, J. E.	Petrolia	Petrolia and Enniskillen
Kent Oil Syndicate	Bothwell	Bothwell
Kerr, John, Estate	Petrolia	Petrolia and Enniskillen
Lather, Arthur	Bothwell	Bothwell
Lennan, L. A.	Box 514, Petrolia	Petrolia and Enniskillen
Leverton, Wm.	Bothwell	Bothwell
Lewis, Laura and William	Oil Springs	Petrolia and Enniskillen
Lidstor, Harold	Wallacetown	Dunwich
Longwood Syndicate	Chatham	Zone
MacGillivray, Mrs. Margaret A.	Oil Springs	Petrolia and Enniskillen
Marcus, A.	Bothwell	Bothwell
McCutcheon, A. P.	Oil Springs	Petrolia and Enniskillen
McGill, Joseph	Bothwell	Bothwell
McMillan, Duncan C.	Bothwell	Bothwell
McMillan & Warwick	Bothwell	Bothwell
Mitchell, Charles	Oil Springs	Petrolia and Enniskillen
Mitchell, Robert	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.	Petrolia	Petrolia and Enniskillen
Petrol Oil & Gas Co.	414 Bay St., Toronto	Dover
Pope, Harry O.	Bothwell	Bothwell
Pope, William Jr.	Bothwell	Bothwell
Prairie Gas & Oil Co.	350 Bay St., Toronto	Dover
Rowe, E. P. Estate	350 Bay St., Toronto	Dover and Raleigh
Saroline Oil Co.	Petrolia	Petrolia and Enniskillen
Shain, Viola May	R.R. 3, Petrolia	Petrolia and Enniskillen
Slack, Charles	Box 863, Petrolia	Petrolia and Enniskillen
Sutherland, Bloss M.	Petrolia	Petrolia and Enniskillen
Thompson, Arnold	Petrolia	Petrolia and Enniskillen
Tunks, James	Bothwell	Bothwell
Union Gas Co. of Canada Ltd.	Gas Bldg., Fifth St., Chatham	Dawn, Raleigh and Zone
Warwick, Joseph	Oil Springs	Petrolia and Enniskillen
Wilson & Sullivan	Sarnia	Adelaide, Brooke and Warwick
Winnett, J. W. G.	418½ Talbot St., London	Bothwell and Warwick
Woodward, Wm.	Oil Springs	Petrolia and Enniskillen
Yerks, Frank	Petrolia	Petrolia and Enniskillen and Warwick
ALBERTA—		
Abasand Oils Ltd.	Credit Foncier Bldg., Edmonton	Fort McMurray
Ace Royalties Ltd.	4 Clarence Block, 122-8th Ave., 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
Allied Royalties Ltd.	201 Lancaster Bldg., Calgary	Turner Valley
Amalgamated Oils Ltd.	902 Lancaster Bldg., Calgary	Turner Valley
Anglo Canadian Oil Co. Ltd.	902 Lancaster Bldg., Calgary	Turner Valley
Argus Royalties Ltd.	900 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
Baltic Oils Ltd.	200 Leeson-Lineham Block, Calgary	Turner Valley
Barsac Royalties Ltd.	303 Toronto General Trusts Bldg., Calgary	Turner Valley
Berlwain Oils Ltd.	73 Adelaide St. W., Toronto, Ont.	Wainwright
Borradaile Oils Ltd.	330 Bay St., Toronto, Ont.	Vermilion
British American Oil Co. Ltd. (b)	Royal Bank Bldg., King & Yonge Sts., Toronto, Ont.	
British Colonial Oils Ltd.	1010 Lancaster Bldg., Calgary	Turner Valley
British Dominion Oil & Development Corp. Ltd.	213-216 Dominion Bank Bldg., Calgary	Turner Valley
British Empire Oil & Development Co. Ltd.	401 Leeson-Lineham Block, Calgary	Turner Valley
California Standard Co.	700 Lancaster Bldg., Calgary	Conrad and Princess
Calmont Oils Ltd.	303 Toronto General Trusts Bldg., Calgary	Turner Valley
Calwin Royalties Ltd.	301 Lancaster Bldg., Calgary	Turner Valley
Canadian Transport Ltd.	Vermilion	Vermilion
Cannar Oils Ltd.	360 McGill St., Montreal, Que.	Vermilion
Carleton Royalties Ltd.	102 Bank of Commerce Chambers, Calgary	Turner Valley
Chinook Oils Ltd.	232 Lougheed Bldg., Calgary	Turner Valley
Coastal Oils Ltd.	232 Lougheed Bldg., Calgary	Turner Valley
Command Oils Ltd.	4 Clarence Block, 122-8th Ave. W., Calgary	Turner Valley

(*) Producers of 300 barrels or more during the year.
(†) Producer and driller.

DIRECTORY OF FIRMS—Continued

Crude Oil Producers in Canada—Concluded

Name	Address	Location—Field
ALBERTA—Concluded		
Commoil Ltd.	4 Clarence Block, 122-8th Ave. W., Calgary	Turner Valley
Commonwealth Drilling Co. Ltd. (a)	4 Clarence Block, 122-8th Ave. W., Calgary	
Conestoga Resources Ltd.	710 Excelsior Life Bldg., Toronto, Ont.	Vermilion
Crest Royalties Ltd.	201 Lancaster Bldg., Calgary	Turner Valley
Crude Oils Ltd.	501 Leeson-Lineham Bldg., Calgary	Turner Valley
D & D Royalties Ltd.	303 Toronto General Trusts Bldg., Calgary	Turner Valley
Dalhousie Oil Co. Ltd.	604-606 Second St. W., Calgary	Turner Valley
Davies Petroleums Ltd. N.P.L.	409 Lancaster Bldg., Calgary	Turner Valley
Deep Oils Ltd.	501 Leeson-Lineham Bldg., Calgary	Turner Valley
Dominion Oil Co. Ltd.	906 Marine Bldg., Vancouver, B.C.	Taber
Drillers & Producers Ltd.	337-8th Ave. W., 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.	902 Lancaster Bldg., Calgary	Turner Valley
Federated Petroleums Ltd.	232 Lougheed Bldg., Calgary	Turner Valley
Foothills Oil & Gas Co. Ltd.	604-606 Second St. W., Calgary	Turner Valley
Four Star Petroleums Ltd.	232 Lougheed Bldg., Calgary	Turner Valley
Franco Oils Ltd.	Vermilion	Vermilion
Gas & Oil Refineries Ltd. (b)	301 Lancaster Bldg., Calgary	
Gem Royalties Ltd.	403 Lancaster Bldg., Calgary	Turner Valley
Granville Oils Ltd.	4 Clarence Block, 122-8th Ave. W., Calgary	Turner Valley
Great Bend	National Trust Bldg., Edmonton	Vermilion
Harris Co. Ltd.	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.	604-606 Second St. W., Calgary	Turner Valley
Independent Royalties Ltd.	403 Lancaster Bldg., Calgary	Turner Valley
Kamalta Well Operators Ltd.	201 Lancaster Bldg., Calgary	Turner Valley
Lion Producing Co. Ltd.	328A, 8th Ave. W., Calgary	Turner Valley
Major National Oils Ltd.	407 Lancaster Bldg., Calgary	Turner Valley
Major Oil Ltd.	403 Lancaster Bldg., Calgary	Taber
Major Oil Investments Ltd.	407 Lancaster Bldg., Calgary	Turner Valley
McDougall-Segur Exploration Company 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
Moose Oils Ltd.	714 Lancaster Bldg., Calgary	Moose Dome
National Drilling Co. Ltd.	401 Leeson-Lineham Bldg., Calgary	Turner Valley
National Petroleum Corp.	401 Leeson-Lineham Bldg., Calgary	Turner Valley
National Vulcan Royalties	401 Leeson-Lineham Bldg., Calgary	Turner Valley
Newell & Chandler Ltd. (a)	337-8th Ave. W., Calgary	
Northclonmel Royalties Ltd.	330 Bay St., Tornto, Ont.	Turner Valley
Oil Ventures Ltd.	501 Leeson-Lineham Block, Calgary	Turner Valley
Okalta Oils Ltd.	Renfrew Bldg., Calgary	Turner Valley
Pacific Petroleums Ltd.	501 Leeson-Lineham Block, Calgary	Turner Valley
Princeville Petroleums Ltd.	720 Stock Exchange Bldg., Vancouver, B.C.	Vermilion
Ram River Oils Ltd.	728 Tegler Bldg., Edmonton	Ram River
Regal Royalties Ltd.	401 Leeson-Lineham Block, Calgary	Turner Valley
Renown Royalties Ltd.	201 Lancaster Bldg., Calgary	Turner Valley
Reward Spooner Model Ltd.	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
Royalite Oil Co. Ltd. (c)	604-606 Second St. W., Calgary	Turner Valley
Royalite Model No. 1 Well	201 Lancaster Bldg., Calgary	Turner Valley
Saskahead Oils Ltd.	Indian Head, Sask.	Vermilion
Saska-Wainwright Oil & Gas Ltd.	103 Bowerman Bldg., Saskatoon, Sask.	Wainwright
Share Royalties Ltd.	61 Canada Life Bldg., Calgary	Turner Valley
Shaw, R. L.	Box 37, Lloydminster, Sask.	Lloydminster
Southwest Petroleum Co. Ltd.	604-606 Second St. W., Calgary	Turner Valley
Sovereign Royalties Ltd.	317 Alberta Corner, Calgary	Turner Valley
Standard Oil Company of British Columbia Ltd.	906 Marine Bldg., Vancouver, B.C.	Taber
Sunhurst Oil Co. Ltd.	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
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.	618-744 West Hastings St., Vancouver, B.C.	Red Coulee
Vanpeg Royalties Ltd.	301 Lancaster Bldg., Calgary	Turner Valley
Vulcan-Brown Petroleums Ltd.	232 Lougheed Bldg., Calgary	Turner Valley
Wain-Con Oils Ltd.	431 Tegler Bldg., Edmonton	Wainwright
Wainwright Petroleums Ltd.	10025, 99 Ave., Edmonton	Wainwright
Western Petroleum Operators Ltd.	407 Lancaster Bldg., Calgary	Turner Valley
Westside Royalties Ltd.	232 Lougheed Bldg., Calgary	Turner Valley
Winalta Royalties Ltd.	301 Lancaster Bldg., Calgary	Turner Valley
York Oils Ltd.	501 Leeson-Lineham Block, Calgary	Turner Valley
NORTHWEST TERRITORIES—		
Imperial Oil Ltd. (Canol Project)	56 Church St., Toronto, Ont.	Fort Norman
Imperial Oil Ltd. (Norman Wells)	56 Church St., Toronto, Ont.	Fort Norman

(a) Drilling only. (b) Operates an absorption plant.
(c) In addition to operating and drilling wells in the Turner Valley field, this company operates an absorption plant.

OTHER NON-METAL MINING INDUSTRIES

DIRECTORY OF FIRMS—Continued

Asbestos Mining Industry

Name of firm	Head or general office address	Location of plant
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
Flintkote Mines Ltd. (*)	283 Roxborough St. E., Toronto, Ont.	Thetford Mines
International Asbestos Co. Ltd. (*)	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 Station

(*) Carried on exploration or development work only.

Feldspar and Quartz Mining Industry

(a) Produces silica.
(b) Produces feldspar.
(c) Operates a mill.
(d) Also produces kaolin.
(e) Produces nepheline syenite.
(f) Produces grinding pebbles.
(g) Contractor.
(h) Produces scapolite.

Name of firm	Head office address	Location of mine or mill
NOVA SCOTIA—		
Nairn, J. (a)	24 Whitney Ave., Sydney	Leitches Creek
Stevens, Archie (a)	11 McKenzie St., Glace Bay	Melford
QUEBEC—		
Bigelow, Gordon (b) (g)	Glen Almond	Derry Tp.
Bon Ami Ltd., (b) (c)	13719 Notre Dame St. E., Montreal	Montreal
Couture, T. (f)	Glen Almond	Glen Almond
Canadian Carborundum Co. Ltd., (a) (c)	Box 57, Niagara Falls, Ont.	St. Canut
Canada China Clay & Silica Ltd. (a) (d)	1600 Royal Bank Bldg., Toronto, Ont.	Amherst Tp.
Canadian Flint & Spar Co. Ltd. (a) (b) (c)	Room 512 Victoria Bldg., Ottawa, Ont.	Buckingham
Excavators (Rock) Ltd. (a) (g)	Noranda	Lac Bouchette
Hart, Rodrique (a)	Notre Dame de la Salette	Portland W. Tp.
Hill, Wm. (a) (f)	Glen Almond	Buckingham Tp.
Industrial Silica Corp. (a)	Room 408—266 St. James St., Montreal	Roberval Co.
Lafrance, Ovila (a)	Angers	Buckingham Tp.
Law, S. H. (a) (b)	Room 28, 14 Toronto St., Toronto, Ont.	Derry Tp.
Micaspar Industries Ltd. (b)	16 James St. S., Hamilton, Ont.	Portland W. Tp.
McGill, Lawrence (h)	R.R. No. 1, Pointe au Chene	Grenville Tp.
Montpetit, Euclyde (a)	Melochville	Beauharnois Co.
Morin, A. H. (a) (b)	Box 3, Buckingham	Buckingham Tp.
Parcher, Earl (b)	Glen Almond	Portland E. Tp.
St. Lawrence Alloys & Metals Ltd. (a) (c)	Beauharnois	Beauharnois Co.
United Mining Industries Ltd. (a) (b)	1451 Notre Dame St. W., Montreal	Buckingham
ONTARIO—		
American Nepheline Corp. (e)	Lakefield	Methuen Tp.
Bancroft Mica & Stone Products (b) (c)	Bancroft	Faraday Tp.
Bathurst Feldspar Mines Ltd. (b)	Room 508, 21 King St. E., Toronto	Bathurst Tp.
Buffalo Ankerite Gold Mines Ltd. (f)	Box 533, South Porcupine	Deloro Tp.
Canspar Mines Ltd. (b)	100 Adelaide St. W., Toronto	Barry's Bay
Craig, T. H. (b)	Perth	Bathurst Tp.
Dominion Mines & Quarries Ltd. (a) (c)	Canada Life Bldg., Toronto	Killarney
Frontenac Floor & Wall Tile Co. Ltd. (b) (c)	Kingston	Kingston
International Nickel Co. of Canada Ltd. (a)	Copper Cliff	Lawson Tp.
Kingston Silica Mines Ltd. (a) (c)	R.R. No. 1, Kingston	Pittsburg Tp.
Keystone Contractors Ltd. (a) (b) (c)	732 Langlois Ave., Windsor	Murchison Tp.
Madawaska Feldspar Co. (a) (b)	275 St. James St., Montreal	Murchison Tp.
Manitoulin Quartzite Co. (a) (c)	732 Langlois Ave., Windsor	Manitoulin Island
Quartz Crystals Mining Co. of Canada Ltd. (a)	712 Federal Bldg., Toronto	Lansdowne Tp.
Verona Rock Products Ltd. (a) (b)	330 Bay St., Toronto	Verona
Wright and Co. (a) (c)	960 Queen St., Sault Ste. Marie, Ont.	Deroche Tp.
BRITISH COLUMBIA—		
Consolidated Mining & Smelting Co. of Canada Ltd. (a)	Trail	Grand Forks

DIRECTORY OF FIRMS—Continued

Firms in the Gypsum Mining Industry

Name of firm	Head office address	Plant location
NOVA SCOTIA—		
Canadian Gypsum Co. Ltd.	170 Bloor St. W., Toronto, Ont.	Wentworth
Conn. Adamant Plaster Co.	10 River St., New Haven, Conn., U.S.A.	Cheverie
Gypsum, Lime & Alabastine, Canada, Ltd. (*)	Paris, Ont.	Baddeck Bay
National Gypsum (Canada) Ltd.	325 Delaware Ave., Buffalo, N.Y.	Walton, Dingwall, Cheticamp
Victoria Gypsum Co. Ltd.	Little Narrows	Little Narrows
Windsor Plaster Co. Ltd.	Windsor	Brooklyn, Hants Co.
NEW BRUNSWICK—		
Canadian Gypsum Co. Ltd.	170 Bloor St. W., Toronto, Ont.	Hillsborough
ONTARIO—		
Canadian Gypsum Co. Ltd.	170 Bloor St. W., Toronto	Hagersville
Cayuga Gypsum Co. Ltd.	Caledonia	North Cayuga Tp.
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

(*) Idle 1944.

Firms in the Iron Oxide Mining Industry

Name of firm	Head office address	Location of plant or mine
QUEBEC—		
Argall, Mrs. Thomas H.	639 Ste. Angèle, Trois Rivières	Pointe du Lac
Girardin, Chas. D.	Yamachiché	Almaville en Haut
Lafrenière, Philias	St. Louis de France	St. Louis de France
Mauricy Oxide Co.	259, 6th Ave., Grand'Mère	St. Adelphe Co.
The Sherwin-Williams Co. of Canada Ltd. (*)	2875 Centre St., Montreal	Red Mill, Champlain Co
BRITISH COLUMBIA—		
Davidson, J. G.	346 Surfton Place, La Jolla, California, U.S.A.	Alta Lake

(*) Produce refined grades.

Operators in the Canadian Mica Mining Industry

(*) Active, but no shipments made.
(a) Markets dressed mica.
(b) Operates a grinding mill.
(c) Mines muscovite mica.

Name of operator	Head office address	Location of mine or plant
QUEBEC—		
Blackburn Bros. Ltd. (a) (b)	Blackburn Bldg., Ottawa, Ont.	Cantley and Perkins Mills
Blood, A. P. (a)	635 Greenwich St., New York 14, N.Y.	Denholm Tp.
Charbonneau, Regina	Perkins	Perkins
Charbonneau, N.	Perkins	Perkins
Charbonneau, Hector	Perkins	Perkins
Chenier, Z. E.	Rockland, Ont.	Grenville Tp.
Constantineau, Marguerite (a)	Pointe au Chêne	Grenville Tp.
Cross, Walter C. (a)	209 Bridge St., Hull	Hull Tp.
Cross, Leslie B.	Cascades	Cascades
Delisle, Jos.	Mistassini	Hudon Tp.
Gagne, Louis	St. Michel de Wentworth	Argenteuil Co.
Girouard, Edmond	Perkins	Perkins
Marier, Louis (a) (c)	Huberdeau	Argenteuil Co.
Mica Laurentian Ltd. (c)	Box 189, Hull	Bergeronnes Tp.
Mineault, Claude	Perkins	Papineau Co.
McLaurin Mica Ltd. (a)	Aldred Bldg., Montreal	Cantley
Mica Company of Canada Ltd. (a)	Hull	Hull
Perkins Mining Co.	Pointe Gatineau	Templeton Tp.

DIRECTORY OF FIRMS—Continued

Operators in the Canadian Mica Mining Industry—Concluded

(*) Active, but no shipments made.
(a) Markets dressed mica.
(b) Operates a grinding mill.
(c) Mines muscovite mica.

Name of operator	Head office address	Location of mine or plant
QUEBEC—Concluded		
Paiement, B.	Perkins	Perkins
Poirier, A. (a)	Wilson's Corner	Wilson's Corner
Rainville, Paul de	Perkins	N. Templeton Tp.
Renaud, J.	Perkins	Perkins
Sabourin, V.	Perkins	Perkins
Severin, J.	3452 Shuter St., Montreal	Charlevoix Co.
Simard, E. (c)	Bergeronnes	Bergeronnes
Sigouin, Frank (a) (c)	Bourmont, via Monet	Abitibi Dist.
Teegee Ltd. (a)	Room 1201 Royal Bank Bldg., Montreal	Montreal
Thompson, Wm. E.	Cantley	Cantley
Trudeau, Wm. (a)	Old Chelsea	Old Chelsea
Victory Mines (a)	517 Booth St., Ottawa, Ont.	W. Hull Tp.
Wallingford, W. M. (a)	Pointe Gatineau	Templeton Tp.
Wallingford, John H.	Perkins	Perkins
Wallingford, E., Ltd.	Perkins	Templeton Tp.
Wallingford, J. N.	Glen Almond	Glen Almond
White, A. W., Mica Ltd. (a)	Room 407, 67 Yonge St., Toronto, Ont.	Notre Dame du Laus
Wilson, Wm. S.	Cascades	Thorne Tp.
ONTARIO—		
Bancroft Mica & Stone Products	c/o S. H. Orser, Bancroft	Bancroft
Cross, Walter C. (Finlan) (c)	209 Bridge St., Hull, Que.	Davis Tp.
Kingston Mica Mining Co. Ltd.	Godfrey	Godfrey
Lee, W. W. (a)	R.R. 1, Perth Road	Perth Road
Loughborough Mining Co. Ltd. (a)	Sydenham	Sydenham
Marston Minerals Ltd. (a) (c)	Drawer 214, Madoc	Effingham Tp.
Micaspar Industries Ltd. (a)	16 James St. S., Hamilton	Loughborough Tp.
Orser and Smith (a)	c/o J. L. Smith, Cataraqui	Bedford Tp.
Purdy Mica Mines Ltd. (a) (c)	North Bay	Eau Claire
Verona Rock Products Ltd.	Verona	Verona
Watts, R. W. (a)	Perth	Perth
BRITISH COLUMBIA—		
Fairey & Co. (b)	661 Taylor St., Vancouver	Vancouver
McKay, R. C.	Oliver	Similkameen Dist.
Richmond, Geo. W. (b)	4190 Blenheim St., Vancouver	Vancouver

Firms in Canadian Peat Industry

(*) Active but no shipment made.
(a) Produces moss.
(b) Produces peat fuel.
(c) Produces humus.
(d) Inactive in 1944.

Name of firm	Head office address	Location of bog or plant
NEW BRUNSWICK—		
Fofard Peat Moss Co. (a)	Shippegan	Shippegan
Western Peat Co. Ltd. (*)	Box 699, New Westminster, B.C.	Shippegan
QUEBEC—		
Beausejour Peat Moss (a)	St. Romald	St. Lambert
Bourque & Fils (a)	St. Marc des Carrières	St. Marc des Carrières
Canada Peat Ltd. (a)	303A rue Lafontaine, Rivière-du-Loup	St. Antonin
Demers & Godbout (*)	Senneterre	Abitibi
Excel Peat Ltd. (a)	319 rue Lafontaine, Rivière-du-Loup	Isle aux Coudres
Maple Leaf Peat Ltd. (a)	303A rue Lafontaine, Rivière-du-Loup	St. Antonin
Premier Peat Moss Ltd. (a)	Isle Verte	Isle Verte
Perfect Peat Products (a)	303A rue Lafontaine, Rivière-du-Loup	St. Antonin
Quebec Peat Moss Co. (a) (b)	St. Guillaume d'Upton	St. Bonaventure
Reid, Roy F. (a)	Waterville	Waterville
Roy, Romeo, (a)	St. Ulric	St. Ulric
Roy, Louis (a)	Rivière Blanche	Rivière Blanche
Saguenay Peat Moss Co. Ltd. (a)	187 Jacques Cartier, Chicoutimi	Bagot Tp.
Tourbières Rivière-Ouelle (a)	2 Côte d'Abraham, Quebec	Rivière Ouelle
Tourbière de St. André Ltée (b)	St. André de Kam.	St. André de Kam.
Tourbière de Pointe-au-Père (a) (b)	Mont Joli	Pointe au Père
Tourbière de Grondines (*) (b)	Grondines	Grondines
Tourbière Ste. Brigide (b)	Ste. Brigide d'Iberville	Ste. Brigide d'Iberville
Tourbe Combustible (b)	Rivière-du-Loup	Withworth Tp.

DIRECTORY OF FIRMS—Continued

Firms in Canadian Peat Industry—Concluded

(*) Active but no shipments made.
(a) Produces moss.
(b) Produces peat fuel.
(c) Produces humus.
(d) Inactive in 1944.

Name of firm	Head office address	Location of bog or plant
ONTARIO—		
Arctic Peat Moss Corp. Ltd. (a)	200 Sterling Securities Bldg., Winnipeg, Man.	Crozier
Canadian Humus Products (c)	Suite 1010, 100 Adelaide St. W. Toronto	Beverley Tp.
Canadian Industries Ltd. (c)	1135 Beaver Hall Hill, Montreal, Que	Harwich Tp.
Erie Peat Ltd. (a)	Box 500, Port Colborne	Wainfleet Tp.
Leasa Peat Works (a) (b)	106 Britannia St., Stratford	Ellice Tp.
Polar Bear Peat Moss Products (a)	Fort Frances	Pinewood
MANITOBA—		
Winnipeg Supply & Fuel Co. Ltd. (a)	812 Boyd Bldg., Winnipeg	Shelley
BRITISH COLUMBIA—		
Alouette Peat Products Ltd. (a)	Pitt Meadows	Pitt Meadows
B.C. Peat Company Ltd. (a)	302 Royal Bank Bldg., Vancouver	Ladner
Byrnerood Peat Farm (a)	2707 McKay Ave., New Westminster	Burnaby
Coast Peat Co. Ltd. (a)	736 Granville St., Vancouver	Burnaby
Columbia Products Ltd. (a)	Box 699, New Westminster	Lulu Island
Commercial Peat Co. Ltd. (d)	R.R. 2, Eburne.	
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	Lulu Island

Canadian Salt Producing Firms

Name of firm	Head or executive office	Location of plant
NOVA SCOTIA—		
Malagash Salt Co. Limited	196 Provost St., New Glasgow	Cumberland Co.
ONTARIO—		
Brunner, Mond Canada, Ltd.	Canadian 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.
Purity Flour Mills Ltd	287 MacPherson Ave., Toronto	Goderich
MANITOBA—		
Canadian Industries Ltd	Box 10, Montreal, Que	Neepawa
ALBERTA—		
Industrial Minerals Ltd	2240 Sun Life Bldg., Montreal, Que	Waterways

The Talc and Soapstone Industry

Name of firm	Head office address	Location of plant or mine
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. Co. Ltd	187 St. Maurice St., Thetford Mines	Leeds Tp.
ONTARIO—		
Canada Talc Limited	Madoc	Huntingdon Tp.
BRITISH COLUMBIA—		
Wartime Metals Corp. (*)	637 Craig St. W., Montreal, Que	Kootenay National Park

MISCELLANEOUS NON-METAL MINING INDUSTRIES IN CANADA

(*) Active but not producing.

Barite

Name of operator, province and product	Head office address	Plant location
Nova Scotia—		
Canadian Industrial Minerals Ltd	Walton, N.S.	Walton
British Columbia—		
Summit Lime Works Ltd	Box 273, Lethbridge, Alta	Golden M.D.
Thrall, Ralph A	Box 273, Lethbridge, Alta	Golden M.D.

Brucite

Quebec—		
Aluminum Company of Canada Ltd	Sun Life Building, Montreal	Wakefield

Corundum

Ontario—		
Wartime Metals Corp	637 Craig St. W., Montreal, Que	Raglan Tp.

Diatomite

Nova Scotia—		
G. W. Wightman (Mrs.)	Smith's Cove, N.S.	Digby Co.
British Columbia—		
Fairey and Co	661 Taylor St., Vancouver	Cariboo M.D. Vancouver

Fluorspar

Nova Scotia—		
Papke, William	Trout River, N.S.	Inverness Co.
Quebec—		
Twin Valley Prospecting Synd	529 Besserer St., Ottawa	Huddersfield Tp.
Ontario—		
Bassett Fluorspar Mining Synd. Ltd	Room 908, 36 Toronto St., Toronto	Madoc Tp.
Detomac Mines Ltd	805 Northern Ontario Bldg., Toronto	Huntingdon Tp.
Fluoroc Mines Ltd. (*)	Box 220, Trenton	Huntingdon Tp.
Gilman, R. T	13 Govt. Road W., Kirkland Lake	Madoc Dist.
Millwood Fluorspar Mines Ltd	Box 206, Madoc	Madoc Dist.
Montgomery, J. K	Havelock	Cardiff Tp.
Reliance Fluorspar Mining Synd. Ltd	Madoc	Huntingdon Tp.
Stocklosar, Chas. A	Box 198, Madoc	Huntingdon Tp.
Tops Mining Synd. Ltd. (*)	c/o W. E. Clark, Harcourt	Cardiff Tp.

Garnet

Ontario—		
Niagara Garnet Co	c/o Wm. A. Yarwood, 8573 Krull Parkway, Niagara Falls, N.Y.	River Valley

Graphite

Ontario—		
Black Donald Graphite Ltd	Black Donald Mines	Brougham Tp.

MISCELLANEOUS NON-METAL MINING INDUSTRIES IN CANADA—Continued

Grindstones

(*) 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, Ont.	Herb Lake

Magnesitic Dolomite

QUEBEC—		
Canadian Refractories Ltd.	1050 Canada Cement Bldg., Montreal	Kilmar and Harrington

Mineral Waters

QUEBEC—		
Cie d'eau Minérale, La	632 Concord Ave., St. Hyacinthe	St. Hyacinthe
Eau Minérale Etoile	Ste. Généviève de Batiscan	Batiscan
Gurd, Charles & Co. Ltd.	1016 Bleury St., Montreal	Varennes
Lemay, Lucien	St. Francois du Lac	Nicolet Tp.
Levesque, Ernest (*)	Rivière-du-Loup Station	St. Louis de Kamouraska
Minard, Edward	Maskinongé	Maskinongé
Montclair-Richelieu Spring Water Co. Ltd.	Chambly Basin	Chambly
Pellerin, A., and Sons	St. Barnabe N.	St. Maurice
Sources Abenakis Springs Ltd.	366 rue Racine, Granby	St. François du Lac
Source Coulombia	L'Epiphanie	L'Epiphanie
Source d'eau Minérale Radnor	St. Maurice	St. Maurice
Usine d'Embouteillage Maski	St. Justin	St. Justin
ONTARIO—		
Carlsbad Springs, The	Carlsbad Springs	Gloucester Tp.
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	Bowman Tp.
Blackburn Bros. Ltd.	85 Sparks St., Ottawa	Perkins
High-Rock Phosphates Ltd.	41 Main St., Buckingham	Portland W. Tp.
Victory Mines	517 Booth St., Ottawa, Ont.	Hull W. Tp.
ONTARIO—		
Ontario Phosphate Industries Ltd. (*)	Room 1101, 62 Richmond St. W., Toronto	Bedford Tp.

Silica Brick

NOVA SCOTIA—		
Dominion Steel & Coal Corp. Ltd.	Sydney	Sydney
ONTARIO—		
Algoma Steel Corp. Ltd.	Sault Ste. Marie	Sault Ste. Marie

Sodium Carbonate

BRITISH COLUMBIA—		
Bishop, V. C. (Mrs.)	c/o Boyds Garage, Clinton	Clinton area
Davison, E. C.	2043 W. 42nd Ave., Vancouver	Clinton area

MISCELLANEOUS NON-METAL MINING INDUSTRIES IN CANADA—Concluded

Sodium Sulphate

(*) Active but not producing.

Name of operator, province and product	Head office address	Plant location
SASKATCHEWAN—		
Hart, Dr. D. C.	606 Broder Bldg., Regina	Snake Hole Lake
Horseshoe Lake Mining Co. Ltd. (*)	Ormiston	Ormiston
Mellor, John F.	Alsask	Alsask
Midwest Chemicals Ltd.	Palo	Whiteshore Lake
Natural Sodium Products Ltd.	Bishopric	Frederic Lake Alsask
Sybouts Sodium Sulphate Co. Ltd.	Gladmar	Gladmar

Sulphur (Pyrites)

Name of operator, province and product	Head office address	Plant location
QUEBEC—		
Aldermac Copper Corp. Ltd.	Dominion Square Bldg., Montreal	Arntfield
Noranda Mines Ltd.	Royal Bank Bldg., Toronto	Noranda
Waite-Amulet Mines Ltd.	Noranda	Duprat Tp.
ONTARIO—		
International Nickel Company of Canada Ltd. (†)	Copper Cliff	Copper Cliff
BRITISH COLUMBIA—		
Cons. Mining & Smelting Co. of Canada Ltd. (†)	Trail	Trail
Britannia Mining & Smelting Co. Ltd.	Britannia Beach	Britannia Beach

(†) Recover sulphur from smelter gas.

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

LIST OF OPERATORS WHICH SHIPPED BRICK, TILE, SEWER PIPE, ETC., MADE FROM DOMESTIC CLAYS

(a) Clay used
(b) Shale used.
(c) Idle.
(*) Produce Bentonite.

NOVA SCOTIA—		
Brooks, Stephen and Son (a) (b)	Box 159, New Glasgow	New Glasgow
Harriss and Harriss	5 Byng Ave., Sydney	Sydney
McCurdy, Henry (c)	Middle Musquodoboit	Middle Musquodoboit
Shaw, L. E., Ltd. (a) (b)	74 Bedford Rd., Halifax	Lantz
Standard Clay Products Ltd. (a) (b)	St. Johns, Que	New Glasgow
NEW BRUNSWICK—		
Ryan, M. and Son, Ltd. (a)	Fredericton	Fredericton.
Shaw, L. E. Ltd. (b)	74 Bedford Rd., 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
Citadelle Brique Ltée (b)	14 rue St. Joseph, Quebec	Boischatel
East-Angus Brick and Tile (a)	Box 553, East Angus	Westbury Tp.
LaPrairie Company Inc., The (a) (b)	906 University Tower Bldg., Montreal	LaPrairie, Delson
Montreal Terra Cotta Limited (a)	911 Dominion Square Bldg., Montreal	Lakeside
Roy, O. and P. (a)	St. George West	St. George West
St. Lawrence Brick Co. Ltd. (b)	1010 St. Catherine St. W., Montreal	LaPrairie
Scott Brique Reg., La (a)	Scott Junction	Scott Junction
Standard Clay Products Ltd. (a)	Box 189, St. Johns	St. Johns
St. Jean La Brique Ltd. (a)	Deschaillons	Deschaillons
ONTARIO—		
Barnes, Wm. R. Co. Ltd. (a)	243 Cumberland Ave., Hamilton	Waterdown
Broadwell, B. and Son (a)	Kingsville	Gosford S. Tp.
Canadian Pressed Brick Co. Ltd. (b)	Kenilworth S., Hamilton	Hamilton
Central Tile Bricks Corp. Ltd. (a)	Tilbury	Tilbury
Chapman Bros. (c)	145 Dawes Rd., Toronto	East York Tp.
Construction Materials Ltd. (a) (b)	Drawer 70, New Toronto	Etobicoke Tp.
Cooksville Company Ltd. (b)	46 Bloor St. W., Toronto	Cooksville
Cornhill, James & Sons Ltd	Box 36, Chatham	Harwich Tp.
Coultis, George & Son (b)	Thedford	Bosanquet Tp.
Curtin, F., Estate (a)	R.R. 4, Lindsay	Lindsay
Curtis Bros. (a)	Box 809, Peterborough	Otonabee Tp.
Deller, Albert & Son (a)	Brownsville	Brownsville
Dochart Brick, Tile & Terra Cotta Works (a)	Arnprior	Arnprior
Donaldson, Thos. G. (a)	R.R. 1, Greenock	Culross Tp.
Douglas, John R. (a)	Wilkesport	Lambton Co.
Elliott, James, Jr. (a)	519 Wellington St. W., Sault Ste. Marie	Korah Tp.
Elliott, Wm. (a)	R.R. 1, Glenannan	Bruce Co.
Fletcher Brick & Tile (a)	Fletcher	Tilbury E. Tp.
Frid Bros. Ltd. (a)	790 Main St. W., Hamilton	Hamilton
Gammage, C. R.	R.R. 2, Dresden	Camden Tp.
Hamilton Pressed Brick Co. Ltd. (a) (b)	211 Kensington Ave. S., Hamilton	Wentworth Co.
Hill, A. W. & Sons	Coatsworth	Tilbury E. Tp.
Howlett, Fred W. & Sons Ltd. (a)	Petrolia	Lambton Co.
Huntsville Brick Works (a)	Box 308, Huntsville	Chaffey Tp.
Interprovincial Brick Co. Ltd. (b)	46 Bloor St. W., Toronto	Cheltenham, Milton
Jamieson Lime Co	Renfrew	Renfrew
Janes, D. A. (a)	Mt. Brydges	Caradoc Tp.
Jasperson Brick & Tile Co. (c)	Kingsville	Coatsworth Tp.
Koebel Bros. (a)	St. Clements	St. Clements

LIST OF OPERATORS WHICH SHIPPED BRICK, TILE, SEWER PIPE, ETC., MADE FROM DOMESTIC CLAYS—Concluded

(a) Clay used. (c) Idle.
(b) Shale used. (*) Produce Bentonite.

Name of firm	Head office address	Location of plant
ONTARIO—Concluded		
Lindsay, Earl & Sons (a)	R.R. 2, Wallaceburg	Kent Co.
Martin, Amos C. (a)	R.R. 3, Wallenstein	Peel Tp.
McFarlane, W. J. (b)	Forest	Forest
McFarren, F. B., Ltd. (b)	120 Wellington St. W., Toronto	Streetsville
Milton Brick Co. Ltd. (b)	170 Bloor St. W., Toronto	Esquesing Tp.
Napanee Brick & Tile Works (a)	R.R. 3, Napanee	Lennox Co.
National Fireproofing Co. of Canada Ltd. (a) (b)	57 Bloor St. W., Toronto 5	Wentworth
National Sewer Pipe Co. Ltd. (a) (b)	Aldershot	E. Glamboro Tp. Hamilton Swansea
Northern Brick & Clay Products (a) (c)	New Liskeard	Temiskaming
Norwich Brick & Tile Works (a)	R.R. 2, Norwich	Oxford Co.
Ontario Reformatories (a) (b)	Mimico	Etobicoke Tp.
Ottawa Brick & Terra Cotta Co. Ltd. (a) (b)	Billings Bridge	Billings Bridge
Owen Sound Brick Co. Ltd. (a)	Owen Sound	Owen Sound
Paxton, Fred R. (a)	70 Herrick Ave., St. Catharines	St. Catharines
Phinn Brick Co. (a)	1042 Adelaide St., London	London
Phippen & Son (a)	390 Dawes Rd., East York	East York
Seegmiller, E. & E., Ltd. (a)	525 Wendell Ave., Kitchener	Kitchener
Snelgrove, A., Estate (a)	Beaverton	Beaverton
Sproat and Sproat (a)	R.R. 4, Seaforth	Tuckersmith Tp.
Standard Brick Co. (a)	500 Greenwood Ave., Toronto	Toronto
Superior Brick & Tile Co., Ltd. (a)	426 Victoria Ave., Fort William	Paipoonge Tp.
Thomson, Ralph (a)	R.R. 4, Atwood	Grey Tp.
Toronto Brick Co. Ltd. (a) (b)	897 Bay St., Toronto 5	Toronto, York Tp.
Wallace, R., & Son (a)	92 First Ave., North Bay	Widdifield Tp.
Wright, F. M. (a)	Comber	Tilbury W. Tp.
MANITOBA—		
Alsip Brick, Tile & Lumber Co. Ltd. (a)	537 Portage Ave., Winnipeg	Winnipeg
Pembina Mt. Clays Ltd. (*)	915 Paris Bldg., Winnipeg	Morden
Wardrop, D. M. (a)	Whitemouth	Whitemouth
SASKATCHEWAN—		
Alberta Clay Products Co. Ltd. (a)	Medicine Hat, Alta.	Ravenscrag Eastend Willows
Bruno Clay Works Ltd. (a)	411 Alberta Ave., Saskatoon	Bruno
Dominion Fire Brick & Clay Products Ltd. (a)	Box 99, Moose Jaw	Claybank
International Clay Products Ltd. (a)	Box 399, Estevan	Estevan
Medalta Potteries Ltd. (a)	332, 7th Ave. W., Calgary, Alta.	Willows, Eastend
Medicine Hat Potteries (a)	Box 672, Medicine Hat, Alta.	Redlyn
Midland Clay Co. (a) (c)	Willow Bunch	Willow Bunch
ALBERTA—		
Acme Brick Co. Ltd. (a)	125 Alberta Block, Edmonton	Cannell
Aetna Coal Co. (*)	East Coulee	Rosedale Ferry
Alberta Clay Products Co. Ltd. (a)	Medicine Hat	Medicine Hat
Grande Prairie Brick Yard	Grande Prairie	Grande Prairie
Gunderson Brick & Coal Co. Ltd. (b)	Redcliffe	Redcliffe
Kidd, Gordon L. (*)	Box 230, Drumheller	Sec. 14-29-20 W. 4
Medicine Hat Brick & Tile Co. Ltd. (a)	Box 100, Medicine Hat	Medicine Hat
Redcliffe Pressed Brick Co. Ltd. (a) (b)	Redcliffe	Redcliffe
BRITISH COLUMBIA—		
Baker Brick & Tile Co. Ltd. (a)	3191 Douglas St., Victoria	Victoria
Bazan Bay Brick & Tile Co.	Saanichton	Bazan Bay
Clayburn Co. Ltd. (a) (b)	850 W. Hastings St., Vancouver	Kilgard
Evans, Coleman & Evans (b)	902 Columbia St., Vancouver	Gabriola Island
Fairey & Co. (a)	661 Taylor St., Vancouver	Vancouver
Gypsum, Lime & Alabastine Canada, Ltd. (*)	Paris, Ont.	New Westminster
Glover, F. (*)	Princeton	Princeton
Haug, Wm. & Son (a)	Box 220, Kelowna	Kelowna
Port Haney Brick Co. Ltd. (a)	846 Howe St., Vancouver	Haney
Port Moody Brick Co. (a)	1875 E. 38th Ave., Vancouver	Port Moody
Richmond, Geo. W. (a)	4190 Blenheim St., Vancouver	Kilgard
Vancouver Brick & Tile Co. Ltd. (a)	902 Columbia St., Vancouver	Sullivan

PRODUCERS OF STONEWARE AND POTTERY

Name of firm	Head office address	Location of plant
New Brunswick—		
Canuck Pottery	198 Union St., Saint John	Saint John
Deichmann, K.	Moss Glen	Moss Glen
Foley Pottery Ltd	Saint John	Musquodoboit Saint John
Quebec—		
Poterie du Saguenay, La	Chicoutimi	Chicoutimi
Laurentian Art Pottery Inc.	St. Jerome	St. Jerome
Ontario—		
Foster Pottery Co.	Main St. W., Hamilton	Hamilton
Alberta—		
Medalta Potteries Ltd	332, 7th Ave. W., Calgary	Medicine Hat
Medicine Hat Potteries	Medicine Hat	Medicine Hat

LIST OF FIRMS IN THE IMPORTED CLAY PRODUCTS INDUSTRY

Name of firm	Address
Quebec—	
Canada Firebrick Company Limited	4741 St. Ambroise St., Montreal
Canadian Potteries Limited	5 Mackenzie King St., St. Johns
Standard Clay Products	St. Johns
Walker-Hind-Sutherland Refractories Ltd	309 St. Ferdinand St., Montreal
Ontario—	
Ajax Clay Products	4160 Dundas St. W., Toronto
Armaco Limited	Bower St., Acton
Canadian Ohio Brass Company Limited	Thorold Rd., Niagara Falls
Canadian Porcelain Company Limited	Paradise Rd., Hamilton
Canada Vitrified Products Limited	Talbot St. E., St. Thomas
Dominion Potteries	Dundas St. N., Oakville
Donvale Pottery Company	27 Davies Ave., Toronto 8
Ecanada Art Pottery	206 Dundurn St. S., Hamilton
Frontenac Floor & Wall Tile Co. Limited	Kingston
Georgetown Clay Products Limited	King St., Georgetown
Green, A. P., Fire Brick Co. Ltd.	Commercial St. (Leaside), Toronto 17
Hamilton Potteries Limited	100 Locke St., Hamilton
McMaster Pottery	Main St., Dundas
National Refractories Limited	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 Limited	282 Sherman Ave. N., Hamilton
Turner's Plastic Fire Brick Co. Ltd.	Audley St., Mimico
British Columbia—	
Allen Refractories	69E, 1st Ave., Vancouver

THE CANADIAN LIME INDUSTRY

(*) Inactive.
(a) Use calcium or high calcium limestone.
(b) Use dolomitic limestone.
(c) Purchase lime.
(d) Kind of limestone not reported.
(e) Brucitic limestone.

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
Quebec—		
Aluminum Company of Canada Ltd. (e)	1700 Sun Life Bldg., Montreal	Wakefield
Arnaud, Edwilda (d)	Joliette	Joliette

THE CANADIAN LIME INDUSTRY—Concluded

Name of firm	Head office address	Location of plant
QUEBEC—Concluded		
Bousquet, Adrien (d)	St. Dominique	St. Dominique
Canadian Refractories Ltd. (e)	1050 Canada Cement Bldg., Montreal	(c)
Carriere St. Maurice Ltd. (d)	1293 rue Hart, Trois-Rivieres	St. Louis de France
Carriere Trois-Rivieres Ltd. (a)	St. Louis de France	St. Louis de France
Cote, Joseph (a)	Metabetchouan	Metabetchouan
Deschambault Quarry Corp. (d) (*)	St. Marc des Carrieres	St. Marc des Carrieres
Dominion Lime Ltd. (a)	Lime Ridge	Lime Ridge
Filion, Narcisse (d) (*)	St. Joachim	St. Joachim
Lalumiere, 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 Carrieres
Trottier, David (d)	St. Marc des Carrieres	St. Marc des Carrieres
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
Canadian Gypsum Co. Ltd. (b)	170 Bloor St. W., Toronto	Guelph
Carleton Lime Products Co. (a)	Box 26, Carleton Place	Carleton Place
Chalmers Lime Products Ltd. (b)	689, 7th St. W., Owen Sound	Owen Sound
Chemical Lime Co. Ltd. (a)	Beachville	Oxford Co.
Gypsum, Lime & Alabastine, Canada, Ltd. (a) (b)	Paris	Beachville, Glen Christie, Halton
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
Gypsum, Lime & Alabastine, Canada, Ltd. (b)	Paris, Ont.	(c)
Manitoba Sugar Co. Ltd. (a)	Fort Garry	Fort Garry
Winnipeg Supply & Fuel Co. Ltd. (a) (b)	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)	Kananaskis	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

PRINCIPAL SAND AND GRAVEL OPERATORS, 1944

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.

Name of firm	Head office address	Location
NOVA SCOTIA—		
Crocket, V. B.	Wallace	Colchester Co.
Nova Scotia Department of Highways	Halifax	Various
Warren Bituminous Paving Co. Ltd. (w)	1454 Bloor St. W., Toronto, Ont.	Yarmouth
NEW BRUNSWICK—		
Likely, Joe A. Ltd.(w)	Saint John	East Saint John
New Brunswick Department of Highways	Fredericton	Various
Warren Bituminous Paving Co. Ltd. (w)	1454 Bloor St. W., Toronto, Ont.	Sussex
QUEBEC—		
Beaudry, Antoine	1706 Plessis, Montreal	St. Henri
Bigras, Omer	Ste. Rose Ouest	Ste. Rose Ouest
Bonner Sand & Ballast Ltd. (w)	1434 St. Catherine St. W., Montreal	South Durham
Breen, Thos.	Kearns	Guigues
Brouillet Sand & Gravel Co.	Rawdon	Ste. Julienne
Canadian Johns Manville Co. Ltd.	Sun Life Bldg., Montreal	Asbestos
Coaticook, City of	Coaticook	Coaticook

PRINCIPAL SAND AND GRAVEL OPERATORS—Continued

Name of firm	Head office address	Location
QUEBEC—Concluded		
Compagnie de Sable Ltee (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'mere	Garneau Jct.
Goyer, Edouard & Frere	Saint Bruno	St. Bruno
Granby, City of	Granby	Granby
Laberge, Evariste	Ste. Foy	Ste. Foy
La Corporation de la Ville de Magog	Magog	Magog
Latulippe, Philippe (w)	240 rue de la Ronde, Quebec	St. Charles River
Marchand, Euclide	505-8e rue Almaville-en-haut	Mont Carmel
Mercure, Camille	555-16eme Ave., St. Hyacinthe	St. Dominique
Patier & Freres	8645 rue Casgrain, Montreal	Two Mountains
Quebec, City of	Quebec	Ste. Therese de Beauport
Roimouski, City of	Rimouski	Rimouski
Riverin, Jean-Joseph Ltee	115 Jacques Cartier, Chicoutimi	Various
Robert & Dufour Enrg.	Ste. Anne de Beaupre	Beauport West
St. Francis River Dredging Co. (w)	St. Francois 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. Felix de Valois	St. Felix de Valois
Tremblay, Jos. Ltee	376 rue Georges, Shawinigan Falls	St. Mathieu
Venne, Oscar	Lachenaie	Lachenaie
ONTARIO—		
Allan, James	R.R. 3, Seaforth	Seaforth
Axford, J. B.	35 Elm St., St. Thomas	South Yarmouth
Barnes, Wm. R. Co. Ltd. (w)	243 Cumberland Ave., Hamilton	Waterdown
Beckett, Morden (w)	Winona	Winona
Benson & Patterson	Stamford	Stamford
Boyd Bros.	Osgoode	Osgoode
Braas Bros. (Hillcrest Sand Co.)	Niagara Falls	Stamford
Brantford, City of	Brantford	Brantford
Burrows, J.	North Bay	Widdifield Tp.
Cameron & Phin (w)	Welland	Port Maitland
Coleman, Gordon T.	235 Sidney St., Cornwall	Bonville
Conlin, Herbert L. Estate (w)	66 King St. W., Toronto	Scarboro Tp.
Consolidated Sand & Gravel Ltd.	402 Harbour Commission Bldg., Toronto	Fuller, Paris and Waterford
Cooper, A. & Co.	212 N. May St., Fort William	Thunder Bay
Cudmore, Harold T.	Hensall	Hensall
Curran & Briggs Ltd. (w)	61 Haverson Blvd., Toronto	Wilberforce, Brooke and Bancroft
Dibblee Construction Co. Ltd. (w)	248 Albert St., Ottawa	Bowesville Road
Ellins Bros.	304 Scarlett Rd., Toronto 9	Etobicoke Tp.
Fewster, Stanley	R.R. 4, St. Marys	Oxford Co.
Forwell Sand & Gravel Ltd.	31 Whitney Place, Kitchener	Waterloo
Foster, R. R.	86 Spadina Ave., Ottawa	Britannia Heights
Gauthier, J.	Porcupine	Whitney Tp.
Goodreau, Charles Estate (w)	Northwood	Harwich Tp.
Grandmaitre, Donat	71 Montreal Rd., Eastview	Rockliffe Village
Hall, Thomas G.	Plattsville	Blenheim Tp.
Hollinger Cons. Gold Mines Ltd.	Timmins	Tisdale Tp.
Howard Sand & Gravel Co. Ltd. (w)	Aldershot	Flamboro Tp.
Jupp, A. E. Construction Co. Ltd.	56 Blake St., Toronto	Pickering Tp.
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	River
Nicholson Transit Co. Ltd. (w)	9690 W. Jefferson Ave., Detroit, Mich., U.S.A.	Eastern Cap
Quigley's Foundry Sands (w)	Bartonville	Waterdown
Rayner Construction Ltd. (w)	29 Commercial St., Leaside	Fergus & Geraldton
Scott, Thos.	R.R. 1, Seaforth	McKillop Tp.
Smythe, C. Ltd. (w)	Box 8, Postal Station D, Toronto 9	Mt. Dennis
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., London	Bentinck Tp.
United Towing & Salvage Co. Ltd. (w)	635 Common St., Montreal, P.Q.	Lake Superior
White, Bertha M. (w)	209 N. Vidal St., Sarnia	Sarnia Tp.
Woollatt Fuel & Supply Co. Ltd. (w)	2171 Ottawa St., Walkerville	Leamington
MANITOBA—		
Alsip Brick, Tile & Lumber Co. Ltd.	537 Portage Ave., Winnipeg	Beausejour
Brandon, City of	City Hall, Brandon	Brandon
Building Products & Coal Co. Ltd. (w)	111 Christie St., Winnipeg	Bird's Hill
Greater Winnipeg Water District	185 King St., Winnipeg	Mile 31 and Mile [illegible] 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	Bird's Hill
SASKATCHEWAN—		
Betteridge, Stanley	Pilot Butte	Pilot Butte
Hudson Bay Mining & Smelting Co. Ltd.	500 Royal Bank Bldg., Winnipeg, Man.	Flin Flon
Prince Albert, City of	Prince Albert	Prince Albert
Saskatchewan Department of Highways	Regina	Various

PRINCIPAL SAND AND GRAVEL OPERATORS—Concluded

Name of firm	Head office address	Location
ALBERTA—		
Alberta Department of Highways	Edmonton	Various
Cristall Sand	10165, 104th St., Edmonton	Perryvale
Jefferies & Sons Ltd. (w)	Calgary	Calgary
BRITISH COLUMBIA—		
British Columbia Department of Highways	Victoria	Various
Chilliwack, City of	Chilliwack	Chilliwack Tp.
Consolidated Mining & Smelting Co. of Canada Ltd.	Trail	Fort Steel and Tadanac
Deeks Sand & Gravel Co. Ltd. (w)	101 West 1st Ave., Vancouver	Coquitland, North Vancouver and Seymour Creek
Gilley Bros. Ltd. (w)	902 Columbia St., New Westminster	Port Coquitlam
Gravel Contractors Ltd.	Dawson Creek	Pouce Coupé River
Highland Sand & Gravel Co. Ltd. (w)	Lynnmour	Lynnmour
Hillside Sand & Gravel Co. Ltd. (w)	1075 Main St., Vancouver	Hillside
McIntyre & Harding Gravel Co. Ltd. (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
Producers Sand & Gravel Co. (1929) Ltd. (w)	1902 Store St., Victoria	Royal Bay
Road Materials Ltd. (w)	8699 Hudson St., Vancouver	North Vancouver
Saanich, District of	Royal Oak P.O., Vancouver Island	Saanich Municipality

DIRECTORY OF THE STONE QUARRYING INDUSTRY, 1944

(*) Firms operating dressing works in conjunction with quarry.
(†) Did not ship in 1944.

Granite

Name	Head office address	Location
NOVA SCOTIA—		
Bower, A. R.	Box 255, Shelburne	Shelburne
Dauphinee, W. T. (*)	Shelburne	Shelburne
N. S. Department of Highways	Halifax	Various
Nixon, W. H. (*)	R.R. 3, Middleton	Nictaux South
Rice Bros. (*)	Lawrencetown	Nictaux West
Rice, W. D. (†)	Middleton	Nictaux West
NEW BRUNSWICK—		
Granite Street Pavement & Construction Co. Ltd. (*)	Box 1137, Saint John	Hampstead
Milne Coutts & Co. Ltd. (*)	St. George	St. George
Mooney, B., and Sons, Realty Ltd.	49 Canterbury St., Saint John	Hampstead
O'Brien and Baldwin (*)	St. George	St. George
Spinneys Quarry	Box 96, St. George	St. George
QUEBEC—		
Anderson, James (*)	Box 125, Beebe	Beebe
Bérubé, Lucien (*)	Brownsburg	Chatham Tp.
Bolduc, Antonio (*)	St. Sebastien	Beauce
Brodie's Limited (*)	1070 Bleury St., Montreal	Mount Johnson Graniteville Guenette
Bussières, Gérard (*)	St. Sebastien	Ste. Cecile
Cloutier, R. L. (*)	Beebe	Beebe
Delwaide & Goffin (*)	1365 rue St. Valier, Quebec	Chicoutimi
Deschambault Quarry Corp.	56 rue St. Pierre, Quebec	St. Gérard
Dery, Lorenzo	Almaville	Almaville
Dallier, Joseph Belley	330 St. Dominique, Jonquière	Jonquière
Dubois, Honoré (*)	Rivière à Pierre	Rivière à Pierre
Drummond, La Compagnie Pierre Concasse	Box 735, Sherbrooke	Drummondville
Dumas & Voyer (*)	Rivière a Pierre	Rivière à Pierre
Gaborinult & Nevers (*)	Box 65, Grenville	Grenville Tp.
Gagnon, Arthur	1740 4ème rue, Grand'Mère	Grand'Mère
Gosselin, Oscar	St. Samuel	St. Samuel
Granite National Ltée (*)	St. Joseph d'Alma	St. Gédéon St. Joseph d'Alma
Grenier, Elie	Glenada	Glenada
Lacasse & Boulais	Box 23, Beebe	Beebe
Laforce, H., & Fils (*)	1327 rue St. Valier, Quebec	Chicoutimi
Laroche, Omer	Rivière à Pierre	Rivière à Pierre
Maltais, Charles	Box 160, St. Joseph d'Alma	St. Joseph d'Alma
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. (*)	660 St. Catherine St. W., Montreal	Cap St. Martin

DIRECTORY OF THE STONE QUARRYING INDUSTRY, 1944—Continued

Granite—Concluded

Name	Head office address	Location
QUEBEC—Concluded		
Sherbrooke, Cité de	Box 754, Sherbrooke	Sherbrooke
Shawinigan Carrière Reg.	57A First St., Shawinigan Falls	Ste. Flore
Silver Granite Co. Ltd. (*)	2331 rue Provençal, Montreal	St. Samuel
Stanstead Granite Quarries Co. Ltd. (*)	Beebe	Beebe
Wilkinson, Frank L. (†)	Beebe	Stanstead Co.
ONTARIO—		
Building Products Ltd. (*)	Box 6063, Montreal	Madoc
Curran & Briggs Ltd.	61 Haverson Blvd., Toronto	Kohler Tp.
Fort William, City of	Fort William	Fort William
Hewitson Construction Co. Ltd.	509 Public Utilities Bldg., Port Arthur	McIntyre Tp.
Ontario Rock Co. Ltd.	Room 303, 2 College St., Toronto	Peterborough Co.
MANITOBA—		
Winnitoba Marble Co. Ltd. (*)	1180 Wall St., Winnipeg	W. Hawk Lake
BRITISH COLUMBIA—		
B.C. Monumental Works Ltd. (*)	27 Kingsway, Vancouver	Vancouver Dist.
Coast Quarries Limited	1840 West Georgia St., Vancouver	Granite Falls
Gilley Bros. Ltd.	902 Columbia St., New Westminster	Coquitlam
Nelson, City of	Nelson	Nelson M.D.
Nelson Granite & Monumental Co. (*)	Nelson	Nelson M.D.
Trail, Corp. of	Trail	Trail
Vancouver Granite Co. Ltd.	308 Pacific Bldg., Vancouver	Nelson Island
Vernon Granite & Marble Co. (*)	Box 265, Vernon	Vernon M.D.
Wilson, James (*)	Sirdar	Nelson M.D.

Limestone

Name	Head office address	Location
NOVA SCOTIA—		
Dillman Bros. (*)	Admiral Rock	Admiral Rock
Eastern Lime Co. Ltd. (*)	Windsor	Windsor
Kirkpatrick, Robie	Kirkhill	Kirkhill
Mosher Limestone Co. Ltd.	Upper Musquodoboit	Upper Musquodoboit
Nairn, J. S.	24 Whitney Ave., Sydney	Scotch Lake
Nova Scotia Department of Agriculture	Halifax	Various
NEW BRUNSWICK—		
Brookville Manufacturing Co. Ltd.	Brookville	Brookville
Snowflake Lime Ltd.	3 Pokiok Rd., Saint John	Saint John
QUEBEC—		
Aluminum Co. of Canada Ltd.	1700 Sun Life Bldg., Montreal	Chicoutimi
Amendements Calcaire de R-B, Les	Rivière-Bleue	Rivière-Bleue
Andorno, Jean (*)	Cap St. Martin	Cap St. Martin
Beaudry, J. P.	101 Taché, Joliette	Joliette
Bedard, Jean, Ltée (*)	82, 33rd Ave., Lachine	Caughnawaga
Boucher, Louis	Percé	Gaspé Co.
Boucher, Telesphore	Notre Dame de la Salette	Notre Dame de la Salette
Bourget, John D.	Defonceville	Gaspé Co.
Canada Cement Co. Ltd.	Box 290, Station B, Montreal	Hull
Canadian Quarries Company	4740 rue Iberville, Montreal	Laval Co.
Carrière du Cap St. Martin	636 Ave. Querbes, Outremont	Cap St. Martin
Carrière Gravel Ltée	Chateau Richer	Chateau Richer
Carrières de St. Dominique Ltée	555, 16eme Ave., St. Hyacinthe	St. Dominique
Carrière Pointe-Claire	Dorion, Vaudreuil	Beaconsfield
Carrière St. Barthelemi Ltée	St. Barthelemi	St. Barthelemi
Carrière St. Maurice Ltée	1293 rue Hart, Trois Rivières	St. Louis de France
Carrière Trois Rivières Ltée	St. Louis de France	St. Louis de France
Carrière Lagacé Ltée	130 Blvd. Labelle, L'Abord-à-Plouffe	L'Abord-à-Plouffe
Charbonneau & Cie	St. Francois de Sales	Laval Co.
Departement de la Justice (*)	Ottawa	St. Vincent de Paul
Deschambault Quarry Corp. (*)	56 rue St. Pierre, Quebec	St. Marc des Carrières
Dominion Lime Ltd.	Lime Ridge	Lime Ridge
Drouin, Belonnie	St. George W., Beauce	Ste. Justine
Durocher, Cyrville	11021 Notre Dame E., Montreal	Montreal East
Filion, Aldège	Lachute	Lachute
Fiset, Eliodore	St. Marc des Carrières	Portneuf Co.
Fortin, Camille	Chambord Junction	Lac St. Jean
Gagné, Octave	St. Ulric	St. Ulric
Gagnon et Leclerc	St. Joachim	St. Joachim
Gaspesian Fertilizer Co.	Port Daniel E.	Port Daniel E.
Gauthier, Jos. O. (*)	St. Marc des Carrières	St. Marc des Carrières
Gingras et 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
Kennedy Construction Co. Ltd.	407 McGill St., Montreal	Actonvale
Lakeshore Construction Co. Ltd.	137 Cartier Ave., Pointe Claire	Pointe Claire
Landry, J. P. A.	St. André, Matapedia	St. André

DIRECTORY OF THE STONE QUARRYING INDUSTRY, 1941—Continued

Limestone—Continued

Name	Head office address	Location
QUEBEC—Concluded		
Langlois, Adjutor	St. Marc des Carrières	St. Marc des Carrières
Larouche, Jean B.	Baie St. Paul	Baie St. Paul
Lasalle Quarry Ltd.	8413 Blvd. St. Michel, Ville St. Michel	Ville St. Michel
Laurentian Stone Co. Ltd.	195 Nicholas St., Ottawa	Hull
Leclerc, J. J.	Drapeau	Drapeau
Martineau Fils Ltée (*)	517 E. Marie-Anne, Montreal	Rosemount
Mercure, Camille	555, 16eme Ave., St. Hyacinthe	St. Dominique
Miner, R. H., Co. Ltd.	719 Sun Life Bldg., Montreal 2	Belanger Village St. Laurent
Ministère de la Voirie	Quebec	St. Charles de Bellechasse
Montreal Quarry & Cut Stone Co.	2020 Ave. Union, Montreal	Montreal
National Quarries Ltd.	6301 Park Ave., Montreal	Laval Co.
Naud, Eugene	Hamlin	St. Marc des Carrières
Ouimet, Eugene	R.R. 2, St. Jean	St. Jean
Paquette, Lewis	Cap St. Martin	Cap St. Martin
Paquin, Laurent (*)	1043 Blvd. des Forges, Trois Rivières	Trois Rivières
Pelletier, Jos. E.	Ste. Anne des Monts	Gaspé N.
Raby, Emile (Syndicate Co-operative)	Ferme-Neuve	Ferme-Neuve
Rioux, Louis	Cowansville	Cowansville
Roberval, Cie de Construction Ltée	Roberval	Roberval
Rousseau, T. E.	105 Cote de la Montagne, Quebec	Matapedia Co.
Salaberry de Valleyfield, La Cité	Hotel de Ville, Salaberry de Valleyfield	Salaberry de Valleyfield
St. Francis Rock Products & Equipment Ltd.	42 Vivian Ave., Mount Royal	St. Laurent
St. Laurent Stone Products & Supplies Ltd.	42 Vivian Ave., Mount Royal	St. Laurent
Shawinigan Chemicals Ltd.	Power Bldg., Montreal	Bedford
Syndicat de St. Godfroi	c/o S. Grenier, St. Godfroi	St. Godfroi
Standard Clay Products Ltd.	Box 189, St. Johns	St. Johns
Standard Lime Co. Ltd.	Joliette	St. Paul de Joliette
Syndicat de Broyage de Lévis	R.R. 1, St. Joseph de Lévis	St. Joseph de Lévis
Tanguay, J. L. and Royer, A.	Ste. Justine	Ste. Justine
Trappe de N. D. de Mistassini, La	Village de Pères (Roberval)	Mistassini
Tremblay, Nap.	31 rue Joffre, Hull	Hull
Tremblay, Welley	Ste. Anne, Chicoutimi	Tremblay Cantor
Union des Carrières & Pavages Ltée	48, 21ème Ave., Limoilou, Quebec	Quebec
Varin, Joseph	Chemin Cote St. Michel, Montreal	Montreal
Verreault, Elz. Ltée	194 Dupont, Quebec	Giffard
Viau, Paul	340 Blvd. du Havre, Valleyfield	Grande Isle
ONTARIO—		
Abitibi Power & Paper Co. Ltd.	Iroquois Falls	Haileybury
Bonter Marble & Calcium Co. Ltd.	Box 61, Marmora	Marmora
Bonter, W. F.	Malone	Malone
Brunner, Mond Canada, Limited	Canadian Bank of Commerce Bldg., Toronto	Anderdon Tp.
Canada Cement Co. Ltd.	Box 290, Station B, Montreal	Belleville
Canada Crushed Stone Co. Ltd.	72 Sun Life Bldg., Hamilton	Dundas Hagersville
Carleton Lime Products Co.	Box 26, Carleton Place	Ramsay Tp.
Chemical Lime Co. Ltd.	Beachville	Beachville
Chem-Ore Mines Ltd.	156 Yonge St., Toronto	Bobcaygeon
Cook, J. S. (*)	Wiarton	Amable Tp.
Gypsum, Lime & Alabastine, Canada, Ltd.	Paris	Beachville Glen Christie Halton
Hagersville Quarries Ltd.	Hagersville	Hagersville
Haldimand Quarries & Construction Ltd.	137 Wellington St. W., Toronto	Hagersville
Jamieson Lime Co.	Renfrew	Horton Tp.
Johnson Bros. Co. Ltd.	37 Market St., Brantford	Walpole Tp.
Kingston Penitentiary	Box 22, Kingston	Kingston
Kirkfield Crushed Stone Ltd.	2700 Dufferin St., Toronto	Kirkfield
LaPierre, M. C.	1949, 8th Ave. E., Owen Sound	Owen Sound
Law, R. C., Crushed Stone Ltd.	Port Colborne	Port Colborne
Limestone Products Ltd.	1109 Millwood Road, Toronto	N. Orillia Tp.
Marlhill Mines Ltd.	Thorold	Marlbank
McDonald, A. G.	Bronte	Lake Ontario
McGinnis & O'Connor	394 King St. E., Kingston	Pittsburg Tp.
North American Cyanamid Ltd.	Niagara Falls, Ont.	Ingersoll
Ontario Rock Co. Ltd.	Room 303, 2 College St., Toronto	Belmont Tp.
Pembroke, Town of	Pembroke	Pembroke
Queenston Quarries Ltd. (*)	72 Sun Life Bldg., Hamilton	St. Davids
Verona Rock Products Ltd. (*)	330 Bay St., Toronto	Verona
Walker Bros.	Box 586, Thorold	Stamford Tp.
Welland Crushed Stone & Building Co. Ltd.	R.R. 2, McLeod Road, Niagara Falls	Stamford Tp.
MANITOBA—		
Building Products & Coal Co. Ltd.	111 Christie St., Winnipeg	Inwood
Tyndall Quarry Co. Ltd. (*)	1591 Erin St., Winnipeg	Garson
Winnipeg, City of	223 James Ave., Winnipeg	Stoney Mountain
Winnipeg Supply & Fuel Co. Ltd.	812 Boyd Bldg., Winnipeg	Moosehorn Stonewall
ALBERTA—		
Loders Lime Co. Ltd.	Kananaskis, Exshaw P.O.	Kananaskis
Summit Lime Works Ltd.	Box 273, Lethbridge	Lethbridge Dist.

DIRECTORY OF THE STONE QUARRYING INDUSTRY, 1944—Concluded

Limestone—Concluded

Name	Head office address	Location
BRITISH COLUMBIA—		
Agassiz Lime Quarry	Box 58, Agassiz	New Westminster M.D.
Beale Quarries Ltd.	744 W. Hastings St., Vancouver	Van Anda
B.C. Department of Highways	Victoria	Various
British Columbia Pulp & Paper Co. Ltd.	Bank of Nova Scotia Bldg., Vancouver	Quatsino Sound
Fife Lime Quarry	957 Rossland Ave., Trail	Fife Station
Koeye Limestone Co.	Namu	Koeye River
Pacific Lime Co. Ltd.	744 W. Hastings St., Vancouver	Blubber Bay

Marble

Name	Head office address	Location
QUEBEC—		
Canadian Dolomite Co. (†)	14 Powell Ave., Ottawa	Portage du Fort
MAB Ltée	77 Cremazie, Quebec	St. Joseph de Beauce
Missisquoi Stone & Marble Co. Ltd. (*)	Philipsburg	Philipsburg
White Grit Company	c/o H. Hayley, Hurdman Rd., Ottawa	Portage du Fort
ONTARIO—		
Stockloser, K., Marble Quarries	Madoc	Eldorado Madoc
White Star Mines (Bolender Bros.)	Haliburton	Eagle Lake
ALBERTA—		
Couch, E. J. (†)	502 Ninth St. E., Calgary	Radnor
BRITISH COLUMBIA—		
Marble and Associated Products	507 Ellice St., Victoria	Malahat

Sandstone

Name	Head office address	Location
NOVA SCOTIA—		
Fairview Crushed Stone Ltd.	637A Gottingen St., Halifax	Halifax
Wallace Quarries Ltd.	Wallace	Wallace
NEW BRUNSWICK—		
Read Stone Company Ltd. (*)	Sackville	Stonehaven
Smith, E. A. (*)	Shediac	Shediac
QUEBEC—		
Blais, Joseph	32 Mont-Marie Ave., Lévis	St. Romuald
Gagnon, L. P.	St. David de Lévis	St. David de Lévis
Sherbrooke, City of	Box 754, Sherbrooke	Ascot Tp.
Peel Construction Co. Ltd.	75 Main St. N., Brampton	Trois Pistoles
Rousseau, T. E.	105 Cote de la Montagne, Quebec	New Carlisle
Simard Adjutor Inc.	Pointe-au-Pic	Pointe-au-Pic
ONTARIO—		
Austin Corner	Belfountain	Inglewood
Campbell Sandstone Quarries Ltd. (*)	Box C19, Westboro	Bells Corners
Martin, E.	Glen Williams	Glen Williams
Norton, A. W.	Limehouse	Limehouse
Sinfield, E. W.	R.R. 1, Terra Cotta	Terra Cotta
Sykes Quarries	Church St., Georgetown	Glen Williams
BRITISH COLUMBIA—		
Cons. Mining & Smelting Company of Canada Ltd.	Trail	Fort Steele M.D.
Canadian Pacific Railway Co.	Montreal	Albert Canyon

Slate

Name	Head office address	Location
QUEBEC—		
Williamson & Crombie	Richmond	Kingsbury
BRITISH COLUMBIA—		
Brown, O. M.	1903 Lansdowne Rd., Victoria	Leachtown

PRODUCERS OF ROCK WOOL, 1944

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

EXPLANATORY NOTES

Method of Computing Quantities and Values of the Mineral Production of Canada in 1944.

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 1944 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 1944 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 1944 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.